Geotechnical Investigation
Proposed Residential Addition to Office Building
233 Argyle Avenue
Ottawa, Ontario

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Executive Summary

EXP Services Inc. (EXP) is pleased to present the results of the geotechnical investigation recently completed for the proposed residential addition to the office building located at 233 Argyle Avenue, Ottawa, Ontario (Figure 1). Terms and conditions of this assignment were outlined in EXP's proposal number: P91297EN dated March 12, 2021 and was authorized by the Smart Living Properties (the client) on March 15, 2021.

A Phase Two Environmental Site Assessment (ESA) was undertaken concurrently with the geotechnical investigation for the site and the results of the Phase Two ESA are reported under separate cover.

It is our understanding that plans call for the design and construction of a residential addition to the existing three (3) story office building located on the site. The proposed new building addition will be constructed on the north side of the existing building. The existing building has a basement with the basement floor measured at approximately 1.3 m depth below existing grade. It is assumed the footings of the existing building are approximately 0.5 m below the basement slab at an approximate 1.8 m depth below existing grade. It is further understood that the new building addition will also be three (3) stories and will have a basement floor located 1.5 m lower than the basement floor of the existing building, resulting in the basement floor set at approximately 2.8 m below existing grade. It is assumed that the footings of the new building addition will be set approximately 0.5 m below the basement floor at a 3.3 m depth below existing grade. Since the site is located in a well-established developed area of the city of Ottawa, raising the grades at the site is not anticipated for this project.

The fieldwork for the geotechnical investigation was completed on March 16 to 19, 2021 and consists of four (4) boreholes with monitoring wells; Borehole Nos. MW21-1 to MW21-4. Borehole Nos. MW21-1, 21-3 and 21-4 were located outside of the existing building and Borehole No. MW 21-2 was located inside the existing building in the basement. The boreholes were advanced to termination and cone refusal depths ranging from 5.2 m to 22.7 m below the existing ground surface. The borehole fieldwork was supervised on a full-time basis by a representative from EXP.

The investigation revealed that the site is underlain by fill to depths ranging from 1.5 m to 1.8 m below existing grade (Elevation 68.3 m and Elevation 68.1 m) followed by native firm to very stiff clay underlain by clayey sand with gravel. Based on the dynamic cone penetration test (DCPT) results from Borehole No. MW21-4, cone refusal was met on inferred boulders or bedrock at a 22.7 m depth (Elevation 47.2 m). The site is underlain by limestone bedrock of the Ottawa or Eastview formations. The groundwater level was measured between 3.7 m and 4.4 m depth below existing grade and 1.7 m below the existing building basement floor (Elevation 66.9 to Elevation 65.4 m).

Based on the borehole information and Table 4.1.8.4.A in the 2012 Ontario Building Code (as amended May 2, 2019), the site classification for seismic site response is **Class D** and the subsurface soils are not susceptible to liquefaction during a seismic event.

Since the site is located in a well-established developed area of the city of Ottawa, raising the grades at the site is not anticipated as part of the proposed development. Therefore, the geotechnical engineering comments and recommendations provided in the report are based on the assumption that there will be no raise in the site grades for this project.

Based on a review of the borehole information, it is considered that the proposed new building addition may be supported by strip and square pad footings designed to bear on the native clay. Strip footings having a maximum width of 1.0 m founded on the surface of the native clay contacted in the boreholes at 1.5 m to 1.8 m depths, may be designed for a bearing pressure at SLS of 80 kPa and factored geotechnical resistance at ULS of 120 kPa. Square pad footings having a width and length of 2.0 m founded on the surface of the native clay may be designed for a bearing pressure at SLS of 100 kPa and factored geotechnical resistance at ULS of 150 kPa.

To minimize the need to underpin the existing footings along the south wall of the existing building where the proposed new building addition will be located, it is recommended that the basement floor slab and footings for the new building addition be placed at the same depth as the existing basement floor slab and existing footings. This is valid for the footings, provided the native clay at the same level as the bottom of the existing footings is capable of supporting the bearing pressure at serviceability limit state (SLS) and factored geotechnical resistance at ultimate limit state (ULS) recommended above for the footings.

However, it is our understanding that the design of the proposed building addition is considering a full basement with the basement floor located 1.5 m deeper than the basement floor of the existing building. This will result in the basement floor and footings of the new building addition set below the existing basement floor slab and footings at approximately a 2.8 m depth below existing grade and 3.3 m depth (assumed 0.5 m depth below the basement slab) below existing grade respectively. Strip footings having a maximum 1.0 m width set at 3.3 m below existing grade on the native clay may be designed for a bearing pressure at SLS of 60 kPa and factored ULS of 90 kPa. Square pad footings having a width and length of 2.0 m and founded at a 3.3 m depth below existing grade may be designed for a bearing pressure at SLS of 70 kPa and factored ULS of 105 kPa. The existing footings along the north wall of the existing building where the addition will be located will need to be underpinned to the same depth as the footings of the new addition and designed for the lower SLS values of 60 kPa and 70 kPa and factored ULS values of 90 kPa and 105 kPa.

EXP can provide additional recommendations regarding underpinning of the footings of the existing building.

The factored geotechnical resistance at ULS includes a resistance factor of 0.5. The total and differential settlements of footings designed in accordance with the recommendations of this report and with careful attention to construction detail are expected to be less than 25 mm and 19 mm respectively.

The basement floor slab of the new building addition may be set at a similar 1.3 m depth as the basement of the existing building or at a lower depth of 2.8 m below existing grade. The basement floor of the proposed building addition at a 1.3 m or 2.8 m depth below existing grade may be designed as a slab-on-grade set on the native clay or on a minimum 300 mm thick engineered fill pad placed on the native clay and should consist of Ontario Provincial Standard Specification (OPSS) Granular B Type II compacted to 98 percent standard Proctor maximum dry density (SPMDD). The existing fill is not considered suitable to support the slab-on-grade. The floor slab should be set on a bed of well-packed 19 mm clear stone at least 200 mm thick placed on the engineered fill pad or native clay. The clear stone would prevent the

capillary rise of moisture from the sub-soil to the floor slab. Adequate saw cuts should be provided in the floor slab to control cracking.

A perimeter drainage system should be installed around the proposed new building addition. If the perimeter drainage system of the existing building is encountered during the construction of the new building addition, it should be reinstated following construction of the new building addition.

The groundwater level ranges from 3.7 m to 4.4 m depths below existing grade and it is at 1.7 m below the existing building basement floor (Elevation 66.9 m to Elevation 65.4 m). For the basement floor slab of the new building set at a 1.3 m depth below existing grade, underfloor drains will not be required. For the basement floor set at a 2.8 m depth below existing grade, an underfloor drainage system will be required.

The subsurface basement walls of the proposed building addition should be backfilled with free draining material, such as OPSS 1010 Granular B Type II and equipped with a perimeter drainage system to prevent the buildup of hydrostatic pressure behind the walls. The walls will be subjected to lateral static and dynamic (seismic) earth forces.

It is anticipated that excavations may be undertaken using conventional equipment capable of removing cobbles, boulders and construction debris within the fill (such as bricks and asphalt debris). All excavation work should be completed in accordance with the Occupational Health and Safety Act (OHSA), Ontario, Reg. 213/91. Based on the definitions provided in OHSA, the subsurface soils at the site are considered to be Type 3 soil. As per OHSA, the sidewalls of open cut excavations undertaken within Type 3 soil, must be sloped back at 1H:1V from the bottom of the excavation. Within zones of persistent seepage, the excavation side slopes are expected to slough and eventually stabilize at 2H:1V to 3H:1V from the bottom of the excavation.

If side slopes cannot be achieved due to space restrictions on site such as the proximity of the excavation to neighboring structures (existing buildings) and infrastructure, the excavation for the proposed new building addition would have to be undertaken within the confines of an engineered support system (shoring system).

Seepage of the surface and subsurface water into these excavations is anticipated. However, it should be possible to collect water entering the excavations at low points and to remove it by conventional pumping techniques. In areas of high infiltration or in areas where more permeable soil layers may exist, a higher seepage rate should be anticipated and may require high-capacity pumps to keep the excavation dry.

It is anticipated that the majority of the material required for underfloor fill and backfilling purposes would have to be imported and should preferably conform to Ontario Provincial Standard Specification (OPSS) Granular B Type II inside the proposed new building addition and against foundation walls and OPSS Select Subgrade Material (SSM) in service trenches outside the proposed new building addition and for exterior subgrade fill.

The above and other related considerations are discussed in greater detail in the attached report.

1. Introduction

EXP Services Inc. (EXP) is pleased to present the results of the geotechnical investigation recently completed for the proposed residential addition to the office building located at 233 Argyle Avenue, Ottawa, Ontario (Figure 1). Terms and conditions of this assignment were outlined in EXP's proposal number: P91297EN dated March 12, 2021 and was authorized by the Smart Living Properties (the client) on March 15, 2021.

It is our understanding that plans call for the design and construction of a residential addition to the existing three (3) story office building located on the site. The proposed new building addition will be constructed on the north side of the existing building. The existing building has a basement with the basement floor measured at approximately 1.3 m depth below existing grade. It is assumed the footings of the existing building are approximately 0.5 m below the basement slab at an approximate 1.8 m depth below existing grade. It is further understood the new building addition will also be three (3) stories and will have a basement floor located 1.5 m lower than the basement floor of the existing building, resulting in the basement floor set at approximately 2.8 m below existing grade. It is assumed the footings of the new building addition will be set approximately 0.5 m below the basement floor at a 3.3 m depth below existing grade. Since the site is located in a well-established developed area of the city of Ottawa, raising the grades at the site is not anticipated for this project.

A Phase Two Environmental Site Assessment (ESA)of the site was undertaken concurrently with the geotechnical investigation and the results of the Phase Two ESA are reported under separate cover.

