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# Geotechnical Investigation
# 725 Westney Road South,
# Ajax, Ontario

***Palmer/SLR Project #***
1904320

***Prepared For***
Firearms Outlets Canada
c/o The Biglieri Group

March 17, 2025

March 17, 2025

Fred Pelligrino
Firearms Outlets Canada
c/o Shilpi Saraf-Uiterlinden
The Biglieri Group
2472 Kingston Rd.
Toronto, ON, M1N 1V3

Dear Mr. Pelligrino:

**Re: Geotechnical Investigation 725 Westney Road South, Ajax, Ontario**
**Project #: 1904320**

Palmer/SLR is pleased to submit the attached report describing the results of our geotechnical investigation for the project at the subject site ("the Site") located in Ajax, Ontario.

The report provides site information from our site investigation, laboratory testing, records reviews, and our interpretations/recommendations for your consideration.

Thank you for the opportunity to be of service on this project. We trust that this report will be satisfactory for your current needs. If you have any questions or require further information, please contact our office at your convenience. This report is subject to the Statement of Limitations provided at the end of this report.

Yours truly,

Sam MacDonald., EIT
Geotechnical Project Manager

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## Appendix A


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General Requirements for Engineered Fill
Particle Size Distribution Report

# 1. Introduction

Palmer/SLR was retained by Firearms Outlets Canada c/o The Biglieri Group to undertake a geotechnical investigation in support of the Site Plan Approval and Zoning By-Law Amendment applications with the Town of Ajax. The proposed development, to be completed over two phases, is the redevelopment of an existing building to facilitate the development of an indoor gun range, retail store for the sale of firearms and ammunition, warehouse, office space as well as an event space. It is Palmer/SLR's understanding that the redevelopment would consist of adding a second floor and no changes to the footprint of the building are anticipated at the time of writing this report.

The objective of this geotechnical investigation was to determine the subsurface conditions in the area of the proposed development by means of three (3) geotechnical exploratory boreholes. From the findings in the boreholes, Palmer/SLR makes engineering recommendations for the project.

The report is provided on the basis of the terms of reference presented above, and on the assumption that the design will be in accordance with applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning the geotechnical aspects of the codes and standards, this office should be contacted to review the changes. It may then be necessary to carry out additional borings and reporting before the recommendations of this office can be relied upon.

The site investigation and recommendations follow generally accepted practice for geotechnical consultants in Ontario. The format and contents are guided by client specific needs and economics and do not conform to generalized standards for services. Laboratory testing follows ASTM or CSA Standards or modifications of these standards that have become standard practice.

This report deals with geotechnical issues only. Environmental site assessments (ESAs) for the Site are provided in separate Palmer/SLR reports.

This report has been prepared for Firearms Outlets Canada c/o The Biglieri Group and their designers. Use of this report by third party without Palmer/SLR's consent is prohibited. The limitations of the report presented within form an integral part of the document and they must be considered in conjunction with this report.

# 2. Site and Regional Geology

The study area is situated within the Iroquois Plain physiographic region of Southern Ontario (Chapman and Putnam, 1984). The topography in this region typically consists of a slightly sloping plain.

A review of available Ontario surficial geology mapping indicated that the overburden materials of the site comprised of clay with deposits of sand and gravel. Bedrock geology mapping indicated that the site is underlain by bedrock comprised of shale, limestone and dolostones of the Georgian Bay Formation (Ontario Geological Survey, 2011).

# 3. Field and Laboratory Work

The field work for the geotechnical investigation was carried out on November 28, 2023 by drilling specialists subcontracted to Palmer/SLR, during which time three (3) boreholes (BH23-1 to BH23-3) were advanced. The locations of boreholes are shown on the Borehole/Monitoring Well Location Plan, **Drawing 1**. The boreholes were drilled to depths ranging from 8.4 to 9.9 m below existing ground surface (Elev. 91.5 to 92.4). Additional Boreholes and monitoring wells were advanced to support the Environmental reporting (BH23-4 to BH23-7) and will not be referenced in this report.

The boreholes were advanced with a power auger drilling machine, where soil stratigraphy was recorded by observing the quality and changes of augered materials which were retrieved from the boreholes, and by sampling the soils at regular intervals of depth using a 50 mm O.D. split spoon sampler, in accordance with the Standard Penetration Test (SPT) method (ASTM D 1586). This sampling method recovers samples from the soil strata, and the number of blows required to drive the sampler 300 mm depth into the soil (SPT 'N' values) gives an indication of the compactness condition or consistency of the sampled soil material. The SPT 'N' values are indicated on the borehole logs (Refer to **Appendix A**). The field work for this investigation was supervised by Palmer/SLR engineering staff, who also logged the boreholes and cared for the recovered samples.

Three (3) monitoring wells were installed in the boreholes to determine stabilized groundwater levels. The stabilized groundwater levels were measured on the date of installation (November 28, 2023), December 7 and 14, 2023. The monitoring well installation details and the measured groundwater levels are summarized in **Table 1** and shown in the individual borehole logs.

All soil samples obtained during this investigation were brought to our laboratory for further examination. These soil samples will be stored for a period of three (3) months after the day of issuing the draft report, after which time they will be discarded unless Palmer/SLR is advised otherwise in writing. In addition to visual examination in the laboratory, all soil samples from geotechnical boreholes were tested for moisture contents. Grain size analyses of two (2) selected soil samples were conducted along with an Atterberg limit test and the results are presented on the individual Borehole logs and in **Appendix B**.

The approximate elevations at the as-drilled borehole locations were surveyed using a differential GPS unit which were not provided by a professional surveyor and should be considered as approximate. Contractors performing the work should confirm the elevations prior to construction. The locations plotted on **Drawing 1** were based on the survey and should be considered as approximate.

# 4. Subsurface Conditions

The borehole locations are shown on **Drawing 1**. General notes on soil sample description are presented on the "Explanation of Terms Used in the record of borehole" sheet in **Appendix A**. The subsurface conditions in the boreholes are presented in the individual borehole logs (**Enclosures 1** to **3** inclusive, **Appendix A**). The subsurface conditions in the boreholes are summarized in the following paragraphs.

## 4.1 Soil Conditions

***Pavement and Fill Materials***

A pavement structure with thickness of about 80 to 90 mm of asphalt over 120 to 150 mm of crushed grey limestone granular fill was encountered surficially in Boreholes BH23-1 and BH23-2 and a pavement structure with thickness of about 80 mm over a 1440 mm layer of sand and gravel subbase was encountered surficially in Borehole BHG23-3. Fill Materials consisting of silty clay with sand and gravel were encountered below the pavement structure in all boreholes and extended to depths ranging from about 2.3 to 3.2 m below existing ground surface (Elev. 88.8 to 89.9). For the cohesionless fill materials, Standard penetration test (SPT) 'N' values ranging from 8 to greater than 50 blows per 300mm penetration indicated loose to very dense compactness condition. For the cohesive fill materials, SPT 'N' values ranging from 8 to 32 blows per 300mm penetration indicated stiff to hard consistency. It should be noted the loose fill was only found in Borehole BH23-2. The in-situ moisture contents measured in the fill samples ranged from approximately 4 to 16%.

***Silty Clay/Clayey Silt Till***

Silty clay till to clayey silt till layers were encountered below the fill materials in Borehole BH23-1 and BH23-2 extending to 7.2 and 2.3 m (Elev. 85.2 and 89.9) and another layer of clayey silt was encountered below the sandy silt in Borehole BH23-2 extending to 5.7 m (Elev. 86.5). In general, SPT 'N' values ranged from 9 to 36 indicating a stiff to hard consistency. The natural moisture contents measured in the soil samples ranged from approximately 7 to 9%.

***Sandy Silt/Silty Sand***

Sandy silt and silty sand layers were encountered below the clayey silt till in Boreholes BH23-1 and BH23-2 and below the fill in BH23-3 and extended to borehole termination depths at 8.4 and 9.2 m below existing ground surface (Elev. 84.0 and 81.5). Sandy silt was also found in BH23-2 In General, SPT 'N' values were taken in the sandy silt resulting in 10 to 70 blows indicating a compact to dense compactness condition. However, locally in Borehole 2 and below 6.0 m in Borehole 23-3, SPT 'N' values of 5 to 8 were recorded indicating a loose compactness. The natural moisture content measured in the soil sample was approximately 6 to12%.

## 4.2 Groundwater Conditions

Three (3) monitoring wells (50 mm dia.) were installed to monitor stabilized groundwater levels. The stabilized groundwater levels were measured on November 28 and December 7, 2023. The monitoring well installation details and the measured groundwater levels are summarized in **Table 1** and shown in the individual borehole logs.

**Table 1: Monitoring Well Details and Water Levels**

| Monitoring Well ID | Screen Interval (mBGS) | Water Level Depth (mBGS)/ Water Level Elevation (m) | | |
|---|---|---|---|---|
| | | November 28, 2023 | December 7, 2023 | December 14, 2023 |
| BH22-1 | 4.9 ~ 7.9 | No GW Accu. /(N/A) | 5.7/86.7 | 5.9/86.5 |
| BH22-2 | 6.6 ~ 9.6 | No GW Accu. /(N/A) | 8.6/83.6 | 8.3/83.9 |
| BH22-3 | 6.6 ~ 9.6 | No GW Accu. /(N/A) | 7.5/84.0 | 7.7/83.8 |

Note: mBGS = meter below ground surface

It should be noted that the groundwater levels can vary and are subject to seasonal fluctuations in response to weather events.

