

# **SCHEDULE B-2 - FILL CONTROL REPORT**

## **FILL CONTROL REPORT**

**GLENELG RESIDENTIAL DEVELOPMENT  
2358737 ONTARIO INC.**

**TOWNSHIP OF SOUTHGATE**

### **PREPARED BY:**

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**CFCA FILE NO. 1060-4171**

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## 1.0 INTRODUCTION

C.F. Crozier & Associates has been retained by 2358737 Ontario Inc. (Developer) to complete a fill control report in support of the Glenelg Residential Development, located in the Village of Dundalk, Township of Southgate, County of Grey (Subject Development). The Developer wishes to commence the pre-grading earthworks operations in Summer of 2020 and thus are seeking approval to do so from the Township of Southgate (Township). The following report has been prepared to provide detail of the proposed earthworks program, and to facilitate the aforementioned approval.

The Developer seeks to enter into a Site Alteration Agreement with the Township for the Subject Development and will be submitting the appropriate fill applications with the Township and GRCA. The proponent's consulting team includes MHBC as the Planning Consultant, Soil Engineers Limited (SEL) as the Geotechnical Consultants and SLR Consulting Ltd. as the Environmental/Hydrogeological Consultant.

## 2.0 BACKGROUND AND SITE DESCRIPTION

The Glenelg Residential Development is approximately 14.6 ha of an overall 33 ha property located at the west end of the Community of Dundalk. The Subject Development is bounded by Glenelg Street to the south, a Natural Heritage Area to the west, the CP Rail Trail to the east and the remainder of the Developer's land to the north (not subject to the current application). The developable area of the property is currently utilized as agricultural land. Refer to Figure 1 for the Site Location Plan.

The Subject Development will consist of 130 single-detached units, 33 townhouse units, open space/park blocks, walkways/trails, a stormwater management block, and approximately 1.3km of Urban Right-of-Way. In addition, Block 137 and 138 have been provided to accommodate roadway access to potential future development located to the north. The Draft Plan has been presented in Figure 2 (MHBC, July 2019). It should be noted that concurrent with this submission, a Draft Plan redline which introduces seven additional single-detached units along the east side of Street A is being submitted for approval by the Township. This redline increases the total unit count for the Subject Development to 170 units and reduces the Stormwater Management Facility Block from 1.37 ha to 1.1 ha.

In 2019, Planning Applications were submitted and approved in support of a Zoning By-law Amendment, Official Plan Amendment, and Draft Plan Application for the Subject Development.

Soil investigations for the Subject Development were completed by Sirati & Partners Consultants Limited in January of 2017 (*Preliminary Report on Geotechnical Investigation – Proposed Residential Development – 231 Glenelg Street*, January 2017). Within this investigation a total of eight (8) boreholes were advanced across the site. These boreholes revealed that the site is underlain by water bearing cohesionless soils between 0.8 m and 3.14 m below existing grade, overlying sandy silt fill. The cohesionless soil strata is composed of silt, sandy silt, silty sand, sand and gravel.

In addition, SLR Consulting Ltd. completed a Hydrogeological Investigation in July of 2019 to determine hydrogeologic constraints and provide site water balance requirements for any future development (*Hydrogeologic Study – 193 Glenelg Street*, July 2019). Groundwater monitoring wells were installed at selected locations for the Hydrogeological Study. The groundwater monitoring program conducted between August 2018 and July 2019 determined that groundwater levels were highest in the Spring and observed between 0.40 m and 1.0 m below existing grade. It is noted that the groundwater monitoring program is still ongoing to ensure seasonal water table depths are accurately characterized. It is expected that the seasonally high groundwater level will be observed in the Spring.

### 3.0 FILL REQUIREMENT

Given the existing topography of the property in relation to the proposed residential development grading, the site will require fill to raise the existing grades to an elevation suitable for servicing.

Based on the proposed site grading, the following Earthworks operations are required. Please note the following volumes are subject to change throughout the detailed design process.

- Topsoil to be Stripped and Stockpiled (0.4 m depth) = 41,200 m<sup>3</sup>
- Cut-to-Fill material (within SWM Facility) = 6700 m<sup>3</sup>
- Cut-to-Fill material from SWM Facility (place within Residential Area) = 2730 m<sup>3</sup>
- Cut-to-Fill material (within Residential Area) = 1260 m<sup>3</sup>
- Mineral Soil Import = 83,900 m<sup>3</sup>
- Drainage Layer Import = 27,800 m<sup>3</sup>

### 4.0 CRITERIA

The placing of fill will not be permitted on the Subject Lands unless authorized by the Township. Furthermore, given that the Subject Lands partially lie within the Grand River Conservation Authority (GRCA) Regulated Area, a fill permit from the Conservation Authority will also be required for alteration to any areas within these limits.

The Township requires confirmation that the quality of the off-site material meets Ministry of Environment, Conservation and Parks (MECP) "Table 2" criteria for residential development lands. To this end, SEL has been retained by the proponent as the Geotechnical Engineer. SEL will confirm that off-site sourced material is clean and suitable for use on the site as fill material. SEL will provide all necessary geotechnical engineering advice during the placement of the material, from the perspective of compaction and testing. Refer to Appendix A for the 'General Requirements for Engineered Fill' prepared by SEL.

GRCA criteria associated with issuance of a Fill Permit pertain to erosion and sediment control, as well as environmental protection, specifically in relation to the nearby Natural Heritage Features.

The following sections of this report speak to areas of interest of the Township and GRCA.

### 5.0 WORK PLAN

#### 5.1 Access Entrance

The proposed filling operation requires fill to be placed in lifts and compacted appropriately, per the recommendations of SEL. Therefore, a construction access route is required. Direct access to the development areas of the site will be provided via Glenelg Street at the existing driveway location. Refer to Drawing 104 for the Site Alteration Plan.

At the site entrance, a mud mat will be constructed to minimize the tracking of material onto Glenelg Street (refer to detail provided on Drawing 104). The entrance will be monitored during fill operations by SEL and Crozier, and any necessary repairs to maintain the entranceway will be completed by the Contractor at the direction of the Field Engineer.

## 5.2 Spill Contingency

During fill placement activities, no on-site storage of fuels and no filling or servicing of machinery and equipment will be allowed within 30 metres of existing ditches and environmentally sensitive lands. Machinery that is present outside of these lands will also require spill contingency procedures and this will be the responsibility of the Contractor as indicated in their contract.

## 5.3 Proposed Pre-Grading Design

The quantities of fill material required to develop the Glenelg Residential Development have been determined based on the Site Grading Plans (to be provided by the Engineer during Earthworks). These grades will ensure that positive drainage is provided on the fill material and any runoff is directed towards the identified sediment and erosion control features.

The details provided on Drawing 104 and the Site Grading Plans provide sufficient information to allow the Contractor to complete the placement of fill within the Subject Lands and to meet the stringent guidelines set out by the GRCA within the permit.

## 5.4 Erosion and Sediment Control

The focus of the erosion and sediment control design is to ensure that drainage leaving the site is appropriately cleaned of sediment prior to leaving. The erosion and sediment control measures designed are also intended to minimize sediment-laden runoff from entering adjacent properties around the site perimeter that are not owned by the Developer.

All sediment and erosion controls will be installed prior to the commencement of any Earthworks operations and maintained throughout all site activities until the site is stabilized or as directed by the Engineer, GRCA and/or Township. Controls are to be reviewed regularly, after each significant rainfall, and maintained in proper working condition. Refer to the Drawing 104 for the locations of the proposed erosion and sediment control measures.

### 5.4.1 Temporary Sediment Basin

During the pre-grading activities, the runoff generated from the disturbed areas will drain to a temporary sediment basin located within the SWM Facility Block. The proposed SWM Facility will be rough graded to act as a temporary sediment basin. The SWM Facility is located within Block 146 at the south end of the development. Swales are proposed to be constructed within the site as Earthworks operations proceed to direct runoff to the pre-graded SWM Facility. In addition, interceptor ditches have been specified around portions of the site perimeter to intercept and convey flow to the sediment basin. Please note interceptor ditches will not interfere with existing drainage conditions. Interceptor ditches will be finished complete with topsoil and hydroseed to reduce potential erosion and reduce flow velocities.