This geotechnical investigation was undertaken to:

a) Establish the subsurface soil and groundwater conditions at the four (4) boreholes located on the site;

b) Provide classification of the site for seismic design in accordance with requirements of the 2012 Ontario Building Code (OBC) as amended May 2, 2019 and assess the liquefication potential of the subsurface soils in a seismic event;

c) Discuss grade raise restrictions;

d) Provide the bearing pressure at Serviceability Limit State (SLS) and factored geotechnical resistance at Ultimate Limit State (ULS) of the most suitable type of foundation for the proposed building addition, as well as anticipated total and differential settlements;

e) Discuss lateral earth pressure against subsurface walls;

f) Comment on slab-on-grade construction and permanent drainage requirements;

g) Discuss excavation conditions and dewatering requirements during construction of the foundations for the proposed building additions;

h) Comment on backfilling requirements and suitability of the on-site soils for backfilling purposes; and,

i) Comment on subsurface concrete requirements and the corrosion potential of subsurface soils to buried metal structures/members.

The comments and recommendations given in this report assume that the above-described design concept will proceed into construction. If changes are made either in the design phase or during construction, this office must be retained to review these modifications. The result of this review may be a modification of our recommendations or it may require additional field or laboratory work to check whether the changes are acceptable from a geotechnical viewpoint.

2. Site Description

The property is located in a well-established developed area of the city of Ottawa on the north side of Argyle Avenue between Bank Street and O'Connor Street. The site for the proposed building addition is currently occupied by an outdoor parking lot.

The neighboring properties on the east and west sides of the site are occupied by multi-story buildings with outdoor parking lots at the rear of the properties.

The topography of the site is relatively flat with approximate ground surface elevations of Elevation 69.8 m and Elevation 69.9 m at the exterior borehole locations.

3. Procedure

The fieldwork for the geotechnical investigation was completed on March 16 to 19, 2021 and consists of four (4) boreholes with monitoring wells; Borehole Nos. MW21-1 to MW21-4. Borehole Nos. MW21-1, 21-3 and 21-4 were located outside of the existing building and Borehole No. MW 21-2 was located inside the existing building in the basement. The boreholes were advanced to termination and cone refusal depths ranging from 5.2 m to 22.7 m below the existing ground surface. The borehole fieldwork was supervised on a full-time basis by a representative from EXP.

The locations of the boreholes were established on site by EXP. The geodetic ground surface elevation at the borehole locations was estimated from the spot elevations shown on the topographic survey plan dated July 28, 2021 and prepared by Annis, O'Sullivan, Vollebekk Ltd. Therefore, the elevations presented in this report should be considered approximate. The borehole locations are shown in Figure 2.

Prior to the fieldwork, the locations of the boreholes were cleared of any public and private underground services. Borehole Nos. MW21-1, MW21-3, and MW21-4 were drilled using a Geo-Probe portable drill rig operated by a drilling specialist subcontracted to EXP. Standard penetration tests (SPTs) were performed in these boreholes at 0.75 m and 1.6 m depth intervals and the soil samples were retrieved by the split-barrel sampler using casing direct push method. The undrained shear strength of the cohesive soils was measured by conducting penetrometer and in-situ vane tests. In Borehole No. MW21-4, a dynamic cone penetration test (DCPT) was conducted from a 7.0 m to a cone refusal depth of 22.7 m below ground surface.

Borehole No. MW21-2 located inside the existing building was undertaken by manual method using a jackhammer to advance a casing barrel sampler. Samples of the soil were obtained on a continuous basis.

A 32 mm diameter monitoring well (with screened section) was installed in each borehole for long-term monitoring of the groundwater level and to obtain samples of the groundwater for analysis as part of the Phase Two ESA. The monitoring wells were installed in accordance with EXP standard practice and the installation configuration is documented on the respective borehole logs. The boreholes were backfilled upon completion of drilling and the installation of the monitoring wells.

All soil samples were visually examined in the field for textural classification, logged, preserved in plastic bags and identified. On completion of the fieldwork, all the soil samples were transported to the EXP laboratory in Ottawa where they were visually examined by a geotechnical engineer and the borehole logs were prepared. The engineer also assigned the laboratory testing which consisted of performing the following tests on the soil samples:

Natural Moisture Content .....24 Tests
Natural Unit Weights.....4 Tests
Grain Size Analysis.....3 Tests
Atterberg Limits.....2 Tests
Chemical Analysis (pH, sulphate, chloride and resistivity) .....1 Test

4. Subsurface Soil and Groundwater Conditions

A detailed description of the geotechnical conditions encountered in the boreholes is given on the borehole logs, Figures 3 to 6. The borehole logs and related information depict subsurface conditions only at the specific locations and times indicated. Subsurface conditions and water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time may also result in changes in the conditions interpreted to exist at the locations where sampling was conducted.

The boreholes were drilled to provide representation of subsurface conditions as part of a geotechnical exploration program and are not intended to provide evidence of environmental conditions.

It should be noted that the soil boundaries indicated on the borehole logs are intended to reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. The "Notes on Sample Descriptions" preceding the borehole logs forms an integral part of this report and should be read in conjunction with this report.

A review of the borehole logs indicates the following subsurface soil conditions with depth and groundwater level measurements.

Borehole Nos. MW 21-1, 21-3 and 21-4 are located outside on the site and Borehole No. 21-2 is located inside the existing building in the basement.

4.1 Asphalt

A 12 mm and 40 mm thick asphalt was contacted at the surface in Borehole Nos. MW21-3 and MW21-4.

4.2 Concrete Slab

From Borehole No. MW21-2 located in the basement of the existing building, the concrete basement floor slab is approximately 115 mm thick.

4.3 Fill

Fill was contacted at ground surface in Borehole No. MW21-1 and beneath the asphalt in Borehole Nos. MW21-3 and MW21-4 and extends to depths of 1.5 m to 1.8 m below existing grade (Elevation 68.3 m and Elevation 68.1 m). Fill was contacted beneath the basement floor slab in Borehole No. MW21-2 and extends to a depth 0.4 m below the existing basement floor slab (Elevation 68.2 m).

The fill material comprises of silty sand and gravel with silt and sand with topsoil, organic pockets, roots, asphalt and brick debris. The fill material is in a very loose to compact state as indicated by the SPT N-values of 3 to 29 and has a natural moisture content ranging from 9 percent to 38 percent.

Grain size analysis was conducted on one (1) sample of the fill and the grain size distribution curve is shown in Figure 7. The test results are summarized in Table I.

Table I: Summary of Grain-size Analysis Results – Fill Sample					
Borehole No. – Sample No.	Depth (m)	Grain-size Analysis (%)			Soil Classification (USCS)
		Gravel	Sand	Silt and Clay	
MW21-3 – SS2	0.8 – 1.4	52	37	11	Poorly Graded Gravel with Silt and Sand (GP-GM)

Based on the results of the grain size analysis, the fill may be classified as a poorly graded gravel with silt and sand (GP-GM) in accordance with the Unified Soil Classification System (USCS).

4.4 Clay (CH to CL)

The fill in all boreholes is underlain by native clay which extends to an 11.3 m depth (Elevation 58.5 m) in Borehole No. MW21-3. Borehole Nos. MW21-1, MW21-2 and MW21-4 terminated in the clay at 5.2 m and 7.0 m depths (Elevation 64.6 m to Elevation 62.9 m). The clay has a firm to very stiff consistency as indicated by the undrained shear strength measurements of 29 kPa to 168 kPa. It has a medium sensitive to sensitive nature based on sensitivity values of 2.4 to 7.7, as indicated by the in-situ vane test results. The clay has a natural moisture content ranging from 39 percent to 76 percent. The natural unit weight of the clay is 16.0 kN/m^3 to 18.1 kN/m^3.

Grain size analysis and Atterberg Limits were conducted on two (2) samples of the clay and the grain size distribution curve is shown in Figures 8 and 9. The test results are summarized in Table II.

Table II: Summary of Results from Grain-Size Analysis and Atterberg Limits - Clay Samples									
Borehole (BH) No.: Sample (SS) No.	Depth (m)	Grain-Size Analysis (%)				Atterberg Limits (%)			
		Gravel	Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plasticity Index	Soil Classification (USCS)
MW21-3 – SS4	2.3 – 2.9	4	9	23	64	57	30	27	Clay of High Plasticity (CH)
MW21-3 – SS10	10.7 – 11.3	0	2	37	61	34	21	13	Clay of low Plasticity (CL)

Based on the results of the grain size analysis and Atterberg Limits, the soil may be classified as a clay (CL to CH) of low to high plasticity in accordance with the Unified Soil Classification System (USCS).

4.5 Clayey Sand

The clay in Borehole No. MW21-3 is underlain by a clayey sand with gravel and silt at an 11.3 m depth (Elevation 58.5 m). The borehole terminated within the clayey sand at a 15.8 m depth (Elevation 54.0 m).

The clayey sand is partially cohesive. The cohesionless portion of the clayey sand is in a very loose state and the cohesive portion of the clayey sand has a very soft consistency, as indicated by the SPT N-value of zero. The clayey sand has a natural moisture content of 36 percent.

4.6 Inferred Boulders or Bedrock

Based on the dynamic cone penetration test (DCPT) results from Borehole No.MW21-4, cone refusal was met on inferred boulders or bedrock at a 22.7 m depth (Elevation 47.2 m). The bedrock geology map (Map 1508A – Generalized Bedrock Geology, Ottawa-Hull, Ontario and Quebec, Geological Survey of Canada, printed by the Surveys and Mapping Branch, 1979) indicates the site is underlain by limestone bedrock of the Ottawa or Eastview formations.

4.7 Groundwater Level

Groundwater level measurements taken 11 to 14 days after drilling in the monitoring wells installed in the outside boreholes, Borehole Nos. MW21-1, MW21-3 and MW21-4, indicates the groundwater level is at 3.7 m to 4.4 m depth below existing grade (Elevation 66.2 m to Elevation 65.4 m). In Borehole No. MW21-2, located in the basement of the existing building, the groundwater level is at a 1.7 m depth below the basement floor slab (Elevation 66.9 m).