# 5. Discussion and Recommendations

It is understood that the proposed development plan includes a two-storey slab on grade addition of the existing structure on site to accommodate an indoor gun range, retail store, warehouse, and office space along with loading bay and a paved parking lot with finished floor elevation (FFE) of 92.04. Further details about the design are unknown at the time of writing this report.

## 5.1 Building Foundation Considerations

For the purposes of this report, it is assumed that the footings will be approximately 1.4 m below the FFE at the elevation of 90.64, in the proposed addition footprint as shown in the attached drawing number C103 labelled “Preliminary Site Grading Plan” drawn by Crozier Consulting Engineers provided by the client. Based on the borehole information, it is considered feasible to support the proposed warehouse building on strip and spread footings on the native very stiff to hard clayey silt till or engineered fill.

Based on the borehole information, the proposed warehouse can be supported by spread and strip footings can be founded on the undisturbed native soils or engineered fill and designed for a factored net bearing resistance at Ultimate Limit State (ULS) of 225 kPa and a bearing resistance at serviceability limit states (SLS) at 150 kPa. Please see Appendix A for general recommendations on engineered fill.

It should be noted that the presence of relatively deep fill was observed up to 3.2 m deep and was noted to be mostly compact to dense, but locally loose to very loose areas are possible due to the nature of fill. The fill is not considered suitable to support foundation loads. Recommendations for engineered fill are provided in Appendix B.

All footing bases must be inspected by qualified geotechnical engineering personnel prior to pouring concrete. The excavated footing bases can be covered with 50 mm thick lean concrete slab immediately after inspection and cleaning in order to avoid disturbance of the founding soil due to water, construction activity and weathering/drying.

Foundations designed to the specified bearing capacity at the SLS of 150 kPa are expected to settle less than 25 mm total and 19 mm differential.

All foundations exposed to seasonal freezing conditions must have at least 1.2 metres of soil cover for frost protection.

In the vicinity of the existing buried utilities, all footings must be lowered to undisturbed native soils, or alternatively the services must be structurally bridged. Where it is necessary to place footings at different levels, the upper footing must be founded below an imaginary 10 horizontal to 7 vertical line drawn up from the base of the lower footing. The lower footing must be installed first to help minimize the risk of undermining the upper footing.

It should be noted that the recommended bearing resistances have been estimated by Palmer/SLR from the borehole information for the design stage only. The investigation and comments are necessarily on-going as new information of the underground conditions becomes available. For example, more specific information is available with respect to conditions between boreholes when foundation construction is underway. The interpretation between boreholes and the recommendations of this report must therefore be checked through field inspections to validate the information for use during the construction stage.

## 5.2 Floor Slab and Permanent Drainage

The existing fills are considered not suitable for supporting the floor slab. Construction of the floor slab as a conventional slab-on-grade on competent native or engineered fill is considered feasible. Preparation of the floor slab subgrade should include stripping of the uncontrolled fill and otherwise deleterious material followed by proof-rolling of the exposed subgrade with a heavy roller to ensure uniform adequate support. Any soft spots revealed during proof rolling must be sub-excavated and backfilled with a well compacted approved material. The backfill required to raise the grade can consist of inorganic soil, placed in shallow lifts (200 mm) and compacted to 98% of Standard Proctor Maximum Dry Density (SPMDD).

A moisture barrier consisting of at least 200 mm of 19 mm clear crushed stone should be installed under the floor slab.

For slab-on-grade building without basement, if the floor slab is more than about 300 mm higher than the exterior grade, then a perimeter drainage system is not considered to be necessary. If the floor is lower, then the perimeter drainage system shown on **Drawing 3** is recommended.

## 5.3 Lateral Earth Pressures

The planned loading bay will experience lateral earth pressures as well as any foundation walls. The lateral earth pressures acting at any depth on foundation walls may be calculated from the following expression:

$$P_h = K (\gamma h + q)$$

where $P_h$ = Lateral earth pressure acting at depth "h" (kPa)

K = Earth pressure coefficient, assumed to be 0.40 for vertical walls and horizontal backfill for permanent construction

$\gamma$ = Unit weight of backfill, may assume a value of 21 kN/m$^3$

h = Depth below finished grade of the point of interest (m)

q = Equivalent value of surcharge on the ground surface (kPa)

The above expression assumes that the perimeter drainage system as shown on **Drawing 3** prevents the build-up of any hydrostatic pressure behind the wall.

## 5.4 Excavations and Backfill

Excavations might extend through the fill materials into the native silty clay till to clayey silt till. Excavations can be carried out with a heavy hydraulic backhoe. It should be noted that the (glacial) tills are non-sorted sediments and therefore may contain boulders. Possible large obstructions such as buried concrete pieces and existing foundations may also be encountered at the Site within the fill materials. Provisions must be made in the excavation contract for the removal of possible boulders in the till or obstructions in the fill material.

All excavations must be carried out in accordance with the most recent Occupational Health and Safety Act (OHSA). In accordance with OHSA, the fill materials, the stiff native cohesive soils would be classified as Type 3 above the groundwater table and Type 4 below the groundwater table.

Provided adequate groundwater control is achieved, it is anticipated that the majority of the foundation excavations at the Site could consist of temporary open cuts with side slopes of 1 horizontal to 1 vertical (1H: 1V) to the base of the excavation. However, depending on the construction procedures adopted by the contractor and weather conditions at the time of construction, some local flattening of the slopes may be required. Where side slopes of excavations are to be steepened, then a positive excavation support system should be considered.

The existing fill in the boreholes is generally not suitable for re-use as backfill. The native soils free from organics and other deleterious materials can be used as general construction backfill. Loose lifts of soil, which are to be compacted, should not exceed 200 mm. Depending on the time of construction and weather, some excavated material may be too wet to compact and will require aeration prior to its use.

Under floor fill should be compacted to at least 98% of SPMDD. The excavated soils are not considered to be free draining. Where free draining backfill is required, imported granular fill such as OPSS Granular "B" should be used. Imported granular fill, which can be compacted with handheld equipment, should be used in confined areas.

It should be noted that the excavated soils are subject to moisture content increase during wet weather which would make these materials too wet for adequate compaction. Stockpiles should be compacted at the surface or be covered with tarpaulins to minimize moisture uptake.

It is expected that any seepage above the groundwater table can be removed by pumping from sumps in the building development area. Groundwater was encountered on site below the expected excavation depths and is not expected to be an issue.

It should be noted that if the construction dewatering system/sumps result in a water taking of more than 50,000 L/day but less than 400,000 L/day, a registration should be made in the Environmental Activity and Sector Registry (EASR). If a water taking is more than 400,000 L/day, a permit to take water (PTTW), issued by the MECP, will be required.

Surface water should be directed away from the excavation area, to prevent ponding of water that could result in disturbance and weakening of the foundation subgrade.

## 5.5 Seismic Considerations

The 2012 Ontario Building Code (OBC 2012) came into effect on January 1, 2014 and contains updated seismic analysis and design methodology. The seismic site classification methodology outlined in the code is based on the subsurface conditions within the upper 30 m below existing grade.

The conservative site classification is based on physical borehole information obtained at depths of less than 30 m and based on general knowledge of the local geology and physiography. In this regard, Palmer/SLR's drilling program included boreholes drilled to depths up to 9.9 m below the existing ground surface. Based on the borehole information and our local experience, a Site Class D may be used for the building design.

Should optimization of the site class be recommended by the structural engineer, in situ geophysical testing or a deep borehole extending to 30 m may be considered.

## 5.6 Pavements

The existing pavement structure consists of 80 to 90 mm of asphalt over 150 mm of grey crushed limestone granular fill in Boreholes BH23-1 and BH23-2 and 90 mm asphalt over 1440 sand and gravel granular subbase in Borehole BH23-3, the subgrade is generally stiff/compact. This pavement structure is generally considered suitable to support a fire truck for temporary access according to OBC Article 3.2.5.6. Further study would be required to provide recommendations for parking lot reconstruction.

# 6. Certification

We trust that the information contained in this report is satisfactory. Should you have any questions, please do not hesitate to contact this office.
This report was prepared and reviewed by the undersigned.

Yours truly,

**Prepared By:**

Sam MacDonald, EIT
Geotechnical Project Manager


**Reviewed By:**

Matthew D. St Denis, P.Eng.
Team Lead, Geotechnical Engineering East

# 7. References

ASTM International. 2018. ASTM D1586 / D1586M-18, Standard test method for standard penetration test (SPT) and split-barrel sampling of soils.

Canadian Geotechnical Society. 2006. Canadian Foundation Engineering Manual, 4th Edition.

Chapman, L.J. and Putnam, D.F. 1984. Physiography of southern Ontario; Ontario Geological Survey

Ontario Geological Survey 2010. Surficial geology of southern Ontario; Ontario Geological Survey, Miscellaneous Release— Data 128 – Revised.

Ontario Geological Survey 2011. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release---Data 126-Revision 1.

# General Comments and Limitations of Report

Palmer/SLR should be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, Palmer/SLR will assume no responsibility for interpretation of the recommendations in the report.