Per the 'Erosion & Sediment Control Guidelines for Urban Construction (Greater Golden Horseshoe Area Conservation Authorities, 2006)', the sediment basin will be sized to provide an active storage volume and permanent pool volume that meets a minimum of 125 m<sup>3</sup> and 185 m<sup>3</sup> per hectare of contributing drainage area, respectively. The following table details the required and provided permanent pool and active storage volumes.

**Table 1: Summary of Sediment Basin Storage Volumes**

	Temporary Sediment Basin	
	Required Volume (m <sup>3</sup> ) <sup>1</sup>	Provided Volume (m <sup>3</sup> )
Permanent Pool	1667	7224
Active Storage	1126	5780

1. This is based on a contributing drainage area of 9.01 ha.

The sediment basin has been designed with a ditch inlet catchbasin outlet structure, which consists of a bird cage temporary grate, ditch inlet catchbasin and a 175 mm diameter orifice. Controlled flows will discharge via a 300 mm diameter outlet pipe to the existing 800 mm diameter HDPE culvert. Flows from this point will be conveyed south to the Southern Natural Heritage Feature. The sediment basin outlet structure detail has been provided on Drawing 104 and extended detention orifice calculations have been provided in Appendix C.

#### 5.4.2 Silt Fencing

Silt fencing will be installed along the perimeter of the development to define the limits of the disturbed area including site clearing, topsoil stripping, fill operations, temporary drainage channels, as well as in areas to intercept any flows leaving the site. Silt fencing will play a crucial role in preventing sediment from migrating off site. Locations for the fences are shown on Drawing 104, but additional fencing may be added as necessary based on decisions by Crozier and the Developer prior to and during placement of fill.

#### 5.4.3 Dust Suppression

During earthwork activities, the Developer and Contractor will be responsible for ensuring that measures for dust suppression are provided as required, such as the application of water or lime.

#### 5.4.4 Topsoil Stockpiles

Since the Earthwork's operations are intended to raise the existing site grades to a suitable elevation required for servicing, it will be necessary to strip topsoil from beneath the fill. Topsoil is to be stockpiled at the north end of the development. Refer to Drawing 104 for this location. It should be noted that topsoil that is not required will be hauled off-site.

### 5.5 **Schedule of Works**

A schedule for the fill operations required for the Subject Development can be found below. The Proponent intends to acquire external fill over a period of three to four months. Placement of fill is anticipated to commence in Summer of 2020, subsequent to the execution of the Site Alteration Agreement with the Township, weather permitting.

The first work to be completed will be the preparation of the site, including but not limited to installation of sediment erosion controls, construction of the interceptor swales and drainage channels.

Following these initial preparations of the site, the Contractor will strip a 0.4 m topsoil layer across the entire site. It is anticipated that approximately 41,200 m<sup>3</sup> of topsoil will be generated; 15,550 m<sup>3</sup> will be stockpiled for future use within the development limits, and 25,650 m<sup>3</sup> will be hauled offsite.

Approximately 8,000 m<sup>3</sup> of cut-to-fill material from the Subject Development, and approximately 111,700 m<sup>3</sup> of imported fill (approximately 83,900 m<sup>3</sup> of mineral import 27,800 m<sup>3</sup> of drainage layer

import) are required to complete the pre-grading activities for the Subject Development. Fill will be placed in 200 mm lifts and compacted based on recommendations from Soil Engineers Ltd. (assume 95% or 98% SPMD). The following is a short description of the possible work plan and schedule to transport and place import material on-site.

**Assumptions:**

Work Day:	10 hours
Work Week:	5 days
Equipment:	10 haul trucks with capacity of 18-20 m <sup>3</sup> Bull-dozer (crawler-mounted) Front End Loader Compactor

Travel Cycle for Haul Trucks: 1 hour (subject to change based on location of the Fill Source)

**Notes:**

1. The size and type of equipment may vary depending on the Contractor's preference and the encountered soil and site conditions.
2. Construction activities are anticipated during typical working hours from Monday to Friday.

Using these assumptions, a total of 100 loads of fill will be transported to the site each day resulting in a daily total of 1900 m<sup>3</sup> of placed fill. Therefore, it should take approximately 60 working days to haul the fill material on-site.

## **5.6 Monitoring of Works**

The site will be monitored to ensure that the placing of fill does not impact adjacent properties or existing watercourses and to ensure that temporary drainage is provided as required to prevent standing water on-site.

Crozier will make periodic site visits to monitor operations and ensure all recommendations proposed within this report are being adhered to, such as placing of fill within identified approved areas, erosion and sedimentation controls and dust suppression.

SEL will be responsible for the oversight and certification of the material placed on the site and appropriate environmental testing. Copies of all testing results will be made available to the Township. The material source will be continuously monitored.

As noted earlier, SEL has prepared site-specific guidelines for the importation and placement of fill within the Fill Area, and a copy of these guidelines are included in Appendix A. This document will outline the frequency and type of testing for the fill material as per the MECP Guidelines and Ontario Regulation 153. A document outlining the Procedures and Requirements for Construction of Engineered Fill has also been provided by SEL and is included in Appendix B.

In the event that the source of material changes during the project, ample notification along with supporting documentation will be provided by SEL and Crozier.

## **5.7 Rehabilitation of the Site**



This filling application is considered an interim activity; a Pre-Servicing Agreement or Subdivision Agreement to enable site servicing is expected over the next 6-12 months.

Erosion/sediment controls are specified around the perimeter of the area of disturbance and adjacent to any existing conveyance routes, which will prevent the migration of sediment from the area of disturbance. The Proponent will be required to maintain these measures until the site is stabilized. The Proponent is required to post a security deposit, as this will provide the financial assurance necessary to address any potential long-term impacts from the Earthworks operations. The security calculations have been provided in Appendix D.

## 6.0 CONCLUSIONS & RECOMMENDATIONS

The Earthworks activities on the property will not have an impact on the adjacent properties or existing Environmental Protection Lands (Natural Heritage Features). The works will be monitored to ensure that the recommendations made within this report are followed.

We trust that this report is satisfactory. Should there be any questions, please do not hesitate to contact the undersigned.

Respectfully Submitted,

**C.F. CROZIER & ASSOCIATES INC.**



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**C.F. CROZIER & ASSOCIATES INC.**



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# APPENDIX A

## Geoenvironmental Guidelines for Earth Fill Importation and Placement (SEL)



# **Soil Engineers Ltd.**

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March 26, 2020

Reference No. 2003-M074

## **Geoenvironmental Guidelines for Earth Fill Importation and Placement Proposed Glenelg Development Township of Southgate (Dundalk)**

Further to recent meetings, emails and conversations with representatives from C.F. Crozier & Associates Inc., the following summarizes specifics with respect to importing and placing earth fill for the above project (receiving site).