Groundwater levels were determined in the boreholes at the times and under the conditions stated in the scope of services. Note that fluctuations in the level of groundwater may occur due to a seasonal variation such as precipitation, snowmelt, rainfall activities, and other factors not evident at the time of measurement and therefore may be at a higher level during wet weather periods.

5. Seismic Site Classification and Liquefaction Potential of Soils

5.1 Site Classification for Seismic Site Response

Based on the borehole information and Table 4.1.8.4.A in the 2012 Ontario Building Code (as amended May 2, 2019), the site classification for seismic site response is **Class D**.

5.2 Liquefaction Potential of Soils

The subsurface soils are not susceptible to liquefaction during a seismic event.

6. Grade Raise Restrictions

The site is underlain by a sensitive marine clay deposit that is prone to consolidation settlement if overstressed by loads imposed on it by site grade raise, foundations and by the permanent lowering of the groundwater level following construction. Overstressing of the clay will result in its consolidation and subsequent settlement of foundations, which may exceed tolerable limits of the structure resulting in cracking of the structure.

Since the site is located in a well-established developed area of the city of Ottawa, raising the grades at the site is not anticipated as part of the proposed development. Therefore, the geotechnical engineering comments and recommendations provided in this report are based on the assumption that there will be no raise in the site grades for this project.

Since the site is underlain by a sensitive marine clay that is susceptible to consolidation settlement, if the above assumption is incorrect, EXP should be contacted to review the acceptability of the proposed grade raise from a geotechnical point of view and provide updated bearing pressure value at serviceability limit state (SLS) and factored geotechnical resistance value at ultimate limit state (ULS) for the footings of the proposed new building addition, in view of the proposed site grade raise.

7. Foundation Considerations

The borehole information indicates the subsurface condition consists of fill underlain by firm to very stiff clay contacted at 1.5 m to 1.8 m depths below existing grade or at 0.4 m depth below the existing building basement floor (Elevation 68.3 m to Elevation 68.1 or 68.2 m). The groundwater level was measured between 3.7 m and 4.4 m depth below existing grade and 1.7 m below the existing building basement floor (Elevation 66.9 to Elevation 65.4 m).

Based on a review of the borehole information, it is considered that the proposed new building addition may be supported by strip and square pad footings designed to bear on the native clay. Strip footings having a maximum width of 1.0 m founded on the surface of the native clay contacted in the boreholes at 1.5 m to 1.8 m depths, may be designed for a bearing pressure at SLS of 80 kPa and factored geotechnical resistance at ULS of 120 kPa. Square pad footings having a width and length of 2.0 m founded on the surface of the native clay may be designed for a bearing pressure at SLS of 100 kPa and factored geotechnical resistance at ULS of 150 kPa.

To minimize the need to underpin the existing footings along the south wall of the existing building where the proposed new building addition will be located, it is recommended that the basement floor slab and footings for the new building addition be placed at the same depth as the existing basement floor slab and existing footings. This is valid for the footings, provided the native clay at the same level as the bottom of the existing footings is capable of supporting the bearing pressure at serviceability limit state (SLS) and factored geotechnical resistance at ultimate limit state (ULS) recommended above for the footings.

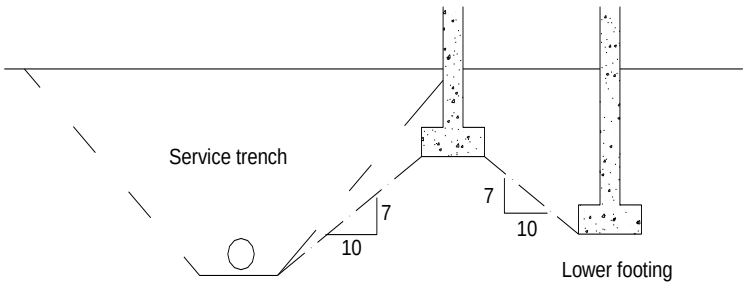
However, it is our understanding that the design of the proposed building addition is considering a full basement with the basement floor located 1.5 m deeper than the basement floor of the existing building. This will result in the basement floor and footings of the new building addition set below the existing basement floor slab and footings at approximately a 2.8 m depth below existing grade and 3.3 m depth (assumed 0.5 m depth below the basement slab) below existing grade respectively. Strip footings having a maximum 1.0 m width set at 3.3 m below existing grade on the native clay may be designed for a bearing pressure at SLS of 60 kPa and factored ULS of 90 kPa. Square pad footings having a width and length of 2.0 m and founded at a 3.3 m depth below existing grade may be designed for a bearing pressure at SLS of 70 kPa and factored ULS of 105 kPa. The existing footings along the north wall where the addition will be located will need to be underpinned to the same depth as the footings of the new addition and designed for the lower SLS values of 60 kPa and 70 kPa and factored ULS values of 90 kPa and 105 kPa. The factored geotechnical resistance at ULS includes a resistance factor of 0.5.

The total and differential settlements of footings designed in accordance with the recommendations of this report and with careful attention to construction detail are expected to be less than 25 mm and 19 mm respectively.

As previously mentioned, the footings for the proposed new addition located adjacent to the footings of the existing building should be located at the same elevation as the bottom of the existing footing to eliminate the need for underpinning of the existing footing. This is subject to confirmation that the

founding soil at the same level as the bottom of the existing footing is capable of supporting the design SLS and factored ULS values noted above. If deeper excavation is required for the new footings located adjacent to existing footings, underpinning of the existing footings may be required. EXP can provide additional recommendations regarding the underpinning of the existing footings.

Footings at different elevations should be located such that the higher footings are set below a line drawn up at 10 horizontal to 7 vertical (10H:7V) from the near edge of the lower footing. This concept should also be applied to service excavation, etc. to ensure that undermining is not a problem.



FOOTINGS NEAR SERVICE TRENCHES OR AT DIFFERENT ELEVATIONS

All footing beds should be examined by a geotechnical engineer to ensure that the founding soil is capable of supporting the bearing pressure at SLS and that the footings have been properly prepared.

It should be noted that the exposed clay subgrade surface is susceptible to disturbance due to movement of workers and construction traffic and the prevailing weather conditions during construction. To prevent disturbance to the clay subgrade, the approved footing beds should be covered or protected with a 50 mm thick concrete mud slab.

A minimum of 1.5 m of earth cover should be provided to the exterior foundations of heated structures to protect them from damage due to frost penetration. The frost cover should be increased to 2.1 m for unheated structures if snow will not be removed from their vicinity and to 2.4 m if snow will be removed from the vicinity of the structure. When earth cover is less than the minimum required, an equivalent thermal combination of earth cover and rigid insulation or rigid insulation alone should be provided. EXP can provide additional comments in this regard, if required.

The recommended bearing pressure at SLS and factored geotechnical resistances at ULS have been calculated by EXP from the borehole information for the design stage only. The investigation and comments are necessarily on-going as new information of 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 monitoring provided by an experienced geotechnical engineer to validate the information for use during the construction stage.

8. Slab-on-Grade Construction and Permanent Drainage Systems

The basement floor slab of the new building addition may be set at a similar 1.3 m depth as the basement of the existing building or at a lower depth of 2.8 m below existing grade. The basement floor of the proposed building addition at a 1.3 m or 2.8 m depth below existing grade may be designed as a slab-on-grade set on the native clay or on a minimum 300 mm thick engineered fill pad placed on the native clay and should consist of Ontario Provincial Standard Specification (OPSS) Granular B Type II compacted to 98 percent standard Proctor maximum dry density (SPMDD). The existing fill is not considered suitable to support the slab-on-grade. The floor slab should be set on a bed of well-packed 19 mm clear stone at least 200 mm thick placed on the engineered fill pad or native clay. The clear stone would prevent the capillary rise of moisture from the sub-soil to the floor slab. Adequate saw cuts should be provided in the floor slab to control cracking.

A perimeter drainage system should be installed around the proposed new building addition. If the perimeter drainage system of the existing building is encountered during the construction of the new building addition, it should be reinstated following construction of the new building addition.

The groundwater level ranges from 3.7 m to 4.4 m depths below existing grade and 1.7 m below the existing building basement floor (Elevation 66.9 to Elevation 65.4 m). For the basement floor slab of the new building addition set at a 1.3 m depth below existing grade, underfloor drains will not be required. For the basement floor set at a 2.8 m depth below existing grade for the new building addition, an underfloor drainage system will be required.

The groundwater level was measured between 3.7 m and 4.4 m depth below existing grade and 1.7 m below the existing building basement floor (Elevation 66.9 to Elevation 65.4 m).

The two (2) drainage systems may comprise of 150 mm diameter perforated pipe or equivalent covered at the top, sides and bottom with a minimum 150 mm thick layer of clear stone that is completely wrapped or covered with a non-woven geotextile such as Terrafix 270R or equivalent. The pipes for the underfloor drainage system should be set at least 300 mm below the underside of the floor slab and placed in parallel rows at 5 m to 6 m centres. The perimeter and underfloor drainage systems should be connected to separate sumps so that at least one system would be operational should the other fail and the design should include back up pumps and generators, in case of mechanical failure and/or power outage.

The perimeter and underfloor drainage systems for the new building addition are anticipated to above the groundwater level and as such the drainage system is not anticipated to lower the groundwater level over the long-term. Therefore, the perimeter and underfloor drainage systems are not anticipated to adversely impact neighboring structures and infrastructure from a groundwater level perspective.

The finished floor slab should be set at least 150 mm higher than the finished exterior grade. The finished exterior grade should be sloped away from the building to prevent ponding of surface water close to the exterior walls of the proposed building addition.

9. Lateral Earth Pressure to Subsurface Walls

The subsurface basement walls of the proposed building addition should be backfilled with free draining material, such as OPSS 1010 Granular B Type II and equipped with a perimeter drainage system to prevent the buildup of hydrostatic pressure behind the walls. The walls will be subjected to lateral static and dynamic (seismic) earth forces. The expressions below assume free draining backfill material, a perimeter drainage system, level backfill surface behind the wall and vertical face on the back side of the wall.

