PATERSON GROUP

memorandum

re: **Geotechnical Review and Design Recommendations**
Proposed Dome Structure
349 Olmstead Street, Ottawa, Ontario

to: Ottawa Footy Sevens – **Chris Surgeoner** – chris@ottawafootysevens.com

date: July 21, 2026

file: PG8082-MEMO.01

Further to your request and authorization, Paterson Group (Paterson) has completed a geotechnical investigation to evaluate the subsurface conditions throughout the subject site in support of the proposed dome structure.

1.0 Background Information

Paterson understands that an inflatable dome structure is being proposed to be constructed throughout the eastern portion of the subject site. Further, the existing parking lot will be expanded to the north. Paterson anticipates the proposed dome structure foundation will consist of a buried cast-in-place grade beam foundation located along the entire perimeter of the dome footprint. Reference should be made to Drawing PG8082-1 - Test Hole Location Plan attached to this memo report.

2.0 Field Program

The current field program was undertaken on July 21, 2026. At that time, eight (8) boreholes were extended to a maximum depth of 3.6 m below the existing ground surface. All fieldwork was completed under full-time supervision of Paterson personnel under the direction of a senior engineer. Previous borehole and test pit investigations had been undertaken by Paterson and others in 2016, 2000 and 1981 and have been considered in this assessment. The location of the test holes are depicted on Drawing PG8082-1 - Test Hole Location Plan attached to the current memo report.

Borehole samples were recovered from a 50 mm diameter split-spoon (SS) or the auger flights (AU). All soil samples were visually inspected and initially classified on site. Grab samples were collected from the test pit at selected intervals. A Standard Penetration Test (SPT) was conducted in conjunction with the recovery of the split spoon samples. The SPT results are recorded as "N" values on the Soil Profile and Test Data sheets. The "N" value is the number of blows required to drive the split spoon sampler 300 mm into the soil after a 150 mm initial penetration using a 63.5 kg hammer falling from a height of 760 mm.

The overburden thickness was evaluated by a dynamic cone penetration test (DCPT) completed at test holes BH 1-26 and BH 5-26. The DCPT consists of driving a steel drill rod, equipped with a 50 mm diameter cone at the tip, using a 63.5 kg hammer falling from a height of 760 mm. The number of blows required to drive the cone into the soil is recorded for each 300 mm increment.

Subsurface Profile

Based on available information, the subsoils profile in the immediate area of the proposed dome structure generally consisted of a layer of topsoil underlain by either fill and/or sand underlain further by glacial till. The fill and glacial till layers mostly consisted of a sandy fines matrix, and occasionally of clayey consistency (BH 1-26, BH 2-26, BH 4-26, BH 7-26). The overburden ranged between loose and compact. The glacial till deposit consisted mostly of silty sand with a variable amount of clay, gravel, cobbles and boulders.

Based on available geological mapping, the bedrock in the subject area consists of interbedded limestone and shale of the Billings Formation, with an overburden drift thickness ranging between 2 to 3 m depth.

Groundwater levels were measured within the four piezometers installed at the time of backfilling test holes BH 1-26, BH 3-26, BH 6-26 and BH 8-26. Based on our review of recovered soil samples, the static groundwater table is anticipated to be encountered at a depth of 2 to 2.5 m below existing ground surface. However, groundwater levels fluctuate annually based on precipitation (or lack thereof) and snow melt. Based on that, groundwater levels are subject to seasonal fluctuations and could vary at the time of construction.

3.0 Geotechnical Assessment and Recommendations

From a geotechnical perspective, the subject site is considered suitable for the proposed structure and parking lot expansion. It is expected that the proposed foundation to support the dome structure will be founded on a combination of re-compacted fill, native, in-situ compact sand and/or glacial till.

The above and other considerations are further discussed in the following sections.

Stripping Depth

Dome Foundation and Parking Lot Expansion

Topsoil and fill, such as those containing organic or deleterious materials, should be stripped from under any buildings and other settlement sensitive structures. Care should be taken not to disturb adequate bearing soils below the founding level during site preparation activities. Disturbance of the subgrade may result in having to sub-excavate the disturbed material and the placement of additional suitable fill material.

Existing construction remnants, such as foundation walls and other construction debris should be entirely removed from within the building perimeters. Under paved areas, existing construction remnants, such as foundation walls, should be excavated to a minimum of 1 m below finished grade.

Foundation Design

Bearing Resistance Values

Conventional shallow footings placed over an undisturbed, compact silty sand or glacial till bearing surface, or re-compacted existing fill (see following section of report for more information) approved by Paterson personnel at the time of construction can be designed using a bearing resistance value at Serviceability Limit States (SLS) of **150 kPa** and a factored bearing resistance value at Ultimate Limit States (ULS) of **225 kPa**, incorporating a geotechnical resistance factor of 0.5.

The bearing surface should be reviewed by Paterson personnel at the time of construction. An undisturbed soil bearing surface consists of one from which all topsoil and deleterious materials, such as loose, frozen or disturbed soil, whether in situ or not, have been removed, in the dry, prior to the placement of concrete.

Re-Compacting Existing Fill and Loose Sand Subgrade Conditions

It is expected the proposed foundation will be founded at a depth equal to or deeper than the depth of frost migration for heated structures (i.e., 1.5 m below finished grade). Based on the available test hole information, existing loose fill may be encountered at the founding depth of the proposed dome structure foundation. Loose in-situ, native silty sand may also be encountered.

Based on this, it is recommended that all bearing surfaces for the perimeter grade beam be compacted/re-compacted by suitably sized compaction equipment (i.e., large diesel plate or smooth-drum vibratory roller) at the time of preparing the subgrade for the placement of footings. This would consist of making several passes across the subgrade under the supervision of Paterson personnel. Re-compaction efforts should be undertaken in the dry and during above-freezing conditions.

Where notably loose areas or unsuitable/deleterious fill materials are encountered that cannot be readily resolved with localized re-compaction, Paterson field personnel would recommend to sub-excavate the localized areas and reinstate them with engineered fill such as OPSS Granular A or OPSS Granular B Type II crushed stone. The localized sub-excavations may be reinstated in maximum 225 mm thick loose lifts and compacted to a minimum of 98% of the materials SPMDD.

Lateral Support

The bearing medium under footing-supported structures is required to be provided with adequate lateral support with respect to excavations and different foundation levels.

Adequate lateral support is provided to a loose to compact silty sand or engineered fill above the groundwater table when a plane extending horizontally and vertically from the underside of the foundation at a minimum of 1.5H:1V passes through in situ soil of the same or higher bearing capacity as the bearing medium soil.

Foundation Lateral Load Resistance, Uplift Resistance and Backfill Recommendations

Overturning and/or uplift on the foundations can be resisted using passive resistance on the sides of the foundations. For Limit States Design, the resistance factor to be applied to the ultimate lateral resistance, including passive pressure, is 0.50. The total lateral resistance will be comprised of the individual contributions from up to several material layers.

Geotechnical parameters for the native silty sand, glacial till and encountered fill, compacted to 98% of SPMDD in 300 mm lift thicknesses over the foundation structure, are provided in Table 1, along with the associated earth pressure coefficients for horizontal resistance calculated for footings under lateral loads. Friction factors between concrete and the various subgrade materials are also provided in Table 1, where normal loads allow them to be used.

Where granular soils and/or granular backfill materials are present, the passive pressure can be calculated using a triangular distribution equal to $K_P \cdot \gamma \cdot H$ where:

K_P = factored passive earth pressure coefficient of the applicable retained soil
γ = unit weight of the fill of the applicable retained soil (kN/m^3)
H = height of the equivalent wall or footing side (m)

Note that for cases where the depth to the top of the structure pushing against the soil does not exceed 50% of the depth to the base of the structure, the effective value of H in the above noted relationship will be the overall depth to the base of the structure. There will also be “edge effects” where the effective width of soil providing the resistance can be increased by 50% of the effective depth on each side of the pushing structural component.