1. Clean earth fill is required to be imported to the property from an external source (source site). It is understood that a Record of Site Condition has not been (and is not expected to be) filed for the property. Therefore, environmentally acceptable site condition standard for the incoming fill is the MOECP Table 2 Residential/Parkland/Institutional Site Condition Standards. The intent is to import, place and compact the fill in the summer of 2020 (as site conditions permit).
2. The project contractor/owner/manager must submit in advance, environmental reports for the source site(s) for review and approval by Soil Engineers Ltd. (SEL) prior to importation of fill to the receiving site. Upon completion of the review, documentation and supporting information will be provided to C.F. Crozier & Associates for distribution to the municipality (minimum 1 week prior to the material being imported to the site). If necessary, SEL will conduct an independent testing of the source site to verify acceptance of fill from the source site(s).
3. It is estimated that the approximately 112 000 cubic metres of material to be imported to the receiving site. Further environmental quality testing of the incoming fill will be conducted at the receiving site at a frequency of one (1) sample for every 3000 m<sup>3</sup> of soil. The samples collected at the receiving site will have random field screening (visual and olfactory examination, and soil vapour measurement using a combustible gas detector). The municipality may require supplemental confirmatory testing at their discretion.
4. A haul access road will be stripped and constructed prior to hauling fill on to the site. The designated fill areas will also be stripped of topsoil. Conditions for site preparation will be provided by C.F. Crozier & Associates with specific reference to the "Fill Control Report".
5. Subgrade preparation of the site is to be carried out by the contractor in accordance with the contract specifications, and entail removal or stripping of any vegetative cover, organic materials and/or topsoil, proof-rolling and compacting the subgrade to 98% of its Maximum Standard Proctor Dry Density (M.S.P.D.D.).
6. The earth fill is to be placed in uniform lifts not exceeding 200mm in thickness (or a suitable thickness as determined in the field by test strips), and placed and compacted to minimum 95% or 98% of its M.S.P.D.D. (as required). The fill will be placed up to a pregrade elevation as determined by C.F. Crozier & Associates in the contract drawings. In the order of +/- 1.5 m of engineered fill is proposed to a pregrade elevation. Any engineered fill (if required) is to be placed in accordance with Soil Engineers Ltd.'s Procedures and Requirements for Construction of Engineered Fill (enclosed).



7. The earth fill proposed for import should be composed of clean mineral soils, generally of a sandy to silty nature as approved by Soil Engineers Ltd., to facilitate uniform compaction to 95% or 98% of the M.S.P.D.D. (as required). The material proposed for the 500 mm thick 'capillary break' layer should contain no more than 15% fines (passing the #200 sieve) and have a permeability (k) value of  $10^{-3}$  or greater (in order to lessen the potential for capillary action).
8. Fill placement locations and grades will be set and monitored by the contractor and periodically checked by C.F. Crozier & Associates in accordance with the contract drawings.
9. Site access locations and maintenance are specified on the contract drawing and/or specifications.
10. Soil Engineers Ltd. will be retained by the owner to provide onsite part-time and/or full-time technical staff (as required) to provide compaction control (i.e. in-situ density testing) and associated laboratory testing to ensure the materials are placed and compacted in accordance with the above and generally with respect to the contract. Upon receipt of a survey plotting the finished engineered fill elevations, Soil Engineers Ltd. will then be able to provide certification of the fill from the environmental as well as geotechnical perspective (if required).
11. Soil Engineers Ltd. will provide summary reports upon completion of the earth fill works. As noted above, survey control stakes will need to be provided and maintained throughout earth fill placement by the contractor to facilitate Soil Engineers Ltd. being able to identify the test locations and elevations.
12. If the contractor selects more than one source for fill, then each source will have to be verified by Soil Engineers Ltd. prior to importation to the site, and it may be necessary to provide additional chemical testing to confirm and ensure that the fill brought to the site at least meets Table 2 Residential/Parkland/Institutional Standards under Ontario Regulation 153-04/551. The Town should be advised of proposed changes in fill sources with confirmation regarding suitability provided by Soil Engineers Ltd. (minimum of 1 week prior to importation).
13. The general contractor must provide manifests to confirm fill transportation records from source to the site.

Should any queries arise regarding these guidelines, please do not hesitate to contact Soil Engineers Ltd. and/or C.F. Crozier & Associates Inc. as appropriate.

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# APPENDIX B

## Procedures and Requirements for Construction of Engineering Fill



# ***Soil Engineers Ltd.***

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## **ENGINEERED FILL CERTIFICATION PROCEDURES AND REQUIREMENTS FOR THE CONSTRUCTION OF ENGINEERED FILL**

The following requirements must be followed to obtain a certifiable engineered fill designed for a Maximum Allowable Soil Bearing Pressure of 150 kPa:

1. Before commencement of the work and prior to any changes made after commencement, Soil Engineers Ltd. will require the following:
  - i) A survey plan must be provided showing the exact dimensions of the engineered fill envelope, with reference to the front and rear property lines. The engineered fill should extend over the whole lot area, but must extend at least 3.0 m beyond the envelope of every possible model variation.
  - ii) The proposed finished engineered fill grade must extend either up to the proposed lot grade or a minimum of 0.5 m above the highest level of the proposed grade for the foundations and must be recorded on the survey plan.
  - iii) A finished grading plan(s) including the original surface contours.
  - iv) A site plan showing all existing underground structures.
2. Placement of engineered fill MUST NOT be permitted until the following requirements are met:
  - i) Survey stakes with exact elevations must be positioned to identify the engineered fill envelope and the proposed finished fill grade. The survey must be carried out by the general contractor for the project or a legal surveyor. The position of the survey stakes must be related to existing permanent surface structures. All survey stakes must be maintained throughout the construction period by the general contractor.
  - ii) All the topsoil and organics must be removed, and the subgrade must be inspected and proof-rolled. Badly weathered soils should be subexcavated and recompacted. A backhoe must be readily available in order to determine the thickness of the topsoil and organics to be removed and the appropriate depth of subexcavation.
  - iii) The thickness of any existing fill must be determined by test pits or boreholes performed under the supervision of our engineer, and the fill must be removed and assessed for possible usage.
  - iv) Written approval has been issued by Soil Engineers Ltd. covering the inspected area.



3. 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. We will require authority to stop operations if conditions are to be unfavourable. The fill must consist of inorganic soils which are free of cobbles and boulders greater than 20cm diameter, and compacted in lifts of no more than 200mm to 98% or + of their maximum Standard Proctor dry density. The fill operation must be inspected on a full-time basis by our field technician under the direction of our geotechnical engineer, and must proceed continuously until its completion.
4. Imported fill must be inspected by our engineer at the source to determine if it is geotechnically suitable for engineered fill compaction. The hauler must provide a document to certify that the material is free of hazardous contaminants.
5.
  - i) Where fill is to be placed in a trench, the bottom of the trench must be widened to accommodate an appropriate compactor, and the sides must be sloped to at least 1 vertical:3 horizontal for proper compaction. In order to achieve the required compaction, any ground slope within the fill envelope must be cut to 1 vertical:3 horizontal to permit safe operation of the construction equipment.
  - ii) Engineered fill for the road embankment and adjacent lots must be performed simultaneously.
  - iii) Access ramps for construction equipment must not be permitted within engineered fill envelope.
  - iv) Where the ground is wet due to subsurface water seepage, an appropriate subdrain scheme must be implemented prior to the fill placement, particularly if it is to be carried out on sloping ground or a bank.
6. Immediately after completion of the engineered fill operation, and prior to lot grading, the following items must be checked and recorded on the plans by the general consultant or legal surveyor:
  - i) The boundaries of the engineered fill with exact reference to the front and rear property lines.
  - ii) The exact elevation of the engineered fill grade as determined by the surveyor.

The engineered fill will be certified only within the boundaries recorded on the plan(s).

7. If for any reason the ongoing engineered fill operation is suspended, the as-built engineered fill grade must be immediately determined by the surveyor for record purposes.

Should the fill operation resume in the future, the engineered fill area must be surveyed again in order to confirm that no unsupervised filling or dumping has taken place, and the as-built subgrade must be reassessed prior to any further placement of engineered fill.



## **PROCEDURES AND REQUIREMENTS FOR CONSTRUCTION OF ENGINEERED FILL**

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The certification of the engineered fill is subject to the following qualifications:

- A. Proper surface drainage must be maintained within the engineered fill area(s). Soil Engineers Ltd. must be informed of any construction activities within the engineered fill envelope which may cause disturbance and loosening of the engineered fill mantle. 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.
- B. If the engineered fill is to be left over the winter months, adequate earth cover, or equivalent, must be provided to protect it against frost action. Otherwise, the finished engineered fill will require inspection to assess the extent of the frost loosening, and to determine the measures for rectification before foundation construction
- C. Footings adjacent to easements for services within the engineered fill envelope must be placed on the undisturbed engineer fill or natural soil at or below the invert level of the pipe, or at a safe level as determined by our field inspection.
- D. The footing subgrade must be inspected by our engineer to ensure the following:
  - 1) The footings and founded on the engineered fill and are a minimum of 3m from the limits of the controlled engineered fill envelope and a minimum of 0.5m below the finished engineered fill grade.
  - 2) The subgrade has not been compromised by construction disturbance and/or environmental degradation.
- E. 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 the engineered fill may require continuous reinforcement with steel bars, depending on the uniformity of the foundations. Should the footings and/or walls require reinforcement, the required number and size of reinforcing bars must be assessed by consideration of uniformity as well as thickness of the placed fill beneath the foundations. In sewer construction, the engineered fill is considered to have the same structural proficiency as a natural inorganic soil.
- F. If the engineered fill exceeds 5m deep in depth, construction of the foundations must not begin until one year after completion of the engineered fill placement.