For design purposes, the lateral static earth thrust against the subsurface walls may be computed from the following equation:

$$P = K_0\, h\, (\tfrac{1}{2}\, \gamma h + q)$$

where P = lateral earth thrust acting on the subsurface wall; kN/m

K_0 = lateral earth pressure coefficient for 'at rest' condition for Granular B Type II backfill material = 0.50

γ = unit weight of free draining granular backfill; Granular B Type II = 22 kN/m^3

h = depth of point of interest below top of backfill, m

q = surcharge load stress, kPa

The lateral dynamic (seismic) thrust may be computed from the equation given below:

$$\Delta_{Pe} = \gamma H^2 \frac{a_h}{g} F_b$$

where Δ_{Pe} = dynamic thrust in kN/m of wall

H = height of wall, m

γ = unit weight of backfill material = 22 kN/m^3

$\frac{a_h}{g}$ = seismic coefficient = 0.32

F_b = thrust factor = 1.0

The dynamic (seismic) thrust does not take into account the surcharge load. The resultant force acts approximately at 0.63H above the base of the wall.

All subsurface walls of the proposed new building addition should be properly dampproofed.

10. Excavation and De-Watering Requirements

10.1 Excess Soil Management

Ontario Regulation 406/19 made under the Environmental Protection Act (November 28, 2019) has been enacted as of January 1, 2021. The new regulation dictates the testing protocol required for the management and disposal of excess soils. As set forth in the regulation, specific analytical testing protocols need to be implemented and followed based on the volume of soil to be managed. The testing protocols are specific as to whether the soils are stockpiled or in situ. In either scenario, the testing protocols are far more onerous than have been historically carried out as part of standard industry practices. These decisions should be factored in and accounted for prior to the initiation of the project-defined scope of work. EXP would be pleased to assist with the implementation of a soil management and testing program that would satisfy the requirements of Ontario Regulation 406/19.

10.2 Excavations

The excavations for the building addition foundations are expected to extend to a maximum depth of 3.3 m below the existing ground surface (Elevation 66.1 m to Elevation 66.0 m). These excavations will extend through the fill and to the native clay. The excavations are anticipated to be near or above the groundwater level.

It is anticipated that excavations may be undertaken using conventional equipment capable of removing cobbles, boulders and construction debris within the fill (such as concrete and asphalt pieces). All excavation work should be completed in accordance with the Occupational Health and Safety Act (OHSA), Ontario, Reg. 213/91. Based on the definitions provided in OHSA, the subsurface soils at the site are considered to be Type 3 soil. As per OHSA, the sidewalls of open cut excavations undertaken within Type 3 soil, must be sloped back at 1H:1V from the bottom of the excavation. Within zones of persistent seepage, the excavation side slopes are expected to slough and eventually stabilize at 2H:1V to 3H:1V from the bottom of the excavation.

If side slopes cannot be achieved due to space restrictions, such as the proximity of the excavation to neighboring structures (existing buildings) and infrastructure, the excavation for the proposed new building addition would have to be undertaken within the confines of an engineered support system (shoring system).

The type of foundation and horizontal distance of the foundations of the neighboring buildings and the infrastructure to the excavation for the proposed new building addition and the founding depths of the foundations of the neighboring buildings and the invert depths of the neighboring infrastructure would have to be determined to assess the need for a shoring system for the excavation of the proposed new building addition. This information would be required for the design of the shoring system, should it be determined that a shoring system will be required for the excavation of the new building addition.

The need for a shoring system, the most appropriate type of shoring system and the design and installation of the shoring system should be determined by the contractors bidding on this project. The design of the shoring system should be undertaken by a professional engineer experienced in shoring design and the installation of the shoring system should be undertaken by a contractor experienced in the installation of shoring systems. The shoring system should be designed and installed in accordance with

latest edition of Ontario Regulation 213/91 under the OHSA and the 2006 Fourth Edition of the Canadian Foundation Engineering Manual (CFEM).

The shoring system as well as the existing building on site, the adjacent neighboring settlement sensitive structures (such as the neighboring buildings) and neighboring infrastructure should be monitored for movement (deflection) on a periodic basis during construction operations.

A pre-construction condition survey of the existing building, adjacent neighboring structures and infrastructure should be undertaken prior to the start of any construction activities.

It is recommended that vibration monitoring be conducted at the site and at adjacent neighboring structures (such as the existing buildings) and infrastructure during the installation of the shoring system and during construction of the new building addition. This is to ensure the existing neighboring structures and infrastructure are not damaged as a result of the construction activities and the installation of the shoring system for the proposed new building addition.

Base heave type failure is not expected in excavations that extend into the native clay at a maximum 3.3 m depth below existing grade.

The clay stratum at the site is susceptible to disturbance due to the movement of construction equipment and personnel on its surface. It is therefore recommended that the excavation at the site should be undertaken by equipment that does not need to travel on the excavated surface, such as a gradall or mechanical shovel.

Extra care should be exercised during the excavation close to the existing building to prevent the undermining of the existing footings. Reference is made to Section 7 of this report regarding measures to prevent the undermining of existing footings.

Many geologic materials deteriorate rapidly upon exposure to meteorological elements. Unless otherwise specifically indicated in this report, walls and floors of excavations must be protected from moisture, desiccation, and frost action throughout the course of construction.

10.3 De-Watering Requirements and Impact on Surrounding Structures and Infrastructure

Seepage of the surface and subsurface water into these excavations is anticipated. However, it should be possible to collect water entering the excavations at low points and to remove it by conventional pumping techniques. In areas of high infiltration or in areas where more permeable soil layers may exist, a higher seepage rate should be anticipated and may require high capacity pumps to keep the excavation dry.

The excavations for foundations are anticipated to be near or above the groundwater level and removal of groundwater from the excavation is anticipated to be minimal or not at all. Therefore, groundwater removal during the short-term construction activities is not anticipated to impact existing neighboring structures (buildings) and infrastructure.

It has been assumed that the maximum excavation depth at the site for foundations of the new building addition will be approximately 3.3 m below existing grade and groundwater removal is anticipated to be minimal or not at all. Therefore, it is noteworthy to mention that new legislation came into force in Ontario on March 29, 2016 to regulate groundwater takings for construction dewatering purposes. Prior to March

29, 2016, a Category 2 Permit to Take Water (PTTW) was required from the Ontario Ministry of the Environment and Climate Change (MOECC) for groundwater takings related to construction dewatering, where taking volumes in excess of 50 m3/day, but less than 400 m3/day, and the taking duration was no more than 30 consecutive days. The new legislation replaces the Category 2 PTTW for construction dewatering with a new process under the Environmental Activity and Sector Registry (EASR). The EASR is an on-line registry, which allows persons engaged in prescribed activities, such as water takings, to register with the MOECC instead of applying for a PTTW.

To be eligible for the new EASR process, the construction dewatering taking must be less than 400 m3/day under normal conditions. The water taking can be groundwater, storm water, or a combination of both. It should be noted that the 30-consecutive day limit on the water taking under the old Category 2 PTTW process has been removed in the new EASR process. Also, it should be noted that the EASR process requires two technical studies be prepared by a Qualified Person, prior to any water taking. These studies include a Water Taking Report, which provides assurance that the taking will not cause any unacceptable impacts, and a Discharge Plan, which provides assurance that the discharge will not result in any adverse impacts to the environment. EXP has qualified persons who can prepare these types of reports, if required. A significant advantage of the new EASR process over the former Category 2 PTTW process, is that the groundwater taking may begin immediately after completing the on-line registration of the taking and paying the applicable fee, assuming the accompanying technical studies have been completed. The former PTTW process typically took more than 90 days, which had the potential to impact construction schedules.

Although this investigation has estimated the groundwater levels at the time of the fieldwork, and commented on dewatering and general construction problems, conditions may be present which are difficult to establish from standard boring and excavating techniques and which may affect the type and nature of dewatering procedures used by the contractor in practice. These conditions include local and seasonal fluctuations in the groundwater table, erratic changes in the soil profile, thin layers of soil with large or small permeabilities compared with the soil mass, etc. Only carefully controlled tests using pumped wells and observation wells will yield the quantitative data on groundwater volumes and pressures that are necessary to adequately engineer construction dewatering systems.

11. Backfilling Requirements and Suitability of On-Site Soils for Backfilling Purposes

The materials to be excavated from the site will consist of silty sand with gravel fill with topsoil and organics, silty sand fill with roots and organics, asphalt, poorly graded gravel with silt and sand containing organics, pieces of bricks and asphalt, cobbles, and boulder, and native clay. Portions of the fill (free of cobbles, boulders, asphalt, concrete, bricks, organics, roots, and construction debris) may be re-used as backfill material, subject to additional geotechnical evaluation and testing at time of construction. The remaining excavated soils are not considered suitable for use under structural elements and for backfilling purposes and therefore must be disposed off-site or used in landscaped areas.

It is anticipated that the majority of the material required for underfloor fill and backfilling purposes would have to be imported and should preferably conform to the following specification:

- Engineered fill under the slab-on-grade area - OPSS 1010 Granular B Type II placed in 300 mm thick lifts and each lift compacted to 98 percent SPMDD.
- Backfill in footing trenches and against foundation walls – OPSS 1010 Granular B Type II placed in 300 mm thick lifts and each lift compacted to 98 percent of the SPMDD inside the building and 95 percent SPMDD outside the building respectively.
- Backfill in services trenches inside building – OPSS 1010 Granular B Type II placed in 300 mm thick lifts and each lift compacted to 98 percent of the SPMDD.
- Backfill in exterior services trenches or exterior subgrade fill– OPSS 1010 Select Subgrade Material (SSM) placed in 300 mm thick lifts and each lift compacted to 95 percent of the SPMDD or on-site approved excavated material as noted above.

12. Subsurface Concrete and Steel Requirements

Chemical tests limited to pH, chloride, sulphate and resistivity were performed on one (1) soil sample. The certificate of the laboratory analysis is attached in Appendix A and the results are summarized in Table III.