Uplift forces on the proposed foundations can be resisted using the dead weight of the concrete foundation and the weight of the materials overlying the foundations. Unit weights of materials are provided in Table 1. General uplift cone prism angle are provided in *Figure 2 – Uplift Cone Angles for Backfill Material* for cohesive and cohesionless soils.

For soil above the groundwater level, uplift forces should be calculated using the drained unit weight. For calculations below groundwater level, the effective unit weight should be used. Backfilled excavations in low permeability soils can be expected to fill with water. Then, effective unit weights should be used if drainage of the footings is not allowed.

Table 1 - Geotechnical Parameters for Uplift Resistance Design

Material Description	Unit Weight (kN/m³)		Friction Angle (°)	Friction Factor,	Earth Pressure Coefficients		
	Drained γ_{dr}	Effective γ'	φ'	tan δ	Active K_A	At-Rest K_O	Passive K_P
OPSS Granular A Crushed Stone	22.0	13.7	38	0.60	0.22	0.36	4.58
OPSS Granular B Type II	21.5	13.4	36	0.55	0.26	0.33	5.04
In-Situ Silty Sand, Glacial Till and Existing Silty Sand Fill	18.0	11.0	33	0.50	0.29	0.46	3.39

Notes:

- ❒ Properties for fill materials are for condition of 98% of modified Proctor maximum dry density.
- ❒ The earth pressure coefficients provided are for horizontal backfill profile.
- ❒ The passive earth pressure coefficients are "ultimate" values. The appropriate factor of safety for working stress design, or resistance factor for limit states design (0.4 to 0.5) should be applied.

Design for Earthquakes

The site class for seismic site response can be taken as Site Designation X_D for foundations constructed at the subject site in accordance with the 2024 Ontario Building Code (OBC 2024). The soils underlying the subject site are not considered susceptible to liquefaction. Reference should be made to the latest revision of the 2024 Ontario Building Code for a full discussion of the earthquake design requirements.

Pavement Structure

Subgrade Preparation

It is anticipated the proposed parking lot expansion would consist of reducing the height of the existing area, which was observed to be higher than the existing parking area, where the expansion would be located to reach the design depth of subgrade. It may be required to raise localized areas throughout this process. These recommendations may also be considered for areas throughout the dome footprint if required.

From a geotechnical perspective, site-generated fill generated from sub-excavation works may be considered acceptable for re-use as subgrade material provided it is prepared as follows. The site-generated soil fill material should be free and segregated of topsoil, organic debris (stumps, logs, peat and/or other organic debris), inorganic material (plastic, metal, PVC, etc.) and/or stones/cobbles larger than 200 mm in their longest dimension. Care will also need to be taken during storage, placement and compaction of the excavated fill soils to maintain them in an unfrozen state and at a moisture content which is suitable for compaction.

Soils intended for re-use which become frozen and/or which have excessive moisture contents will not be considered suitable for reuse at the subject site. Placement of this material during winter months increases the risk of placing frozen material which may result in future poor performing areas that will require future repair.

It is recommended that site-generated fill, reviewed and approved by Paterson at the time of preparation and placement, is placed in maximum 300 mm thick loose lifts, compacted to a minimum of 95% of the materials SPMDD and using a suitably sized vibratory smooth-drum roller in the dry and above-freezing conditions and upon Paterson reviewed- and approved-subgrade. Each lift of material is recommended to be verified by Paterson for adequate levels of compaction using a nuclear densometer gauge and following laboratory testing of in-situ soils for standard Proctor values.

If the above-noted material is encountered at the subgrade level for the proposed parking expansion areas, provided the material is re-compacted using the same recommendations as provided in the *Re-Compacting Existing Fill and Loose Sand Subgrade Conditions* of this report, the subgrade would be considered acceptable for the parking area from a geotechnical perspective. Soft spots, if encountered, will be recommended to be removed and reinstated using engineered fill per the recommendations provided in the aforementioned *Re-Compacting Existing Fill and Loose Sand Subgrade Conditions* section of this report.

Pavement Design

It is expected the existing light-duty parking area will be extended towards the north. The recommended pavement structure is presented in Table 2.

Table 2 – Recommended Pavement Structure – Light-Duty Parking Areas

Thickness (mm)	Material Description
50	**Wear Course** - Superpave 12.5 Asphaltic Concrete
150	**BASE** - OPSS Granular A Crushed Stone
300	**SUBBASE** - OPSS Granular B Type II
SUBGRADE - Either Paterson-reviewed and -approved fill, in situ soil, or OPSS Granular B Type I or II material placed over in situ soil.	

Performance graded (PG) 58-34 asphaltic concrete is recommended for use on this project. The pavement granular materials should be placed in maximum 300 mm thick lifts and compacted to a minimum of 100% of the material's standard Proctor maximum dry density (SPMDD).

All fill and silty sand subgrade surfaces should be proof rolled with a suitably sized vibratory smooth-drum roller prior to the placement of the subbase stone layer and as described in above-noted sections of this memorandum report. If soft spots develop in the subgrade during compaction or due to construction traffic, the affected areas should be sub-excavated and replaced with OPSS Granular A or Granular B Type II Material.

Pavement Joint Tie-In

Where the proposed pavement structure meets the existing asphalt surface, the following recommendations should be followed:

- A 300 mm wide section of existing asphalt roadways should be saw cut from the existing pavement edge to provide a sound surface to abut the proposed pavement structure.
- It is recommended to mill a 300 mm wide and 50 mm deep section of the existing asphalt at the saw cut edge.
- The proposed pavement structure subbase materials should be tapered no greater than 3H:1V to meet the existing subbase materials.
- Clean existing granular road subbase materials can be reused upon assessment by Paterson personnel at the time of excavation (construction) as to its suitability.
- All compaction efforts should be reviewed and approved by Paterson at the time of construction.

Protection of Footings Against Frost Action

Perimeter footings of heated structures are required to be insulated against the deleterious effects of frost action. A minimum 1.5 m thick soil cover, or an equivalent thickness of soil cover and foundation insulation, should be provided for adequate frost protection of heated structures. Exterior unheated footings, such as those for isolated exterior piers, are more prone to deleterious movement associated with frost action. These should be provided with a minimum 2.1 m thick soil cover, or an equivalent thickness of soil cover and foundation insulation. Paterson may provide structure-specific frost protection designs once design details are available for review from a geotechnical perspective.

Sewer and Water Pipe Bedding and Backfill

The pipe bedding for sewer and water pipes should consist of at least 150 mm of OPSS Granular A. The material should be placed in a maximum 225 mm thick loose lifts and compacted to a minimum of 99% of its SPMDD. The bedding material should extend at least to the spring line of the pipe. The cover material, which should consist of OPSS Granular A, should extend from the spring line of the pipe to at least 300 mm above the obvert of the pipe. The material should be placed in maximum 225 mm thick lifts and compacted to a minimum of 99% of its SPMDD.

Reinstatement of the trench located above the pipe cover layer should consist of placing trench-generated workable soil fill (i.e., saturated soils are not expected to be workable or suitable for this purpose unless allotted an adequate drying period of several days in dry conditions and turned over periodically) in maximum 300 mm thick loose lifts and compacted using a suitably sized vibratory roller to a minimum of 95% of the materials SPMDD, or, making several passes (i.e., a minimum of 5 to 6) under the supervision of Paterson field personnel.

Lateral support zones for pipes may be considered as 1.5H:1V for sewers placed in overburden and should be considered during the site sewer design to mitigate potential undermining of shallower sewer pipes by adjacent, deeper sewers or foundation structures. Each lift of soil fill placed within the service trenches should be reviewed and approved at the time of construction by Paterson personnel. Wet site-generated fill, such as the grey silty clay, will be difficult to re-use, as the high-water contents make compacting and using the backfill impractical without an extensive drying period.

Groundwater Control During Construction

Based on our review, the site is anticipated to be underlain by a relatively permeable silty sand deposit. It is anticipated the proposed foundation will be founded at a depth that would be higher than the static groundwater table, however, it is recommended to circulate design drawings identifying these depths to Paterson for further review and prior to construction.

