**Soil Engineers Ltd.**
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
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November 30, 2022 Reference No. 2206-S054



Beachcroft Investments Inc. (Ballantry Homes)
20 Cachet Woods Court, Suite 6
Markham, Ontario
L6C 3G1

Attention: Ms. Uzo Rossouw

**Re: Preliminary Geotechnical Assessment**
**Proposed Residential Development**
**63 and 63A Trafalgar Road**
**Town of Erin**

Dear Madam:

As per your request, we have completed the subsurface investigation for the captioned project and herein present our preliminary findings and recommendations.

## SITE CONDITION

The subject site is located on the east side of Trafalgar Road and about 500 m north of Wellington 22 in the Town of Erin. At the time of investigation, the site is a farm field, consisting of soy bean crops. The existing site gradient is undulating with a grade difference of more than 10 m.

Based on the preliminary concept plan prepared by KLM Planning Partners Inc., the property will be developed with low rise residential dwellings serviced with municipal sewers and access roadway.

## FIELD WORK

The field work, consisting of eleven (11) sampled boreholes with monitoring wells, extending to a depth of 4.7 to 6.7 m, was completed at the site between November 18 and 25, 2022. The borehole and monitoring well locations are shown on Drawing No. 1, enclosed. The depths and details of the monitoring wells are shown on the Borehole Logs.

The field work was supervised and the findings were recorded by a Geotechnical Technician. The ground elevation at each borehole location was obtained using a hand-held Global Navigation Satellite System (GNSS) equipment.

## SOIL AND GROUNDWATER CONDITIONS

Detailed descriptions of the encountered subsurface conditions are presented on the enclosed Borehole Logs comprising Figures 1 to 11, inclusive. The revealed stratigraphy is plotted on the Subsurface Profile, Drawing No. 2.

The boreholes were performed on the farm field, where topsoil and ploughed soil were contacted at the ground surface in all boreholes. The thickness of the revealed topsoil is approximately 36 cm with the ploughed soil extending to a depth of 0.5 to 0.9 m below the prevailing ground surface. Beneath the ploughed soil, the site is underlain by predominantly sand and gravelly sand deposits. Sandy silt till and silt deposits were generally contacted in the lower stratigraphy in some of the boreholes. A localized sandy silt deposit was contacted near the ground surface below the ploughed soil in Borehole 6.

Based on sample examination, the sands and silt appeared to be in a wet state and may be water bearing at lower depths.

All boreholes were checked for the presence of groundwater upon completion of borehole drilling. Groundwater was recorded in Boreholes 3 and 6 at a depth of 5.5 m below grade or at El. 428.4 m and 428.7 m, respectively.

## DISCUSSION AND RECOMMENDATIONS

Based on the borehole findings, the preliminary geotechnical considerations pertaining to the preliminary design of the development are presented below:

1. The topsoil and ploughed soil must be removed from the area of construction. They can be stockpiled and reused in landscaping areas only. Any surplus will have to be disposed off-site.

2. In areas where the site will be re-graded with additional earth fill, the earth fill should be placed in an engineered manner for underground services, building foundations and pavement construction.

3. The proposed structures can be supported on conventional footings, founded on engineered fill or sound native soil. The recommended soil bearing pressures of 150 kPa at Serviceability Limit State (SLS) and 240 kPa at Ultimate Limit State (ULS) can be

used for the design of spread and strip footings. The total and differential settlements of the conventional spread and strip footings, designed for the bearing pressure at SLS, are estimated to be 25 mm and 20 mm, respectively.

4. The footing subgrade must be inspected by a geotechnical engineer, or a geotechnical technician under the supervision of a geotechnical engineer. Footings exposed to weathering or in unheated areas, should have at least 1.4 m of earth cover for protection against frost action or must be adequately insulated.

5. Based on the borehole findings and the latest Ontario Building Code, the proposed development should be designed to resist an earthquake force using Site Classification 'D' (stiff soil).