Table III: Chemical Test Results on Soil Sample

Borehole No. (Sample No.)	Soil Type	Depth (m)	pH	Sulphate (%)	Chloride (%)	Resistivity (ohm-cm)
MW21-1 (SS4)	Clay	2.3 – 2.9	7.94	0.0086	0.0551	826

The sulphate content in the clay is less than 0.1 percent. This concentration in the clay would have a negligible potential of sulphate attack on subsurface concrete. The concrete should be designed in accordance with Table Nos. 3 and 6 of CSA A.23.1-14. However, the concrete should be dense, well compacted and cured.

Based on a review of the resistivity test result, the clay sample is considered corrosive to moderately corrosive to bare steel as per the National Association of Corrosion Engineers (NACE). Appropriate measures should be undertaken to protect buried steel elements from corrosion.

13. General Comments

The comments given in this report are intended only for the guidance of design engineers. The number of boreholes required to determine the localized underground conditions, between boreholes 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 results, so that they may draw their own conclusions as to how the subsurface conditions may affect them.

The information contained in this report is not intended to reflect on environmental aspects of the soils and groundwater. Reference is made to the Phase Two ESA report completed by EXP regarding the environmental aspects of the soils and groundwater.

We trust that the information contained in this report is satisfactory for your purposes. Should you have any questions, please contact this office.

Sincerely,

Susan M. Potyondy, P.Eng.
Senior Project Manager, Geotechnical Services
Earth and Environment

Ismail M. Taki, M.Eng., P.Eng.
Senior Manager, Eastern Region
Earth and Environment

Figures

0 50m 100m 200m
HORIZONTAL 1:5,000

EXP Services Inc.
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Ottawa, ON K2B 8H6
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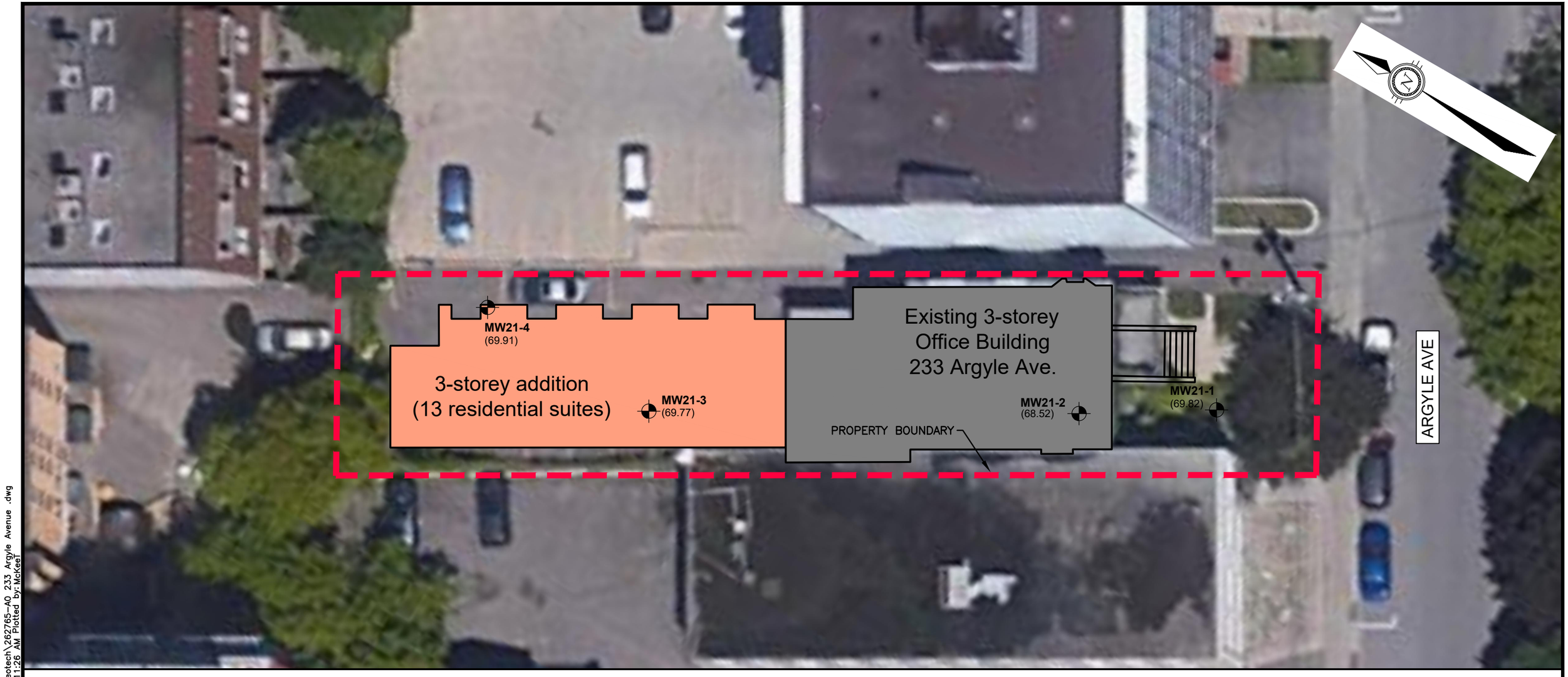
DESIGN AN	GEOTECHNICAL INVESTIGATION PROPOSED RESIDENTIAL ADDITION TO OFFICE BUILDING	SCALE 1:5,000
DRAWN TM		SKETCH NO
DATE APRIL, 2021	SITE LOCATION PLAN	FIG 1
FILE NO OTT-00262765-A0	233 ARGYLE AVENUE, OTTAWA, ONTARIO	

Filename: E:\OTT\OTT-00262765-A0\60 Execution\65 Drawings\geotech\262765-A0 233 Argyle Avenue .dwg
Last Saved: Apr 16, 2021 9:45 AM Last Plotted: Apr 26, 2021 11:26 AM Plotted by: McKeeT



LEGEND

MW21-1 (69.82) MONITORING WELL NO. & LOCATION (APPROXIMATE GROUND SURFACE ELEVATION, m)

NOTES:

1. THE BOUNDARIES AND SOIL TYPES HAVE BEEN ESTABLISHED ONLY AT BOREHOLE LOCATIONS. BETWEEN BOREHOLES THEY ARE ASSUMED AND MAY BE SUBJECT TO CONSIDERABLE ERROR.
2. SOIL SAMPLES WILL BE RETAINED IN STORAGE FOR THREE MONTHS AND THEN DESTROYED UNLESS THE CLIENT ADVISES THAT AN EXTENDED TIME PERIOD IS REQUIRED.
3. TOPSOIL AND ASPHALT QUANTITIES SHOULD NOT BE ESTABLISHED FROM THE INFORMATION PROVIDED AT THE BOREHOLE LOCATIONS.
4. BOREHOLE ELEVATIONS SHOULD NOT BE USED TO DESIGN BUILDING(S) OR FLOOR SLABS OR PARKING LOT(S) GRADES.
5. THIS DRAWING FORMS PART OF THE REPORT PROJECT NUMBER AS REFERENCED AND SHOULD BE USED ONLY IN CONJUNCTION WITH THIS REPORT.

0 2m 4m 8m
HORIZONTAL 1:200

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DESIGN	AN
DRAWN	TM
DATE	APRIL, 2021
FILE NO	OTT-00262765-A0

GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENTIAL ADDITION
TO OFFICE BUILDING

BOREHOLE (MONITORING WELL) LOCATION PLAN
233 ARGYLE AVENUE, OTTAWA, ONTARIO

SCALE 1:200
SKETCH NO FIG 2

Filename: E:\OTT\OTT-00262765-A0\60 Execution\65 Drawings\geotech\262765-A0 233 Argyle Avenue .dwg
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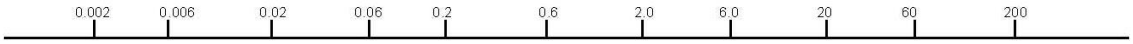
Notes On Sample Descriptions

1. All sample descriptions included in this report follow the Canadian Foundations Engineering Manual soil classification system. This system follows the standard proposed by the International Societv for Soil Mechanics and Foundation Engineering. Laboratory grain size analyses provided by **exp** Services Inc. also follow the same system. Different classification systems may be used by others; one such system is the Unified Soil Classification. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.

ISSMFE SOIL CLASSIFICATION

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



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 boring process. The reader is cautioned that fills are heterogeneous in nature and 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 obstruction 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 given 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. These readings are to advise of 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 undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional 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 by the borings. 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.