If any one of the above qualifications is not met, Soil Engineers Ltd. cannot warrant the condition of the engineered fill and explicitly accepts no liability for any damage resulting from placement of foundations or structures on the engineered fill.



# APPENDIX C

## Extended Detention Orifice Calculations



Project: 1060-4171  
Project No.: Glenelg  
File: Sediment Basin  
Design by: HB  
Date: 2020.03.16

**EXTENDED DETENTION SPECIFICATIONS - SEDIMENT BASIN**  
(Per MOECC)

Extended Detention Volume		5780
t (drawdown time - seconds, <i>hours in italics</i> )	48.0	172800
Ao (cross section area of orifice - sqm)		0.0241
h (maximum water elevation above orifice for extended detention- m) **		0.59
C (discharge coefficient)		0.64
Ap (average surface area for extended detention - sqm)		8218

$$t = 2 * A_p * (h^{0.5}) / (C * A_o * (g^{*2})^{0.5})$$

Ao =	0.025770941 sqm	d =	181	mm
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Extended Detention Orifice Diameter (as designed)	d =	<b>175</b>	mm
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# APPENDIX D

## Security Calculations



**GLENELG RESIDENTIAL DEVELOPMENT**  
**SITE ALTERATION SECURITIES**

40 Huron Street, Suite 301, Collingwood ON L9Y 4R3

CFCA File No.: 1060-4171

T (705) 446-3510 F (705) 446-3520

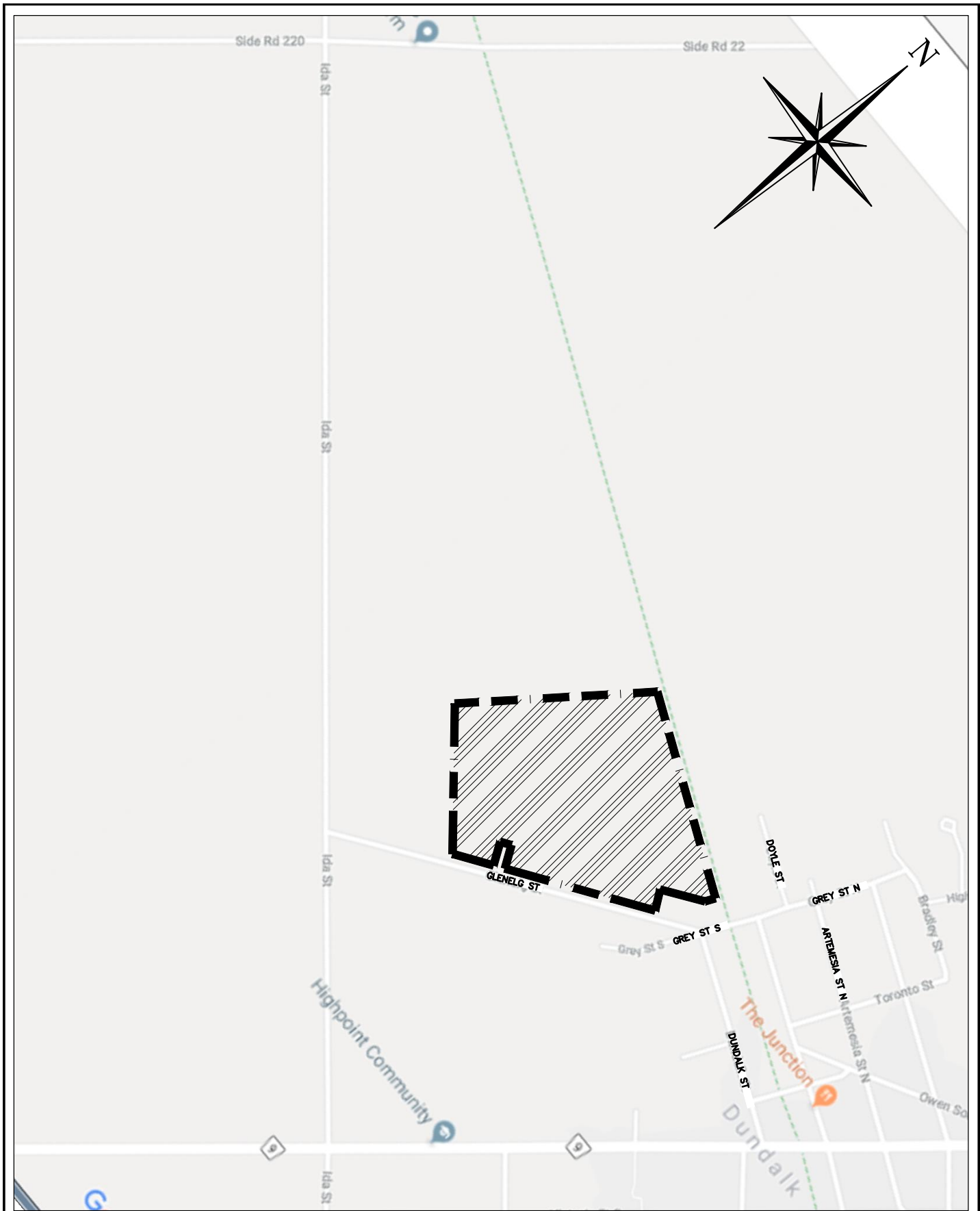
Date: 2020.03.18



ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
<b>1.0</b>	<b>Supply &amp; Install Sediment &amp; Erosion Controls</b>				
a)	Heavy Duty Silt Fence (OPSD 219.130)	1700	m	\$20.00	\$34,000.00
b)	Mud Mat	1	Each	\$5,500.00	\$5,500.00
c)	300mm dia., 450mm deep Rip Rap c/w Terrafix Geotextile 270R	200	m <sup>2</sup>	\$130.00	\$26,000.00
<b>2.0</b>	<b>Supply &amp; Install Materials for Temporary Sediment Basin</b>				
a)	300mm diameter Temporary CSP	14	m	\$300.00	\$4,170.00
b)	600mm diameter Temporary CSP	12	m	\$450.00	\$5,490.00
c)	Ditch Inlet Catchbasin (OPSD 705.030) c/w 175 mm dia. Orifice Plate	1	Each	\$5,000.00	\$5,000.00
				<b>Sub-total</b>	<b>\$80,160.00</b>
<b>3.0</b>	<b>5% Engineering Contingency</b>			<b>Sub-total</b>	<b>\$4,008.00</b>
<b>4.0</b>	<b>5% Maintenance Contingency</b>			<b>Sub-total</b>	<b>\$4,008.00</b>
				<b>Total</b>	<b>\$88,176.00</b>