6. Where the proposed structures have a basement, the basement should be maintained at least 1.0 m above the highest groundwater level. The perimeter walls should be damp-proofed and provided with a perimeter drainage system. The subdrain must be encased in a fabric filter to protect them against blockage by silting and connected into a positive outlet.

7. The subgrade for slab-on-grade construction should consist of sound native soil or well compacted earth fill. The floor slab should be placed on a granular bedding of at least 15 cm thick, consisting of 19-mm Crusher-Run Limestone (CRL) or equivalent, compacted to its maximum Standard Proctor dry density (SPDD).

8. Where the separation between the basement and the groundwater is less than 1.0 m, underfloor subdrain system should also be implemented

9. Class 'B' bedding, consisting of compacted 19-mm CRL, or equivalent, is recommended for the construction of the underground utilities. Where saturated soils is evident in the subgrade soils or where dewatering is required, a Class 'A' concrete bedding should be considered. The service pipes must consist of leak-proof joints, or the joints must be wrapped with a waterproof membrane.

10. The on-site inorganic soils are generally suitable for trench backfill. Any wet soils must be pre-drained before reusing for backfill. The backfill in service trenches should be compacted to at least 95% SPDD in 20 cm layers or the lift thickness should be determined by test strips. In the zone within 1.0 m below the road subgrade or below the slab on grade, the material should be compacted to 98% SPDD with the water content at 2% to 3% drier than the optimum. This is to provide the required stiffness for the floor and pavement construction.

11. Excavation should be carried out in accordance with Ontario Regulation 213/91. The types of material are classified in the table below:

| Material | Type |
|---|---|
| Sandy Silt Till | 2 |
| Drained Sand, Gravelly Sand, Sandy Silt and Silt | 3 |
| Saturated Soils | 4 |

12. For excavation extending below the groundwater level or into the saturated soils, the yield is expected to be appreciable and persistent. Dewatering by closely spaced sumps will be required.

This report is preliminary in nature and is subject to change in the comprehensive report.

We trust the above satisfies your present requirements. Should you have any further queries, please feel free to contact this office.

Yours truly,
**SOIL ENGINEERS LTD.**

Cedric Ramos, B.A.Sc.

Kin Fung Li, P.Eng.
CR/KFL

**ENCLOSURES**

| | |
|---|---|
| Logs of Boreholes | Figures 1 to 11 |
| Borehole and Monitoring Well Location Plan | Drawing No. 1 |
| Subsurface Profile | Drawing No. 2 |

# LIST OF ABBREVIATIONS AND DESCRIPTION OF TERMS

The abbreviations and terms commonly employed on the borehole logs and figures, and in the text of the report, are as follows:

## SAMPLE TYPES

AS Auger sample
CS Chunk sample
DO Drive open (split spoon)
DS Denison type sample
FS Foil sample
RC Rock core (with size and percentage recovery)
ST Slotted tube
TO Thin-walled, open
TP Thin-walled, piston
WS Wash sample

## PENETRATION RESISTANCE

Dynamic Cone Penetration Resistance:

A continuous profile showing the number of blows for each foot of penetration of a 2-inch diameter, 90° point cone driven by a 140-pound hammer falling 30 inches.

Plotted as '—●—'

Standard Penetration Resistance or 'N' Value:

The number of blows of a 140-pound hammer falling 30 inches required to advance a 2-inch O.D. drive open sampler one foot into undisturbed soil.

Plotted as '○'

WH Sampler advanced by static weight
PH Sampler advanced by hydraulic pressure
PM Sampler advanced by manual pressure
NP No penetration

## SOIL DESCRIPTION

Cohesionless Soils:

| 'N' (blows/ft) | Relative Density |
|---|---|
| 0 to 4 | very loose |
| 4 to 10 | loose |
| 10 to 30 | compact |
| 30 to 50 | dense |
| over 50 | very dense |

Cohesive Soils:

| Undrained Shear Strength (ksf) | 'N' (blows/ft) | Consistency |
|---|---|---|
| less than 0.25 | 0 to 2 | very soft |
| 0.25 to 0.50 | 2 to 4 | soft |
| 0.50 to 1.0 | 4 to 8 | firm |
| 1.0 to 2.0 | 8 to 16 | stiff |
| 2.0 to 4.0 | 16 to 32 | very stiff |
| over 4.0 | over 32 | hard |