Log of Borehole MW21-1

Project No: OTT-00262765-A0

Project: Proposed Residential Addition to Office Building

Location: 233 Argyle Avenue, Ottawa, Ontario

Figure No. 3

Page. 1 of 1

Date Drilled: 'March 18, 2021

Drill Type: GeoProbe Drill Rig

Datum: Approximate Elevation

Logged by: A. Neguss Checked by: A. Nader

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Approximate Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		TOPSOIL AND FILL Topsoil and silty sand with gravel, black organic pockets, brown and black, moist, (very loose)	69.82	0	3	0	SS1	
		FILL Silty sand, trace gravel, with roots and black organic pockets, brown, moist, (very loose)	69.0	1	3	0	SS2	
		CLAY (CL to CH) Low to high plasticity, brownish grey to grey, (firm to very stiff)	68.3	2	6, 168	0	SS3	17.6
					7, 144	0	SS4	18.1
				3	1, 48	0	SS5	
			66.17	4				
					Hammer Weight	0	SS6	
		Borehole advanced by pushing the casing from 5.2 m to 6.1 m depths for monitoring well installation.	64.6	5				
			63.7	6				
		Borehole Terminated at 6.1 m Depth						

LOG OF BOREHOLE LOGS OF BOREHOLES_262765_233 ARGYLE AVE.GPJ TROW OTTAWA.GDT 4/26/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm monitoring well installed upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00262765-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	4.6	
Mar. 30, 2021	3.7	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole MW21-2

Project No: OTT-00262765-A0

Project: Proposed Residential Addition to Office Building

Location: 233 Argyle Avenue, Ottawa, Ontario

Figure No. 4

Page. 1 of 1

Date Drilled: 'March 16, 2021

Drill Type: Manual Drilling

Datum: Approximate Elevation

Logged by: A. Neguss Checked by: A. Nader

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)

Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Approximate Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		CONCRETE SLAB ~115 mm thick	68.52	0	20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
		FILL ~250 mm thick	68.4					
		Poorly graded gravel with silt and sand (GP-GM), brown, moist	68.2				BS1	
		CLAY (CL to CH)		1			BS2	
		Low to high plasticity, brownish grey to grey	66.87	2			BS3	17.6
							BS4	
				3			BS5	
				4			BS6	
			63.3	5				
		Borehole Terminated at 5.2 m Depth						

LOG OF BOREHOLE LOGS OF BOREHOLES_262765_233 ARGYLE AVE.GPJ TROW OTTAWA.GDT 4/26/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm monitoring well installed upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00262765-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	3.0	
Mar. 30, 2021	1.7	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole MW21-3

Project No: OTT-00262765-A0

Project: Proposed Residential Addition to Office Building

Location: 233 Argyle Avenue, Ottawa, Ontario

Figure No. 5

Page. 1 of 2

Date Drilled: 'March 18, 2021

Drill Type: GeoProbe Drill Rig

Datum: Approximate Elevation

Logged by: A. Neguss Checked by: A. Nader

Split Spoon Sample
Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Shear Strength by Vane Test (S)
Combustible Vapour Reading
Natural Moisture Content
Atterberg Limits
Undrained Triaxial at % Strain at Failure
Shear Strength by Penetrometer Test

GWL	SYMBOL	SOIL DESCRIPTION	Approximate Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		ASPHALT ~12 mm thick	69.77	0			SS1	
		FILL Poorly graded gravel with silt and sand (GP-GM), black organic pockets, asphalt and bricks debris, black, frozen	69.8					
		FILL Poorly graded gravel with silt and sand (GP-GM), cobbles and boulders, brown, moist, (compact)	69.0	1	29		SS2	
		CLAY (CL to CH) Low to high plasticity, medium sensitivity to sensitive, grey, (firm to very stiff)	68.1	2	15		SS3	
				3	2		SS4	16.0
					29 s=4.1 Hammer Weight		SS5	
				4	38 s=5.4			
			65.35		58 s=2.4			
				5	Hammer Weight		SS6	
				6	62 s=4.4			
					Hammer Weight		SS7	
				7	43 s=4.3			
				8	Hammer Weight		SS8	
					115 s=4.4			
				9	Hammer Weight		SS9	
				10	67 s=4.8			

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm monitoring well installed upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00262765-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	2.7	
Mar. 30, 2021	4.4	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE LOGS OF BOREHOLES_262765_233 ARGYLE AVE.GPJ TROW OTTAWA.GDT 4/26/21

Log of Borehole MW21-3

Project No: OTT-00262765-A0

Project: Proposed Residential Addition to Office Building

Figure No. 5

GWL	SYMBOL	SOIL DESCRIPTION	Approximate Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		CLAY (CL to CH) Low to high plasticity, medium sensitivity to sensitive, grey, (firm to very stiff) *(continued)*	59.77	10	Shear Strength 20 40 60 80 / 50 100 150 200 kPa	250 500 750 / 20 40 60		
		Hammer Weight		11			SS10	
		CLAYEY SAND With gravel and silt, partially cohesive, grey, wet, (very loose)	58.5	12				
		Hammer Weight					SS11	
				13				
				14				
				15			SS12	
		Borehole Terminated at 15.8 m Depth	54.0					

LOG OF BOREHOLE LOGS OF BOREHOLES_262765_233 ARGYLE AVE.GPJ TROW OTTAWA.GDT 4/26/21

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm monitoring well installed upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00262765-A0

WATER LEVEL RECORDS		
Date	Water Level (m)	Hole Open To (m)
On Completion	2.7	
Mar. 30, 2021	4.4	

CORE DRILLING RECORD			
Run No.	Depth (m)	% Rec.	RQD %

Log of Borehole MW21-4

Project No: OTT-00262765-A0

Project: Proposed Residential Addition to Office Building

Location: 233 Argyle Avenue, Ottawa, Ontario

Figure No. 6

Page. 1 of 3

Date Drilled: 'March 19, 2021

Drill Type: GeoProbe Drill Rig

Datum: Approximate Elevation

Logged by: A. Neguss Checked by: A. Nader

Split Spoon Sample ⊠
Auger Sample ◧
SPT (N) Value ○
Dynamic Cone Test ——
Shelby Tube ■
Shear Strength by Vane Test +S

Combustible Vapour Reading □
Natural Moisture Content ×
Atterberg Limits ⊢○
Undrained Triaxial at % Strain at Failure ⊕
Shear Strength by Penetrometer Test ▲

GWL	SYMBOL	SOIL DESCRIPTION	Approx. Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		ASPHALT ~40 mm thick	69.91	0				
		FILL Poorly graded gravel with silt and sand (GP-GM), brown, moist, (loose)	69.9		5		SS1	
				1	7		SS2	
			68.1		8, 96		SS3	
		CLAY (CL to CH) Low to high plasticity, medium sensitivity to sensitive, grey, (firm to stiff)		2	2	×	SS4	
				3	62, s=4.4			
					Hammer Weight	×	SS5	
			66.07	4	38, s=748, s=4.0			
					Hammer Weight	×	SS6	
				5	58, s=3.4			
				6	Hammer Weight	×	SS7	
					53, s=4.4			
			62.9	7				
		Dynamic Cone Penetration Test (DCPT) conducted from 7.0 m depth to cone refusal at 22.7 m depth		8				
				9				
				10				

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm monitoring well installed upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00262765-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	3.0	
Mar. 30, 2021	3.8	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE LOGS OF BOREHOLES_262765_233 ARGYLE AVE.GPJ TROW OTTAWA.GDT 4/26/21

Log of Borehole MW21-4

Project No: OTT-00262765-A0

Project: Proposed Residential Addition to Office Building

Figure No. 6

GWL	SYMBOL	SOIL DESCRIPTION	Approximate Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		Dynamic Cone Penetration Test (DCPT) conducted from 7.0 m depth to cone refusal at 22.7 m depth *(continued)*	59.91					

Standard Penetration Test N Value: 20 40 60 80
Shear Strength kPa: 50 100 150 200
Combustible Vapour Reading (ppm): 250 500 750
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 20 40 60

Continued Next Page

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm monitoring well installed upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00262765-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	3.0	
Mar. 30, 2021	3.8	

CORE DRILLING RECORD

Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE LOGS OF BOREHOLES_262765_233 ARGYLE AVE.GPJ TROW OTTAWA.GDT 4/26/21

Log of Borehole MW21-4

Project No: OTT-00262765-A0

Project: Proposed Residential Addition to Office Building

Figure No. 6

GWL	SYMBOL	SOIL DESCRIPTION	Approximate Elevation m	Depth	Standard Penetration Test N Value / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	SAMPLES	Natural Unit Wt. kN/m³
		Dynamic Cone Penetration Test (DCPT) conducted from 7.0 m depth to cone refusal at 22.7 m depth *(continued)*	47.91	22	20 40 60 80 / 50 100 150 200	250 500 750 / 20 40 60		
		Cone Refusal at 22.7 m Depth	47.2					

NOTES:

1. Borehole data requires interpretation by EXP before use by others
2. A 32 mm monitoring well installed upon completion of drilling.
3. Field work supervised by an EXP representative.
4. See Notes on Sample Descriptions
5. Log to be read with EXP Report OTT-00262765-A0