Based on the above-noted condition, it is anticipated that excavations will be located above the groundwater table such that groundwater infiltration into the excavations should be low and controllable using open sumps. Pumping from open sumps should be sufficient to control the groundwater influx through the sides of shallow excavations. The contractor should be prepared to direct water away from all bearing surfaces and subgrades, regardless of the source, to prevent disturbance to the founding medium.

For typical ground or surface water volumes being pumped during the construction phase exceeding 50,000 L/day, it is required to register on the Environmental Activity and Sector Registry (EASR). A minimum of two to four weeks should be allotted for completion of the EASR registration and the Water Taking and Discharge Plan to be prepared by a Qualified Person as stipulated under O.Reg. 63/16. Additional local discharge permits will be required to be attained by the City of Ottawa if preference and consideration is given to discharging groundwater handled during the construction phase to the nearest sewer outlet.

Temporary Open Excavation Recommendations

The side slopes of excavations in the soil and fill overburden materials should either be cut back at acceptable slopes or should be retained by shoring systems from the start of the excavation until the structure is backfilled.

It is assumed that sufficient room will be available for the overall foundation excavation to be undertaken by open-cut methods (i.e. unsupported excavations). The excavation side slopes above the groundwater level extending to a maximum depth of 3 m should be cut back to 1H:1V or flatter. The flatter slope is required for excavation below groundwater level. The subsoil at this site is considered to be mainly a Type 2 soil according to the Occupational Health and Safety Act and Regulations for Construction Projects.

Excavated soil should not be stockpiled directly at the top of excavations and heavy equipment should be kept away from the excavation sides. Slopes in excess of 3 m in height should be periodically inspected by Paterson in order to detect if the slopes are exhibiting signs of distress.

It is recommended that a trench box be used at all times to protect personnel working in sewer and servicing trenches. It is expected that services, if required, will be installed by "cut and cover" methods and excavations will not be left open for extended periods of time.

Winter Construction

Precautions must be taken if winter construction is considered for this project. The subsoil conditions at this site consist of frost susceptible materials. In the presence of water and freezing conditions, ice could form within the soil mass. Heaving and settlement upon thawing could occur. In the event of construction during below zero temperatures, the founding stratum should be protected from freezing temperatures using straw, propane heaters and tarpaulins or other suitable means.

In this regard, the base of the excavations should be insulated from sub-zero temperatures immediately upon exposure and until such time as heat is adequately supplied to the building and the footings are protected with sufficient soil cover to prevent freezing at founding level.

Trench excavations and pavement construction are also difficult activities to complete during freezing conditions without introducing frost into the subgrade or in the excavation walls and bottoms. Precautions should be taken if such activities are to be carried out during freezing conditions. Additional information could be provided, if required. The trench excavations should be carried out in a manner that will avoid the introduction of frozen materials into the trenches. Also, pavement construction is difficult during winter.

The subgrade consists of frost susceptible soils which will experience total and differential frost heaving as the work takes place. In addition, the introduction of frost, snow or ice into the pavement materials, which is difficult to avoid, could adversely affect the performance of the pavement structure. Additional information could be provided, if required. Provisions should also be carried out for accommodating spring-thaw conditions when subgrade conditions for pavements and other works are impacted by higher degrees of soil saturation.

Corrosion Potential and Sulphate

The results of analytical testing by others show that the sulphate content is less than 0.1%. This result is indicative that Type 10 Portland cement (normal cement) would be appropriate for this site. The chloride content and the pH of the sample indicate that they are not significant factors in creating a corrosive environment for exposed ferrous metals at this site, whereas the resistivity is indicative of a low to slightly aggressive corrosive environment.

Landscaping Considerations

Since the subject site is not underlain by clay soils, the proposed foundation is not subject to restrictions associated with tree plantings or setbacks advised for clay subsoils. There are no applicable setbacks for the proposed works from a geotechnical perspective.

4.0 Design and Construction Requirements

It is recommended that the following be carried out by Paterson once preliminary and future details of the proposed development have been prepared:

- ❒ Review the preliminary and detailed architectural, structural, grading and servicing plans, from a geotechnical perspective.
- ❒ Review of the geotechnical aspects of the excavation contractor's shoring design, if not designed by Paterson, prior to construction, if applicable.

For the foundation design data provided herein to be applicable, a materials testing and observation services program is required to be completed. The following aspects should be performed by Paterson:

- ❒ Observation of all bearing surfaces prior to the placement of concrete.
- ❒ Sampling and testing of the concrete and fill materials used.
- ❒ Observation of all subgrades prior to backfilling or placing formwork.
- ❒ Field density tests to determine the level of compaction achieved during the placement of engineered fill.
- ❒ Sampling and testing of the bituminous concrete including mix design reviews.

A report confirming the construction has been conducted in general accordance with the recommendations could be issued, upon request, following the completion of a satisfactory materials testing and observation program by Paterson. All excess soil must be handled as per *Ontario Regulation 406/19: On-Site and Excess Soil Management.*

5.0 Statement of Limitations

The recommendations provided are in accordance with Paterson's present understanding of the project. Our recommendations should be reviewed at the time of construction to ensure conformity to the assumptions made in this report. Should any conditions at the site be encountered which differ from those at presented in this report, we request that we be notified immediately in order to permit reassessment of our recommendations.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than the Ottawa Footy Sevens or their agents is not authorized without review by Paterson for the applicability of our recommendations to the alternative use of the report.

We trust that the current submission meets your immediate requirements.

Best Regards,

Paterson Group Inc.



Drew Petahtegoose, P.Eng.



Attachments:

- ❒ Soil Profile and Test Hole Data Sheets
- ❒ Symbols and Terms
- ❒ Analytical Testing Results
- ❒ Figure 1 – Key Plan
- ❒ Figure 2 – Uplift Cone Angles for Backfill Material
- ❒ Drawing PG8082-1 – Test Hole Location Plan

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

349 Olmstead Street, Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 370699.65 **NORTHING:** 5032812.51 **ELEVATION:** 61.94

PROJECT: Proposed Sports Dome Structure

ADVANCED BY: CME-55 Low Clearance Drill

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010 **DATE:** July 9, 2026

FILE NO. : PG8082

HOLE NO. : BH 1-26

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.08m [61.86m]			AU 1						
FILL: Brown silty sand with gravel 0.69m [61.25m]		1	SS 2	42	3-3-5-8 8			0.44 m 2026-07-21	61
GLACIAL TILL: Loose, dark brown silty clay with sand, gravel, cobbles and boulders		2	SS 3	33	3-3-3-4 6				60
			SS 4	33	3-3-2-4 5				
3.66m [58.28m]		3	SS 5	33	2-2-3-4 5				59
Dynamic Cone Penetration Test commenced at 3.66 m depth		4					1, 6, 6, 11		58
		5					10, 10, 17		57
		6					17, 22		56
6.83m [55.11m]		7					50, 72		55
End of Borehole Practical refusal to DCPT at 6.83 m depth (GWL at 0.44 m depth - July 21, 2026)		8							54

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

349 Olmstead Street, Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 370758.26 **NORTHING:** 5032819.98 **ELEVATION:** 62.07

PROJECT: Proposed Sports Dome Structure

ADVANCED BY: CME-55 Low Clearance Drill

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010 **DATE:** July 9, 2026

FILE NO. : PG8082

HOLE NO. : BH 2-26

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.18m [61.89m]									62
FILL: Brown silty sand		1	AU 1						
			SS 2	42	3-3-4-3 7				61
		2	SS 3	25	1-3-3-2 6				60
2.29m [59.78m]									
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles and boulders		3	SS 4	21	1-4-2-2 6				59
			SS 5	21	2-2-2-2 4				
3.66m [58.41m]									
End of Borehole		4							58
		5							57
		6							56
		7							55
		8							