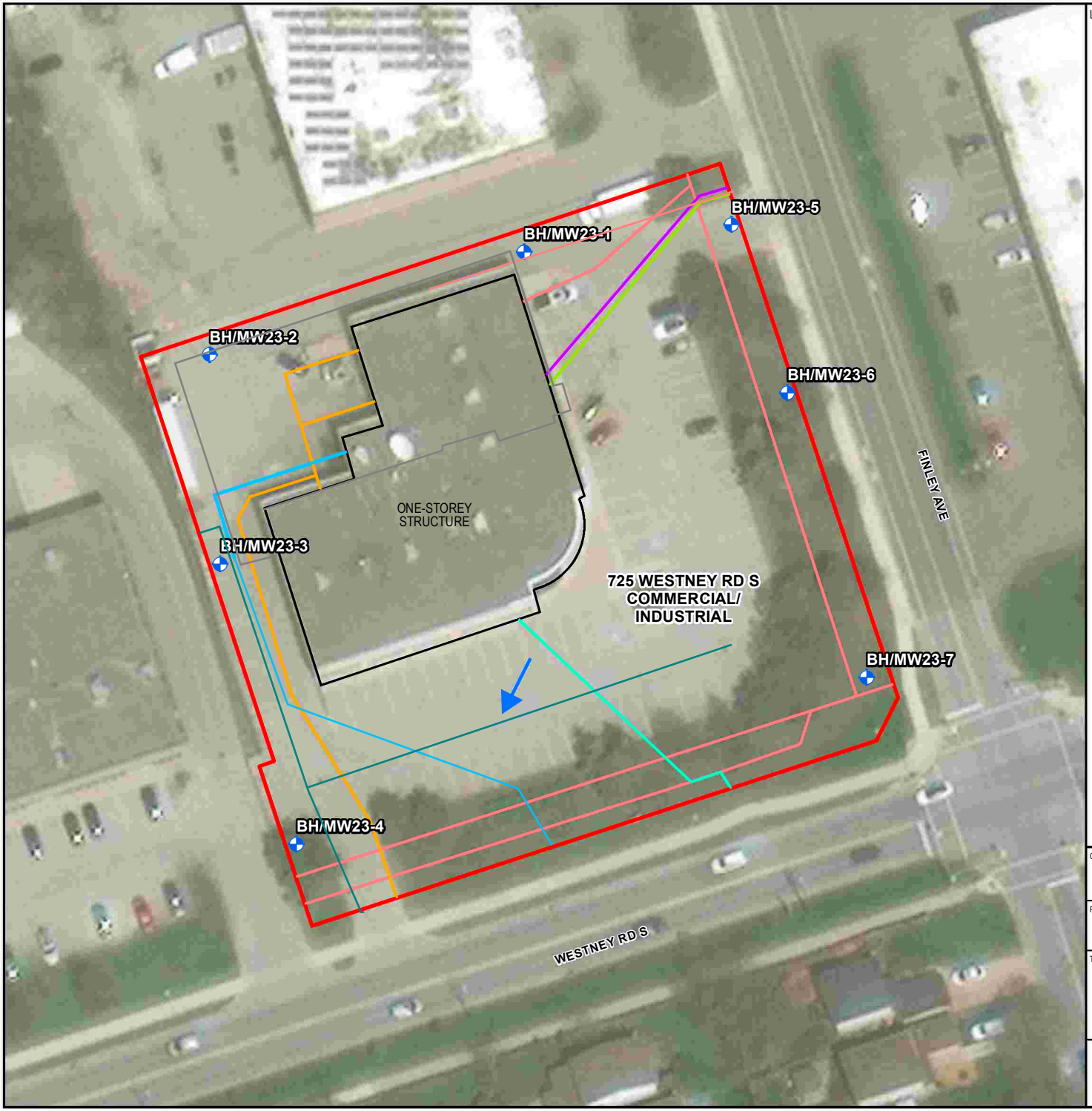
The comments given in this report are intended only for the guidance of design engineers. The number of boreholes and test pits required to determine the localized underground conditions between boreholes and test pits affecting construction costs, techniques, sequencing, equipment, scheduling, etc., would be much greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole and test pit results, so that they may draw their own conclusions as to how the subsurface conditions may affect them. This work has been undertaken in accordance with normally accepted geotechnical engineering practices.

This report is intended solely for the Client named. The material in it reflects our best judgment in light of the information available to Palmer/SLR at the time of preparation. Unless otherwise agreed in writing by Palmer/SLR, it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

The conclusions and recommendations given in this report are based on information determined at the test hole locations. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the test holes may differ from those encountered at the test hole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. The benchmark and elevations used in this report are primarily to establish relative elevation differences between the test hole locations and should not be used for other purposes, such as grading, excavating, planning, development, etc.

The design recommendations given in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Palmer/SLR accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.




LEGEND

- Borehole/Monitoring Well Location
- Water Main
- Gas Utility
- Hydro Utility
- Bell Utility (Buried)
- Fibre Optic Utility
- Cable/TV Utility
- Inferred Ground Water Flow Direction
- Phase Two Property
- Storm Sewer
- Proposed building addition

0 4 8 16 24 32 40
METRE SCALE

North American Datum 1983
Universal Transverse Mercator Projection Zone 17

Scale: 1:750
Page Size: Letter (8.5 x 11 inches)

Drawn: CV
Checked: SG
Date: Feb 5, 2024

Source Notes:
Imagery (2022, Maxar) provided by Esri basemap service.

NORTH

CLIENT
Firearms Outlets Canada

PROJECT
725 Westney Rd S, Ajax

TITLE
**Borehole Location Plan**

Palmer | PART OF SLR

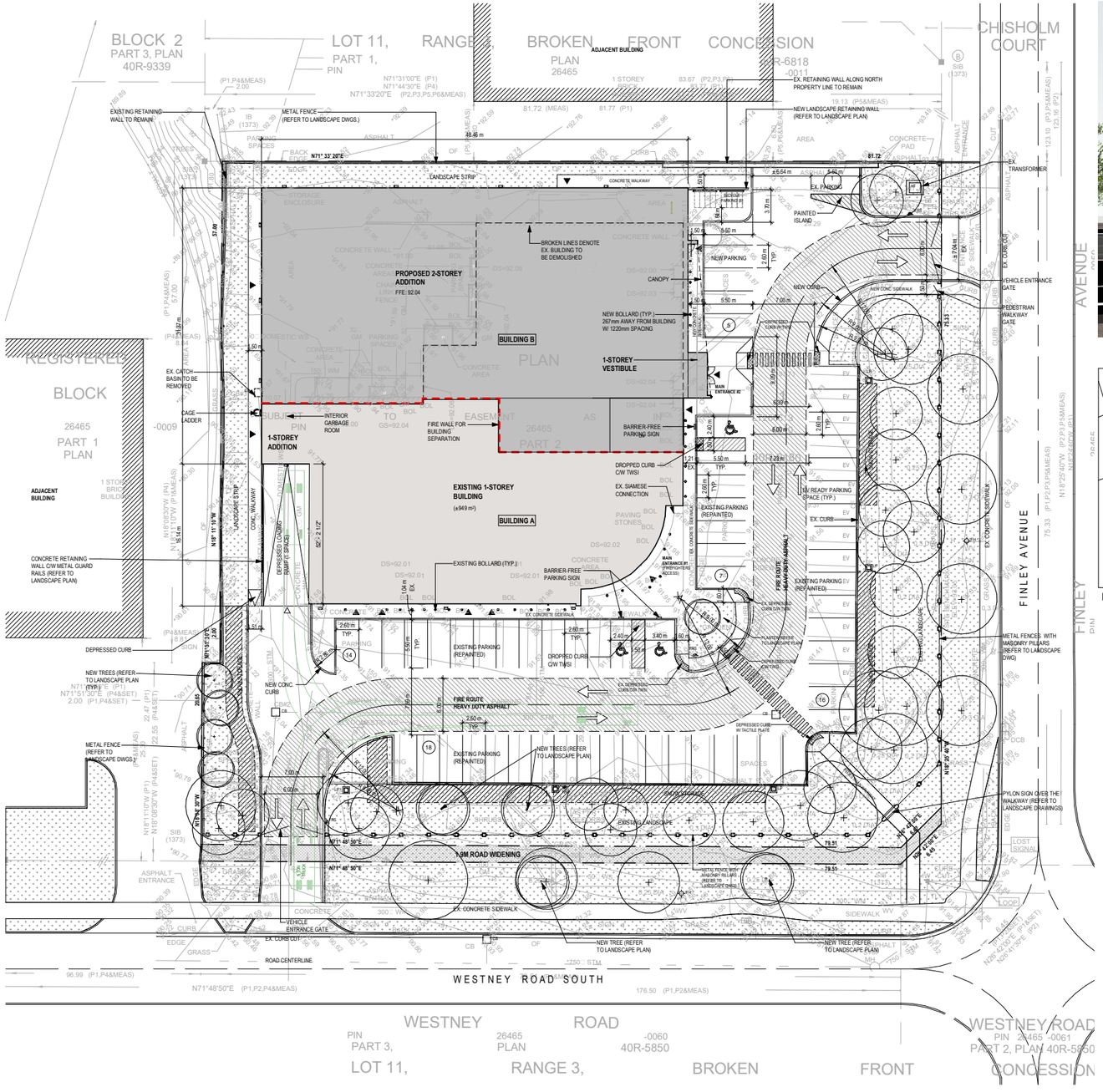
REF. NO. 1904320-MR-112-1

**Drawing 1**

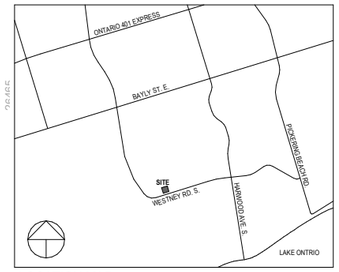
Document Path: G:\Shared drives\Projects 2019\19043 - The Biglieri Group\1904320 - 725 Westney Rd S, Ajax - ESA\GIS\1_Workspace\Task 1 - EC Figures\110-PhTwoDr\1904320-MR-112-1 (Dr 2 - Borehole Location Plan).mxd