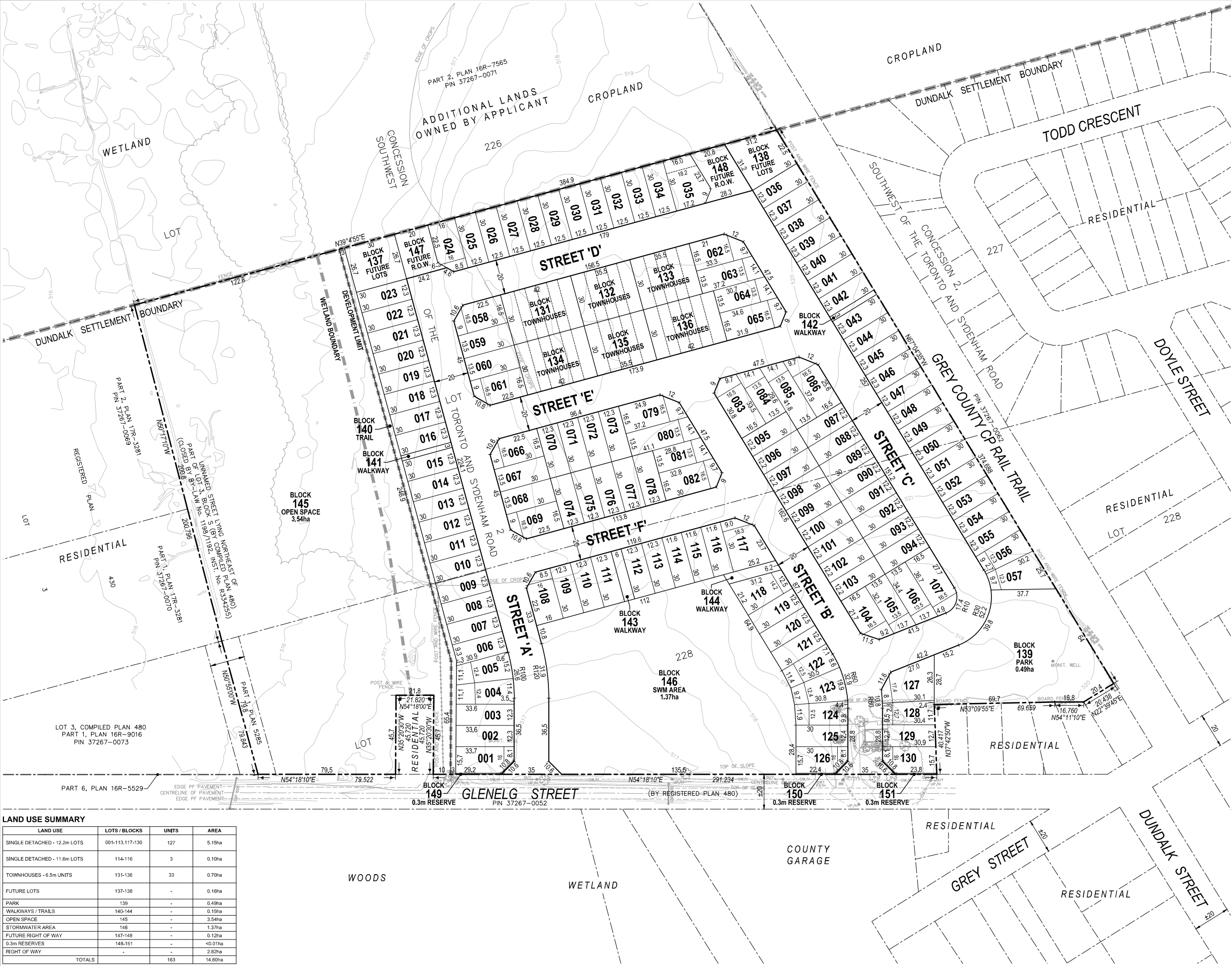
Refer to Drawing 104 - Site Alteration Plan (CFCA, March 2020)

# LIST OF FIGURES

Figure 1:	Site Location Plan
Figure 2:	Draft Plan of Subdivision
Drawing 104:	Site Alteration Plan



<div>Legend</div> <div> = SUBJECT PROPERTY</div>	<div>Project</div> <div>GLENELG TOWNSHIP OF SOUTHGATE</div> <div>Drawing</div> <div>SITE LOCATION</div>	<div><div>CROZIER CONSULTING ENGINEERS</div><div>THE HARBOUREDGE BUILDING, 40 HURON STREET, SUITE 301, COLLINGWOOD, ON L9Y 4R3 705 446-3510 T 705 446-3520 F WWW.CFCROZIER.CA INFO@CFCROZIER.CA</div></div> <div><table><tr><td>Drawn By</td><td>B.K.</td><td>Design By</td><td>B.P.</td><td>Project</td><td>1060-4171</td></tr><tr><td>Scale</td><td>N.T.S.</td><td>Date</td><td>09/26/2018</td><td>Check By</td><td>B.N.R.</td></tr><tr><td></td><td></td><td></td><td></td><td>Drawing</td><td>FIG. 1</td></tr></table></div>	Drawn By	B.K.	Design By	B.P.	Project	1060-4171	Scale	N.T.S.	Date	09/26/2018	Check By	B.N.R.					Drawing	FIG. 1
Drawn By	B.K.	Design By	B.P.	Project	1060-4171															
Scale	N.T.S.	Date	09/26/2018	Check By	B.N.R.															
				Drawing	FIG. 1															

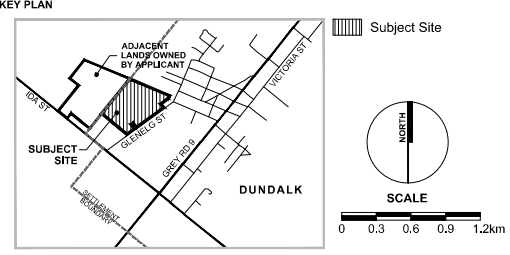


LAND USE SUMMARY			
LAND USE	LOTS / BLOCKS	UNITS	AREA
SINGLE DETACHED - 12.2m LOTS	001-113,117-130	127	5.15ha
SINGLE DETACHED - 11.6m LOTS	114-116	3	0.10ha
TOWNHOUSES - 6.5m UNITS	131-136	33	0.70ha
FUTURE LOTS	137-138	-	0.16ha
PARK	139	-	0.49ha
WALKWAYS / TRAILS	140-144	-	0.15ha
OPEN SPACE	145	-	3.54ha
STORMWATER AREA	146	-	1.37ha
FUTURE RIGHT OF WAY	147-148	-	0.12ha
0.3m RESERVES	149-151	-	<0.01ha
RIGHT OF WAY			2.82ha
TOTALS		163	14.60ha

LEGAL DESCRIPTION  
PART OF LOTS 227 AND 228  
CONCESSION 2, SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD  
ALL OF LOT Y AND PART OF THE UNNAMED STREET,  
LYING NORTHEAST OF PART LOT 3, BLOCK S, COMPILED PLAN 480  
TOWNSHIP OF SOUTHGATE  
COUNTY OF GREY

OWNER'S CERTIFICATE  
I HEREBY AUTHORIZE MACNAUGHTON HERMSEN BRITTON CLARKSON PLANNING LIMITED  
TO SUBMIT THIS PLAN FOR APPROVAL.  
DATE: \_\_\_\_\_ SHAKIR REHMATULLAH - PRESIDENT  
2358737 ONTARIO INC.

SURVEYOR'S CERTIFICATE  
I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED ON THIS PLAN  
AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY  
SHOWN.  
DATE: \_\_\_\_\_ DAN DZALDOV - OLS  
SCHAEFFER DZALDOV BENNETT LTD.  
P: 416-887-0101



LEGEND	
	PROJECT BOUNDARY LINE
	RIGHT OF WAY LINE
	BLOCK LINE
	LOT LINE
	0.3m RESERVE
	PARCEL FABRIC

03	Jul. 17, 2019	REDESIGN TO ACCOMMODATE TRAIL, ADD THREE 11.6m SINGLE DETACHED LOTS	M.M.
02	May 2, 2019	FULL REDESIGN OF SITE	M.M.
01	Oct. 12, 2018	REVISED SURVEY INFO	M.M.
REVISION No.	DATE	ISSUED / REVISION	BY

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51(17)  
OF THE PLANNING ACT R.S.O. 1990 C.P.13 AS AMENDED  
A. AS SHOWN E. AS SHOWN J. AS SHOWN  
B. AS SHOWN F. AS SHOWN K. ALL MUNICIPAL SERVICES AS  
C. AS SHOWN G. AS SHOWN REQUIRED  
D. 127 SINGLE DETACHED LOTS H. MUNICIPAL WATER SUPPLY L. AS SHOWN  
& 56 TOWNHOUSE UNITS I. LOAM/SILT LOAM