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

349 Olmstead Street, Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 370754.38 **NORTHING:** 5032892.90 **ELEVATION:** 62.09

PROJECT: Proposed Sports Dome Structure

ADVANCED BY: CME-55 Low Clearance Drill

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010 **DATE:** July 9, 2026

FILE NO. : PG8082

HOLE NO. : BH 3-26

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									62
TOPSOIL 0.13m [61.96m]									
FILL: Brown silty sand 0.69m [61.40m]			AU 1						
Brown **SILTY SAND**		1	SS 2		2-4-4-3 8				61
		2	SS 3		3-4-5-5 9				60
2.97m [59.12m]			SS 4		2-2-2-4 4				
GLACIAL TILL: Dark brown silty sand with gravel, cobbles and boulders 3.66m [58.43m]		3	SS 5	33	5-4-3-3 7				59
End of Borehole		4							58
(GWL at 1.26 m depth - July 21, 2026)		5							57
		6							56
		7							55
		8							

1.26 m 2026-07-21

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

349 Olmstead Street, Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 370750.53 **NORTHING:** 5032928.69 **ELEVATION:** 62.11

PROJECT: Proposed Sports Dome Structure

ADVANCED BY: CME-55 Low Clearance Drill

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010 **DATE:** July 9, 2026

FILE NO. : PG8082

HOLE NO. : BH 4-26

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									62
TOPSOIL 0.15m [61.96m]									
FILL: Brown silty sand with organics		1	AU 1						61
			SS 2		1-2-2-1 4				
2.44m [59.67m]		2	SS 3	42	1-2-1-2 3				60
GLACIAL TILL: Loose, grey silty clay with gravel, cobbles and boulders		3	SS 4	67	4-3-4-6 7				59
3.66m [58.45m]									
End of Borehole		4							58
		5							57
		6							56
		7							55
		8							

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P:/AutoCAD Drawings/Test Hole Data Files/PG80xx/PG8082/data.sqlite 2026-07-21, 14:15 Paterson_Template SS

SOIL PROFILE AND TEST DATA

Geotechnical Investigation

349 Olmstead Street, Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 370716.51 **NORTHING:** 5032948.77 **ELEVATION:** 62.42

PROJECT: Proposed Sports Dome Structure

ADVANCED BY: CME-55 Low Clearance Drill

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010 **DATE:** July 9, 2026

FILE NO. : **PG8082**

HOLE NO. : **BH 5-26**

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.13m [62.29m]									
FILL: Brown silty sand with gravel			AU 1						
1.22m [61.20m]		1	SS 2		1-4-3-1 7				
Compact, brown **SILTY SAND**			SS 3	58	1-3-4-5 7				
2.44m [59.98m]		2							
GLACIAL TILL: Dark brown silty sand with gravel, trace clay, occasional cobbles and boulders									
3.66m [58.76m]		3	SS 4	58	3-9-4-7 13				
Dynamic Cone Penetration Test commenced at 3.66 m depth		4					4 / 23 / 20 / 32 / 36 / 69		
5.46m [56.96m]		5							
End of Borehole									
Practical refusal to DCPT at 5.46 m depth		6							
		7							
		8							

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

349 Olmstead Street, Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 370683.79 **NORTHING:** 5032924.46 **ELEVATION:** 61.97

PROJECT: Proposed Sports Dome Structure

ADVANCED BY: CME-55 Low Clearance Drill

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010 **DATE:** July 9, 2026

FILE NO. : **PG8082**

HOLE NO. : **BH 6-26**

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) / UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.05m [61.92m]									
FILL: Crushed stone and gravel, some sand 0.76m [61.21m]			AU 1						
Brown **SILTY SAND**		1							61
		2	SS 2	42	4-4-6-7 10				60
2.90m [59.07m]									
GLACIAL TILL: Brown silty sand with gravel, cobbles and boulders		3	SS 3	42	4-5-7-8 12				59
3.66m [58.31m]									
End of Borehole		4							58
(GWL at 0.02 m depth - July 21, 2026)		5							57
		6							56
		7							55
		8							54

0.02 m 2026-07-21

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

349 Olmstead Street, Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 370685.94 **NORTHING:** 5032884.71 **ELEVATION:** 61.94

PROJECT: Proposed Sports Dome Structure

ADVANCED BY: CME-55 Low Clearance Drill

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010 **DATE:** July 9, 2026

FILE NO. : PG8082

HOLE NO. : BH 7-26

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) ▲ UNDRAINED SHEAR STRENGTH (kPa) 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									
TOPSOIL 0.05m [61.89m]									61
Dark, brown **SAND** with gravel		1	AU 1						
2.79m [59.15m]		2	SS 2	33	3-4-5-12 9				60
GLACIAL TILL: Brown silty clay with sand, gravel, cobbles and boulders		3	SS 3	50	3-9-3-5 12				59
3.66m [58.28m]									58
End of Borehole		4							
		5							57
		6							56
		7							55
		8							54

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SOIL PROFILE AND TEST DATA

Geotechnical Investigation

349 Olmstead Street, Ottawa, ON

COORD. SYS.: MTM ZONE 9 **EASTING:** 370659.07 **NORTHING:** 5032858.31 **ELEVATION:** 65.08

PROJECT: Proposed Sports Dome Structure

ADVANCED BY: CME-55 Low Clearance Drill

REMARKS: Datum: NAD1983 (Canada) Geoid: HT2-2010 **DATE:** July 9, 2026

FILE NO. : PG8082

HOLE NO. : BH 8-26

SAMPLE DESCRIPTION	STRATA PLOT	DEPTH (m)	SAMPLE TYPE AND NO.	SAMPLE RECOVERY (%)	SAMPLE N OR RQD	SAMPLE WATER CONTENT (%)	PEN. RESIST. (BLOWS/0.3m) DCPT (50mm DIA. CONE) 20 40 60 80 / REMOULDED SHEAR STRENGTH (kPa) △ / UNDRAINED SHEAR STRENGTH (kPa) ▲ 20 40 60 80 / PL (%) WATER CONTENT (%) LL (%) 20 40 60 80	PIEZOMETER CONSTRUCTION	ELEVATION (m)
GROUND SURFACE									65
TOPSOIL 0.15m [64.93m]			AU 1						
FILL: Brown sand with gravel and topsoil		1	SS 2	33	3-3-2-3 5				64
1.45m [63.63m]									
GLACIAL TILL: Compact to loose, brown silty sand, with cobbles and boulders, trace clay		2	SS 3	50	5-5-6-6 11			2.32 m 2026-07-21	63
			SS 4	58	3-4-5-6 9				
3.66m [61.42m]		3	SS 5		4-3-5-4 8				62
End of Borehole		4							61
(GWL at 2.32 m depth - July 21, 2026)		5							60
		6							59
		7							58
		8							

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Log of Borehole BH 10

Project No: OTT-00231875-A0

Project: Geotechnical Investigation. New Ecole Elementaire Horizon-Jeunesse

Location: 349 Olmstead Avenue, City of Ottawa, Ontario

Figure No. 12

Page. 1 of 1

Date Drilled: 3/16/16

Drill Type: CME 75 - truck mount

Datum: Geodetic

Logged by: A.N. Checked by: I.T.