WATER LEVEL RECORDS

Date	Water Level (m)	Hole Open To (m)
On Completion	3.0	
Mar. 30, 2021	3.8	

CORE DRILLING RECORD

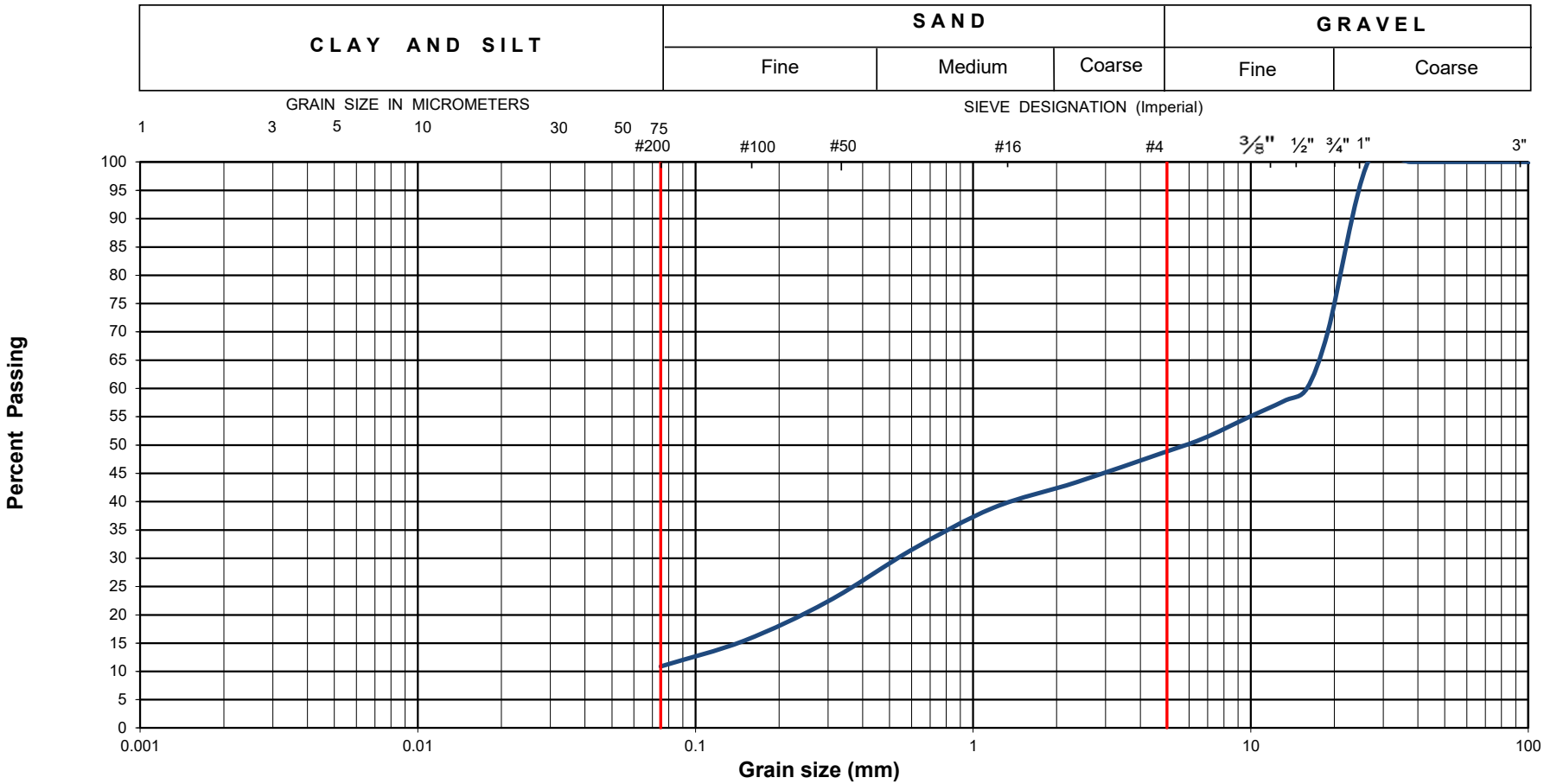
Run No.	Depth (m)	% Rec.	RQD %

LOG OF BOREHOLE LOGS OF BOREHOLES_262765_233 ARGYLE AVE.GPJ TROW OTTAWA.GDT 4/26/21

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Sieve Analysis of Aggregate
ASTM C-136

Unified Soil Classification System

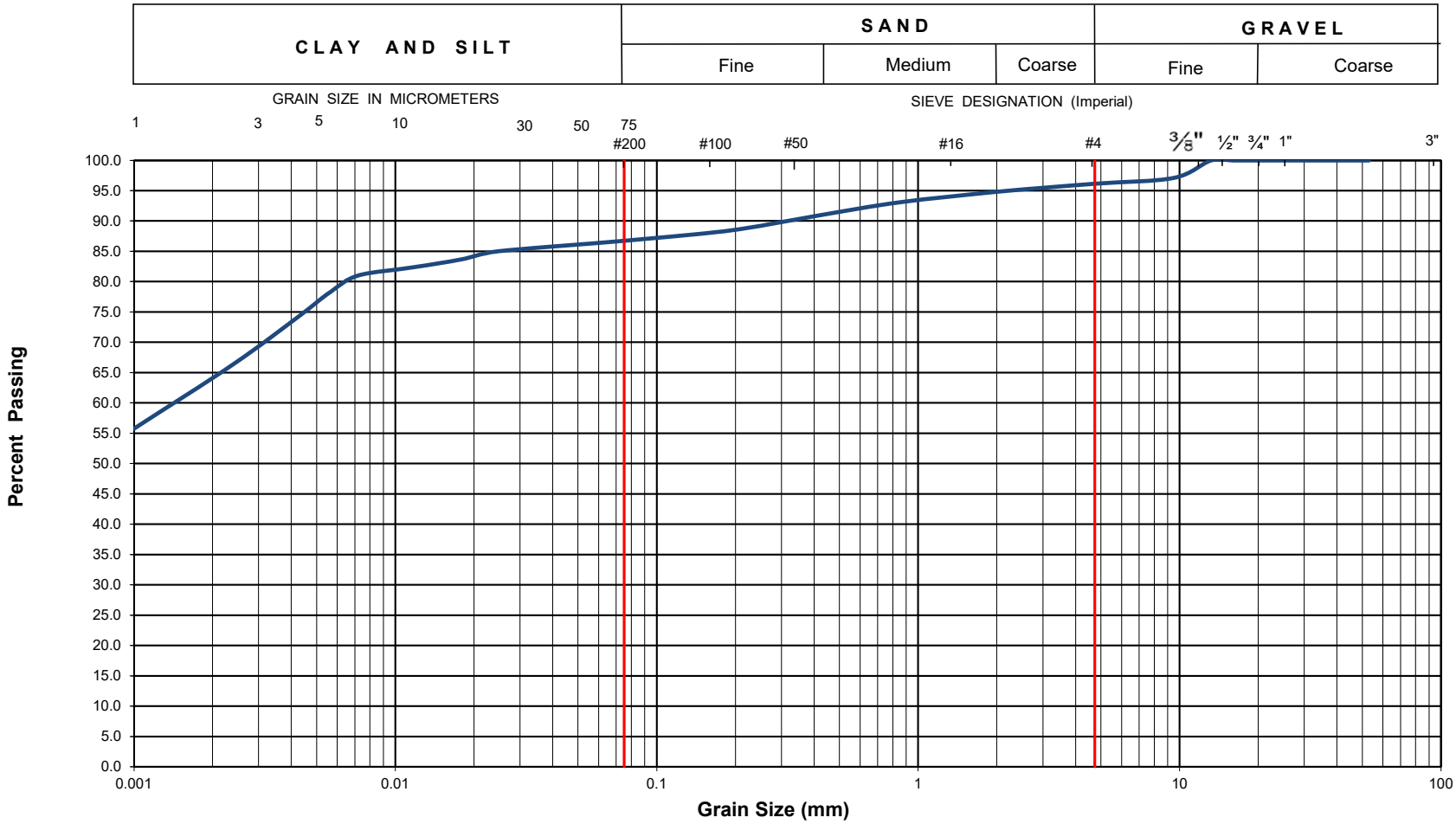


EXP Project No.:	**OTT-00262765-A0**	**Project Name :**	**Proposed Residential Addition to Office Building**						
Client :	**Smart Living Properties**	**Project Location :**	**233 Argyle Avenue, Ottawa, Ontario**						
Date Sampled :	**March 18, 2021**	**Borehole No:**	**MW21-3**	**Sample:**	**SS2**	**Depth (m) :**	**0.8-1.4**		
Sample Composition :		**Gravel (%)**	**52**	**Sand (%)**	**37**	**Silt & Clay (%)**	**11**	**Figure :**	**7**
Sample Description :	**FILL: Poorly Graded Gravel with Silt and Sand (GP-GM)**								

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422

Unified Soil Classification System

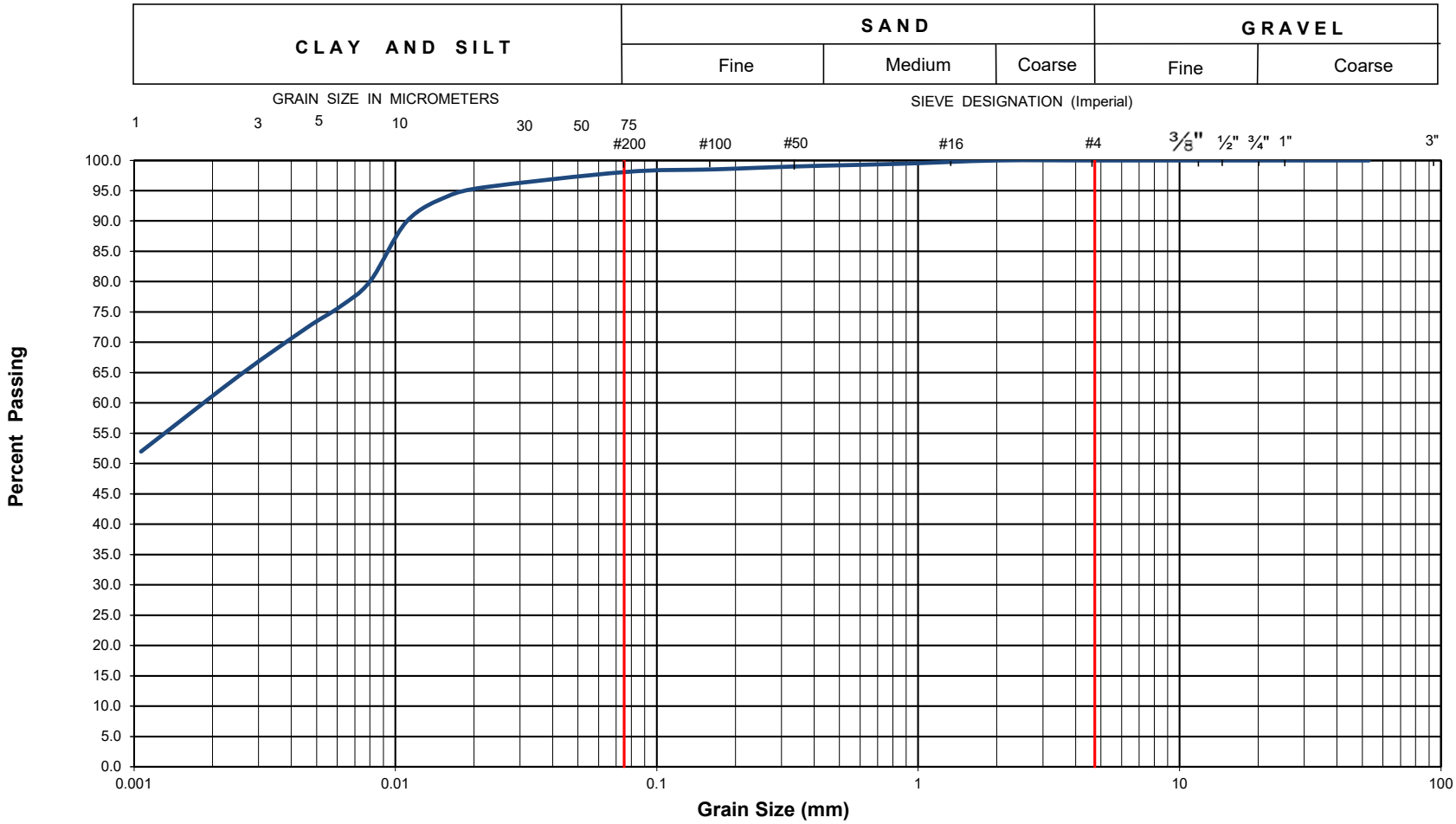


EXP Project No.:	**OTT-00262765-A0**	**Project Name :**	**Proposed Residential Addition to Office Building**						
Client :	**Smart Living Properties**	**Project Location :**	**233 Argyle Avenue, Ottawa, Ontario**						
Date Sampled :	**March 18, 2021**	**Borehole No:**	**MW21-3**	**Sample No.:**	**SS4**	**Depth (m) :**	**2.3-2.9**		
Sample Description :		**% Silt and Clay**	**87**	**% Sand**	**9**	**% Gravel**	**4**	**Figure :**	**8**
Sample Description :		**CLAY of High Plasticity (CH)**							

EXP Services Inc.
100-2650 Queensview Drive
Ottawa, ON K2B 8H6

Grain-Size Distribution Curve
Method of Test For Particle Size Analysis of Soil
ASTM C-136/ASTM D422

Unified Soil Classification System



EXP Project No.:	**OTT-00262765-A0**	**Project Name :**	**Proposed Residential Addition to Office Building**						
Client :	**Smart Living Properties**	**Project Location :**	**233 Argyle Avenue, Ottawa, Ontario**						
Date Sampled :	**March 18, 2021**	**Borehole No:**	**MW21-3**		**Sample No.:**	**SS10**		**Depth (m) :**	**10.7-11.3**
Sample Description :		**% Silt and Clay**	**98**	**% Sand**	**2**	**% Gravel**	**0**	**Figure :**	**9**
Sample Description :		**CLAY of Low Plasticity (CL)**							

Appendix A:
Laboratory Certificate of Analysis

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: EXP SERVICES INC
2650 QUEENSVIEW DRIVE, UNIT 100
OTTAWA, ON K2B8H6
(613) 688-1899
ATTENTION TO: Athir Nader
PROJECT: OTT-00262765-A0
AGAT WORK ORDER: 21T725846
SOIL ANALYSIS REVIEWED BY: Nivine Basily, Inorganics Report Writer
DATE REPORTED: Apr 01, 2021
PAGES (INCLUDING COVER): 6
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days following analysis, unless expressly agreed otherwise in writing. Please contact your Client Project Manager if you require additional sample storage time.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*

AGAT Laboratories

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MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
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FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 21T725846

PROJECT: OTT-00262765-A0

CLIENT NAME: EXP SERVICES INC

ATTENTION TO: Athir Nader

SAMPLING SITE:233 Argyle St./330 Meleat St.

SAMPLED BY:EXP

Inorganic Chemistry (Soil)

DATE RECEIVED: 2021-03-25 **DATE REPORTED: 2021-04-01**

				MW21-1 SS4
		SAMPLE DESCRIPTION:		7.5'-9.5'
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2021-03-18
Parameter	Unit	G / S	RDL	2262833
Chloride (2:1)	µg/g		4	551
Sulphate (2:1)	µg/g		4	86
pH (2:1)	pH Units		NA	7.94
Resistivity (2:1) (Calculated)	ohm.cm		1	826

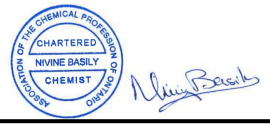
Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

2262833 EC, pH, Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil). Resistivity is a calculated parameter.

Dilution required, RDL has been increased accordingly.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



AGAT Laboratories

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MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
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http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 21T725846

PROJECT: OTT-00262765-A0

CLIENT NAME: EXP SERVICES INC

ATTENTION TO: Athir Nader

SAMPLING SITE:233 Argyle St./330 Meleat St.

SAMPLED BY:EXP

Inorganic Chemistry (Soil) %

DATE RECEIVED: 2021-03-25 **DATE REPORTED: 2021-04-01**

			SAMPLE DESCRIPTION:	MW21-1 SS4 7.5'-9.5'
			SAMPLE TYPE:	Soil
			DATE SAMPLED:	2021-03-18
Parameter	Unit	G / S	RDL	2262833
Chloride (2:1)	%		0.0004	0.0551
Sulphate (2:1)	%		0.0004	0.0086

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

2262833 Chloride and Sulphate were determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water: 1 part soil).

Dilution required, RDL has been increased accordingly.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: EXP SERVICES INC

AGAT WORK ORDER: 21T725846

PROJECT: OTT-00262765-A0

ATTENTION TO: Athir Nader

SAMPLING SITE:233 Argyle St./330 Meleat St.

SAMPLED BY:EXP

Soil Analysis

RPT Date: Apr 01, 2021			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Inorganic Chemistry (Soil)															
Chloride (2:1)	2262607		3	2	NA	< 2	94%	70%	130%	105%	80%	120%	107%	70%	130%
Sulphate (2:1)	2262607		140	141	0.3%	< 2	91%	70%	130%	97%	80%	120%	105%	70%	130%
pH (2:1)	2279153		7.00	6.86	2.0%	NA	99%	90%	110%						

Comments: NA signifies Not Applicable.
pH duplicates QA acceptance criteria was met relative as stated in Table 5-15 of Analytical Protocol document.

Duplicate NA: results are under 5X the RDL and will not be calculated.

Inorganic Chemistry (Soil) %															
Chloride (2:1)	2262607		0.0003	0.0002	NA	< 0.0002	94%	70%	130%	105%	80%	120%	107%	70%	130%
Sulphate (2:1)	2262607		0.0140	0.0141	0.7%	< 0.0002	91%	70%	130%	97%	80%	120%	105%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: EXP SERVICES INC

AGAT WORK ORDER: 21T725846

PROJECT: OTT-00262765-A0

ATTENTION TO: Athir Nader

SAMPLING SITE:233 Argyle St./330 Meleat St.

SAMPLED BY:EXP

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Chloride (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate (2:1)	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
pH (2:1)	INOR 93-6031	MSA part 3 & SM 4500-H+ B	PH METER
Resistivity (2:1) (Calculated)	INOR-93-6036	McKeague 4.12, SM 2510 B,SSA #5 Part 3	CALCULATION

AGAT Laboratories
5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only
Work Order #: 21T725846.
Cooler Quantity: one - no ice.
Arrival Temperatures: 16 | 16.5 | 16.4 / 1.8 | 1.9 | 2.1
Custody Seal Intact: ☐ Yes ☑ No ☐ N/A
Notes: on ice.

Report Information:
Company: EXP Services Inc. Ottawa
Contact: Athir Nader
Address: 2650 Queensview dr. Unit 100, Ottawa, ON, K2B 8H6
Phone: 613-688-1899 Fax:
Reports to be sent to:
1. Email: athir.nader@exp.com
2. Email:

Regulatory Requirements:
(Please check all applicable boxes)
☐ Regulation 153/04 — Table ____ (Indicate One) ☐ Ind/Com ☐ Res/Park ☐ Agriculture — Soil Texture (Check One) ☐ Coarse ☐ Fine
☐ Excess Soils R406 — Table ____ (Indicate One) ☐ Regulation 558 ☐ CCME
☐ Sewer Use ☐ Sanitary ☐ Storm — ____ (Region) ☐ Prov. Water Quality Objectives (PWQO) ☐ Other ____ (Indicate One)

Turnaround Time (TAT) Required:
Regular TAT ☑ 5 to 7 Business Days
Rush TAT (Rush Surchargs Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day
OR Date Required (Rush Surcharges May Apply):
Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays
For 'Same Day' analysis, please contact your AGAT CPM

Project Information:
Project: OTT-00262765-A0
Site Location: 233 Argyle st / 330 Meleat st.
Sampled By: EXP
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Is this submission for a **Record of Site Condition?** ☐ Yes ☐ No
Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Invoice Information: Bill To Same: Yes ☑ No ☐
Company:
Contact:
Address:
Email:

Sample Matrix Legend
B Biota
GW Ground Water
O Oil
P Paint
S Soil
SD Sediment
SW Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI, DOC Y/N	O. Reg 153: Metals & Inorganics	O. Reg 153: Metals - ☐ CrVI, ☐ Hg, ☐ HWSB	O. Reg 153: BTEX, F1-F4 PHCs	O. Reg 153: Analyze F4G if required ☐ Yes ☐ No	O. Reg 153: PAHs	O. Reg 153: PCBs	O. Reg 153: VOC	O. Reg 558: Landfill Disposal Characterization TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	O. Reg 406: Excess Soils SPLP Rainwater Leach ☐ Metals ☐ VOCs ☐ SVOCs	O. Reg 406: Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4	Salt - EC/SAR	pH	Resistivity	Sulphate	Chloride	Potentially Hazardous or High Concentration (Y/N)
MW21-1 BH# 7.5-9.5'	Mar. 18	— AM PM	1	S														✓	✓	✓	✓	
BH# 2 SS5 10-12'	Mar. 19	— AM PM	1	S														✓	✓	✓	✓	
		AM PM																				
		AM PM																				
		AM PM																				
		AM PM																				
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		AM PM																				

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Jeff MacMillan	Mar. 23/21	3:52	Burthelet	2021/03/23	16h30
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
	21/3/24	16h00	Lakshanya. March 25		8:40
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

Page 1 of 1
N°: T111716

Document ID: DIV-78-1511.018
Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT
Date Issued: August 26, 2020

Appendix B:
Legal Notification

Legal Notification

This report was prepared by EXP Services Inc. (EXP) for the account of Smart Living Properties.

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. EXP accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this project.

Report Distribution

Jeremy Silburt, Smart Living Properties; Jeremy@smartlivingproperties.ca