113 COLLIER STREET  
BARRIE, ON, L4M 1H2  
P: 705 728 0045 F: 705 728 2010  
WWW.MHBCPLAN.COM

PLANNING  
URBAN DESIGN  
& LANDSCAPE  
ARCHITECTURE  
MHBC PLANNING

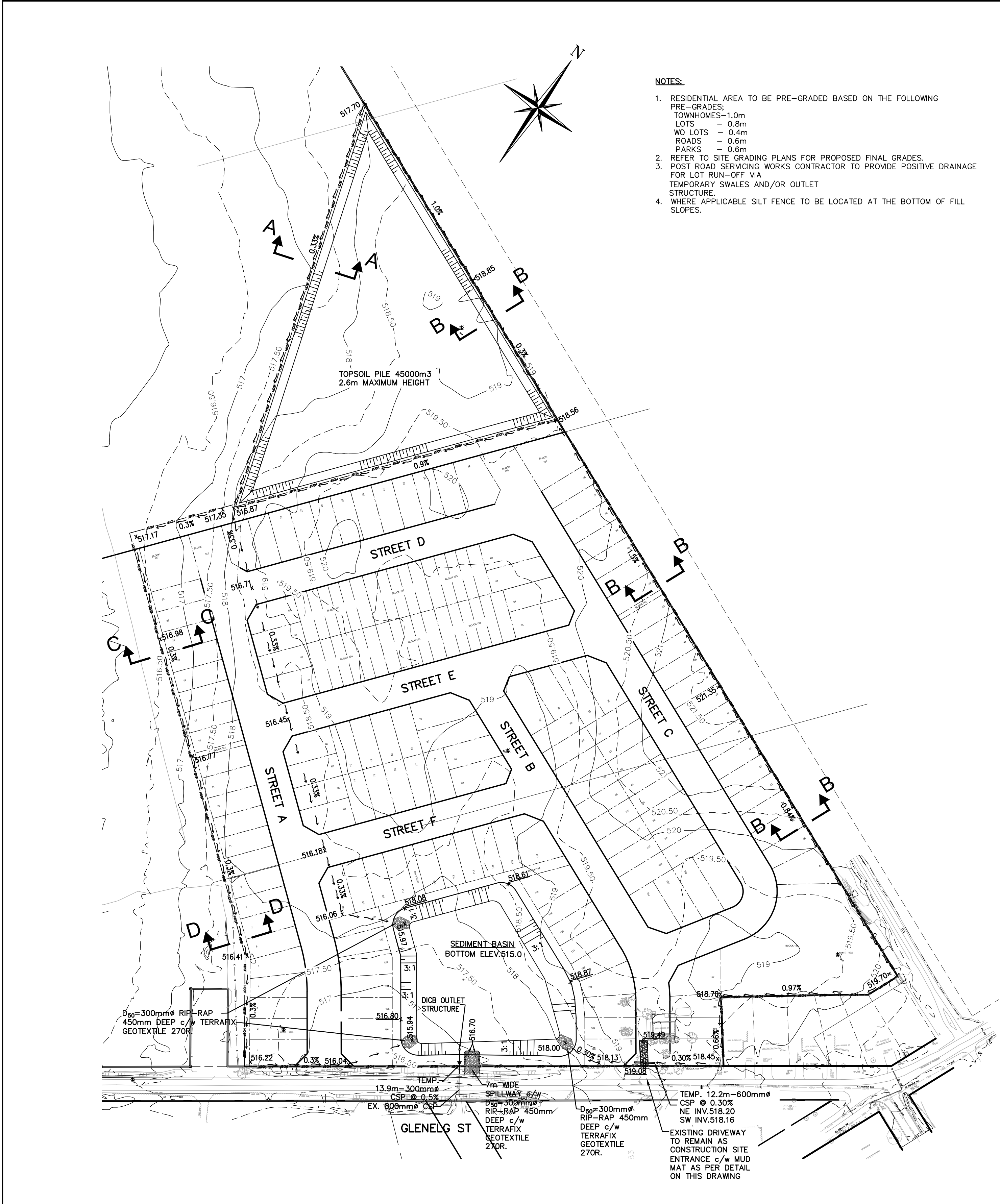
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FILE No.	15184H	
SCALE	1:1,000 (ARCH D)	
DRAWN BY	M.M.	
CHECKED BY	K.M.	
OTHER		

PROJECT

**231 GLENELG STREET**  
2358737 ONTARIO INC.  
3621 HIGHWAY 7 EAST, SUITE 503  
MARKHAM, ON L3R 0G6  
P:(905) 479-9292 F:(905) 429-9165  
WWW.FLATOGROUP.COM

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- NOTES:**
- RESIDENTIAL AREA TO BE PRE-GRADED BASED ON THE FOLLOWING PRE-GRADES:  
TOWNHOMES-1.0m  
LOTS - 0.8m  
WO LOTS - 0.4m  
ROADS - 0.6m  
PARKS - 0.6m
  - REFER TO SITE GRADING PLANS FOR PROPOSED FINAL GRADES.
  - POST ROAD SERVICING WORKS CONTRACTOR TO PROVIDE POSITIVE DRAINAGE FOR LOT RUN-OFF VIA TEMPORARY SWALES AND/OR OUTLET STRUCTURE.
  - WHERE APPLICABLE SILT FENCE TO BE LOCATED AT THE BOTTOM OF FILL SLOPES.

- GENERAL NOTES:**
- CONSTRUCTION EQUIPMENT TO USE EXISTING ACCESS POINT, LOCATED AT HWY 10, AS INDICATED ON THIS DRAWING. MUD MAT TO BE MAINTAINED AT ACCESS POINT.
  - ALL WORKS SHALL BE COMPLETED IN ACCORDANCE WITH THE OCCUPATIONAL HEALTH AND SAFETY ACT. THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE "CONSTRUCTOR" AS DEFINED IN THE ACT.
  - ALL SEDIMENT AND EROSION CONTROL FACILITIES AND WORKS ARE TO BE CONSTRUCTED AND IN PLACE TO THE APPROVAL OF THE SITE ENGINEER PRIOR TO ANY GRADING OPERATIONS COMMENCING. TYPICAL WORKS INCLUDE SILT FENCES, INTERCEPTOR SWALES, STRAW BALE CHECK DAMS AND SEDIMENT TRAPS.
  - ALL TEMPORARY TOPSOIL STOCKPILES ARE TO BE PROVIDED WITH THE NECESSARY SEDIMENT AND EROSION CONTROL FEATURES.
  - ALL INTERCEPTOR SWALES ARE TO BE SEEDED TO STABILIZE THEIR BANKS IMMEDIATELY FOLLOWING CONSTRUCTION.
  - REFER TO APPLICATION FORM FOR GRUBBING OF TREES WITHIN LIMITS OF FILL AREA.
  - NO GRADING OF LANDS WILL OCCUR WITHIN SPECIFIED BUFFERS ALONG PROPERTY LINES AND INTERNAL TO SITE.
  - WHERE SHOWN, THE LOCATION OF ALL UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES ARE NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND ACCURACY OF THE LOCATION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

**MAINTENANCE & OPERATIONS OF SEDIMENT CONTROLS**

**SILT FENCE**

- SILT FENCE MUST BE INSPECTED WEEKLY FOR RIPS OR TEARS, BROKEN STAKES, BLOW-OUTS AND ACCUMULATION OF SEDIMENT.
- SILT FENCE MUST BE INSPECTED FOLLOWING ALL 15MM OR GREATER RAIN STORM EVENT OR AS DIRECTED BY SITE ENGINEER.
- SEDIMENT MUST BE REMOVED FROM SILT FENCE WHEN ACCUMULATION REACHES 50% OF THE HEIGHT OF THE FENCE.
- ALL SILT FENCES MUST BE REMOVED ONLY WHEN THE ENTIRE SITE IS STABILIZED AND AS DIRECTED BY THE SITE ENGINEER.