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	Geodetic 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 ~250mm	64	0				
		FILL Gravelly sand, dark brown, moist, (compact)	63.8		12	×		
					10	×		20.7
		SILTY SAND Fine grained, brown, oxidized stains, moist, (compact)	63.0	1				
					12	×		20.3
		Borehole Terminated at 1.80 m Depth	62.2					

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

LOG OF BOREHOLE BH LOGS - 231875 - NOUVELLE HORIZON SCHOOL.GPJ TROW OTTAWA.GDT 4/6/16

NOTES:
1. Borehole data requires interpretation by exp. before use by others
2. Borehole backfilled with cuttings upon completion
3. Field work supervised by an **exp** representative.
4. See Notes on Sample Descriptions
5. This Figure is to read with exp. Services Inc. report OTT-00231875-A0

WATER LEVEL RECORDS		
Elapsed Time	Water Level (m)	Hole Open To (m)
Completion	dry	1.8

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

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SOIL PROFILE & TEST DATA

Proposed Play-yard Improvement
Vision Jeunesse and Petit Prince Schools
City of Vanier, Ontario

DATUM Approximate geodetic

FILE NO. G7716

REMARKS

HOLE NO. TP 1

BORINGS BY Backhoe **DATE** 12 April 2000

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	63.09
FILL: Dark brown to brown, mixture of silt, sand and organics							
0.44							
Dark brown **CLAYEY SILT** to SANDY SILT							
0.54							
Loose, brown SILT		G	1				
0.84							
Loose, brown SANDY SILT		G	2			1	62.09
1.27							
GLACIAL TILL: Compact to dense, dark grey, mixture of silt and shale fragments		G	3				
1.55							
End of Test Pit							

Pen. Resist. Blows/0.3m
● 50 mm Dia. Cone

○ Water Content %
20 40 60 80

PIEZOMETER CONSTRUCTION

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE & TEST DATA

Proposed Play-yard Improvement
Vision Jeunesse and Petit Prince Schools
City of Vanier, Ontario

DATUM Approximate geodetic

REMARKS

BORINGS BY Backhoe **DATE** 12 April 2000

FILE NO. **G7716**

HOLE NO. **TP 2**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	PIEZOMETER CONSTRUCTION
GROUND SURFACE						0	63.21	20 40 60 80	
Dark brown silty TOPSOIL									
0.18									
Loose to compact, brown **SANDY SILT/SILT**, occasional silty sand layers and 0.6m dia. boulders near surface.									
1.04						1	62.21		
GLACIAL TILL: Compact, dark brown silt with sand and frequent shale fragments and cobbles		G	4						
1.60									
End of Test Pit									
(Water infiltration at west end of TP @ 0.6m depth)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE & TEST DATA

Proposed Play-yard Improvement
Vision Jeunesse and Petit Prince Schools
City of Vanier, Ontario

DATUM Approximate geodetic

REMARKS

BORINGS BY Backhoe **DATE** 12 April 2000

FILE NO. **G7716**

HOLE NO. **TP 3**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	PIEZOMETER CONSTRUCTION
GROUND SURFACE						0	63.22		
Dark brown silty TOPSOIL 0.10									
Loose to compact, brown SILT to SANDY SILT, occasional cobbles and boulders		G	5			1	62.22		
1.40									
GLACIAL TILL: Dark brown, mixture of silt, sand, gravel and cobbles 1.55									
End of Test Pit									
(Water infiltration @ base of TP)									

Water Content % scale: 20 40 60 80

Shear Strength (kPa) scale: 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE & TEST DATA

Proposed Play-yard Improvement
Vision Jeunesse and Petit Prince Schools
City of Vanier, Ontario

DATUM Approximate geodetic

REMARKS

BORINGS BY Backhoe **DATE** 12 April 2000

FILE NO. **G7716**

HOLE NO. **TP 4**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone ○ Water Content %	PIEZOMETER CONSTRUCTION
GROUND SURFACE						0	62.93		
Dark brown silty TOPSOIL									
0.30									
Compact, light brown **SILT**, some sandy silt layers (turns dark brown @ 1.5m depth)		G	6			1	61.93		
1.65									
End of Test Pit (Water infiltration @ 1.0m depth)									

20 40 60 80

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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SOIL PROFILE & TEST DATA

Proposed Play-yard Improvement
Vision Jeunesse and Petit Prince Schools
City of Vanier, Ontario

DATUM Approximate geodetic

FILE NO. **G7716**

REMARKS

HOLE NO. **TP 5**

BORINGS BY Backhoe **DATE** 12 April 2000

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content % (20 40 60 80)	PIEZOMETER CONSTRUCTION
GROUND SURFACE						0	61.93		
Grey stone dust									
0.14									
FILL: Brown, mixture of clay, silt, sand, gravel, occasional cobbles		G	7						
0.88									
Grey crushed stone (12mm clear)						1	60.93		
1.09									
End of Test Pit									
(100mm dia. black drainage pipe embedded in clear stone, top of pipe @ 0.99m depth, water in clear stone @ 1.0m)									

Shear Strength (kPa) (20 40 60 80 100)
▲ Undisturbed △ Remoulded

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SOIL PROFILE & TEST DATA

Proposed Play-yard Improvement
Vision Jeunesse and Petit Prince Schools
City of Vanier, Ontario

DATUM Approximate geodetic

REMARKS

BORINGS BY Backhoe **DATE** 12 April 2000

FILE NO. **G7716**

HOLE NO. **TP 6**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	PIEZOMETER CONSTRUCTION
GROUND SURFACE						0	61.97	20 40 60 80	
FILL: Dark brown silty topsoil									
0.30									
FILL: Brown, mixture of clay, silt, sand and gravel, occasional cobbles and concrete fragments						1	60.97		
1.40									
End of Test Pit									
(Top of 200mm dia. concrete pipe encountered @ 1.4m depth)									
(Dry upon completion)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE & TEST DATA

Proposed Play-yard Improvement
Vision Jeunesse and Petit Prince Schools
City of Vanier, Ontario

DATUM Approximate geodetic

REMARKS

BORINGS BY Backhoe **DATE** 12 April 2000

FILE NO. **G7716**

HOLE NO. **TP 7**

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	PIEZOMETER CONSTRUCTION
GROUND SURFACE						0	61.87	20 40 60 80	
Grey crushed stone dust									
0.15									
FILL: Brown, mixture of silt, sand and gravel, occasional cobbles									
0.98						1	60.87		
Clear crushed stone (19mm)									
1.21									
End of Test Pit									
(Top of 150mm dia. perforated plastic pipe encountered @ 1.15m depth)									

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE & TEST DATA

Proposed Play-yard Improvement
Vision Jeunesse and Petit Prince Schools
City of Vanier, Ontario

DATUM Approximate geodetic

FILE NO. **G7716**

REMARKS

HOLE NO. **TP 8**

BORINGS BY Backhoe **DATE** 12 April 2000

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	PIEZOMETER CONSTRUCTION
GROUND SURFACE						0	61.95		
Grey crushed stone dust 0.11									
Clear crushed stone (12mm) 0.42									
FILL: Mixture of silt, sand, gravel 0.56									
Clear stone (around and over pipe), 25mm 0.90									
End of Test Pit									
(Top of 100mm black drainage pipe encountered @ 0.84m depth)									
(Water infiltration @ 0.4m from the west edge of test pit)									

○ Water Content %: 20 40 60 80

20 40 60 80 100
Shear Strength (kPa)
▲ Undisturbed △ Remoulded

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SOIL PROFILE & TEST DATA

Proposed Play-yard Improvement
Vision Jeunesse and Petit Prince Schools
City of Vanier, Ontario

DATUM Approximate geodetic

FILE NO. G7716

REMARKS

HOLE NO. TP 9

BORINGS BY Backhoe DATE 12 April 2000

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone / ○ Water Content %	PIEZOMETER CONSTRUCTION
GROUND SURFACE						0	61.98		
Stone dust 0.15									
Grey crushed stone (19mm) 0.25									
FILL: Brown, mixture of silt, sand, gravel 0.52									
Clear crushed stone 0.65									
End of Test Pit									
(Top of 100mm dia. black drainage pipe 0.58m depth)									

Water Content % scale: 20 40 60 80

Shear Strength (kPa) scale: 20 40 60 80 100

▲ Undisturbed △ Remoulded

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SOIL PROFILE AND TEST DATA

Andre Laurendeau School

Datum
Remarks

Sheet No. 1 of 3
Hole No. B.H. 1

Borings By C.M.E. Auger **Date** March 10, 1981

SOIL DESCRIPTION	Legend	SAMPLE TYPE	SAMPLE NO.	N	DEPTH	ELEV.
Ground Surface					0	92.9
FILL: Brown silty sand, some gravel, trace wood.	×	G	1		2	
3.9					4	
TILL: Compact black sandy silt, some gravel.	△	G	2			
	△	SS	3	15	6	86.9
	△				8	
	△				10	
	△	SS	4	10		
	△				12	80.9
	△				14	
	△	SS	5	14	16	
	△				18	74.9
20'	△					