# FIREARMS OUTLET CANADA
## INTERIOR RENOVATION & ADDITION

725 WESTNEY ROAD SOUTH
AJAX, ONTARIO L1S 7J7




1 SITE PLAN
1" = 20'-0"


LOCATION MAP

**SITE STATISTICS**

LOT AREA: ±6,563.15 m²
DEVELOPABLE (NET) LOT AREA: 6,324.71 m²
ZONING CATEGORY: PE

| | | | |
|---|---|---|---|
| **SETBACKS** | FRONT YARD: | ±26.1m | |
| | EXTERIOR SIDE YARD: | 27.1m | |
| | INTERIOR SIDE YARD: | 4.5m | |
| | REAR YARD: | 3.0m | |
| **BUILDING AREA** | EXISTING: ±854 m² (9191 SF) | | |
| | ADDITION: 1,314 m² (14,144 SF) | | |
| | **TOTAL: 2,168 m² (23,335 SF)** | | |
| **GFA** | EXISTING: ±854 m² (9191 SF) | | |
| | ADDITION | GROUND FLOOR: 1,314 m² (14,144 SF) | |
| | | SECOND FLOOR: 1,207 m² (13,001 SF) | |
| | | TOTAL: 2,521 m² (27,145 SF) | |
| | **TOTAL: 3,375 m² (36,336 SF)** | | |
| **LOT COVERAGE** | 33.9% | | |
| **FSI** | 0.53 | | |
| **BUILDING HEIGHT** | 46 FT | | |
| **GFA BREAKDOWN** | RETAIL: 271 m² (8% OF GFA) | | |
| | OFFICES: 84.2 m² | | |
| | CLASSROOMS: 96 m² | | |
| | WASHROOMS: 67 m² | | |
| | VESTIBULES: 20 m² | | |
| | SECURITY ROOM: 17 m² | | |
| | STAFF/LUNCH ROOM: 8 m² | | |
| | LOBBY: 60 m² | | |
| | RESTAURANT: 245 m² | | |
| | LOADING: 24 m² | | |
| | WAREHOUSE: 311 m² | | |
| | SHOOTING RANGES: TRADITIONAL RANGE: 625 m² (BOOTHS:56 m²)(15 LANES) CLAYHOUSE SHOTGUN RANGE: 1,059 m² (BOOTHS: 89 m²)(8 LANES) **TOTAL: 1,684 m² (BOOTHS: 145 m²)(23 LANES)** | | |
| | OTHER SPACES: 448 m² (CORRIDOR/MECH ROOM/ELEC ROOM STORAGE/ JANITOR/STAIRS/ LOBBY) | | |
| **PARKING** | REQUIRED | RETAIL: 10 SPACES (1 PER 28m²) | |
| | | CLASSROOMS: 5 SPACES (1 PER 20m²) | |
| | | WAREHOUSE: 1 SPACE (1 PER 500m²) | |
| | | RESTAURANT: 25 SPACES (1 PER 10m²) | |
| | | SHOOTING RANGES: 21 SPACES (0.92 PER LANE) | |
| | | **TOTAL: 61 SPACES** | |
| | PROVIDED | 61 SPACES (INCLUDING 3 BARRIER-FREE PARKING SPACES) (INCLUDING 16 EV READY PARKING SPACES) | |
| **BICYCLE PARKING** | PROVIDED | 8 SPACES (SHORT TERM) | |
| **SNOW STORAGE** | PROVIDED | 206 m² | |
| **PAVED AREA** | 2,126 m² | | |
| **LANDSCAPED AREA** | 1,978 m² (31% LOT AREA) | | |
| **SOFT LANDSCAPE** | 1,415 m² (71.5% LANDSCAPED AREA) | | |

**LEGEND**

- PROPERTY LINE
- MEN DOOR (ENTRANCES & EXITS)
- TRUCK ENTRANCES
- HYDRO TRANSFORMER
- FH — FIRE HYDRANT
- CB — CATCH BASIN
- FIRE DEPARTMENT CONNECTION
- FRS — FIRE ROUT SIGN
- XX — INDICATE NUMBER OF PARKING SPACES
- ACCESSIBLE PARKING SPACES
- LP — LIGHT POLE (REFER TO ELEC. PLAN)
- FIRE WALL SEPERATION

| No. | Date: | Issued/Revision: | By |
|---|---|---|---|
| 15 | 03/19/2025 | ISSUED FOR SPA | HW |
| 14 | 09/17/2024 | ISSUED FOR REVIEW | HW |
| 13 | 06/21/2024 | ISSUED FOR PRE-CON PHASE II | HW |
| 12 | 06/12/2024 | ISSUED FOR COORDINATION | HW |
| 11 | 06/05/2024 | ISSUED FOR COORDINATION | HW |
| 10 | 05/29/2024 | ISSUED FOR COORDINATION | HW |
| 9 | 05/03/2024 | ISSUED FOR COORDINATION | HW |
| 8 | 04/09/2024 | ISSUED FOR COORDINATION | HW |
| 7 | 12/19/2023 | ISSUED FOR REVIEW | HW |
| 6 | 12/18/2023 | ISSUED FOR COORDINATION | HW |
| 5 | 12/08/2023 | ISSUED FOR REVIEW | HW |
| 4 | 11/21/2023 | ISSUED FOR REVIEW | HW |
| 3 | 11/06/2023 | ISSUED FOR REVIEW | HW |
| 2 | 07/18/2023 | ISSUED FOR REVIEW | HW |
| 1 | 07/17/2023 | ISSUED FOR REVIEW | HW |

Client:

FIREARMS OUTLET CANADA


**WANG ARCHITECTS INC.**
3950 14th Ave, Unit 609
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Project :

FIREARMS OUTLET CANADA

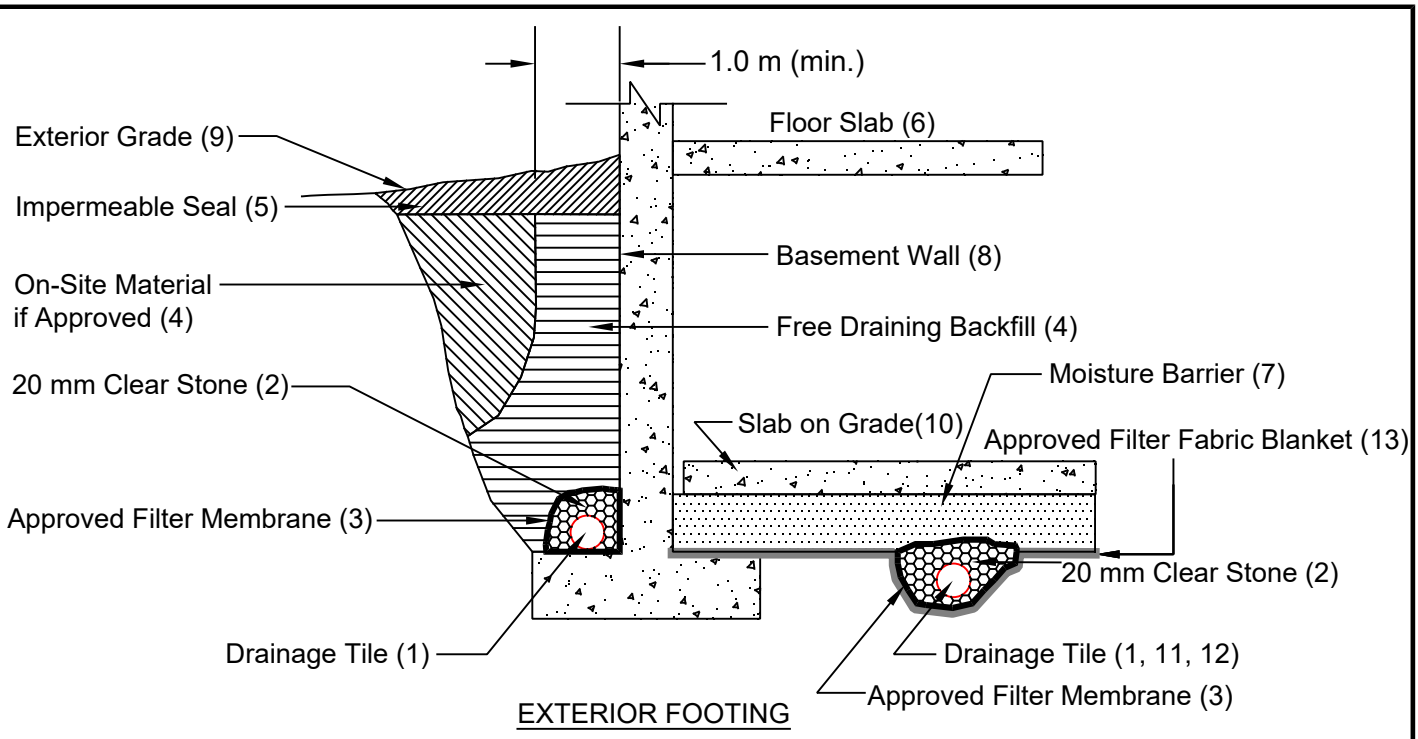
725 WESTNEY RD. S.,
AJAX, ON L1S 7J7

Drawing Name :

SITE PLAN

| | | | |
|---|---|---|---|
| Scale : | As indicated | Project No : | 00026 |
| Drawn by : | ZC | Drawing No : | A1.1 |
| Checked by : | HW | | |