**STRAW BALE / ROCK CHECK DAM**

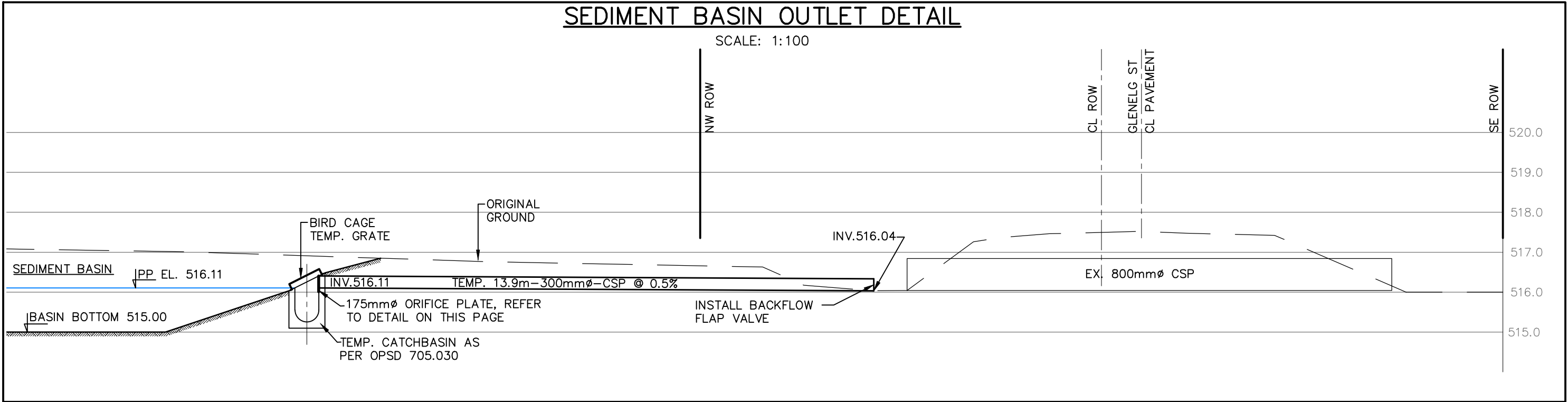
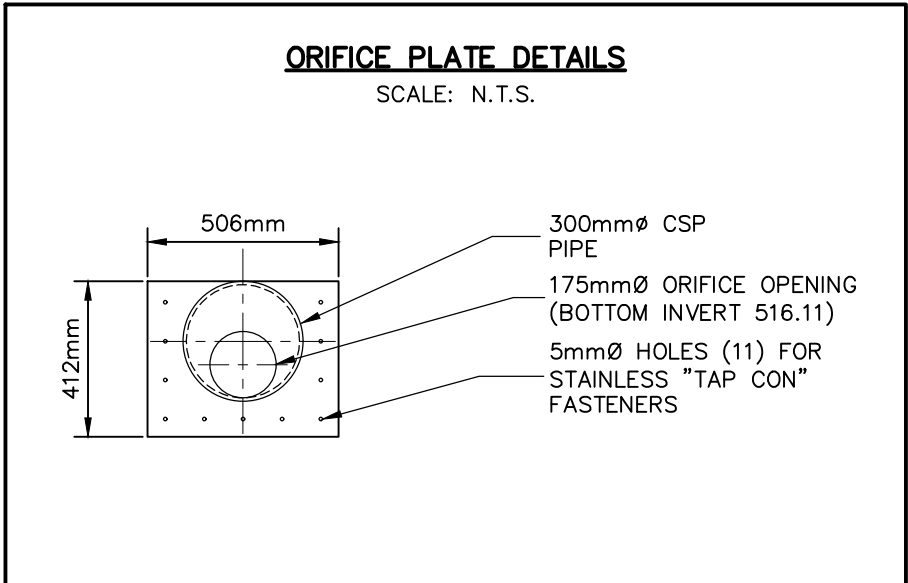
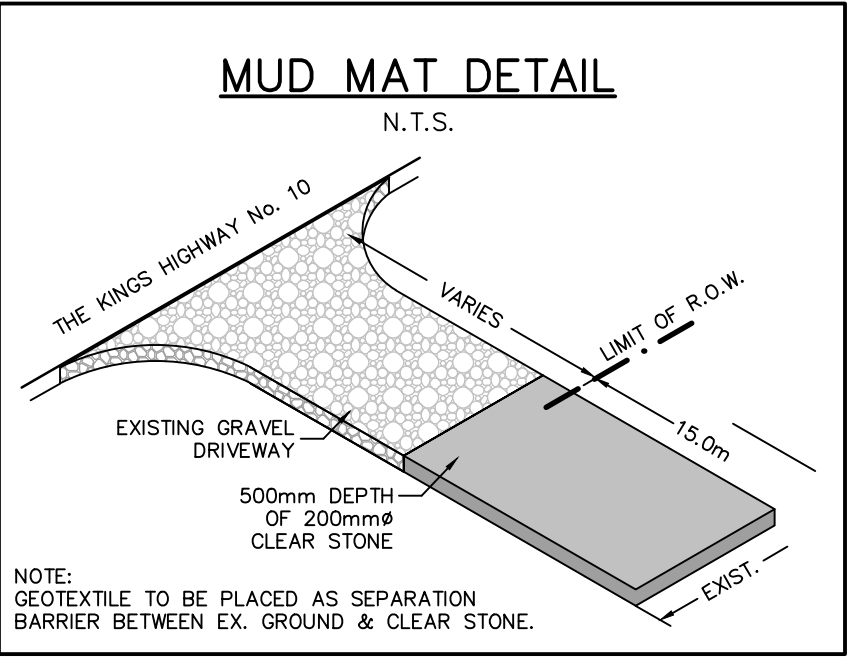
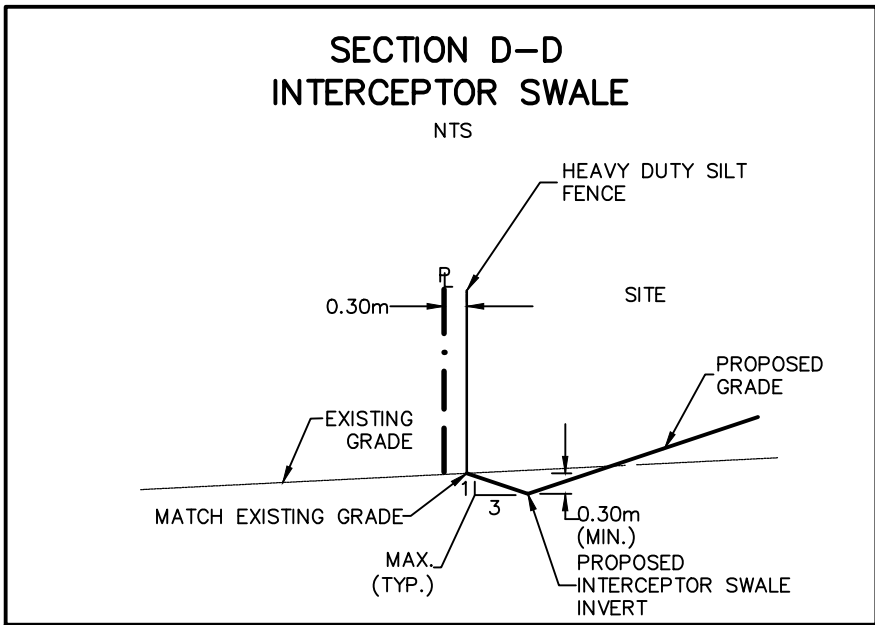
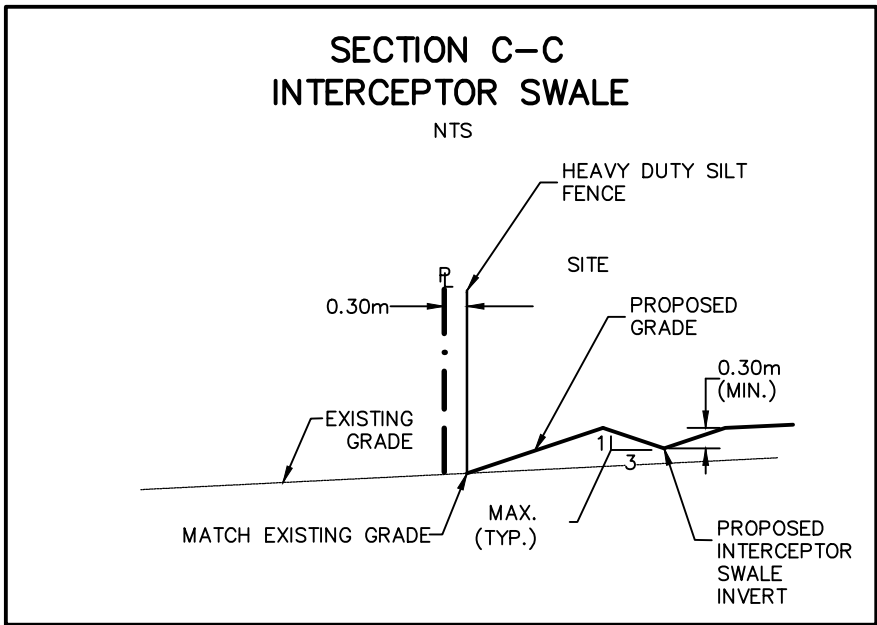
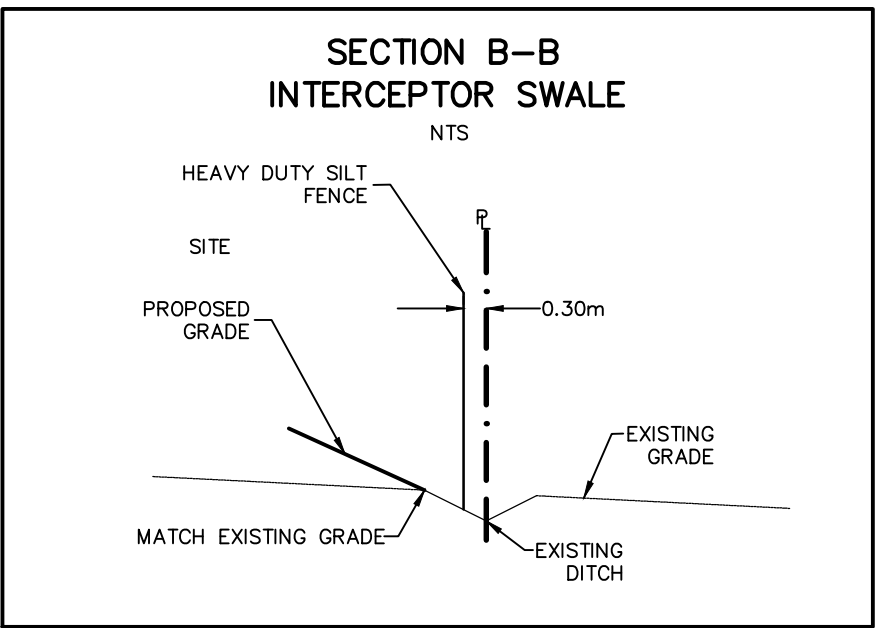
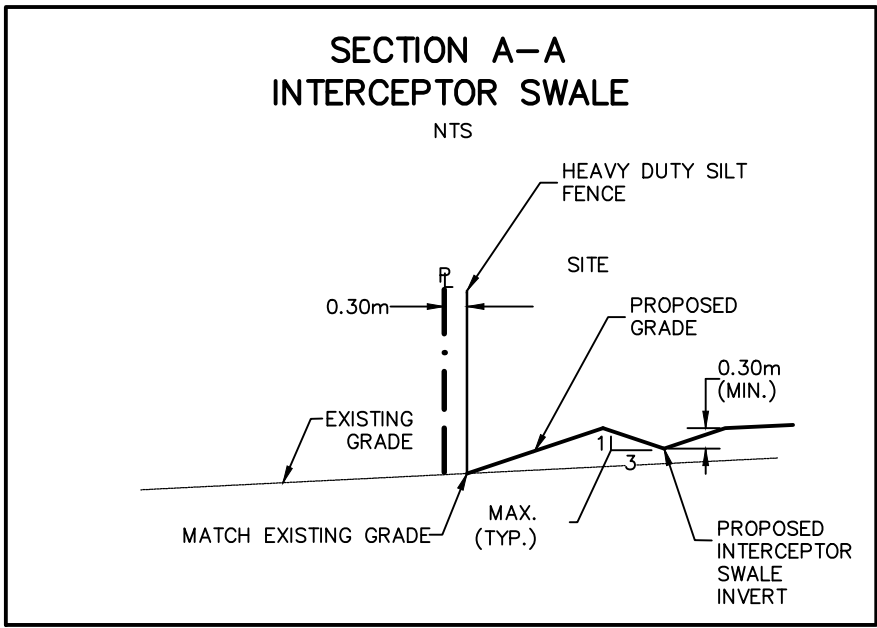
- REMOVE ACCUMULATED SEDIMENT UP STREAM OF THE CHECK DAM IF GREATER THAN ONE HALF OF DAM HEIGHT.
- SILT REMOVAL MUST BE UNDERTAKEN WITH CARE TO MINIMIZE DOWN STREAM SEDIMENTATION IN SWALE OR DITCH.
- STRAW BALE CHECK DAM AND ALL ACCUMULATED SEDIMENT MUST BE REMOVED WITH CARE ONCE THE CONSTRUCTION SITE IS STABILIZED AND AS DIRECTED BY THE SITE ENGINEER.