Penetration Resistance Blows/Ft
●—● 2 inch Diameter Cone
o Moisture Content in %
20 40 60 80 100

G.W.L. 7.3' July 9, 1981

SEAL

Standpipe to 17.5'

1000 2000 3000
▲ Shear Strength (psf)

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SOIL PROFILE AND TEST DATA

Andre Laurendeau School

Datum
Remarks

Sheet No. 2 of 3
Hole No. B.H. 2

Borings By C.M.E. Auger **Date** March 10, 1981

SOIL DESCRIPTION	Legend	SAMPLE TYPE	SAMPLE NO.	N	DEPTH	ELEV.
Ground Surface					0	92.7
FILL: light brown silty fine sand, trace gravel.	×	SS	6	5	6	86.7
8.0					8	
GLACIAL TILL: Compact black sandy silt, trace gravel.	△	SS	7	15	12	80.7
15'					14	
Dense black sandy silt, trace gravel.	▲	SS	8	41	16	
					18	74.7
20'						

Penetration Resistance Blows/Ft
●—● 2 inch Diameter Cone
o Moisture Content in %
20 40 60 80 100

SEAL

G.W.L. 5.1'
July 6, 1981

Standpipe
@ 15'

1000 2000 3000
▲ Shear Strength (psf)

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SOIL PROFILE AND TEST DATA

Andre Laurendeau School

Datum
Remarks G = grab

Sheet No. 3 of 3
Hole No. 3
B.H. 3

Borings By C.M.E. Auger **Date** March 10, 1981

SOIL DESCRIPTION	Legend	SAMPLE TYPE	SAMPLE NO.	N	DEPTH	ELEV.
Ground Surface					0	90.4
2" Sod over	×	G	9			
Light brown fine grained sand with some silt.	×				2	
	×	G	10		4	
	×				6	84.4
6.5	×					
GLACIAL TILL	△				8	
Compact black sandy silt with a trace of gravel.	△				10	
	△	G	11		12	78.4
	△				14	
15.5	△					
					16	
					18	72.4

Penetration Resistance Blows/Ft
●—● 2 inch Diameter Cone
o Moisture Content in %
20 40 60 80 100

G.W.L. 8.9'
July 8, 1981

1000 2000 3000
▲ Shear Strength (psf)

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the relative strength of cohesionless soils is the compactness condition, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm. An SPT N value of "P" denotes that the split-spoon sampler was pushed 300 mm into the soil without the use of a falling hammer.

Compactness Condition	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory shear vane tests, unconfined compression tests, or occasionally by the Standard Penetration Test (SPT). Note that the typical correlations of undrained shear strength to SPT N value (tabulated below) tend to underestimate the consistency for sensitive silty clays, so Paterson reviews the applicable split spoon samples in the laboratory to provide a more representative consistency value based on tactile examination.

Consistency	Undrained Shear Strength (kPa)	'N' Value
Very Soft	<12	<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

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their "sensitivity". The sensitivity, S_t, is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil. The classes of sensitivity may be defined as follows:

Low Sensitivity:	$S_t < 2$
Medium Sensitivity:	$2 < S_t < 4$
Sensitive:	$4 < S_t < 8$
Extra Sensitive:	$8 < S_t < 16$
Quick Clay:	$S_t > 16$

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NQ or larger size core. However, it can be used on smaller core sizes, such as BQ, if the bulk of the fractures caused by drilling stresses (called "mechanical breaks") are easily distinguishable from the normal in situ fractures.

RQD %	**ROCK QUALITY**
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube, generally recovered using a piston sampler
G	-	"Grab" sample from test pit or surface materials
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size BQ, NQ, HQ, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

PLASTICITY LIMITS AND GRAIN SIZE DISTRIBUTION

WC%	-	Natural water content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic Limit, % (water content above which soil behaves plastically)
PI	-	Plasticity Index, % (difference between LL and PL)
Dxx	-	Grain size at which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

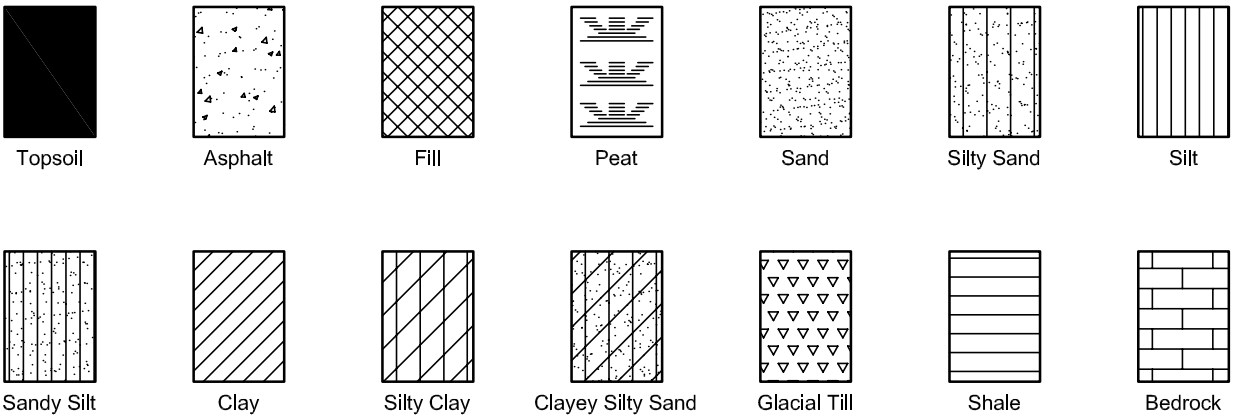
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

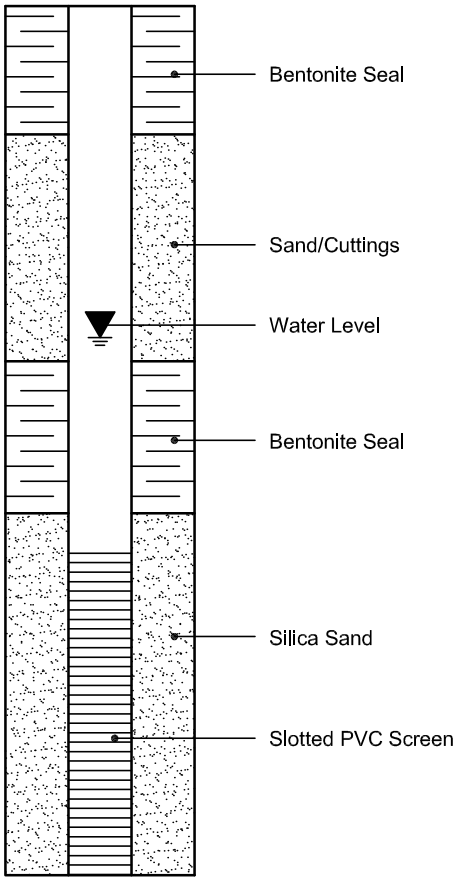
SYMBOLS AND TERMS (continued)