C:\Users\HenryWang\Documents\725 Westney Rd S- Working drawings_HenryWang.rvt



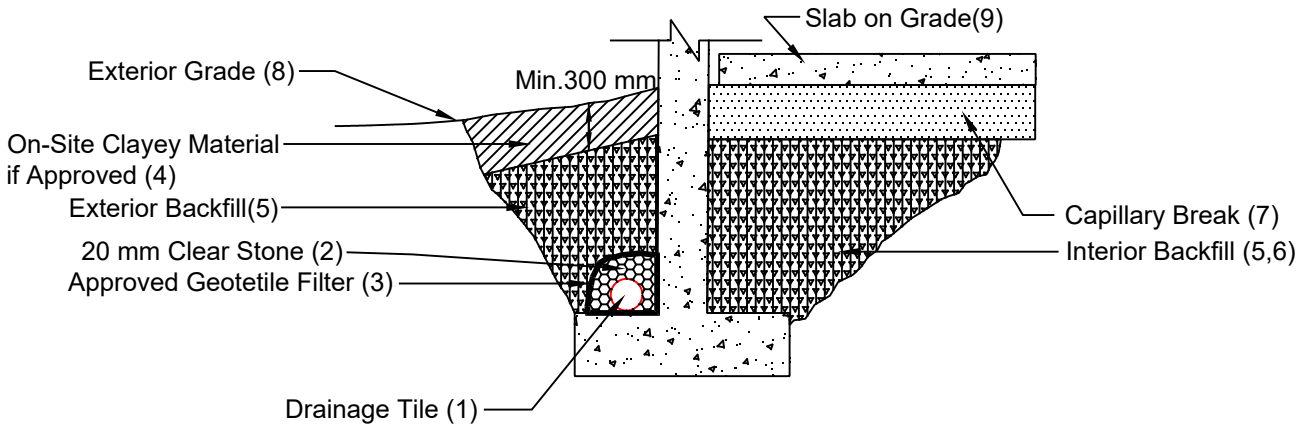

EXTERIOR FOOTING

**Notes**

1. Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet.
2. 20 mm (3/4") clear stone - 150 mm (6") top and side of drain. If drain is not on footing, place100 mm (4 inches) of stone below drain .
3. Wrap the clear stone with an approved filter membrane (Terrafix 270R or equivalent).
4. Free Draining backfill - OPSS Granular B or equivalent compacted to the specified density. Do not use heavy compaction equipment within 450 mm (18") of the wall. Use hand controlled light compaction equipment within 1.8 m (6') of wall. The minimum width of the Granular 'B' backfill must be 1.0 m.
5. Impermeable backfill seal - compacted clay, clayey silt or equivalent. If original soil is free-draining, seal may be omitted. Maximum thickness of seal to be 0.5 m.
6. Do not backfill until wall is supported by basement and floor slabs or adequate bracing.
7. Moisture barrier to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material. A vapour barrier may be required for specialty floors.
8. Basement wall to be damp proofed /water proofed.
9. Exterior grade to slope away from building.
10. Slab on grade should not be structurally connected to the wall or footing.
11. Underfloor drain invert to be at least 300 mm (12") below underside of floor slab.
12. Drainage tile placed in parallel rows 6 to 8 m (20 to 25') centers one way. Place drain on 100 mm (4") clear stone with 150 mm (6") of clear stone on top and sides. Enclose stone with filter fabric as noted in (3).
13. The entire subgrade to be sealed with approved filter fabric (Terrafix 270R or equivalent) if non-cohesive (sandy) soils below ground water table encountered.
14. Do not connect the underfloor drains to perimeter drains.
15. Review the geotechnical report for specific details.

## DRAINAGE AND BACKFILL RECOMMENDATIONS
## Basement with Underfloor Drainage

(not to scale)

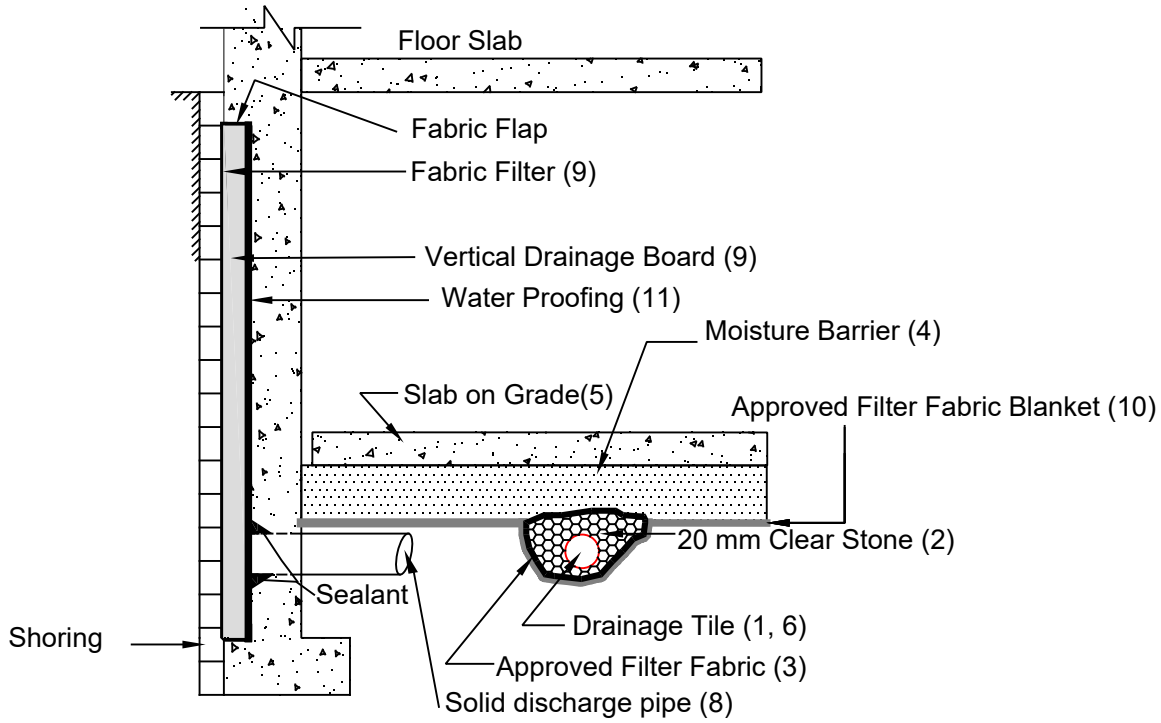



EXTERIOR FOOTING

**Notes**

1. Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet.
2. 20 mm (3/4") clear stone - 150 mm (6") top and side of drain. If drain is not on footing, place100 mm (4 inches) of stone below drain .
3. Wrap the clear stone with an approved geotetile filter (Terrafix 270R or equivalent).
4. The on-site clayey material, if approved, can be used as backfill in the upper 300 mm.
5. The interior and exterior fill adjacent to foundation walls should be OPSS Granular 'B' Type I. Compact to at least 98% SPMDD.
6. Do not use heavy compaction equipment within 450 mm (18") of the wall. Do not fill or compact within 1.8 m (6') of the wall. Place fill on both sides simultaneously.
7. Capillary break to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material. A vapour barrier may be required for specialty floors (consult with archtect).
8. Exterior grade to slope away from building at min. 2%.
9. Slab on grade should not be structurally connected to the wall or footing.
10. Review the geotechnical report for specific details.

**DRAINAGE AND BACKFILL RECOMMENDATIONS**
**Slab on Grade Construction Without Underfloor Drainage**
(not to scale)




EXTERIOR FOOTING

**Notes**

1. Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet, spaced between columns.
2. 20 mm (3/4") clear stone - 150 mm (6") top and side of drain. If drain is not on footing, place100 mm (4 inches) of stone below drain .
3. Wrap the clear stone with an approved filter membrane (Terrafix 270R or equivalent).
4. Moisture barrier to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material. A vapour barrier may be required for specialty floors.
5. Slab on grade should not be structurally connected to the wall or footing.
6. Underfloor drain invert to be at least 300 mm (12") below underside of floor slab. Drainage tile placed in parallel rows 6 to 8 m (20 to 25') centers one way. Place drain on 100 mm (4") clear stone with 150 mm (6") of clear stone on top and sides. Enclose stone with filter fabric as noted in (3).
7. Do not connect the underfloor drains to perimeter drains.
8. Solid discharge pipe located at the middle of each bay between the solider piles, approximate spacing 2.5 m, outletting into a solid pipe leading to a sump.
9. Vertical drainage board with filter cloth should be kept a minium of 1.2 m below exterior finished grade.
10. The entire subgrade to be sealed with approved filter fabric (Terrafix 270R or equivalent) if non-cohesive (sandy) soils below ground water table encountered.
11. The basement walls should be water proofed using bentonite or equivalent water-proofing system.
12. Review the geotechnical report for specific details. Final detail must be approved before system is considered acceptable.

## DRAINAGE RECOMMENDATIONS
## Shored Basement wall with Underfloor Drainage System

(not to scale)

# Appendix A

Notes on Sample Descriptions

Explanation of Terms Used in the Record of Borehole

Borehole Logs

## NOTES ON SAMPLE DESCRIPTIONS

1. All sample descriptions included in this report generally follow the Unified Soil Classification system. Laboratory grain size analyses provided by PECG also follow the same system. Different classification systems may be used by others, such as the system by the International Society for Soil Mechanics and Foundation Engineering (ISSMFE). Please note that with the exception of samples where Gradation and / or Atterberg Limits testing have been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between classification systems.