Method of Determination of Undrained Shear Strength of Cohesive Soils:

x 0.0 Field vane test in borehole; the number denotes the sensitivity to remoulding

△ Laboratory vane test

☐ Compression test in laboratory

For a saturated cohesive soil, the undrained shear strength is taken as one half of the undrained compressive strength

## METRIC CONVERSION FACTORS

1 ft = 0.3048 metres
1lb = 0.454 kg
1 inch = 25.4 mm
1ksf = 47.88 kPa

**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 1

**FIGURE NO.:** 1

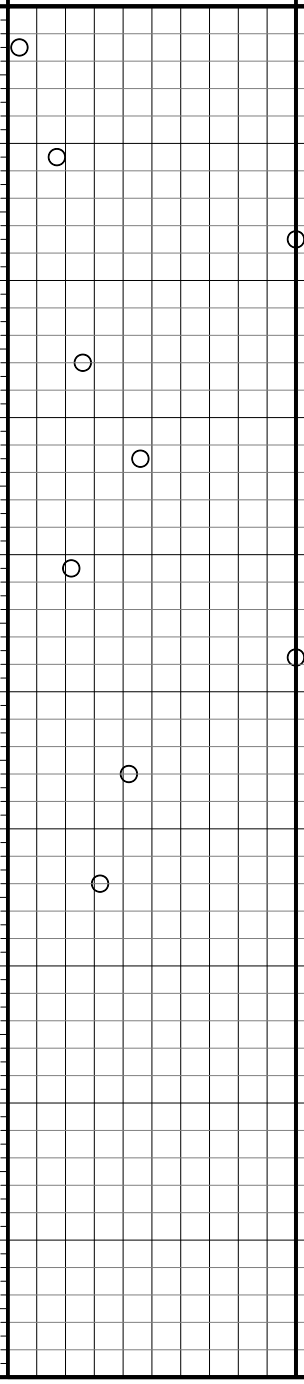
**PROJECT DESCRIPTION:** Proposed Residential Development

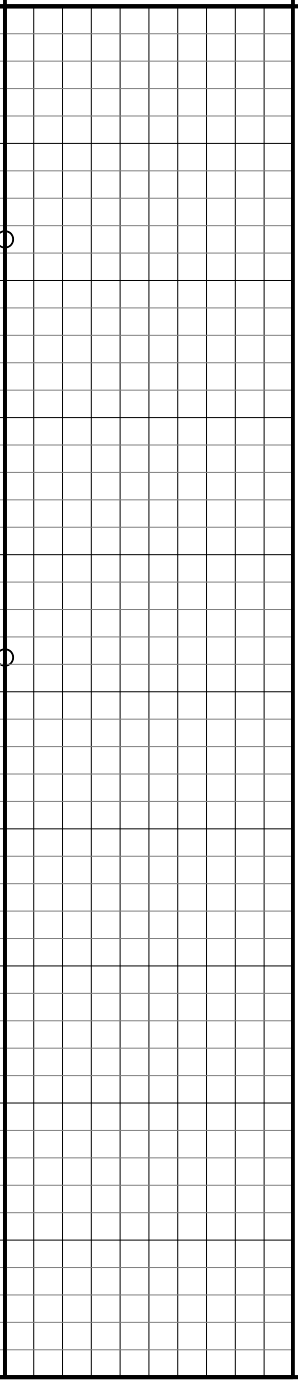
**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

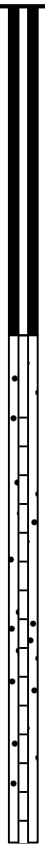
**DRILLING DATE:** November 22, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) |
|---|---|---|---|---|---|
| 434.3 | Ground Surface | | | | |
| 0.0 | **36 cm Topsoil** | | | | 0 |
| | **PLOUGHED SOIL**<br>Dark brown sand, occ. rootlets | 1 | DO | 4 | |
| 433.6 | | | | | |
| | Brown, compact<br>**SAND**<br>fine to medium grained | 2 | DO | 17 | 1 |
| 432.8 | | | | | |
| 1.5 | Brown, dense to very dense<br>**GRAVELLY SAND**<br>occ. cobbles and boulders<br>wet below 5.1 m | 3 | DO | 50/28 | 2 |
| | | 4 | DO | 26 | |
| | | 5 | DO | 46 | 3 |
| | | 6 | DO | 22 | 4 |
| | | 7 | DO | 50/15 | |
| | | 8 | DO | 42 | 5 |
| | | 9 | DO | 32 | 6 |
| 427.6 | | | | | |
| 6.7 | **END OF BOREHOLE**<br>Installed 50 mm Ø monitoring well to 6.1 m<br>completed with 3.1 m screen<br>Sand backfill from 2.4 to 6.1 m<br>Bentonite seal from 0.0 m to 2.4 m<br>Provided with a monument casing | | | | 7 |
| | | | | | 8 |
| | | | | | 9 |
| | | | | | 10 |




WATER LEVEL



Dry upon Completion

**Soil Engineers Ltd.**

**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 2

**FIGURE NO.:** 2

**PROJECT DESCRIPTION:** Proposed Residential Development

**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**DRILLING DATE:** November 22, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) |
|---|---|---|---|---|---|
| 436.3 | Ground Surface | | | | |
| 0.0 | **36 cm Topsoil** | | | | 0 |
| | **PLOUGHED SOIL** | 1 | DO | 6 | |
| 435.6 | Dark brown sand, occ. rootlets | | | | |
| | Brown, loose | | | | |
| | **SAND** | 2 | DO | 5 | 1 |
| | fine to medium grained | | | | |
| | | 3 | DO | 7 | 2 |
| 433.9 | | | | | |
| 2.4 | Brown, dense to very dense | 4 | DO | 45 | |
| | **GRAVELLY SAND** | | | | |
| | occ. cobbles and boulders | 5 | DO | 50/15 | 3 |
| | | | | | 4 |
| | | 6 | DO | 50/15 | |
| | | | | | 5 |
| | | | | | 6 |
| 429.7 | | 7 | DO | 60 | |
| 6.6 | **END OF BOREHOLE** | | | | 7 |
| | Installed 50 mm Ø monitoring well to 6.1 m completed with 3.1 m screen | | | | 8 |
| | Sand backfill from 2.4 to 6.1 m | | | | 9 |
| | Bentonite seal from 0.0 m to 2.4 m | | | | 10 |
| | Provided with a monument casing | | | | |

Dynamic Cone (blows/30 cm) 10 30 50 70 90

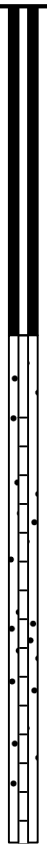
Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

WATER LEVEL



Dry upon Completion

**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 3

**FIGURE NO.:** 3

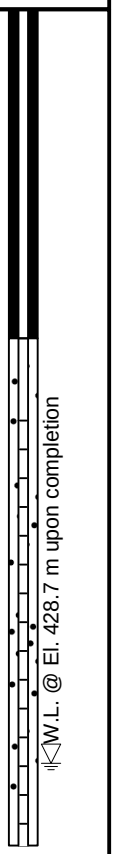
**PROJECT DESCRIPTION:** Proposed Residential Development

**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**DRILLING DATE:** November 24, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) | Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90 | Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40 | WATER LEVEL |
|---|---|---|---|---|---|---|---|---|
| 434.2 | Ground Surface | | | | | | | |
| 0.0 | **36 cm Topsoil** | | | | 0 | | | |
| | **PLOUGHED SOIL** Dark brown sand, occ. rootlets | 1 | DO | 7 | | | | |
| 433.5 | | | | | | | | |
| 0.7 | Brown, compact **SAND** fine to medium grained | 2 | DO | 12 | 1 | | | |
| 432.8 | | | | | | | | |
| | Brown, dense to very dense **GRAVELLY SAND** occ. cobbles and boulders wet below 5.5 m | 3 | DO | 60 | 2 | | | |
| | | 4 | DO | 52 | | | | |
| | | 5 | DO | 39 | 3 | | | |
| | | 6 | DO | 50/15 | 4 | | | |
| | | | | | 5 | | | |
| | | | | | 6 | | | |
| 427.6 | | 7 | DO | 54 | | | | |
| 6.6 | **END OF BOREHOLE** Installed 50 mm Ø monitoring well to 6.1 m completed with 3.1 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing | | | | 7 | | | |
| | | | | | 8 | | | |
| | | | | | 9 | | | |
| | | | | | 10 | | | |

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**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 4

**FIGURE NO.:** 4

**PROJECT DESCRIPTION:** Proposed Residential Development

**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**DRILLING DATE:** November 18, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) | Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90 | Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40 | WATER LEVEL |
|---|---|---|---|---|---|---|---|---|
| 0.0 | Ground Surface | | | | | | | |
| 0.0 | **36 cm Topsoil** | 1 | DO | 12 | 0 | ○ | | |
| | **PLOUGHED SOIL** Dark brown sand, occ. rootlets | | | | | | | |
| 0.5 | Brown, compact **SAND** fine to medium grained | 2 | DO | 50/15 | 1 | ○ | | |
| 1.0 | Brown, very dense **GRAVELLY SAND** occ. cobbles and boulders | 3 | DO | 72 | 2 | ○ | | |
| | | 4 | DO | 50/10 | | ○ | | |
| | | 5 | DO | 88 | 3 | ○ | | |
| 3.7 | Very dense to dense **SILTY SAND TILL** some gravel to gravelly a trace of clay occ. cobbles and boulders — brown — grey | 6 | DO | 50 | 4 | ○ | | |
| | | 7 | DO | 66 | 5 | ○ | | |
| | | 8 | DO | 35 | 6 | ○ | | |
| | | 9 | DO | 36 | | ○ | | |
| 6.6 | **END OF BOREHOLE** Installed 50 mm Ø monitoring well to 6.1 m completed with 3.1 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing | | | | 7 8 9 10 | | | Dry upon Completion |

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**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 5

**FIGURE NO.:** 5

**PROJECT DESCRIPTION:** Proposed Residential Development

**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**DRILLING DATE:** November 24, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) | Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90 | Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40 | WATER LEVEL |
|---|---|---|---|---|---|---|---|---|
| 433.9 | Ground Surface | | | | | | | |
| 0.0 | **36 cm Topsoil** | | | | 0 | | | |
| | **PLOUGHED SOIL** | 1 | DO | 4 | | | | |
| 433.2 | Dark brown sand, occ. rootlets | | | | | | | |
| 0.7 | Brown, compact | | | | | | | |
| | **SAND** | 2 | DO | 7 | 1 | | | |
| | fine grained | | | | | | | |
| | some silt | 3 | DO | 4 | | | | |
| | | | | | 2 | | | |
| | | 4 | DO | 21 | | | | |
| | | | | | 3 | | | |
| | | 5 | DO | 27 | | | | |
| 429.8 | | | | | | | | |
| 4.1 | Brown, dense | | | | 4 | | | |
| | **GRAVELLY SAND** | | | | | | | |
| | occ. cobbles and boulders | 6 | DO | 42 | 5 | | | |
| 428.3 | | | | | | | | |
| 5.6 | Brown, dense | | | | 6 | | | |
| | **SANDY SILT TILL** | | | | | | | |
| | traces of gravel and clay | | | | | | | |
| | occ. cobbles and boulders | 7 | DO | 40 | | | | |
| 427.3 | | | | | | | | |
| 6.6 | **END OF BOREHOLE** | | | | 7 | | | |
| | Installed 50 mm Ø monitoring well to 6.1 m | | | | | | | |
| | completed with 3.1 m screen | | | | 8 | | | |
| | Sand backfill from 2.4 to 6.1 m | | | | | | | |
| | Bentonite seal from 0.0 m to 2.4 m | | | | 9 | | | |
| | Provided with a monument casing | | | | | | | |
| | | | | | 10 | | | |

W.L. @ El. 428.4 m upon completion

**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 6

**FIGURE NO.:** 6

**PROJECT DESCRIPTION:** Proposed Residential Development

**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**DRILLING DATE:** November 21, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) | Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90 | Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40 | WATER LEVEL |
|---|---|---|---|---|---|---|---|---|
| 443.7 | Ground Surface | | | | | | | |
| 0.0 | **36 cm Topsoil** | | | | 0 | | | |
| | **PLOUGHED SOIL** | 1 | DO | 10 | | | | |
| 443.0 | Dark brown sand, occ. rootlets | | | | | | | |
| 0.7 | Brown, compact | | | | | | | |
| | **SANDY SILT** | 2 | DO | 12 | 1 | | | |
| | some gravel | | | | | | | |
| | | 3 | DO | 10 | | | | |
| 441.5 | | | | | 2 | | | |
| 2.2 | Brown, compact to very dense | | | | | | | |
| | **SANDY GRAVEL** | 4 | DO | 25 | | | | |
| | occ. cobbles and boulders | | | | 3 | | | |
| | | 5 | DO | 38 | | | | |
| | | 6 | DO | 24 | 4 | | | |
| 438.7 | | 7 | DO | 50/28 | | | | |
| 5.0 | **END OF BOREHOLE** | | | | 5 | | | |
| | Installed 50 mm Ø monitoring well to 4.6 m completed with 3.1 m screen<br>Sand backfill from 0.9 to 4.6 m<br>Bentonite seal from 0.0 m to 0.9 m<br>Provided with a monument casing | | | | 6 | | | |
| | | | | | 7 | | | |
| | | | | | 8 | | | |
| | | | | | 9 | | | |
| | | | | | 10 | | | |

Dry upon Completion

**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 7

**FIGURE NO.:** 7

**PROJECT DESCRIPTION:** Proposed Residential Development

**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**DRILLING DATE:** November 23, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) |
|---|---|---|---|---|---|
| 442.3 | Ground Surface | | | | |
| 0.0 | **36 cm Topsoil** | | | | 0 |
| | **PLOUGHED SOIL**<br>Dark brown sand, occ. rootlets | 1 | DO | 6 | |
| 441.6 | | | | | |
| 0.7 | Brown, very loose to very dense<br>**SAND**<br>fine to well graded<br>a trace to some gravel | 2 | DO | 3 | 1 |
| | | 3 | DO | 18 | 2 |
| | | 4 | DO | 48 | |
| | | 5 | DO | 34 | 3 |
| | | 6 | DO | 50/23 | 4 |
| | | 7 | DO | 45 | 5 |
| 435.7 | | | | | 6 |
| 6.6 | **END OF BOREHOLE**<br>Installed 50 mm Ø monitoring well to 6.1 m<br>completed with 3.1 m screen<br>Sand backfill from 2.4 to 6.1 m<br>Bentonite seal from 0.0 m to 2.4 m<br>Provided with a monument casing | | | | 7 |
| | | | | | 8 |
| | | | | | 9 |
| | | | | | 10 |

Dynamic Cone (blows/30 cm) 10 30 50 70 90

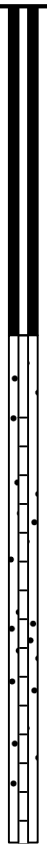
Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40