STRATA PLOT

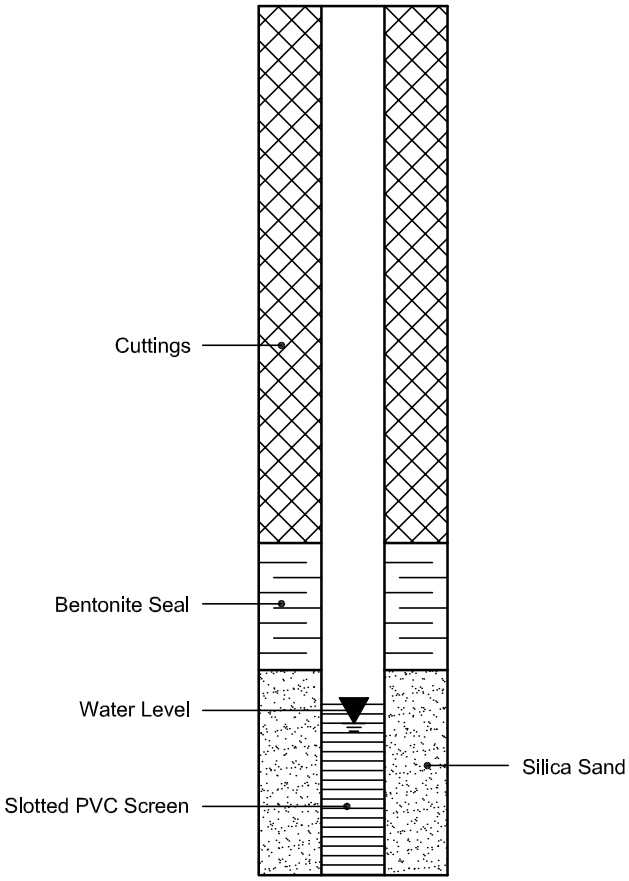


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



Certificate of Analysis

Report Date: 15-Jul-2026

Client: **Paterson Group Consulting Engineers (Ottawa)**

Order Date: 9-Jul-2026

Client PO: 66400

Project Description: PG8082

	Client ID:	BH3-26 SS4	-	-	-		
	Sample Date:	09-Jul-26 09:00	-	-	-	-	-
	Sample ID:	2628779-01	-	-	-		
	Matrix:	Soil	-	-	-		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	79.5	-	-	-	-	-
General Inorganics							
pH	0.05 pH Units	7.39	-	-	-	-	-
Resistivity	0.1 Ohm.m	52.5	-	-	-	-	-
Anions							
Chloride	10 ug/g	<10	-	-	-	-	-
Sulphate	10 ug/g	71	-	-	-	-	-

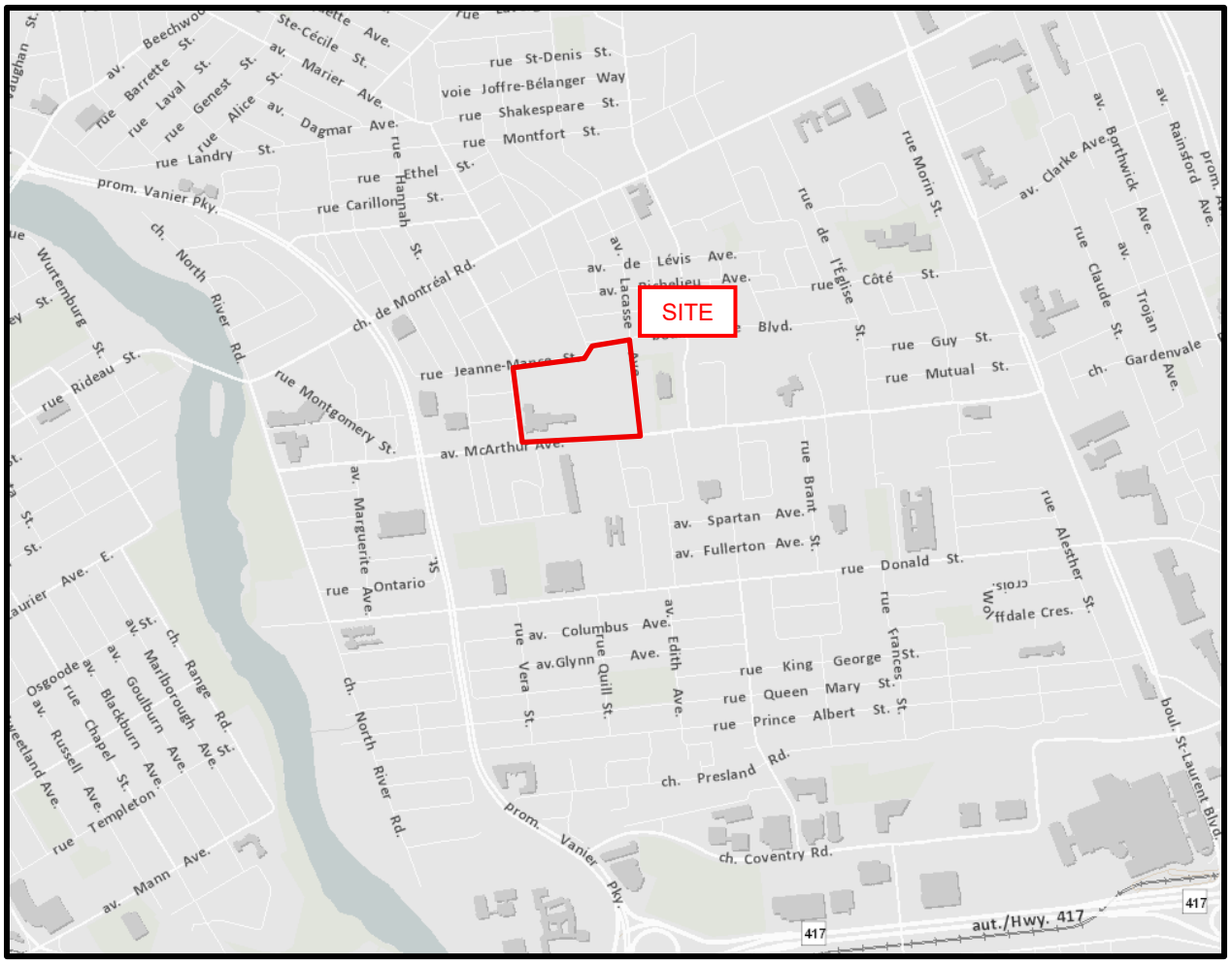
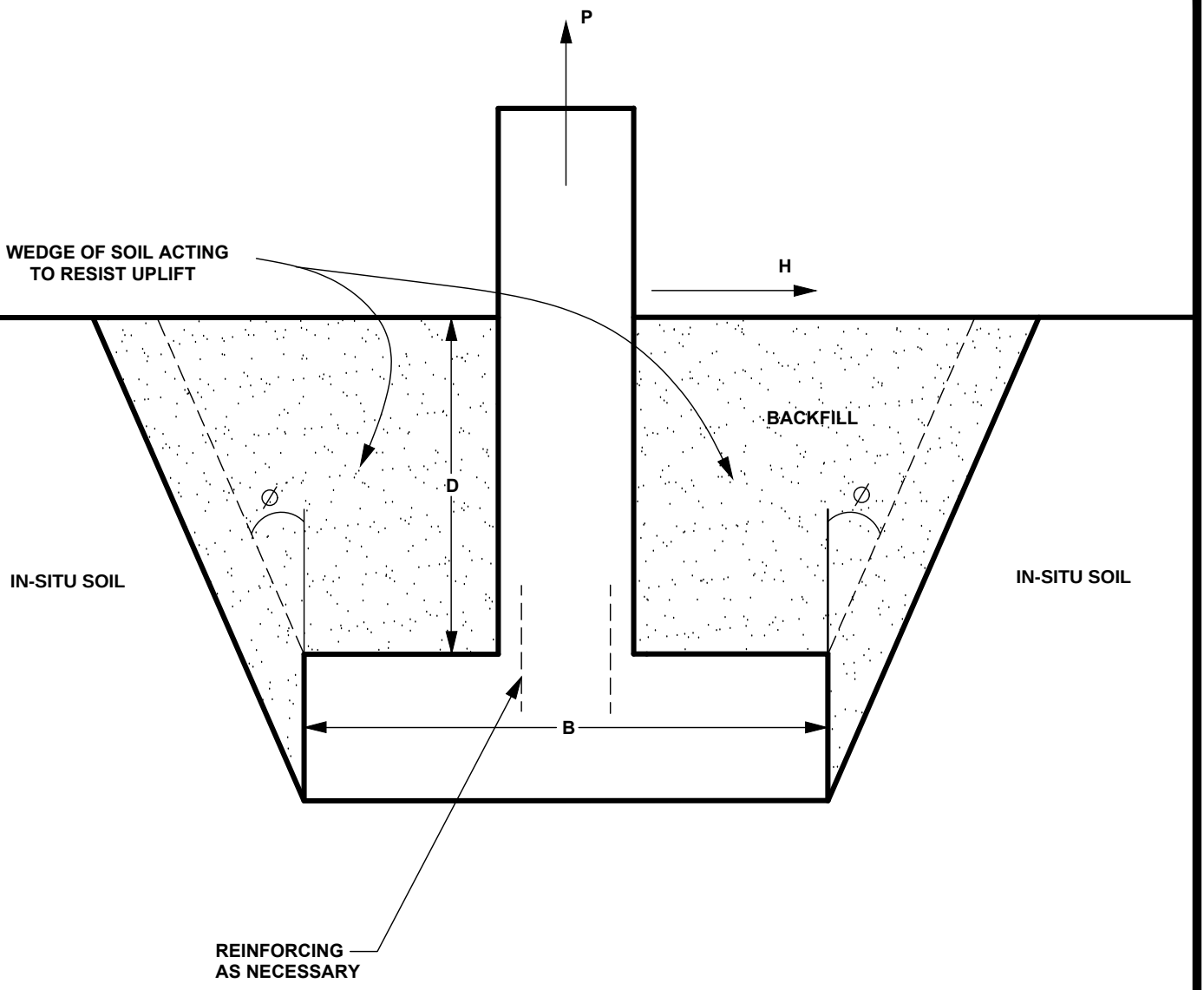