**MUD MAT MAINTENANCE**

- INSPECT MUD MAT WEEKLY TO ASSESS CONDITION AND ENSURE OPERATION EFFICIENCY.
- SUPPLY AND PLACE ADDITIONAL CLEAR STONE AS DIRECTED BY SITE ENGINEER.
- MAT TO REMAIN IN PLACE UNTIL SITE IS STABILIZED OR AS DIRECTED BY SITE ENGINEER.

**DECOMMISSIONING / RESTORATION**

- FOLLOWING COMPLETION OF CONSTRUCTION AND AS DIRECTED BY SITE ENGINEER, ALL EROSION AND SEDIMENT CONTROL WORKS ARE TO BE REMOVED INCLUDING ANY ACCUMULATED SEDIMENT.
- ALL WORKS LOCATED ON LANDS OUTSIDE THE PROPOSED DEVELOPMENT AREA ARE TO BE GRADED TO MATCH EXISTING SURROUNDING GROUND AND HYDROSEEDDED.
- ALL SEDIMENT BUILD-UP TO BE REMOVED FROM SEDIMENT BASINS. CUT AREAS AND SEDIMENT BASINS TO BE TREATED WITH 25mm OF TOPSOIL AND HYDROSEEDDED AS DIRECTED BY SITE ENGINEER.
- FOLLOWING COMPLETION OF ZONE 3 CUT AREA, TOP SOIL TO BE SPREAD OUT AT 400mm DEPTH WITHIN THE CUT AREA LIMITS AND HYDROSEEDDED.



- THIS DRAWING IS THE EXCLUSIVE PROPERTY OF C.F. CROZIER & ASSOCIATES INC. AND THE REPRODUCTION OF ANY PART 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 THE DRAWINGS.
- ALL EXISTING UNDERGROUND UTILITIES TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

**TEMPORARY BENCHMARKS**

**GEODETIC BENCHMARKS**

No.	ISSUE / REVISION	DATE: DD/MM/YYYY
1	ISSUED FOR FIRST SUBMISSION	13/03/2020

**GLENELG RESIDENTIAL DEVELOPMENT  
TOWNSHIP OF SOUTHGATE**

**SITE ALTERATION PLAN**



THE HARBOUREDGE BUILDING,  
40 HURON STREET, SUITE 301,  
COLLINGWOOD, ON L9Y 4R3  
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Drawn By	J.K	Design By	J.K/D.T.	Project	1060-4171
Scale	1:1500	Date	01/11/2019	Check By	D.T.
				Drawing	104