ISSMFE SOIL CLASSIFICATION

| CLAY | SILT | | | SAND | | | GRAVEL | | | COBBLES | BOULDERS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | FINE | MEDIUM | COARSE | FINE | MEDIUM | COARSE | FINE | MEDIUM | COARSE | | |

0.002 0.006 0.02 0.06 0.2 0.6 2.0 6.0 20 60 200

EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

| CLAY (PLASTIC) TO | FINE | MEDIUM | CRS. | FINE | COARSE |
|---|---|---|---|---|---|
| SILT (NONPLASTIC) | SAND | | | GRAVEL | |

UNIFIED SOIL CLASSIFICATION

2. Fill: Where fill is designated on the borehole log, it is defined as indicated by the sample recovered during the drilling process. The reader is cautioned that fills are heterogeneous in nature and consequently variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstructions such as wood, large concrete pieces or subsurface basements, floors, tanks, etc. None of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams or layers of organically contaminated soil. This organic material can result in the generation of methane gas and / or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and if so the results are indicated on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. The readings are to advise to the presence of gas only, and a detailed study is recommended for sites where any explosive gas / methane is detected. Some fill material may be contaminated by toxic / hazardous waste that renders it unacceptable for deposition in any but designated land fill sites. Unless specifically stated, the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential / commercial areas underground reconstruction, buried oil tanks are common and are generally not detected in a conventional preliminary geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and / or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated on the borehole logs. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone, caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

# EXPLANATION OF TERMS USED IN THE BOREHOLE LOGS

## Sample Type

| | |
|---|---|
| AS | Auger sample |
| BS | Block sample |
| CS | Chunk sample |
| DO | Drive open |
| DS | Dimension type sample |
| FS | Foil sample |
| RC | Rock core |
| SC | Soil core |
| SS | Spoon sample |
| ST | Slotted tube |
| TO | Thin-walled, open |
| TP | Thin-walled, piston |
| WS | Wash sample |

## Penetration Resistance

**Standard Penetration Resistance (SPT), 'N':**

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in) to drive uncased a 50 mm (2 in) diameter open sampler for a distance of 300 mm (12 in).

**Dynamic Cone Penetration Resistance, $N_d$:**

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in) to drive uncased a 50 mm (2 in) diameter 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in).

## Textural Classification of Soils

| Classification | Particle Size |
|---|---|
| Boulders | >300 mm |
| Cobbles | 75 mm – 300 mm |
| Gravel (Gr) | 4.75 mm – 75 mm |
| Sand (Sa) | 0.075 mm – 4.75 mm |
| Silt (Si) | 0.002 mm – 0.075 mm |
| Clay (Cl) | <0.002 mm |

| Terminology | Proportion |
|---|---|
| Trace | 0 – 10% |
| Some | 10 – 20% |
| Adjective (e.g. silty or sandy) | 20 – 35% |
| And (e.g. sand and gravel) | > 35 % |

## Soil Description

**a) Cohesive Soils**

| Consistency | Undrained Shear Strength (kPa) | SPT 'N' Value |
|---|---|---|
| Very Soft | < 12 | 0 – 2 |
| Soft | 12 – 25 | 2 – 4 |
| Firm | 25 – 50 | 4 – 8 |
| Stiff | 50 – 100 | 8 – 15 |
| Very Stiff | 100 – 200 | 15 – 30 |
| Hard | > 200 | > 30 |

**b) Cohesionless Soils**

| Density Index (Relative Density) | Undrained Shear Strength (kPa) | SPT 'N' Value |
|---|---|---|
| Very Loose | N/A | < 4 |
| Loose | N/A | 4 – 10 |
| Compact | N/A | 10 – 30 |
| Dense | N/A | 30 – 50 |
| Very Dense | N/A | > 50 |

## Soil Tests

| | |
|---|---|
| w | Water content |
| $w_p$ | Plastic limit |
| $w_l$ | Liquid limit |
| C | Consolidation (oedometer) test |
| CID | Consolidated isotropically drained triaxial test |
| CIU | Consolidated isotropically undrained triaxial test with porewater pressure measurement |
| $D_R$ | Relative density (Specific gravity, Gs) |
| DS | Direct shear test |
| ENV | Environmental / chemical analysis |
| M | Sieve analysis for particle size |
| MH | Combined sieve and hydrometer (H) analysis |
| MPC | Modified proctor compaction test |
| SPC | Standard proctor compaction test |
| OC | Organic content test |
| V | Field vane (LV – laboratory vane test) |
| γ | Unit weight |

Palmer

# LOG OF BOREHOLE BH23-1



PROJECT: Geotechnical Investigation - 725, Westney Rd S - ESA

CLIENT: Firearms Outlets Canada

PROJECT LOCATION: Ajax, ON

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan N 4854841.217 E 658696.877

Method: Solid Stem Augers

Diameter: 100 mm

Date: Nov 28, 2023

REF. NO.: 1904320

ENCL NO.: 1

| (m) ELEV / DEPTH | CLASSIFICATION | NUMBER | TYPE | BLOWS "N" 0.3 m | ELEVATION |
|---|---|---|---|---|---|
| 92.4 | Ground Surface | | | | |
| 92.3 / 0.1 | **ASPHALT:** 80mm<br>**FILL:** clayey silt, trace sand and gravel, occational rootlets, brown, moist, stiff | 1 | SS | 13 | 92 |
| 91.7 / 0.7 | **SANDY SILT** trace gravel, contains cobbles, grey, moist, compact | 2 | SS | 12 | 91 |
| | | 3 | SS | 15 | |
| | | 4 | SS | 13 | |
| | | 5 | SS | 36 | 89 |
| | | 6 | SS | 12 | 88 |
| | | 7 | SS | 9 | 87 |
| | | | | | 85 |

GROUND WATER CONDITIONS: W. L. 92.4 m, Nov 28, 2023; W. L. 86.7 m, Jul 12, 2023

Bentonite

Sand

Screen

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT $w_P$ | NATURAL MOISTURE CONTENT $w$ | LIQUID LIMIT $w_L$

WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)

| GR | SA | SI | CL |
|---|---|---|---|
| 8 | 41 | 39 | 12 |

Continued Next Page

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

# LOG OF BOREHOLE BH23-1

PROJECT: Geotechnical Investigation - 725, Westney Rd S - ESA

CLIENT: Firearms Outlets Canada

Method: Solid Stem Augers

PROJECT LOCATION: Ajax, ON

Diameter: 100 mm

REF. NO.: 1904320

DATUM: Geodetic

Date: Nov 28, 2023

ENCL NO.: 1

BH LOCATION: See Borehole Location Plan N 4854841.217 E 658696.877

| (m) ELEV / DEPTH | CLASSIFICATION | STRATA PLOT | SAMPLES: NUMBER | SAMPLES: TYPE | SAMPLES: BLOWS/0.3 m "N" | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa) | PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT / WATER CONTENT (%) | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Continued | | | | | | | | | | | |
| 84.0 | **SANDY SILT** trace gravel, contains cobbles, grey, moist, compact(Continued) | | 8 | SS | 10 | | Bentonite | | | | | |
| 8.4 | **END OF BOREHOLE**<br>1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole.<br>2. Water Level Readings:<br>Date W. L. Depth (mBGS)<br>28 Nov 2023 Dry<br>7 Dec 2023 5.72 | | | | | | | | | | | |

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT $w_P$ — NATURAL MOISTURE CONTENT $w$ — LIQUID LIMIT $w_L$

WATER CONTENT (%): 10 20 30

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; $\varepsilon_f$=3% Strain at Failure

# LOG OF BOREHOLE BH23-2

PROJECT: Geotechnical Investigation - 725, Westney Rd S - ESA

CLIENT: Firearms Outlets Canada

PROJECT LOCATION: Ajax, ON

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan N 4854827.456 E 658654.784

Method: Solid Stem Augers

Diameter: 100 mm

Date: Nov 28, 2023

REF. NO.: 1904320

ENCL NO.: 2

| (m) ELEV / DEPTH | CLASSIFICATION | NUMBER | TYPE | BLOWS 0.3 m "N" | ELEVATION |
|---|---|---|---|---|---|
| 92.2 | Ground Surface | | | | |
| 92.0 / 0.1 | **ASPHALT:** 90 mm<br>**FILL:** sand and gravel, trace silt, brown, moist, loose | 1 | SS | 8 | |
| 91.4 / 0.7 | **FILL:** clayey silt, trace sand, trace gravel, grey, moist, stiff | 2 | SS | 15 | 91 |
| 90.7 / 1.5 | **SILTY CLAY:** trace gravel, contains cobbles, grey, moist, hard | 3 | SS | 32 | |
| 89.9 / 2.3 | **SANDY SILT:** trace gravel, contains cobbles, grey, moist, dense to very dense | 4 | SS | 70 | 90 |
| | | 5 | SS | 60 | Bentonite |
| 88.0 / 4.2 | **CLAYEY SILT:** trace gravel, grey, moist, stiff | 6 | SS | 10 | 88 |
| 86.5 / 5.7 | **SILTY SAND:** trace gravel, some clay, grey, moist, compcat to loose | 7 | SS | 17 | 87<br>Sand<br>85 |

GROUND WATER CONDITIONS: W. L. 92.2 m, Nov 28, 2023

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE & Sensitivity, × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT $w_P$ — NATURAL MOISTURE CONTENT $w$ — LIQUID LIMIT $w_L$

WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

# LOG OF BOREHOLE BH23-2

PROJECT: Geotechnical Investigation - 725, Westney Rd S - ESA

CLIENT: Firearms Outlets Canada

Method: Solid Stem Augers

PROJECT LOCATION: Ajax, ON

Diameter: 100 mm

REF. NO.: 1904320

DATUM: Geodetic

Date: Nov 28, 2023

ENCL NO.: 2

BH LOCATION: See Borehole Location Plan N 4854827.456 E 658654.784

| (m) ELEV / DEPTH | CLASSIFICATION | STRATA PLOT | NUMBER | TYPE | BLOWS 0.3 m "N" | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa) / WATER CONTENT (%) | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | REMARKS AND GRAIN SIZE DISTRIBUTION (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Continued | | | | | | | | | | GR SA SI CL |
| | **SILTY SAND:** trace gravel, some clay, grey, moist, compcat to loose(Continued) | | 8 | SS | 14 | | Screen | | | | 7 40 42 11 |
| 9 | | | | | | | 84 | | | | |
| | | | | | | | W. L. 83.6 m Jul 12, 2023 | | | | |
| | | | | | | | 83 | | | | |
| | | | 9 | SS | 6 | | Bentonite | | | | |
| 82.3 | | | | | | | | | | | |
| 9.9 | **END OF BOREHOLE**<br>1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole.<br>2. Water Level Readings:<br>Date W. L. Depth (mBGS)<br>28 Nov 2023 Dry<br>07 Dec 2023 8.58 | | | | | | | | | | |

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT $w_P$ — NATURAL MOISTURE CONTENT $w$ — LIQUID LIMIT $w_L$

WATER CONTENT (%): 10 20 30

GROUNDWATER ELEVATIONS

Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

# LOG OF BOREHOLE BH23-3

PROJECT: Geotechnical Investigation - 725, Westney Rd S - ESA

CLIENT: Firearms Outlets Canada

PROJECT LOCATION: Ajax, ON

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan N 4854799.502 E 658656.195

Method: Solid Stem Augers

Diameter: 100 mm

Date: Nov 28, 2023

REF. NO.: 1904320

ENCL NO.: 3

| (m) ELEV / DEPTH | CLASSIFICATION | NUMBER | TYPE | BLOWS "N" 0.3 m | ELEVATION |
|---|---|---|---|---|---|
| 91.5 | Ground Surface | | | | |
| 91.4 / 0.1 | **ASPHALT:** 80mm<br>**FILL:** sand and gravel, trace clay, contains cobbles, grey, moist, compact to dense | 1 | SS | 13 | |
| | | 2 | SS | 50/ initial 150 mm | |
| 90.0 / 1.5 | **SILTY CLAY:** trace gravel, contains sand layers, grey, moist, very stiff | 3 | SS | 30 | |
| 89.2 / 2.3 | **SANDY SILT:** trace gravel, grey, moist, conmpact to loose | 4 | SS | 15 | |
| | | 5 | SS | 12 | |
| | | 6 | SS | 25 | |
| | contains cobbles, grey at 4.6m | 7 | SS | 19 | |
| | | 8 | SS | 15 | |
| | | 9 | SS | 8 | |

GROUND WATER CONDITIONS: W. L. 91.5 m, Nov 28, 2023

Bentonite

Sand

W. L. 84.0 m, Jul 12, 2023

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

SHEAR STRENGTH (kPa) (20 40 60 80 100)
- ○ UNCONFINED
- ● QUICK TRIAXIAL
- + FIELD VANE & Sensitivity
- × LAB VANE

PLASTIC LIMIT $w_P$ — NATURAL MOISTURE CONTENT $w$ — LIQUID LIMIT $w_L$

WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARKS AND GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

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Continued Next Page

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES

+ 3, × 3: Numbers refer to Sensitivity

○ ε=3% Strain at Failure

# LOG OF BOREHOLE BH23-3

PROJECT: Geotechnical Investigation - 725, Westney Rd S - ESA

CLIENT: Firearms Outlets Canada

PROJECT LOCATION: Ajax, ON

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan N 4854799.502 E 658656.195

Method: Solid Stem Augers

Diameter: 100 mm

Date: Nov 28, 2023

REF. NO.: 1904320

ENCL NO.: 3

| (m) ELEV / DEPTH | CLASSIFICATION | STRATA PLOT | NUMBER | TYPE | BLOWS 0.3 m "N" | GROUND WATER CONDITIONS | ELEVATION | DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100) | PLASTIC LIMIT $w_P$ / NATURAL MOISTURE CONTENT $w$ / LIQUID LIMIT $w_L$ / WATER CONTENT (%) (10 20 30) | POCKET PEN. (Cu) (kPa) | NATURAL UNIT WT (kN/m³) | REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Continued | | | | | | | | | | | |
| | **SANDY SILT:** trace gravel, grey, moist, conmpact to loose(Continued) | | 10 | SS | 5 | | Screen | | | | | 6 35 51 8 |
| 9 | | | | | | | 83 | | | | | |
| | | | 11 | SS | 7 | | 82 | | | | | |
| 81.6 | | | | | | | Bentonite | | | | | |
| 9.9 | **END OF BOREHOLE**<br>1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole.<br>2. Water Level Readings:<br>Date W. L. Depth (mBGS)<br>28 Nov 2023 Dry<br>07 Dec 2023 7.51 | | | | | | | | | | | |

GROUNDWATER ELEVATIONS

Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

# Appendix B

General Requirements on Engineered Fill

Particle Size Distribution

## GENERAL REQUIREMENTS FOR ENGINEERED FILL

Compacted imported soil that meets specific engineering requirements, is free of organics and debris and that has been continually monitored on a full-time basis by a qualified geotechnical representative is classified as engineered fill. Engineered fill that meets these requirements and is bearing on suitable native subsoil can be used for the support of foundations.

Imported soil used as engineered fill can be removed from other portions of the site or can be brought in from other sites. In general, most of Ontario soils are too wet to achieve the 100% Standard Proctor Maximum Dry Density (SPMDD) and will require drying and careful site management if they are to be considered for engineered fill. Imported non-cohesive granular soil is preferred for all engineered fill. Specifically, OPSS Granular 'B' sand and gravel fill material is recommended.

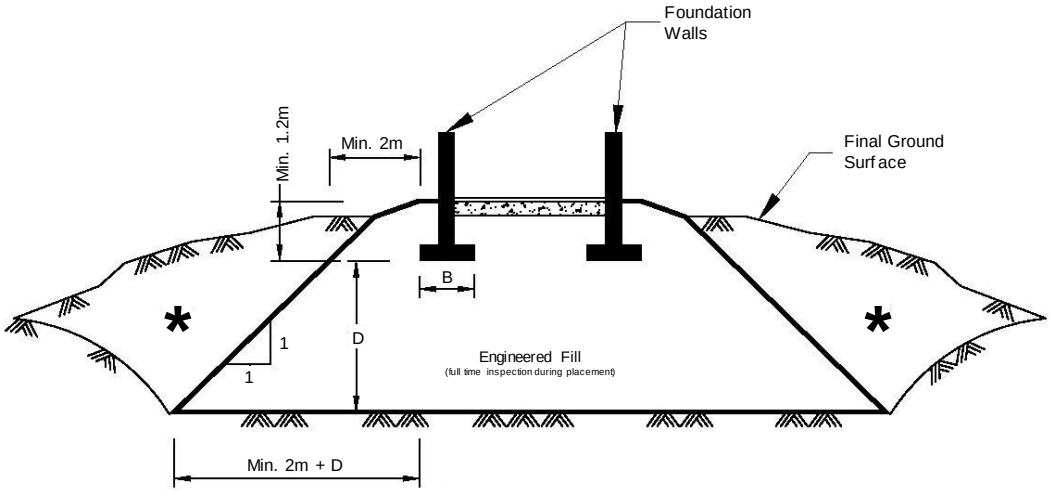
Adverse weather conditions such as rain make the placement of engineered fill to the required degree of density difficult or impossible; additionally, engineered fill cannot be placed during freezing conditions, i.e. normally not between December 15 and April 1 of each year.

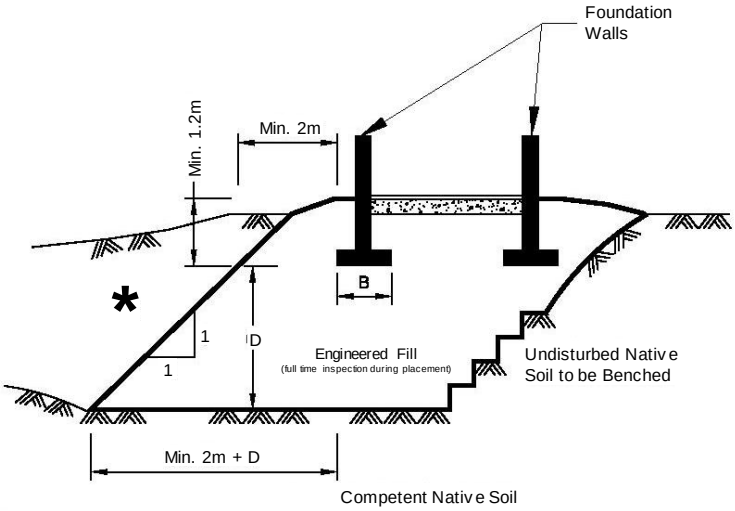
The location of the foundations on the engineered fill pad is critical and certification by a qualified surveyor that the foundations are within the stipulated boundaries is mandatory. Since layout stakes are often damaged or removed during fill placement, offset stakes must be installed and maintained by the surveyors during the course of fill placement so that the contractor and engineering staff are continually aware of where the engineered fill limits lie. Excavations within the engineered fill pad must be backfilled with the same conditions and quality control as the original pad.