FIGURE 1

KEY PLAN

PATERSON GROUP



WHERE P = UPLIFT LOAD
H = HORIZONTAL LOAD
B = WIDTH OF FOOTING

∅ - USE 20° FOR COHESIONLESS SOIL (ie.- GRANULAR BACKFILL COMPACTED TO 95% MPMDD)
- USE 30° FOR COHESIVE SOIL (ie.- SILTY CLAY COMPACTED WITH A SHEEPSFOOT ROLLER)

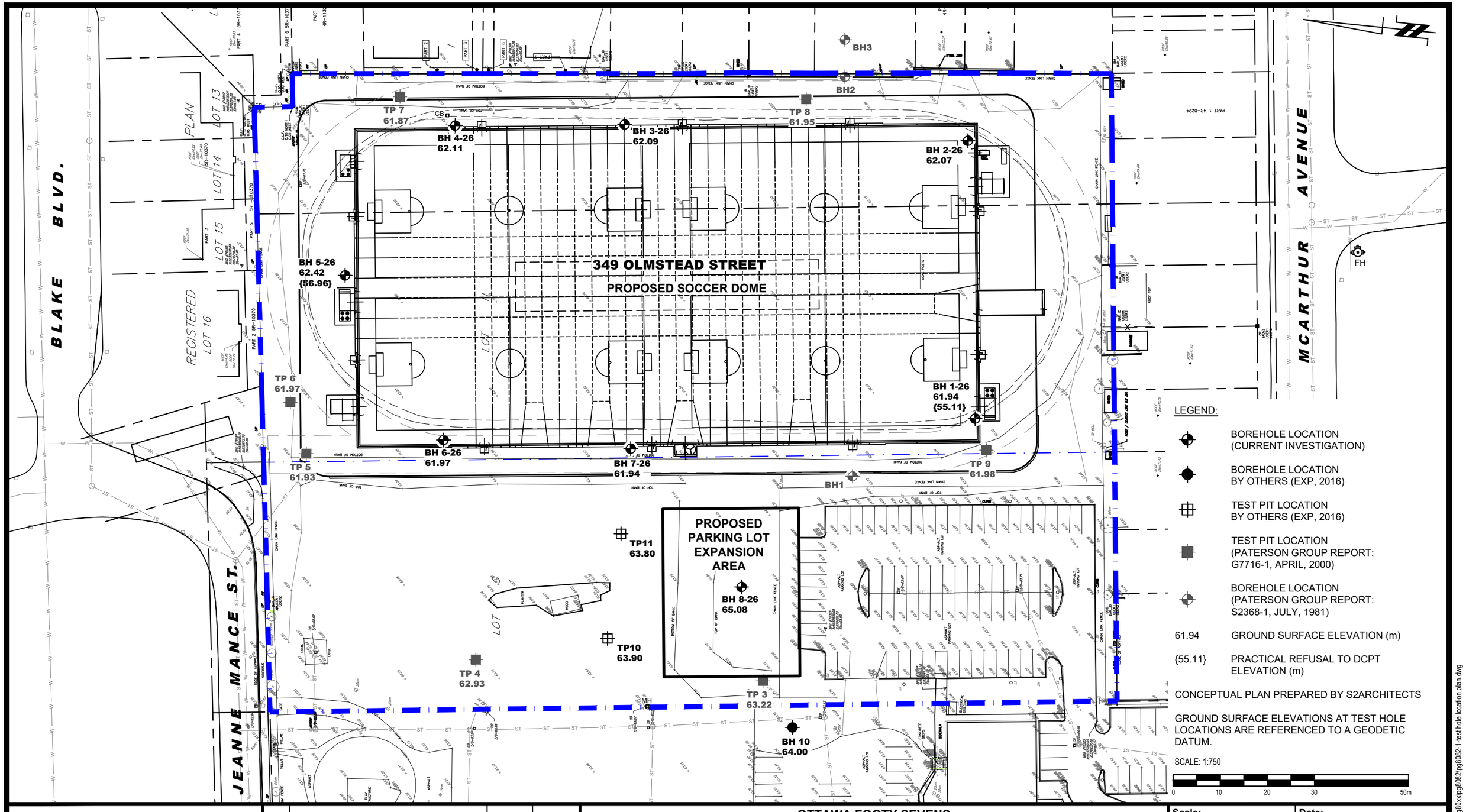
FIGURE 2

UPLIFT CONE ANGLES FOR BACKFILL MATERIAL

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7S9
TEL: (613) 226-7381

OTTAWA FOOTY SEVENS
PROPOSED DOME STRUCTURE
349 OLMSTEAD STREET- OTTAWA, ONTARIO

Report No.:	Scale:	
PG8082-MEMO.01	N.T.S.	
Date:	Drawn:	Approved:
07/2026	DP	DP



LEGEND:

- BOREHOLE LOCATION (CURRENT INVESTIGATION)
- BOREHOLE LOCATION BY OTHERS (EXP, 2016)
- TEST PIT LOCATION BY OTHERS (EXP, 2016)
- TEST PIT LOCATION (PATERSON GROUP REPORT: G7716-1, APRIL, 2000)
- BOREHOLE LOCATION (PATERSON GROUP REPORT: S2368-1, JULY, 1981)
- 61.94 GROUND SURFACE ELEVATION (m)
- {55.11} PRACTICAL REFUSAL TO DCPT ELEVATION (m)

CONCEPTUAL PLAN PREPARED BY S2ARCHITECTS

GROUND SURFACE ELEVATIONS AT TEST HOLE LOCATIONS ARE REFERENCED TO A GEODETIC DATUM.

SCALE: 1:750

0 10 20 30 50m

PATERSON GROUP
9 AURIGA DRIVE
OTTAWA, ON
K2E 7T9
TEL: (613) 226-7381

NO.	REVISIONS	DATE	INITIAL

OTTAWA FOOTY SEVENS
GEOTECHNICAL INVESTIGATION
PROPOSED SPORTS DOME STRUCTURE
349 OLMDSTEAD STREET
OTTAWA, ONTARIO

Title: TEST HOLE LOCATION PLAN

Scale: 1:750	Date: 07/2026
Drawn by: YA	Report No.: PG8082-1
Checked by: DP	Dwg. No.: PG8082-1
Approved by: DP	Revision No.:

11x17

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