WATER LEVEL



Dry upon Completion

**Soil Engineers Ltd.**

**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 8

**FIGURE NO.:** 8

**PROJECT DESCRIPTION:** Proposed Residential Development

**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**DRILLING DATE:** November 23, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) | Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90 | Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40 | WATER LEVEL |
|---|---|---|---|---|---|---|---|---|
| 439.7 | Ground Surface | | | | | | | |
| 0.0 | **36 cm Topsoil** | | | | 0 | | | |
| | **PLOUGHED SOIL** | 1 | DO | 9 | | | | |
| 439.2 | Dark brown sand, occ. rootlets | | | | | | | |
| 0.5 | Brown, dense to very dense | | | | | | | |
| | **GRAVELLY SAND** | | | | | | | |
| | occ. cobbles and boulders | 2 | DO | 37 | 1 | | | |
| | | 3 | DO | 58 | 2 | | | |
| | | 4 | DO | 50/10 | | | | |
| | | 5 | DO | 50/15 | 3 | | | |
| | | | | | 4 | | | |
| | | 6 | DO | 50/15 | | | | |
| 434.2 | | | | | 5 | | | |
| 5.5 | Brown, very dense | | | | | | | |
| | **SILT** | | | | 6 | | | |
| | fine grained | 7 | DO | 56 | | | | |
| 433.1 | | | | | | | | |
| 6.6 | **END OF BOREHOLE** | | | | 7 | | | |
| | Installed 50 mm Ø monitoring well to 6.1 m completed with 3.1 m screen<br>Sand backfill from 2.4 to 6.1 m<br>Bentonite seal from 0.0 m to 2.4 m<br>Provided with a monument casing | | | | 8 | | | |
| | | | | | 9 | | | |
| | | | | | 10 | | | |

Dry upon Completion

**Soil Engineers Ltd.**

**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 9

**FIGURE NO.:** 9

**PROJECT DESCRIPTION:** Proposed Residential Development

**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**DRILLING DATE:** November 24, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) | Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90 | Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40 | WATER LEVEL |
|---|---|---|---|---|---|---|---|---|
| 437.7 | Ground Surface | | | | | | | |
| 0.0 | **36 cm Topsoil** | | | | 0 | | | |
| | **PLOUGHED SOIL** Dark brown sand, occ. rootlets | 1 | DO | 5 | | | | |
| 437.0 | | | | | | | | |
| 0.7 | Brown, compact **SAND** fine to medium grained | 2 | DO | 4 | 1 | | | |
| 435.9 | | 3 | DO | 31 | | | | |
| 1.8 | Brown, dense to very dense **GRAVELLY SAND** occ. cobbles and boulders | | | | 2 | | | |
| | | 4 | DO | 50/15 | | | | |
| | | | | | 3 | | | |
| | | 5 | DO | 50/10 | | | | |
| | | | | | 4 | | | |
| 433.0 | | 6 | DO | 50/3 | | | | |
| 4.7 | **END OF BOREHOLE** Installed 50 mm Ø monitoring well to 4.6 m completed with 3.1 m screen Sand backfill from 0.9 to 4.6 m Bentonite seal from 0.0 m to 0.9 m Provided with a monument casing | | | | 5 | | | Dry upon Completion |
| | | | | | 6 | | | |
| | | | | | 7 | | | |
| | | | | | 8 | | | |
| | | | | | 9 | | | |
| | | | | | 10 | | | |

**Soil Engineers Ltd.**

**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 10

**FIGURE NO.:** 10

**PROJECT DESCRIPTION:** Proposed Residential Development

**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**DRILLING DATE:** November 25, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) | Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90 | Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40 | WATER LEVEL |
|---|---|---|---|---|---|---|---|---|
| 438.0 | Ground Surface | | | | | | | |
| 0.0 | **36 cm Topsoil** | | | | 0 | | | |
| | **PLOUGHED SOIL** Dark brown sand, occ. rootlets | 1 | DO | 11 | | | | |
| 437.1 | | 2 | DO | 50/5 | 1 | | | |
| 0.9 | Brown, dense to very dense **GRAVELLY SAND** occ. cobbles and boulders | 3 | DO | 50/15 | | | | |
| | | 4 | DO | 34 | 2 | | | |
| | | 5 | DO | 38 | 3 | | | |
| | | 6 | DO | 50/15 | 4 | | | |
| | | | | | 5 | | | |
| 431.6 | | 7 | DO | 50/10 | 6 | | | |
| 6.4 | **END OF BOREHOLE** Installed 50 mm Ø monitoring well to 6.1 m completed with 3.1 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing | | | | 7 | | | |
| | | | | | 8 | | | |
| | | | | | 9 | | | |
| | | | | | 10 | | | |

Dry upon Completion

**Soil Engineers Ltd.**

**JOB NO.:** 2206-S054

# LOG OF BOREHOLE: 11

**FIGURE NO.:** 11

**PROJECT DESCRIPTION:** Proposed Residential Development

**METHOD OF BORING:** Flight Auger

**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**DRILLING DATE:** November 25, 2022

| El. (m) / Depth (m) | SOIL DESCRIPTION | SAMPLES Number | Type | N-Value | Depth Scale (m) | Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90 | Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40 | WATER LEVEL |
|---|---|---|---|---|---|---|---|---|
| 435.6 | Ground Surface | | | | | | | |
| 0.0 | **36 cm Topsoil** | 1 | DO | 12 | 0 | | | |
| | **PLOUGHED SOIL** Dark brown sand, occ. rootlets | | | | | | | |
| 434.9 | | | | | | | | |
| 0.7 | Brown, dense to very dense **SAND** well graded trace to some gravel | 2 | DO | 40 | 1 | | | |
| | | 3 | DO | 74 | 2 | | | |
| | | 4 | DO | 62 | | | | |
| | | 5 | DO | 46 | 3 | | | |
| 431.5 | | | | | 4 | | | |
| 4.1 | Dense **SILT** fine grained occ. clay seams | 6 | DO | 38 | 5 | | | |
| | brown / grey | 7 | DO | 38 | 6 | | | |
| 429.0 | | | | | | | | |
| 6.6 | **END OF BOREHOLE** Installed 50 mm Ø monitoring well to 6.1 m completed with 3.1 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing | | | | 7 8 9 10 | | | Dry upon Completion |


KEY PLAN NTS

BH/MW1

BH/MW2

BH/MW3

BH/MW4

BH/MW5

BH/MW6

BH/MW7

BH/MW8

BH/MW9

BH/MW10

BH/MW11

PARK / STORMWATER MANAGEMENT
AREA=0.888±Ha.
( 2.194±Acs. )
UNDERGROUND TANK

EXISTING HERITAGE HOUSE

FUTURE DEVELOPM MIXED USE
AREA=2.404±Ha.
( 5.940±Acs. )

AREA=0.947±Ha.
( 2.340±Acs. )

EXISTING SCHOOL / POTENTIAL FUTURE COMMERCIAL

PARK / STORMWATER MANAGEMENT
AREA=1.459±Ha.
( 3.605±Acs. )
UNDERGROUND TANK

NEW WELL

FUTURE WATER TOWER
±0.160±Ha.
(395±Acs. )

O.S.

BUFFER

WOODLOT

TRAFALGAR ROAD
(Also Known As MAIN STREET)

PART 1, PLAN 61R-2749

PART 1, PLAN 61R-4411

PART 1 PLAN 61R-7420

PART 1, PLAN 61R-8646

PART 2, PLAN 61R-10987

LOT LINE

*Soil Engineers Ltd.*
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

# Borehole and Monitoring Well Location Plan

**SITE:** 63 and 63A Trafalgar Road, Town of Erin

| | | | |
|---|---|---|---|
| **DESIGNED BY:** C.R. | **CHECKED BY:** K.F.L. | **DWG NO.:** 1 | |
| **SCALE:** 1:4000 | **REF. NO.:** 2206-S054 | **DATE:** November 2022 | **REV** - |

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**SUBSURFACE PROFILE**
**DRAWING NO. 2**
**SCALE: AS SHOWN**

**JOB NO.:** 2206-S054
**REPORT DATE:** November 2022
**PROJECT DESCRIPTION:** Proposed Residential Development
**PROJECT LOCATION:** 63 and 63A Trafalgar Road, Town of Erin

**LEGEND**

GRAVELLY SAND | SANDY SILT | SILT | PLOUGHED SOIL
SAND | SANDY SILT TILL

WATER LEVEL (END OF DRILLING)