To perform satisfactorily, engineered fill requires the cooperation of the designers, engineers, contractors and all parties must be aware of the requirements. The minimum requirements are as follows, however, the geotechnical report must be reviewed for specific information and requirements.

1. Prior to site work involving engineered fill, a site meeting to discuss all aspects must be convened. The surveyor, contractor, design engineer and geotechnical engineer must attend the meeting. At this meeting, the limits of the engineered fill will be defined. The contractor must make known where all fill material will be obtained from and samples must be provided to the geotechnical engineer for review, and approval before filling begins.
2. Detailed drawings indicating the lower boundaries as well as the upper boundaries of the engineered fill must be available at the site meeting and be approved by the geotechnical engineer.
3. The building footprint and base of the pad, including basements, garages, etc. must be defined by offset stakes that remain in place until the footings and service connections are all constructed. Confirmation that the footings are within the pad, service lines are in place, and that the grade conforms to drawings, must be obtained by the owner in writing from the surveyor and Palmer. Without this confirmation no responsibility for the performance of the structure can be accepted by Palmer. Survey drawing of the pre and post fill location and elevations will also be required.
4. The area must be stripped of all topsoil and fill materials. Subgrade must be proof-rolled. Soft spots must be dug out. The stripped native subgrade must be examined and approved by an engineer prior to placement of fill.

5. The approved engineered fill material must be compacted to 100% Standard Proctor Maximum Dry Density throughout. Engineered fill should not be placed during the winter months. Engineered fill compacted to 100% SPMDD will settle under its own weight approximately 0.5% of the fill height and the structural engineer must be aware of this settlement. In addition to the settlement of the fill, additional settlement due to consolidation of the underlying soils from the structural and fill loads will occur and should be evaluated prior to placing the fill.
6. Full-time geotechnical inspection by approved geotechnical engineering personnel during placement of engineered fill is required. Work cannot commence or continue without the presence of a geotechnical engineering representative.
7. The fill must be placed such that the specified geometry is achieved. Refer to the attached sketches for minimum requirements. Take careful note that the projection of the compacted pad beyond the footing at footing level is a minimum of 2 m. The base of the compacted pad extends 2 m plus the depth of excavation beyond the edge of the footing.
8. A bearing capacity of 100 kPa at SLS (150 kPa at ULS) can be used provided that all conditions outlined above are adhered to. A minimum footing width of 500 mm (20 inches) is suggested and footings must be provided with nominal steel reinforcement.
9. All excavations must be made in accordance with the Occupational Health and Safety Regulations of Ontario
10. After completion of the engineered fill pad a second contractor may be selected to install footings. The prepared footing bases must be evaluated by engineering staff from geotechnical consultant prior to footing concrete placements. All excavations must be backfilled under full time supervision by approved geotechnical engineering personnel to the same degree as the engineered fill pad. Surface water cannot be allowed to pond in excavations or to be trapped in clear stone backfill. Clear stone backfill can only be used with the approval of a geotechnical engineer.
11. After completion of compaction, the surface of the engineered fill pad must be protected from disturbance from traffic, rain and frost. During the course of fill placement, the engineered fill must be smooth-graded, proof-rolled and sloped/crowned at the end of each day, prior to weekends and any stoppage in work in order to promote rapid runoff of rainwater and to avoid any ponding surface water. Any stockpiles of fill intended for use as engineered fill must also be smooth-bladed to promote runoff and to protect from excessive moisture take up.
12. If there is a delay in construction, the engineered fill pad must be inspected and accepted by the geotechnical engineer. The location of the structure must be reconfirmed that it remains within the pad.
13. The geometry of the engineered fill as illustrated in these general requirements is broad in nature. Each project will have its own unique requirements. For example, if perimeter sidewalks are to be constructed around the building, then the projection of the engineered fill beyond the foundation wall may need to be extended.
14. These guidelines are to be read in conjunction with the Palmer report attached.




* Backfill in this area as per Palmer report

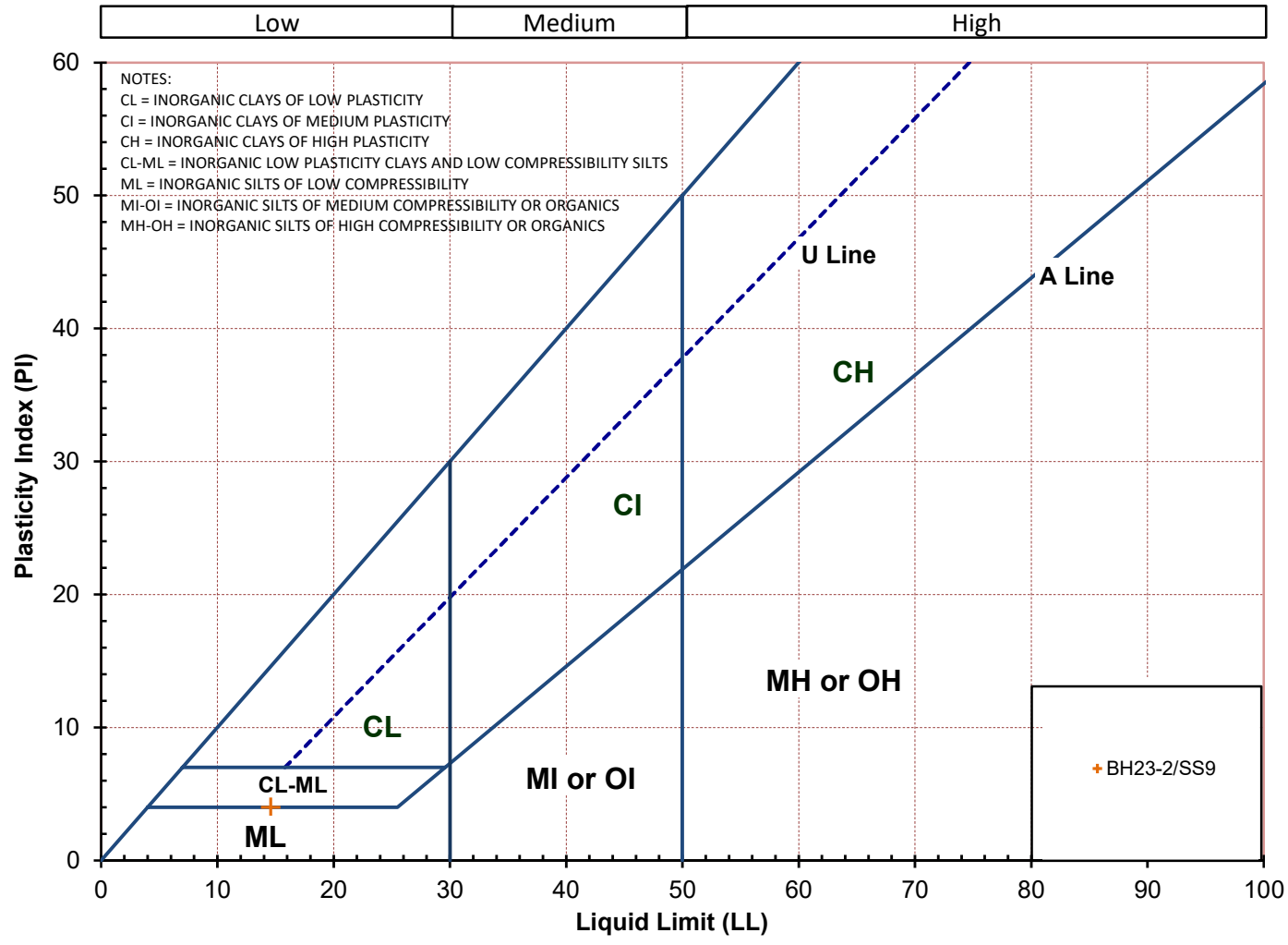
*Palmer Environmental Consulting Group Inc.*
*871 Equestrain Ct, Unit 1*
*Oakville, ON L6L 6L7*

# Plasticity Chart

| | | | |
|---|---|---|---|
| Project No. | 1904320 | Lab No. | R23-015 |
| Project Name | 725 Westney Road | Tested By | BW |
| Client | The Biglieri Group | Checked By | OT |
| Location | South Ajax,Ontario | Date | 12/21/2023 |

**Test Results**

| Test No | Sample No | LL | PL | PI | Fines | W% | Description | USCS |
|---|---|---|---|---|---|---|---|---|
| 1 | BH23-2/SS9 | 15 | 11 | 4 | | | | CL-ML |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |



Palmer Environmental Consulting Group Inc.
871 Equestrain Ct, Unit 1
Oakville, ON L6L 6L7

# Particle Size Distribution Report
## (ASTM D421/422)

| | | | |
|---|---|---|---|
| Project No.: | 1904320 | Lab No.: | R23-015 |
| Project Name: | 725 Westney Road | Tested By: | BW |
| Client: | The Biglieri Group | Checked By: | TO |
| Location: | South Ajax,Ontario | Date: | 1//2/24 |

**Test Results**

| Test No. | Sample No. | Clay | Silt | Sand | | | Gravel | | Cobble+ | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Fine | Medium | Coarse | Fine | Coarse | | |
| 1 | BH23-1/SS6 | 12 | 39 | 41 | | | 8 | | | |
| 2 | BH23-2/SS8 | 11 | 42 | 40 | | | 7 | | | |
| 3 | BH23-3/SS10 | 8 | 51 | 35 | | | 6 | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |