

Geotechnical
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Hydrogeology

Geological
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Materials Testing

Building Science

Archaeological Services

Geotechnical Investigation

Proposed Barrhaven South
Urban Expansion Area
Community Design Plan
Barnsdale Road
Ottawa, Ontario

Prepared For

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1.0 Introduction

Paterson Group Inc. (Paterson) was commissioned by Minto Communities Inc. (Minto) to conduct a geotechnical investigation for the proposed Barrhaven South Urban Expansion Area - Community Design Plan located over portions of several existing properties at 3713 and 3872 Greenbank Road, 3713 and 3809 Borrisokane Road (Formally Cedarview Road) and 3882 Barnsdale Road, in the City of Ottawa (refer to Figure 1 - Key Plan presented in Appendix 2). The findings of our hydrogeological investigation, which was completed in conjunction with our geotechnical investigation, are presented under a separate cover (Paterson Report PG3757-1).

The objectives of the current investigation were to:

- ☐ Determine the subsoil and groundwater conditions at this site by means of a subsurface investigation consisting of boreholes and test pits.
- ☐ Provide geotechnical recommendations for the design of the proposed development including construction considerations which may affect the design.

The following report has been prepared specifically and solely for the aforementioned project which is described herein. Investigating the presence or potential presence of contamination on the proposed development was not part of the scope of work. Therefore, the present report does not address environmental issues.

2.0 Method of Investigation

2.1 Field Investigation

Field Program

The field program for the current investigation was carried out between November 17 and December 10, 2016. At that time, a total of 30 boreholes and 125 test pits, were advanced to depths ranging from 2.6 to 9.8 m below existing ground surface. The test hole locations for the current investigation were distributed in a manner to provide general coverage of the proposed urban expansion area and adjacent properties along Barnsdale Road between Borrisokane Road (Formally Cedarview Road) and Greenbank Road. Previous investigations were carried out in October 2003 and December 2011 where 27 test pits were advanced to depths ranging from 2.7 to 7 m between the two previous investigations. The locations of all the test holes are illustrated on Drawing PG3607-1 - Test Hole Location Plan, included in Appendix 2.

The boreholes were advanced using a track-mounted auger drill rig operated by a two-person crew. The drilling procedure consisted of augering to the required depths at the selected locations, while sampling and testing the overburden. The test pits were advanced using a rubber tire backhoe.

A supplemental field investigation was carried on July 14 and 15, 2016 and July 19 to July 21, 2016 for the supplemental hydrogeological study completed as per city review comments. A 83 mm diameter auger hole was excavated using a Riverside/Bucket auger to a depth of 0.3 m and a second auger hole was excavated to a depth of 0.6 m at 18 locations for the recommended permeameter testing and five (5) monitoring wells were installed to a maximum depth of 16.7 m. During the permeameter testing, all soil from the auger flights were visually inspected and initially classified on site. A composite soil sample was collected from the two separate auger hole locations and submitted for a sieve analysis. The fieldwork was conducted under the full-time supervision of Paterson personnel under the direction of a senior engineer. Results of the sieve analysis are presented in Table 1.

Sampling and In Situ Testing

Soil samples were recovered from the test pit sidewalls and within the boreholes from the auger flights or using a 50 mm diameter split-spoon sampler. The depths at which the grab, auger and split spoon samples were recovered from the test holes are shown as G, AU and SS, respectively, on the Soil Profile and Test Data sheets presented in Appendix 1.

The 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.

All soil samples were classified on site, placed in sealed plastic bags and were transported to our laboratory for further review and testing.

Subsurface conditions observed in the test holes were recorded in detail in the field. Reference should be made to the Soil Profile and Test Data sheets presented in Appendix 1 for specific details of the soil profile encountered at the test hole locations.

Groundwater

Flexible polyethylene standpipes were installed in selected boreholes to permit the monitoring of groundwater levels subsequent to the completion of the field program. Monitoring wells, using 50 mm diameter PVC screen and risers were installed at BH 1-15, 5-15, 8-15, 9-15, 10-15, 11-15, 14-15, 17-15, 18-15, 19-15, 21-15, 23-15, 26-15, 29-15 and BH 31-16 to 36-16 across the site to provide the means to conduct in situ permeability testing for our hydrogeological investigation and long term groundwater level monitoring. The in-situ permeability testing results will be reported under separate cover.

Sample Storage

All samples will be stored in the laboratory for a period of one month after issuance of this report. They will then be discarded unless we are otherwise directed.

2.2 Field Survey

The test hole locations were selected by Paterson personnel in a manner to provide general coverage of the proposed urban expansion area and adjacent areas with future development potential while taking into consideration underground utilities and site features. The borehole locations and ground surface elevations at the borehole locations were provided by Stantec Geomatics and are referenced to geodetic datum. The test pit locations were located through the use of a handheld GPS device and elevation data inferred from City of Ottawa basemap ground surface contours (+/- 0.5 m). The locations and ground surface elevations of the test holes are presented on Drawing PG3607-1 - Test Hole Location Plan, in Appendix 2.

2.3 Laboratory Testing

The soil samples recovered from the subject site were visually examined in our laboratory to review the results of the field logging. Fifteen (15) split spoon and five (5) test pit grab samples were submitted for grain size analyses. The testing was performed in general accordance with ASTM C117 Test Method for Materials Finer Than 75-m (No. 200) Sieve in Mineral Aggregates by Washing and ASTM C136 - Test Method for Sieve Analysis of Fine and Coarse Aggregates. The results of the grain size analysis testing are presented in Subsection 3.2 and in the Grain Size Distribution sheets in Appendix 1.

Soil samples from selected borehole locations were subjected to water content testing, in general accordance with ASTM D2216-05 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass. The results of the moisture content testing are presented in the Soil Profile Test Data sheets in Appendix 1.

3.0 Existing Conditions

3.1 Surface Conditions

The subject site is a mix of undeveloped, former agricultural land, forested areas and the location of an on-going aggregate extraction operation. The south portion of the CDP consists of former agricultural fields that are separated by mature trees. Fill piles of varying material have been placed at several locations across the subject site. Two aggregate extraction operations are underway within the north portion of the CDP area (Brazeau - Todd Pit and Drummond - Costello Pit). The boundary of the area licensed under the Aggregate Resources Act is presented in Drawing PG3607-1 - Test Hole Location Plan. The timeline estimation for the future closure of the aggregate extraction operations is presented in Subsection 4.1. Residential developments currently under construction followed by Greenbank Road are located to the east of the CDP area. Barnsdale Road is located to the south and Borrisokane Road (Formally Cedarview Road) is located to the west of the subject site. Photographs of the surface conditions taken during our field investigation are presented in Appendix 2.

The subject parcels have significant topographical relief. The ground surface elevation within the central portion of the CDP lands is approximately ± 110 m at its highest, along the west side is at 107 to ± 109 m, and drops to 101 to ± 104 m in the southeast portion of the parcel. Multiple fill piles and large areas currently excavated to several meters below original grade were observed within the east portion of the CDP lands. The aggregate extraction operations are anticipated to be several meters below the grade of the surrounding parcels based on our cursory observations.

The areas investigated that lie outside of the CDP lands consists of former agricultural fields that are divided by mature trees within the land parcel to the west of the CDP lands. A forested area and shallow pond were observed within the southwest corner of the west parcel. Topographical relief extends in a south and west direction with elevations reaching 99.7 to ± 102 m, respectively. The land parcel to the east consists of former agricultural fields with the majority of the mature trees removed. Several existing residences were observed within the east parcel along Barnsdale Road.

3.2 Subsurface Profile

Inside CDP Area

Generally, the sub-surface profile encountered at the test hole locations was noted to consist of a sandy topsoil, or fine grained soil with significant root matting at ground surface followed by a predominantly coarse-grained deposit of till, glacial fluvial and silty fine sand and/or sandy silt. A silty sand overlying a silty clay was encountered within a small portion of the eastern CDP area. Silty sand deposits were encountered intermittently across the CDP lands.

Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile encountered at each test hole.

Silty Fine Sand

The predominantly coarse grained soils within the subject development parcel consist of silty fine sand, sandy silt. The coarse grained soils were noted to be mixed with gravel, cobbles and boulders at several locations.

A total of Eighteen (18) grab samples were collected from test pits completed as part of the supplemental hydrogeological study and submitted for grain size analysis. During 2015, a total of ten (10) split spoon samples and three (3) test pit grab samples were submitted for grain size analyses. Previous investigations included twelve (12) grab samples from test pit locations. The results are presented in Table 1 and on the Grain Size Distribution sheets in Appendix 1. The textural descriptions of the samples are indicated under the Classification heading, along with the Unified Soil Classification. Tested samples varied from SP to SM to ML.

The results of the SPTs indicate that the state of compaction of these coarse-grained soils is predominantly within the compact to very dense ranges.

Table 1 - Grain Size Distribution - Inside CDP Area				
Sample	Gravel (%)	Sand (%)	Silt and Clay (%)	Classification
BH 5-15 SS10	13.6	47.3	39.1	SM - Silty sand with gravel
BH9-15 SS8	0	89.9	10.1	SP-SM - Poorly graded sand with silt
BH11 SS8 & 9	11.2	49.4	39.4	SM - Silty sand, some gravel
BH17-15 SS9	23.9	68.3	7.8	SW-SM - Well graded sand with silt and gravel
BH1-15 SS9	0	93	7	SP-SM - Poorly graded sand with silt
BH21-15 SS10 & 11	11.8	56.3	31.9	SM - silty sand, some gravel
BH27-15 SS7	0	48	52	ML - Sandy silt
TP7-15 G2	16.3	79.5	4.2	SP - Poorly graded sand with gravel
TP20-15 G3	26.3	43	30.7	SM - Silty sand with gravel
TP31A-15 G2	47.8	50.1	2.1	SW - Well graded sand with gravel
TP6-11 G14	0	89.9	10.1	Fine sand, some silt
TP7-11 G18	0	43.9	56.1	Sandy silt/silty sand
TP8-11 G20	0	98.2	1.8	Fine sand
TP9-11 G21	19.2	65	15.8	Sand-gravel, some silt
TP10-11 G26	5.2	60.3	34.5	Silty sand
TP5-03 G1	49.8	45.4	4.8	Granular B Type I
TP5-03 G2	0	97.7	2.3	Sand
TP10-03 G1	44.3	48.1	7.6	Granular B Type I
TP10-03 G2	0	97.2	2.8	Sand
TP13-03 G2	2.3	96.3	1.4	Granular B Type I
TP14-03 G1	54.2	42.4	3.4	Granular B Type I
BH24-15 SS5	14.4	47.1	38.5	SM - Silty sand, some gravel

Table 1 (Continued) - Grain Size Distribution - Inside CDP Area				
Sample	Gravel (%)	Sand (%)	Silt and Clay (%)	Classification
BH29-15 SS12	23.7	45.6	30.7	SM - Silty sand with gravel
TP11-11 G28	68.3	30	1.7	Sand-gravel
SA 1	0.4	93.5	6.1	SP-SM - Poorly Graded Sand with Silt
SA 2	13.2	75	11.8	SP-SM - Poorly Graded Sand with Silt
SA 3	0.4	90.3	9.3	SW-SM - Well Graded Sand with Silt
SA 4	39.4	56	4.6	SP - Poorly Graded Sand with Gravel
SA 5	2	90	8	SP-SM - Poorly Graded Sand with Silt
SA 6	0.2	93.6	6.2	SP-SM - Poorly Graded Sand with Silt
SA 7	21.4	69.8	8.8	SW-SM - Well Graded Sand with Silt and Gravel
SA 8	5.6	75.7	18.7	SM - Silty Sand
SA 9	20	74.9	5.1	SP-SM - Poorly Graded Sand with Silt and Gravel
SA 10	18.8	70.7	10.5	SW-SM - Well Graded Sand with Silt and Gravel
SA 11	4.2	73.1	22.7	SM - Silty Sand
SA 12	3.2	78.4	18.4	SM - Silty Sand
SA 13	8	58.7	33.3	SM - Silty Sand
SA 14	18.1	75.9	6	SP-SM - Poorly Graded Sand with Silt and Gravel
SA 15	26.4	65.3	8.3	SW-SM - Well Graded Sand with Silt and Gravel
SA16	1.7	91.3	7	SP-SM - Poorly Graded Sand with Silt
SA17	0.9	68.8	7.3	SM - Silty Sand
SA18	11.2	66.9	21.9	SM - Silty Sand

Fill

An area of loose fill was encountered at BH5-15 that extends the depth of the borehole and consists of silty sand with clay and gravel. Very dense brown silty sand with cobbles and boulder fill was encountered within the area around BH36-16, extending to a depth of 2.9 m below existing ground surface.

Bedrock

Based on digital geological mapping produced by Natural Resources Canada, sourced from the Geological Survey of Canada, the bedrock in this area consists of dolomite of the Oxford formation with an overburden drift thickness of 15 to 25 m depth. Relevant mapping for surficial soils and bedrock geology and drift thickness within the subject site are presented in Appendix 2.

Outside CDP Area

The areas investigated outside of the CDP area was considered to provide a better characterization of the area subsurface conditions and groundwater elevation and direction within the CDP lands. Therefore, the test hole findings from our study completed outside of the CDP area are detailed below and in Appendix 1. The ground surface outside the CDP zone is covered by a sandy topsoil and/or agricultural soils. Below the abovenoted soils, the soil profile encountered at the test hole locations consists predominantly of coarse-grained deposits of till, silty fine sand and/or sandy silt with occurrences of silty clay to the west of the CDP within the upper 3 m of the test pits and within boreholes encountering glacial till with a silty clay matrix. A glacial till with silty sand to sandy silt matrix was encountered within the northern portion of the west parcel and transitions to a silty sand to sandy silt heading south.

Within the east parcel, a glacial till with silty sand matrix was encountered with some areas overlying a silty sand deposit

Reference should be made to the Soil Profile and Test Data sheets in Appendix 1 for the details of the soil profile encountered at each test hole.

Silty Clay

Within the south area of the west parcel, localized silty clay layers were noted in the areas of TP79-15 to TP82-15. The silty clay is typically overlain by a silty sand layer. The thickness of the silty clay at the borehole locations within this part of the site ranged from 1.5 to 3.0 m from ground surface.

Silty Fine Sand

The predominantly coarse grained soils within the subject development parcel consist of silty fine sand, sandy silt. The silty sand, sandy silt deposits were noted to contain gravel, cobbles and boulders at several locations.

Six (6) split spoon samples and two (2) test pit grab samples were submitted for grain size analyses. Previous investigations included five (5) test pit grab sample. The results are presented in Table 1 and on the Grain Size Distribution sheets in Appendix 1. The textural descriptions of the samples are indicated under the Classification heading, along with the Unified Classification. Tested samples varied from SP to SM to ML.

The results of the SPTs indicate that the state of compaction of these coarse-grained soils is predominantly within the compact to very dense ranges.

Table 2 - Grain Size Distribution - Outside CDP Area				
Sample	Gravel (%)	Sand (%)	Silt and Clay (%)	Classification
BH2-15 SS7	0	86.1	13.9	SM - Silty sand
BH14-15 SS11	0	90.7	9.3	SP-SM - Poorly graded sand with silt
BH18-15 SS11 & SS13	0	24.9	75.1	ML - Silt with sand
BH19-15 SS12	0	19.6	80.4	ML - Silt with sand
BH25-15 SS6	0	46	54	ML - Sandy silt
BH26-15 SS7&SS8	0	25.6	74.4	ML - Silt with sand
TP35-15 G2	0	90.5	9.5	SP-SM - Poorly graded sand with silt
TP55-15 G2	0	88.4	11.6	SP-SM - Poorly graded sand with silt
TP5-11 G11	0	98.3	1.7	Fine sand
TP3-11 G6	0	41	59	Sandy silt
TP3-11 G6	0	41	59	Sandy silt
TP1-11 G2	0	47.7	52.3	Silty sand
TP7 G1	50.8	48.6	0.6	Granular B Type I

There were a few localized zones within the deposits that appeared, based on their SPT “N” values to be within the loose range. These loose zones were generally confined within compact to dense deposits, but were located below the groundwater level. These zones were often associated with “running sands”, where a “quick” condition is created at the base of the auger casing due to the auger casing diameter associated with typical soil drilling operations, and the actual state of compaction of the soil can be underestimated by the SPT. The adjacent parcel to the east of the CDP zone previously underwent a modified field program to investigate similar localized zones with low SPT “N” values and assess whether or not the low values were due to the drilling methods. In several instances “sister” boreholes were put down to further investigate the “running sand” conditions and/or the low SPT “N” values, which can occur due to the relatively large auger casing size of hollow stem augers. The modified drilling procedure in these instances generally consisted of advancing the sister borehole using wash boring methods, so the casing was full of water to prevent the occurrence of “quick” conditions. In each case, this method yielded significantly higher N values and indicated that the low N values were due to the sampling conditions, rather than indicative of loose soil.

The regional aggregate mapping has been provided within Drawing PG3607-5 - Aggregate Resources Inventory of the City of Ottawa from the Ontario Geological Survey ARIP 191.

Bedrock

Based on digital geological mapping produced by Natural Resources Canada, sourced from the Geological Survey of Canada, the bedrock in this area consists of dolomite of the Oxford formation with an overburden drift thickness of 15 to 25 m depth.

3.3 Groundwater

The measured groundwater levels in the boreholes from the current and previous investigations are presented in Table 3 on the following page.

Table 3: Summary of Groundwater Level Readings

Borehole Number	Ground Elevation, m	Groundwater Levels, m		Recording Date
		Depth	Elevation	
BH 1-15	105.75	Dry to 9.14	-	May 3, 2016
BH 2-15	104.86	6.58	98.28	May 3, 2016
BH 3-15	109.77	Dry to 5.27	-	May 3, 2016
BH 4-15	111.09	Dry to 9.75	-	May 3, 2016
BH 5-15	108.75	Dry to 9.14	-	May 3, 2016
BH 6-15	102.59	Dry to 4.40	-	May 3, 2016
BH 7-15	102.30	Damaged	-	May 3, 2016
BH 8-15	106.93	7.49	99.44	May 3, 2016
BH 9-15	106.70	Dry to 2.30	-	May 3, 2016
BH 10-15	110.71	Dry to 9.38	-	May 3, 2016
BH 11-15	105.82	1.83	103.99	May 3, 2016
BH 12-15	105.26	Dry to 7.79	-	May 3, 2016
BH 13-15	102.74	3.64	99.10	May 3, 2016
BH 14-15	103.47	3.62	99.85	May 3, 2016
BH 15-15	103.56	7.11	96.45	May 3, 2016
BH 16-15	107.24	Dry to 7.34	-	May 3, 2016
BH 17-15	107.97	Dry to 9.05	-	May 3, 2016
BH 18-15	101.08	0.99	100.09	May 3, 2016
BH 19-15	103.99	6.25	97.74	May 3, 2016
BH 20-15	107.88	Dry to 7.60	-	May 3, 2016
BH 21-15	102.47	6.03	96.44	May 3, 2016
BH 22-15	101.71	5.40	96.31	May 3, 2016
BH 23-15	98.90	3.28	95.62	May 3, 2016
BH 24-15	98.36	3.60	94.76	May 3, 2016
BH 25-15	99.56	1.80	97.76	May 3, 2016
BH 26-15	100.07	1.84	98.23	May 3, 2016
BH 27-15	101.30	4.20	97.10	May 3, 2016
BH 28-15	104.64	Damaged	-	May 3, 2016
BH 28A-15	104.65	Damaged	-	May 3, 2016
BH 29-15	102.14	5.59	96.55	May 3, 2016
BH 30-15	99.45	3.74	95.71	May 3, 2016

Table 3: Summary of Groundwater Level Readings (Continued)				
Borehole Number	Ground Elevation, m	Groundwater Levels, m		Recording Date
		Depth	Elevation	
BH 31-16	108.99	13.02	95.97	42578
BH 32-16	103.48	7.37	96.11	42578
BH 33-16	110.04	9.46	100.58	42578
BH 34-16	107.46	11.4	96.06	42578
BH 35-16	105.41	9.36	96.05	42578
BH 36-16	109.08	12.95	96.13	42578

4.0 Discussion

4.1 Geotechnical Assessment

Based on the results of the geotechnical investigation, the subject site is suitable, from a geotechnical perspective, for the proposed development. It is anticipated that conventional shallow foundations would be suitable for low rise, wood framed housing and commercial buildings constructed within the CDP area. No permissible grade raise restriction is required from a geotechnical perspective due to the absence of a silty clay deposit within the current CDP area based on the existing test hole coverage. It is further understood that park areas, school and a park and ride area are also anticipated within the CDP area, which are all suitable to be constructed within the subject CDP area.

Municipal services are anticipated within the subject site and will be completed mostly through OHSA Type 2 and 3 soils. Where excavations extend below the groundwater level, high groundwater infiltration rates should be anticipated. To further address the groundwater issues on site, Paterson is completing a series of groundwater level readings at the monitoring wells installed at the borehole locations and has completed hydraulic conductivity testing at selected well locations. The results of our groundwater review along with historical area groundwater information will be issued under separate cover (Paterson Report PG3757-1).

As part of our current study, a slope stability analysis was completed for the slopes observed along the existing aggregate extraction operations. The results of our analysis are presented in Subsection 4.6.

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

4.2 Future Closure of Aggregate Extraction Pits

The aggregate extraction areas known as the Drummond Costello Pit and Brazeau Todd Pit are utilized for the excavation and supply of sand and gravel. Both aggregate extraction areas have been in operation well before 1990 and continue to operate to supply pit sand and gravel for the Ottawa area. Based on what is currently known of the existing aggregate extraction pits and the remaining operations, the following closure summary is provided:

- Since the current aggregate extraction pits are in close proximity to existing residential and commercial developed lands, the aggregate extraction operations are expected to continue for at least another 10 years based on the

availability of the resource materials remaining in the pits.

- ❑ Once the aggregate extraction operation is completed, consideration will be given to the closure of the pits. In doing so, it is expected that the sites will accept clean fill to backfill most of the area. The source of fill material will be generated based on construction activities in the immediate area and throughout the western portion of the Ottawa area due to the proximity of Highway 416. The time required to fill these pits will be at least 10 to 15 years due to the massive areas.
- ❑ The disposal of clean fill material to backfill the pits is another source of revenue for the pit operators over the long term. Furthermore, the land value also increases when the pits are closed and level with the surrounding grades.
- ❑ Once the pits are in-filled, it is expected that a moratorium on development will be applied to these areas to permit the soil placed as backfill in these areas to consolidate. Furthermore, the moratorium will most likely be a condition applied by MNR for the closure of an aggregate extraction license. In the best case scenario, a 5 year moratorium would be applied to these site.

Therefore, for the closure plan to be completed and the land becoming available for re-development, it is expected that 25 to 30 years will be required.

Future Redevelopment of the Pit Areas

Following the closure of the existing pits, consideration for the redevelopment of the pit areas will have to consider the following issues:

- ❑ It is expected that the backfill of the pits will be using secondary quality materials from excess soil being transported to the subject site from off-site developments. The material will most likely be end dumped and spread using a bulldozer. The backfilled areas are expected to have loose to slightly compact material. Therefore, the material would not be considered suitable as an engineered fill capable of supporting conventional residential or commercial development.
- ❑ Due to the depth of the backfill within the pits (8 to 10 m below the existing surrounding grades), ground improvement techniques will be required to enable development. Techniques such as dynamic compaction, surcharging and/or rapid impact compaction will be required to prepare the subsoil to support light development. Ground improvement techniques are expensive.

- ❑ The re-development of the subject site would be more suitable as parkland, stormwater management facilities and/or commercial development when fronting close to Highway 416. Ground improvement techniques would be required for building structures while more conventional compaction methods would be possible for parks and SWMF.

Although the closure of the pits will provide land that can be developed, the aforementioned constraints will result in expensive re-development land for residential land use. Therefore, commercial development would most likely be considered if structures were contemplated. The use of the site as parkland or a storm water management facility would be a more logical use.

4.3 Foundation Design

Bearing Resistance for Shallow Foundations

Conventional shallow footings should be founded on undisturbed, soil bearing surface or engineered granular fill materials placed over undisturbed soil subgrade surface.

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 for footings.

Footings placed on undisturbed, compact silty sand or glacial till bearing surface 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 **250 kPa**. A geotechnical resistance factor of 0.5 has been applied to the above noted bearing resistance at ULS value. These values should be confirmed by field review by geotechnical personnel at the time of construction.

Note that the allowable soil pressure for working stress design can be taken to be equal to the bearing resistance at SLS value, as noted above, for the appropriate bearing medium.

Where the placing of engineered granular fill is required, to establish the bearing medium, the bearing resistance values can be taken to be equivalent to the bearing resistance values of the parent subgrade soil, as detailed above, provided OPSS Granular B Type II or Granular A materials, compacted to a minimum of 98% of their SPMDD values are used and approved by the geotechnical consultant at the time of construction.

Settlement

Footings designed using the above-noted bearing resistance value at SLS will be subjected to potential post-construction total and differential settlements of 25 and 20 mm, respectively. These are the generally accepted tolerable settlement values for wood-frame residential construction.

4.4 Design for Earthquakes

The site class for seismic site response can be taken as Class D for the foundations considered at this site. Reference should be made to the latest revision of the Ontario Building Code for a full discussion of the earthquake design requirements. The seismic site classification mapping from the Geological Survey of Canada (Open File 6273) has been included within Drawing PG3607-6 - Seismic Site Classification mapping.

Based on the current information, including the level of the existing groundwater table, grain size distribution and compactness of the underlying sand layer, the soil underlying the subject site is not susceptible to liquefaction.

4.5 Groundwater Control

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. It is anticipated that pumping from open sumps will be sufficient to control the groundwater influx through the sides of shallow excavations.

A temporary Ministry of the Environment and Climate Change (MOECC) permit to take water (PTTW) may be required for this project if more than 400,000 L/day of ground and/or surface water is to be pumped during the construction phase. A minimum 4 to 5 months should be allowed for completion of the PTTW application package and issuance of the permit by the MOECC.

For typical ground or surface water volumes, being pumped during the construction phase, between 50,000 to 400,000 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. If a project qualifies for a PTTW based upon anticipated conditions, an EASR will not be allowed as a temporary dewatering measure while awaiting the MOECC review of the PTTW application.

4.6 Stormwater Management Facility

The stormwater management facility (SWMF) may consist of a wet pond with inlet and outlet control structures. Dependent upon the hydraulic conductivity of the underlying material, consideration may be given to providing a clay liner, HDPL geomembrane liner or other impermeable membrane for construction of a wet cell facility.

It is recommended for the preliminary pond design that side slopes be graded at 2.5H:1V, or shallower, above the permanent pond water level and at 3H:1V, or shallower, below the permanent pond water level.

4.7 Slope Stability Review

The slope conditions were reviewed by Paterson personnel during our field investigation. Based on our review, the subject slopes within the east end of the existing aggregate extraction operation were noted vary between 8 to 10 m. The slopes were grass and lightly brush covered, minor surficial erosion was noted, however, no signs of slope instability were observed. Three (3) slope cross-sections were studied as the worst case scenario for the subject slopes. The section locations are presented in Drawing PG3607-1 - Test Hole Location Plan, in Appendix 2.

Slope Stability Analysis

The analysis of the stability of the slopes was carried out using SLIDE, a computer program which permits a two-dimensional slope stability analysis using several methods including the Bishop's method, which is a widely used and accepted analysis method. The program calculates a factor of safety, which represents the ratio of the forces resisting failure to those favoring failure. Theoretically, a factor of safety of 1.0 represents a condition where the slope is stable. However, due to intrinsic limitations of the calculation methods and the variability of the subsoil and groundwater conditions, a factor of safety greater than one is usually required to ascertain that the risks of failure are acceptable. A minimum factor of safety of 1.5 is generally recommended for conditions where the failure of the slope would endanger permanent structures. A horizontal acceleration of 0.16G was considered for the sections for the seismic loading condition. A factor of safety of 1.1 is considered to be satisfactory for stability analyses including seismic loading.

Subsoil conditions at the cross-sections were inferred based on the nearby test holes and general knowledge of the area's geology. The strength parameters used for the analysis are provided in Figures 2 to 7 presented in Appendix 2.

Static Analysis

The static analysis results for Sections A, B and C are presented in Figures 2, 4 and 6 in Appendix 2. The factor of safety for the slopes was greater than 1.5 for all three (3) sections analysed for global stability. Shallow slip circles with slope stability factors of safety of less than 1.5 were noted along the surface of Section C. However, it should be noted that the overall global stability of Section C has a factor of safety of greater than 1.5.

Seismic Loading Analysis

The results of the analyses including seismic loading are shown in Figures 3, 5 and 7 for the slope sections. The results indicate that the overall factor of safety for the sections are greater than 1.1 with the exception of the minor surficial slip failures observed at Section C.

Based on the results of the slope stability analysis, the existing slopes are considered stable from a geotechnical perspective. No development setbacks are required from top of existing slope from a slope stability perspective for the proposed residential, commercial and parkland blocks.

5.0 Constraints and Opportunities

Overall, the subject site provides significant opportunities for development across the subject site from a geotechnical perspective. The soils profile encountered at the test hole locations allows for conventional building construction, road and service construction without soil improvement requirements or grade raise restrictions. Also, the soils provide potential for significant groundwater recharge, as discussed in our Hydrogeological - Existing Conditions Report PG3757-1 - Revision 1 dated September 12, 2016.

No constraints are present from a geotechnical perspective for the majority of the subject site. However, the development of the existing aggregate extraction operations will be postponed until the extraction operations are no longer feasible and significant in-filling of the area has been completed and approved from a geotechnical perspective for development as detailed in Subsection 4.1.

6.0 Statement of Limitations

The recommendations made in this report are in accordance with our present understanding of the project.

A geotechnical investigation of this nature is a limited sampling of a site. The recommendations are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around the test locations. The extent of the limited area depends on the soil, bedrock and groundwater conditions, as well the history of the site reflecting natural, construction, and other activities.

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 Minto Communities Inc. or their agent(s) is not authorized without review by Paterson Group for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.



David J. Gilbert, P.Eng.



Carlos P. Da Silva, P.Eng.



Report Distribution:

- ☐ Minto Communities Inc. (3 copies)
- ☐ Paterson Group Inc. (1 copy)

APPENDIX 1

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

GRAIN SIZE DISTRIBUTION SHEETS

[illegible]

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH 2-15

BORINGS BY CME 75 Power Auger

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
Compact, brown SILTY SAND with gravel and cobbles - rootlets in upper 100mm		AU	1			0	104.86					
		SS	2	79	10	1	103.86					
		SS	3	63	16	2	102.86					
	2.29											
Soft to firm, grey SILTY CLAY with sand and gravel		SS	4	100	3	3	101.86					
		SS	5	100	2	4	100.86					
	4.88											
Very dense, grey SILTY SAND with gravel, cobbles, boulders and clay		SS	6	50	56	5	99.86					
		SS	7	67	50	6	98.86					
	6.30											
Dense, grey SILTY SAND		SS	8	67	48	7	97.86					
		SS	9	58	39	8	96.86					
		SS	10	83	36	9	95.86					
		SS	11		35							
	9.75											
End of Borehole												
(GWL @ 7.03m-July 28, 2016)												

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

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.




FILE NO.
PG3607

REMARKS

HOLE NO.
BH 3-15

BORINGS BY CME 75 Power Auger

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Brown silty sand with gravel, cobbles and boulders, trace clay - rootlets in upper 200mm		AU	1			0	109.77					
		SS	2	75	25	1	108.77					
		SS	3	67	45	2	107.77					
		SS	4	100	11	3	106.77					
Loose to very dense, brown SILTY SAND with gravel and cobbles		SS	5	100	7	4	105.77					
		SS	6	100	38	5	104.77					
		SS	7	100	33	6	103.77					
		SS	8	75	53	7	102.77					
		SS	9	79	42	8	101.77					
		SS	10	100	57	9	100.77					
		SS	11	100	57	8	101.77					
Very dense, grey SILTY SAND		SS	12	92	51	9	100.77					
		SS	13	96	57							
End of Borehole												
(BH dry to 5.27m depth - July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH 4-15

BORINGS BY CME 75 Power Auger

DATE December 2, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
Very dense to compact, brown SILTY SAND with gravel, cobbles and boulders - rootlets in upper 100mm - grey by 4.5m depth		AU	1			0	111.09					
		SS	2	63	59	1	110.09					
		SS	3	4	28	2	109.09					
		SS	4	4	32	3	108.09					
		SS	5	54	17	4	107.09					
		SS	6	63	24	5	106.09					
		SS	7	58	21	6	105.09					
		SS	8	79	27	7	104.09					
		SS	9	79	18	8	103.09					
		SS	10	75	21	9	102.09					
		SS	11	100	24							
		SS	12	63	23							
		SS	13	58	19							
End of Borehole	9.75											
(BH dry to 9.75m depth - July 28, 2016)												

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. **PG3607**

REMARKS

HOLE NO. **BH 5-15**

BORINGS BY CME 75 Power Auger

DATE December 10, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
GROUND SURFACE								20	40	60	80		
FILL: Grey silty sand with clay, gravel and wood		SS	1	42	13	0	108.75						
		SS	2	25	21	1	107.75						
		SS	3	33	5	2	106.75						
		SS	4	42	4	3	105.75						
		SS	5	42	3	4	104.75						
		SS	6	42	3	5	103.75						
		SS	7	17	5	6	102.75						
		SS	8	25	37	7	101.75						
		SS	9	0	50+	8	100.75						
		SS	10	58	9	9	99.75						
		SS	11	0	1								
End of Borehole	9.14												
(BH dry to 9.14m depth - July 28, 2016)													
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH 6-15

BORINGS BY CME 75 Power Auger

DATE December 3, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
Dense to very dense, grey-brown SILTY SAND with gravel, cobbles and boulders		AU	1			0	102.59					
		SS	2	75	31	1	101.59					
		SS	3	100	50+	2	100.59					
Compact to dense, grey-brown SILTY SAND		SS	4	83	27	3	99.59					
		SS	5	58	27	4	98.59					
		SS	6	67	26	5	97.59					
		SS	7	71	31	6	96.59					
		SS	8	67	30	7	95.59					
		SS	9	63	30	8	94.59					
		SS	10	75	25	9	93.59					
		SS	11	100	19							
		SS	12	100	15							
		SS	13	100	15							
End of Borehole												
(BH dry to 4.40m depth - July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **BH 7-15**

DATE December 10, 2015

[illegible]

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
Compact to loose, brown SILTY SAND with gravel and cobbles - rootlets in upp-er 100mm - with boulders by 1.5m depth		AU	1			0	106.93					
		SS	2	58	12	1	105.93					
		SS	3	46	16	2	104.93					
		SS	4	58	8	3	103.93					
Grey SILTY CLAY with sand, gravel and cobbles	3.28	SS	5	92	7	4	102.93					
		SS	6	100	2	5	101.93					
		SS	7	100	6	6	100.93					
		SS	8	100	5	7	99.93					
Compact to dense, grey SILTY SAND with gravel, cobbles and boulders	6.35	SS	9	92	18	8	98.93					
		SS	10	75	46	9	97.93					
		SS	11	75	41	10						
		SS	12	83	49	11						
End of Borehole (GWL @ 7.95m-July 28, 2016)	9.14					12						

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH 9-15

BORINGS BY CME 75 Power Auger

DATE December 7, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
Loose to compact, brown SILTY SAND - rootlets in upper 100mm - running sand encountered at 6.7m depth		AU	1			0	106.70					
		SS	2	58	9	1	105.70					
		SS	3	46	5	2	104.70					
		SS	4	58	5	3	103.70					
		SS	5	54	23	4	102.70					
		SS	6	71	24	5	101.70					
		SS	7	63	29	6	100.70					
		SS	8	71	31	7	99.70					
		SS	9	71	27	8	98.70					
		SS	10	92	27	9	97.70					
		SS	11	75	13							
		SS	12	100	11							
		SS	13	100	7							
End of Borehole	9.75											
(BH dry to 2.30m depth - July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH10-15

BORINGS BY CME 75 Power Auger

DATE December 4, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Brown silty sand with gravel, cobbles and boulders - rootlets in upper 200mm - some clay by 1.5m depth		AU	1			0	110.71					
		SS	2	79	11	1	109.71					
		SS	3	42	4	2	108.71					
		SS	4	50	7							
	3.05					3	107.71					
Loose to dense, grey-brown SILTY SAND , some gravel, cobbles and boulders		SS	5	75	8							
		SS	6	79	72	4	106.71					
		SS	7	67	41	5	105.71					
		SS	8	71	28							
	5.64					6	104.71					
Compact, grey SILTY SAND		SS	9	75	26							
		SS	10	75	17	7	103.71					
		SS	11	79	26	8	102.71					
		SS	12	71	25							
	9.14					9	101.71					
Very dense, grey SILTY SAND with gravel, cobbles and boulders	9.75	SS	13	67	50							
End of Borehole												
(BH dry to 9.38m depth - July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Geotechnical Investigation Barrhaven South Urban Expansion Ottawa, Ontario

FILE NO. PG3607

HOLE NO. **BH11-15**

DATE December 3, 2015

[illegible]

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH12-15

BORINGS BY CME 75 Power Auger

DATE December 2, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
Dense to very dense, brown SILTY SAND with gravel, cobbles and boulders - rootlets in upper 100mm		AU	1			0	105.26					
		SS	2	88	42	1	104.26					
		SS	3	33	50+							
		SS	4	67	50+	2	103.26					
		SS	5	83	58	3	102.26					
		SS	6	100	31	4	101.26					
		SS	7	75	47	5	100.26					
Dense, brown SILTY SAND		SS	8	92	30	6	99.26					
		SS	9	79	31							
		SS	10	75	35	7	98.26					
- grey by 7.6m depth		SS	11	92	34	8	97.26					
		SS	12	100	32							
		SS	13	88	37	9	96.26					
End of Borehole												
(BH dry to 7.79m depth - July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

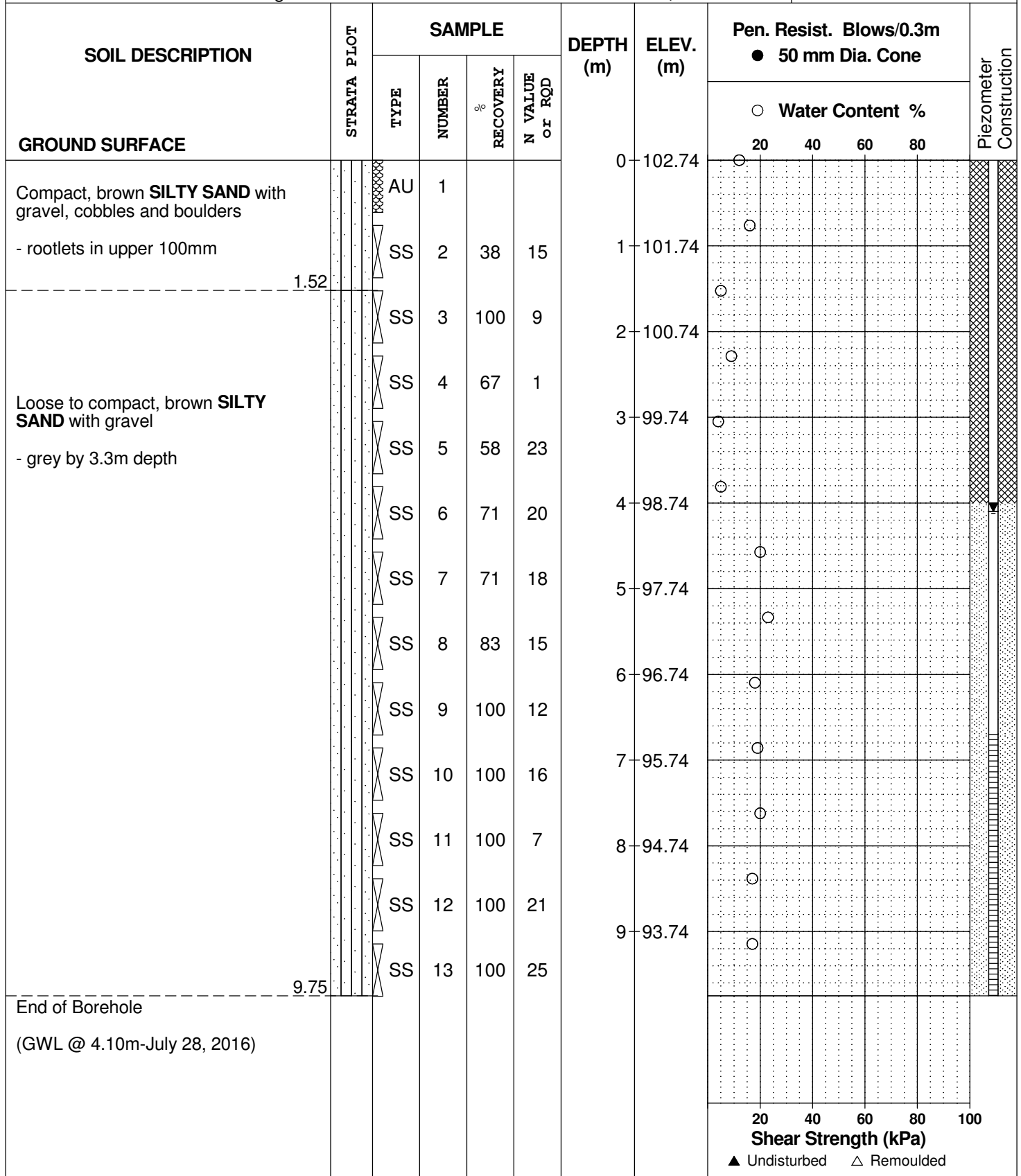
REMARKS

BORINGS BY CME 75 Power Auger

DATE November 30, 2015

FILE NO. **PG3607**

HOLE NO. **BH13-15**



SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH14-15

BORINGS BY CME 75 Power Auger

DATE December 7, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE													
Compact, brown SILTY SAND with gravel and cobbles in upper 0.8m depth - rootlets in upper 100mm - grey by 3m depth		AU	1			0	103.47						
		SS	2	75	10	1	102.47						
		SS	3	75	11	2	101.47						
		SS	4	71	21								
		SS	5	71	16	3	100.47						
		SS	6	67	22	4	99.47						
		SS	7	75	21	5	98.47						
		SS	8	100	12								
		SS	9	100	12	6	97.47						
		SS	10	100	6	7	96.47						
		SS	11	100	16	8	95.47						
		SS	12	71	10								
		SS	13	63	11	9	94.47						
End of Borehole	9.75												
(GWL @ 4.20m-July 28, 2016)													
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH15-15

BORINGS BY CME 75 Power Auger

DATE December 2, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
Loose to compact, brown SILTY SAND - rootlets in upper 100mm - grey by 5.3m depth - running sand encountered at 6.8m depth - loose by 8.4m depth		AU	1			0	103.56					
		SS	2	100	5	1	102.56					
		SS	3	92	10	2	101.56					
		SS	4	100	8	3	100.56					
		SS	5	75	11	4	99.56					
		SS	6	79	21	5	98.56					
		SS	7	67	14	6	97.56					
		SS	8	100	18	7	96.56					
		SS	9	100	19	8	95.56					
		SS	10	100	18	9	94.56					
		SS	11	100	16							
		SS	12	100	8							
		SS	13	100	6							
End of Borehole	9.75											
(GWL @ 4.99m-July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH16-15

BORINGS BY CME 75 Power Auger

DATE December 2, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
Loose to dense, brown SILTY SAND with gravel, cobbles and boulders - rootlets in upper 100mm		AU	1			0	107.24					
		SS	2	50	5	1	106.24					
		SS	3	79	17	2	105.24					
		SS	4	67	18	3	104.24					
		SS	5	79	28	4	103.24					
		SS	6	67	32	4	103.24					
Compact, brown SILTY SAND - trace gravel and cobbles from 6.9 to 8.8m depth - grey by 7.6m depth		SS	7	63	30	5	102.24					
		SS	8	96	36	6	101.24					
		SS	9	100	34	7	100.24					
		SS	10	79	17	7	100.24					
		SS	11	100	13	8	99.24					
		SS	12	88	19	9	98.24					
		SS	13	79	31	9	98.24					
End of Borehole												
(BH dry to 7.34m depth - July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH17-15

BORINGS BY CME 75 Power Auger

DATE December 4, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE							0	107.97					
Loose to dense, dark brown SILTY SAND with gravel, cobbles and boulders - rootlets in upper 200mm		AU	1										
		SS	2	42	9	1	106.97						
		SS	3	2	6								
		SS	4	67	36								
	3.35	SS	5	79	23	3	104.97						
Compact, brown SILTY SAND - trace gravel from 3.35 to 4.9m depth - with gravel and cobbles from 4.9 to 6.1m depth		SS	6	71	27	4	103.97						
		SS	7	63	37	5	102.97						
		SS	8	79	37								
		SS	9	71	50+	6	101.97						
	6.10	SS	10	75	50+	7	100.97						
Very dense to dense, brown SAND with gravel, silt and cobbles		SS	11	79	50+	8	99.97						
		SS	12	88	43								
		SS	13	79	28	9	98.97						
	9.75												
End of Borehole													
(BH dry to 9.05m depth - July 28, 2016)													
									20	40	60	80	100
									Shear Strength (kPa)				
									▲ Undisturbed △ Remoulded				

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

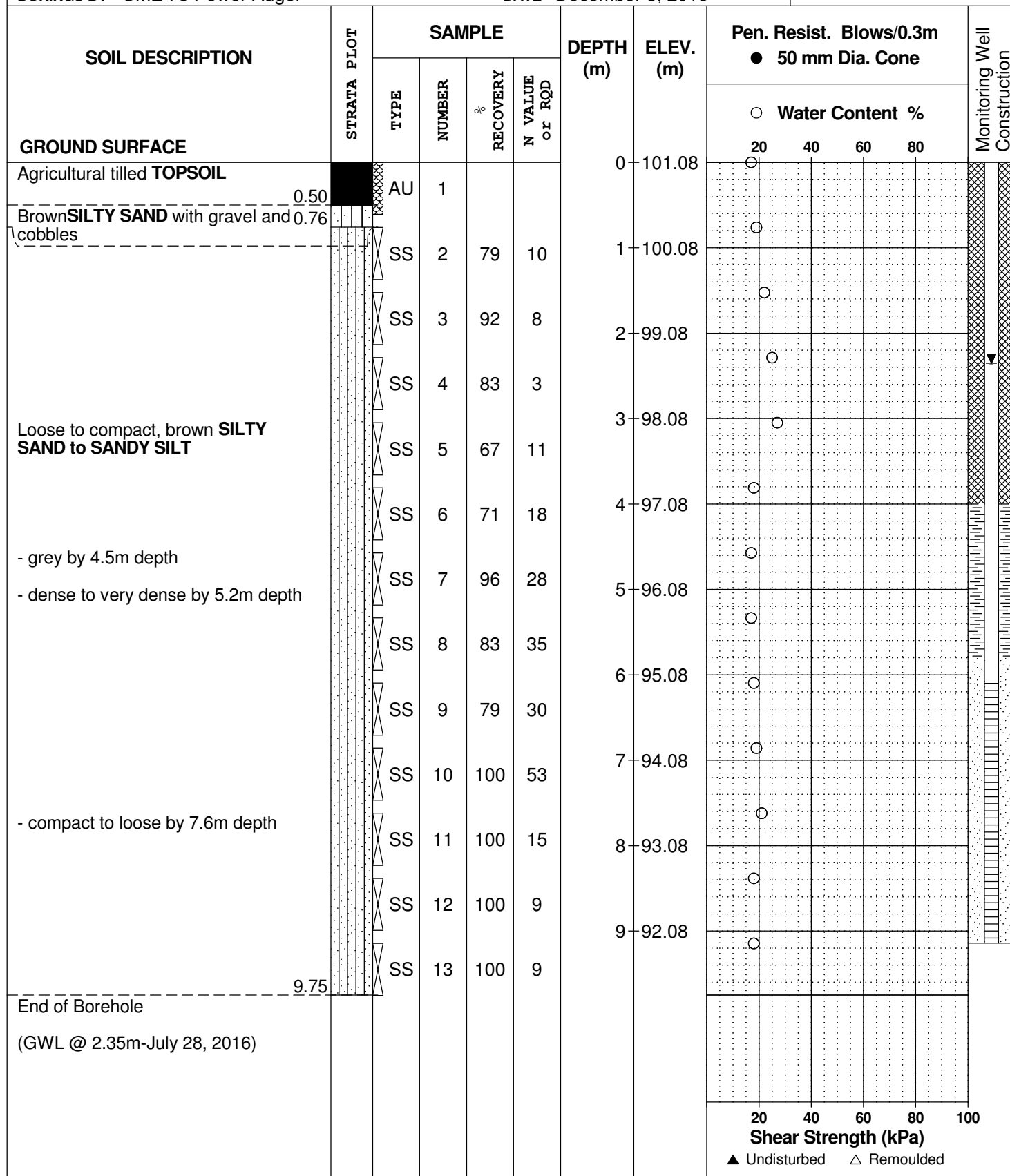
FILE NO.
PG3607

REMARKS

HOLE NO.
BH18-15

BORINGS BY CME 75 Power Auger

DATE December 8, 2015



SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **BH19-15**

DATE December 18, 2015

[illegible]

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

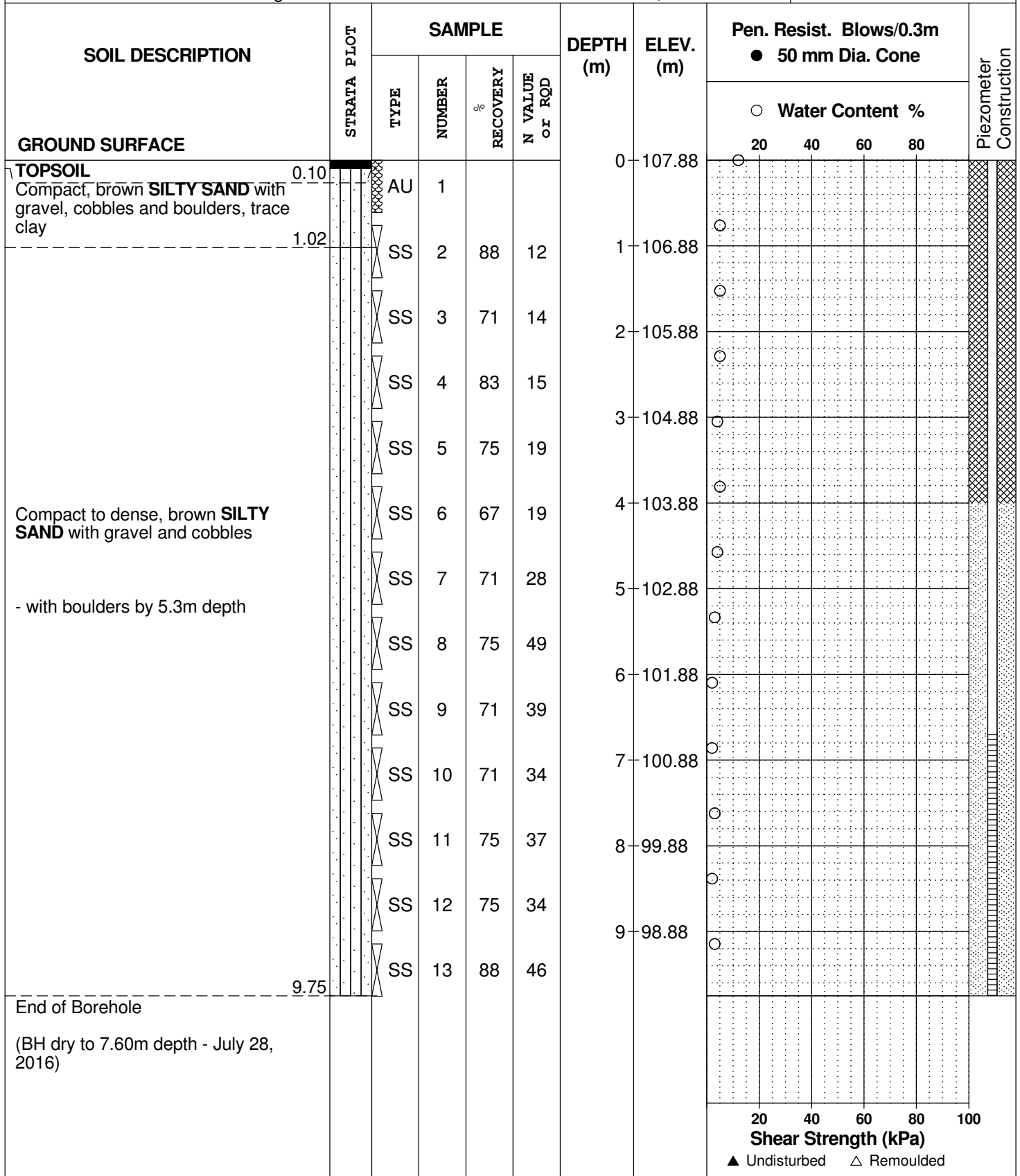
FILE NO.
PG3607

REMARKS

HOLE NO.
BH20-15

BORINGS BY CME 75 Power Auger

DATE December 1, 2015



SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH21-15

BORINGS BY CME 75 Power Auger

DATE December 9, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	102.47					
Very loose, brown SILTY SAND with gravel, cobbles and boulders - compact to dense by 2.3m depth - grey-brown by 3.8m depth		AU	1			1	101.47					
		SS	2	54	3	2	100.47					
		SS	3	50	3	3	99.47					
		SS	4	67	14	4	98.47					
		SS	5	13	28	5	97.47					
		SS	6	79	12	6	96.47					
		SS	7	79	25	7	95.47					
		SS	8	92	21	8	94.47					
		SS	9	63	19	9	93.47					
		SS	10	29	33							
		SS	11	58	12							
		SS	12	79	31							
		SS	13	75	13							
End of Borehole	9.75											
(GWL @ 6.73m-July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH22-15

BORINGS BY CME 75 Power Auger

DATE November 27, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Brown clayey silt with sand and gravel - rootlets in upper 200mm	0.70	AU	1			0	101.71					
		SS	2	100	25	1	100.71					
Compact to loose, brown SILTY SAND with gravel and cobbles		SS	3	100	7	2	99.71					
	2.44	SS	4	100	15	3	98.71					
		SS	5	88	28	4	97.71					
		SS	6	100	29	5	96.71					
		SS	7	100	39	6	95.71					
		SS	8	79	40	7	94.71					
		SS	9	96	40	8	93.71					
		SS	10	100	38	9	92.71					
		SS	11	100	18							
		SS	12	100	26							
		SS	13	100	10							
End of Borehole	9.75											
(BH dry to 6.15m depth - July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATE December 9, 2015

[illegible]

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

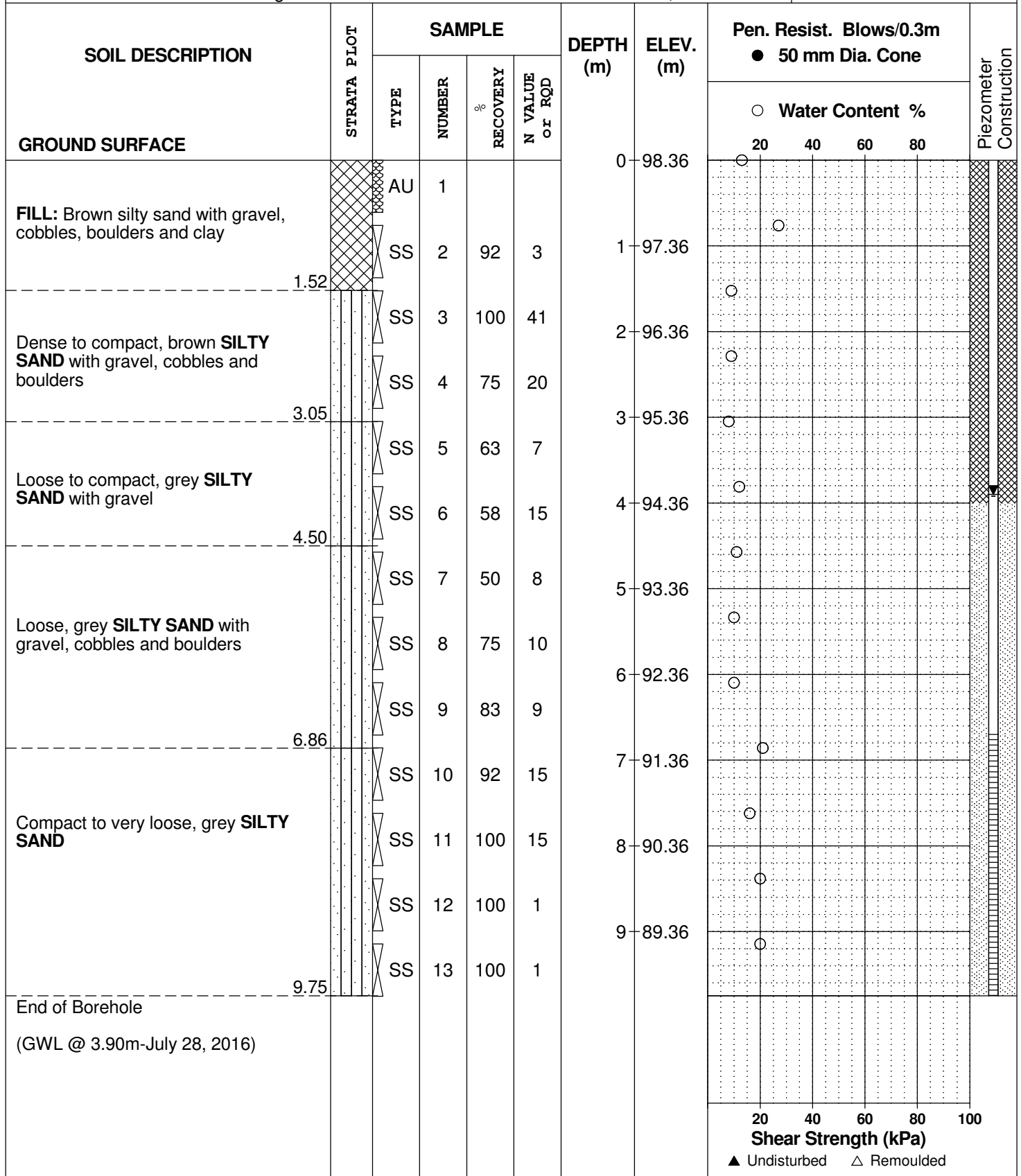
FILE NO.
PG3607

REMARKS

HOLE NO.
BH24-15

BORINGS BY CME 75 Power Auger

DATE November 27, 2015



SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH25-15

BORINGS BY CME 75 Power Auger

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.30					0	99.56					
Brown SILTY SAND with gravel	0.76	AU	1									
Loose to compact, brown SILTY SAND to SANDY SILT - grey by 1.5m depth		SS	2	75	5	1	98.56					
		SS	3	71	16	2	97.56					
		SS	4	67	26	3	96.56					
		SS	5	88	27	4	95.56					
		SS	6	79	15	5	94.56					
		SS	7	67	15	6	93.56					
		SS	8	75	24	7	92.56					
		SS	9	71	30	8	91.56					
		SS	10	75	18	9	90.56					
		SS	11	63	19							
		SS	12	79	51							
		SS	13	88	52							
End of Borehole	9.75											
(Piezometer damaged - July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH26-15

BORINGS BY CME 75 Power Auger

DATE December 8, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.30					0	100.07					
Dark brown SILTY SAND with gravel, cobbles, topsoil and roots	0.76	AU	1									
Loose to compact, brown SANDY SILT to SILTY SAND		SS	2	88	11	1	99.07					
		SS	3	88	7	2	98.07					
		SS	4	83	3	3	97.07					
		SS	5	71	7	4	96.07					
		SS	6	79	9	5	95.07					
		SS	7	83	15	6	94.07					
		SS	8	100	6	7	93.07					
		SS	9	100	6	8	92.07					
		SS	10	79	9	9	91.07					
		SS	11	79	14							
		SS	12	83	20							
		SS	13	71	24							
	- grey by 8.4m depth											
End of Borehole	9.75											
(GWL @ 3.09m-July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH27-15

BORINGS BY CME 75 Power Auger

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.30	AU	1			0	101.30					
Loose, brown SILTY SAND with gravel, cobbles and boulders	1.50	SS	2	100	4	1	100.30					
		SS	3	100	5	2	99.30					
		SS	4	83	9	3	98.30					
		SS	5	71	16	4	97.30					
		SS	6	67	20	5	96.30					
		SS	7	71	19	6	95.30					
		SS	8	75	55	7	94.30					
		SS	9	100	40	8	93.30					
		SS	10	88	32	9	92.30					
		SS	11	100	50							
		SS	12	83	53							
		SS	13	100	51							
			9.75									
End of Borehole												
(GWL @ 4.96m-Jul 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **BH28-15**

DATE December 1, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS Moved 4m west of BH 28-15

HOLE NO. **BH28A-15**

BORINGS BY CME 75 Power Auger

DATE December 1, 2015

[illegible]

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH29-15

BORINGS BY CME 75 Power Auger

DATE December 9, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.30	AU	1			0	102.14					
Loose to dense, brown SILTY SAND with gravel, cobbles and boulders		SS	2	92	9	1	101.14					
		SS	3	75	17	2	100.14					
		SS	4	71	35	3	99.14					
		SS	5	79	38	4	98.14					
		SS	6	75	33	5	97.14					
		SS	7	83	36	6	96.14					
		SS	8	91	50+	7	95.14					
		SS	9	58	26	8	94.14					
		SS	10	67	64	9	93.14					
		SS	11	63	30							
		SS	12	54	19							
		SS	13	83	2							
	- compact to loose by 8.3m depth											
End of Borehole	9.75											
(GWL @ 6.37m-July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH30-15

BORINGS BY CME 75 Power Auger

DATE November 27, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
Brown SILTY SAND , trace gravel and organics	0.76	AU	1			0	99.45					
Very dense to compact, brown SILTY SAND with gravel, cobbles and boulders		SS	2	58	81	1	98.45					
		SS	3	63	55	2	97.45					
		SS	4	79	27	3	96.45					
		SS	5	67	25	4	95.45					
		SS	6	67	29	5	94.45					
		SS	7	71	25	6	93.45					
		SS	8	75	28	7	92.45					
Compact, grey SILTY SAND to SANDY SILT	5.33	SS	9	63	10	8	91.45					
		SS	10	75	21	9	90.45					
		SS	11	71	16	10						
		SS	12	100	28	11						
		SS	13	100	21	12						
- trace gravel to 8.4m depth												
End of Borehole	9.75											
(GWL @ 4.41m-July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH31-16

BORINGS BY CME 55 Power Auger

DATE July 20, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE													
Compact, brown SANDY SILT , some gravel, trace cobbles, rootlets		SS	1	79	17	0	108.99						
		SS	2	75	11	1	107.99						
Compact, brown SILTY SAND , some gravel		SS	3	79	13	2	106.99						
		SS	4	71	11	3	105.99						
		SS	5	92	21	4	104.99						
						4	104.99						
Compact to dense, brown SAND with gravel, some silt and cobbles - some boulders by 6.4m depth		SS	6	58	34	5	103.99						
		SS	7	47	50+	6	102.99						
		SS	8	83	82	7	101.99						
		SS	9	50	41	8	100.99						
		SS	10	62	57	9	99.99						
		SS	11	83	46	10	98.99						
		SS	12	50	22	11	97.99						
							12	96.99					
							13	95.99					
							14	94.99					
						15	93.99						
						16	92.99						
End of Borehole													
(GWL @ 13.02m-July 28, 2016)													
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. BH32-16

DATE July 20, 2016

[illegible]

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH33-16

BORINGS BY CME 55 Power Auger

DATE July 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	110.04					
Compact to very dense, brown SILTY SAND with gravel, cobbles and boulders - grey by 0.8m depth		SS	1	46	27							
		SS	2	58	18	1	109.04					
		SS	3	67	60	2	108.04					
		SS	4	75	41							
		SS	5	79	35	3	107.04					
Dense, brown SANDY SILT						4	106.04					
Dense, brown SAND , trace to some silt		SS	6	71	29	5	105.04					
		SS	7	71	34	6	104.04					
		SS	8	62	32	8	102.04					
		SS	9	71	30	9	101.04					
		SS	10	83	15	11	99.04					
Compact, brown to grey SILT with sand						12	98.04					
End of Borehole												
(GWL @ 9.46m-July 28, 2016)												
								Shear Strength (kPa)				
								20	40	60	80	100
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. **PG3607**

REMARKS

HOLE NO. **BH34-16**

BORINGS BY CME 55 Power Auger

DATE July 19, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
Compact, brown SANDY SILT with gravel, some cobbles, rootlets 0.71		SS	1	50	27	0	107.46					
Dense, brown SILTY SAND , some gravel and cobbles 1.52		SS	2	71	31	1	106.46					
Dense to very dense, brown SAND , trace silt and gravel - trace cobbles by 4.9m depth		SS	3	58	36	2	105.46					
		SS	4	58	30	3	104.46					
		SS	5	67	70	4	103.46					
		SS	6	58	56	5	102.46					
		SS	7	67	67	6	101.46					
		SS	8	62	36	7	100.46					
		SS	9	58	41	8	99.46					
		SS	10	67	33	9	98.46					
		SS	11	83	23	10	97.46					
		SS	12	100	23	11	96.46					
- compact by 11.7m depth 11.73						12	95.46					
End of Borehole (GWL @ 11.40m-July 28, 2016)						13	94.46					
						14	93.46					
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **BH35-16**

DATE July 21, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE													
Brown SILTY SAND , trace gravel, organics and rootlets	0.76					0	105.41						
Very dense to compact, brown SILTY SAND with gravel, cobbles and boulders	5.33					1	104.41						
						2	103.41						
						3	102.41						
						4	101.41						
						5	100.41						
Compact, grey SILTY SAND to SANDY SILT - trace gravel to 8.4m depth	9.14					6	99.41						
						7	98.41						
						8	97.41						
						9	96.41						
Dense to compact, brown SILT , some sand	12.80	SS	1	71	46	10	95.41						
		SS	2	62	35	11	94.41						
		SS	3	46	26	12	93.41						
End of Borehole (GWL @ 9.36m-July 28, 2016)													
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
BH36-16

BORINGS BY CME 55 Power Auger

DATE July 21, 2016

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Brown silty sand with gravel, 0.30 some cobbles and boulders		SS	1	40	50+	0	109.08					
FILL: Brown silt with sand and gravel, some cobbles and boulders		SS	2	50	63	1	108.08					
		SS	3	64	50+	2	107.08					
		SS	4	79	50+	3	106.08					
	2.90	SS	5	79	37	4	105.08					
Dense to very dense, brown SILT with sand, trace gravel		SS	6	83	34	5	104.08					
		SS	7	67	61	6	103.08					
		SS	8	50	64	7	102.08					
		SS	9	62	44	8	101.08					
		SS	10	75	50	9	100.08					
		SS	11	58	52	10	99.08					
		SS	12	50	10	11	98.08					
		SS	13	58	52	12	97.08					
13.70		SS	14	50	10	14	95.08					
Compact, brown fine to medium SAND						15	94.08					
						16	93.08					
	16.76											
End of Borehole												
(GWL @ 12.95m-July 28, 2016)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 1-15**

BORINGS BY Backhoe

DATE December 2, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 2-15**

DATE December 2, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE													
TOPSOIL	0.10					0	106.80						
Compact, brown SILTY SAND		G	1			1	105.80						
		G	2			2	104.80						
End of Test Pit	3.00					3	103.80						
(TP dry upon completion)													

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded


SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 3-15**

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE													
TOPSOIL	0.20					0	105.40						
Loose, brown to grey SILTY SAND with gravel, cobbles and boulders		G	1			1	104.40						
End of Test Pit	3.10					3	102.40						
(Open hole GWL @ 2.9m depth)													
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 4-15**

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY % ○	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	107.00						
Loose, brown to grey SILTY SAND with gravel, cobbles and boulders - rootlets in upper 150mm		G	1			1	106.00						
End of Test Pit (TP dry upon completion)	3.00	G	2			3	104.00						
<div>20406080100</div> <div>Shear Strength (kPa)</div> <div>▲ Undisturbed △ Remoulded</div>													

SOIL PROFILE AND TEST DATA

DATUM Geodetic elevations interpolated from City of Ottawa basemap.


FILE NO. PG3607

REMARKS

HOLE NO. **TP 5-15**

BORINGS BY Backhoe

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	107.70						
Loose to compact, brown to grey SILTY SAND with gravel, cobbles and boulders - rootlets in upper 200mm		G	1			1	106.70						
						2	105.70						
						3	104.70						
						4							
						5							
						6							
						7							
						8							
						9							
						10							
End of Test Pit (TP dry upon completion)	3.00					3	104.70						

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded



SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 6-15**

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Grey silty clay with sand, gravel, cobbles and boulders - rootlets in upper 100mm		G	1			0	111.30					
Compact, grey SILTY SAND		G	2			1	110.30					
End of Test Pit (TP dry upon completion)						2	109.30					
						3	108.30					

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded


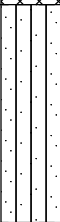
SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. TP 7-15

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction			
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %							
								20	40	60	80				
GROUND SURFACE						0	111.90								
FILL: Grey-brown silty sand with gravel, cobbles and boulders - rootlets in upper 100mm		G	1			1	110.90								
- rootlets in upper 100mm						2	109.90								
Very dense, brown SILTY SAND , trace gravel		G	2												
- rootlets in upper 100mm						3	108.90								
End of Test Pit (TP dry upon completion)															

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 8-15**

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	109.30						
Dense, brown SILTY SAND		G	1			1	108.30						
End of Test Pit (TP dry upon completion)	3.00	G	2			3	106.30						
								20	40	60	80	100	
								Shear Strength (kPa)				▲ Undisturbed	△ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. TP 9-15

BORINGS BY Backhoe

DATE December 2, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	108.40					
TOPSOIL	0.20											
Brown SILTY SAND , trace cobbles												

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 10-15**

DATE December 2, 2015

SOIL PROFILE AND TEST DATA

FILE NO. PG3607

HOLE NO. **TP 11-15**

DATE December 2, 2015

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. TP 12-15

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	105.40						
Loose, brown SILTY SAND with gravel, cobbles and boulders			1										
1.20						1	104.40						
Compact, grey SILTY SAND			2										
3.00						2	103.40						
End of Test Pit (TP dry upon completion)						3	102.40						
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 13-15

BORINGS BY Backhoe

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	106.60						
Compact, brown SILTY SAND with gravel, cobbles and boulders - grey by 0.4m depth		G	1			1	105.60						
		G	2			2	104.60						
End of Test Pit (TP dry upon completion)	3.00					3	103.60						
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. TP 14-15

BORINGS BY Backhoe

DATE November 30, 2015


SOIL PROFILE AND TEST DATA

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

HOLE NO. **TP 15-15**

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	109.40						
FILL: Grey-brown silty clay with sand, gravel, cobbles, boulders and debris - rootlets in upper 200mm		G	1			1	108.40						
						2							
						3							
						4							
						5							
						6							
						7							
						8							
						9							
						10							
End of Test Pit (TP dry upon completion)						3	106.40						

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 16-15

BORINGS BY Backhoe

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE						0	108.50	20	40	60	80	
TOPSOIL												
0.40												
Compact, brown SILTY SAND , trace organics		G	1			1	107.50					
- grey by 0.9m depth												
		G	2			2	106.50					
3.00						3	105.50					
End of Test Pit												
(TP dry upon completion)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				


SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 17-15**

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	110.50						
FILL: Brown silty sand with gravel and cobbles, some boulders - rootlets in upper 150mm		G	1			1	109.50						
						2							
						3							
						4							
						5							
						6							
						7							
						8							
						9							
						10							
End of Test Pit (TP dry upon completion)	3.00	G	2			3	107.50						
								20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. TP 18-15

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY % 90°	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	107.40						
Dense to very dense, brown SILTY SAND , some gravel and cobbles, trace to some boulders - rootlets in upper 100mm													

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 19-15**

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	104.40					
Compact to very dense, brown SILTY SAND with gravel, some cobbles and boulders		G	1			1	103.40					
						2	102.40					
End of Test Pit (TP dry upon completion)						3	101.40					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 20-15**

DATE December 2, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL						0	101.90					
----- 0.20												
Loose, dark brown SILTY SAND , some gravel		G	1									
----- 0.70												
Stiff, light grey SILTY CLAY , some cobbles and boulders		G	2			1	100.90					
----- 1.50												
Very dense, light grey SILTY SAND with gravel, cobbles and boulders		G	3			2	99.90					
----- 3.00												
End of Test Pit						3	98.90					
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 21-15

BORINGS BY Backhoe

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE													
TOPSOIL	0.15					0	104.50						
Very stiff, brown CLAYEY SILT		G	1			1	103.50						
Dense to compact, brown SILTY SAND with clay		G	2			2	102.50						
End of Test Pit (TP dry upon completion)						3	101.50						
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 22-15**

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	104.40						
Loose, brown SILTY SAND with roots		G	1			1	103.40						
Very stiff, grey CLAYEY SILT		G	2			2	102.40						
End of Test Pit (Open hole GWL @ 1.6m depth)						3	101.40						

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 23-15**

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	107.00						
Compact, brown SILTY SAND - grey by 0.8m depth						1	106.00						
						2	105.00						
						3	104.00						
End of Test Pit (TP dry upon completion)													

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 24-15**

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Grey silty clay with sand, gravel, cobbles and boulders 0.80 Compact, brown SILTY SAND - grey by 2.0m depth 3.00 End of Test Pit (TP dry upon completion)		G	1			0	107.40					
		G	2			1	106.40					
		G	3			2	105.40					
						3	104.40					

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 25-15**

BORINGS BY Backhoe

DATE November 30, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 26-15**

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	107.70						
Compact, brown SILTY SAND - grey by 1.1m depth		G	1			1	106.70						
		G	2			2	105.70						
End of Test Pit (TP dry upon completion)	3.00					3	104.70						
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. TP 27-15

BORINGS BY Backhoe

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	109.90						
Compact, brown SILTY SAND with gravel, cobbles and boulders - grey by 0.8m depth		G	1			1	108.90						
	G	2			2	107.90							
End of Test Pit	3.00					3	106.90						
(TP dry upon completion)													

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded


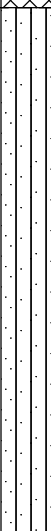
SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 28-15**

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	110.70						
FILL: Brown silty sand with gravel, some cobbles and boulders - rootlets in upper 150mm		G	1			1	109.70						
Compact, brown SILTY SAND , some gravel		G	2			2	108.70						
End of Test Pit (TP dry upon completion)						3	107.70						

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

HOLE NO. **TP 29-15**

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Dark brown silty sand with gravel and cobbles, trace boulders - rootlets in upper 100mm 0.70		G	1			0	106.20					
Dense, brown SILTY SAND , some gravel 2.00		G	2			1	105.20					
Dense, brown SILTY SAND with gravel, cobbles and boulders 3.00						2	104.20					
End of Test Pit (TP dry upon completion)						3	103.20					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 30-15**

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	106.50						
Very dense, brown SILTY SAND with gravel, cobbles and boulders						1	105.50						
						2	104.50						
End of Test Pit (TP dry upon completion)						3	103.50						

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. TP 31-15

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction		
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %						
								20	40	60	80			
GROUND SURFACE						0	105.50							
Very dense, brown SILTY SAND with gravel, cobbles and oversized boulders - rootlets in upper 100mm		G	1			1	104.50							
		G	2			2	103.50							
End of Test Pit (TP dry upon completion)	3.00					3	102.50							
								20	40	60	80	100		
								Shear Strength (kPa)						
								▲ Undisturbed △ Remoulded						

[illegible]

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	103.00						
Very dense, light brown SILTY SAND , some gravel, cobbles and boulders - rootlets in upper 200mm		G	1			1	102.00						
Compact, brown SILTY SAND , trace gravel		G	2			3	100.00						
End of Test Pit													
(TP dry upon completion)													

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 34-15

BORINGS BY Backhoe

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction			
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %							
								20	40	60	80				
GROUND SURFACE						0	103.70								
Loose, brown SILTY SAND with roots - grey by 0.5m depth	G	1				1	102.70								
						2	101.70								
	G	2				3	100.70								
End of Test Pit (TP dry upon completion)	3.10														
								20	40	60	80	100			
								Shear Strength (kPa)							
								▲ Undisturbed △ Remoulded							

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 35-15**

BORINGS BY Backhoe

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	103.90					
Loose to compact, brown SILTY SAND , trace gravel and rootlets - grey by 0.8m depth		G	1			1	102.90					
		G	2			2	101.90					
						3	100.90					
End of Test Pit (TP dry upon completion)	3.00											

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 36-15

BORINGS BY Backhoe

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction			
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %							
								20	40	60	80				
GROUND SURFACE						0	104.00								
Loose to compact, brown SILTY SAND , trace gravel and roots - grey by 0.7m depth		G	1												
						1	103.00								
		G	2												
						2	102.00								
End of Test Pit (TP dry upon completion)	3.00					3	101.00								
								20	40	60	80	100			
								Shear Strength (kPa)							
								▲ Undisturbed △ Remoulded							

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 37-15**

BORINGS BY Backhoe

DATE November 23, 2015

SOIL PROFILE AND TEST DATA

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

HOLE NO. **TP 38-15**

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	104.40						
Loose to compact, brown SILTY SAND , trace to some gravel, cobbles and roots - grey by 0.9m depth						1	103.40						
						2	102.40						
						3	101.40						
End of Test Pit (TP dry upon completion)	3.00												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

REMARKS

HOLE NO. **TP 39-15**

BORINGS BY Backhoe

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	105.20						
Loose to compact, brown SILTY SAND - grey by 0.8m depth													
		G	1										
		G	2			2	103.20						
										</			

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 41-15**

BORINGS BY Backhoe

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	107.20					
Compact, brown SILTY SAND - grey by 0.4m depth		G	1			1	106.20					
		G	2			2	105.20					
End of Test Pit (TP dry upon completion)	3.00					3	104.20					

Shear Strength (kPa)
 ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. TP 42-15

BORINGS BY Backhoe

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	107.90					
Compact, brown SILTY SAND with gravel, cobbles and boulders - grey by 0.7m depth		G	1									
						1	106.90					
		G	2			2	105.90					
End of Test Pit (TP dry upon completion)	3.10					3	104.90					
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.


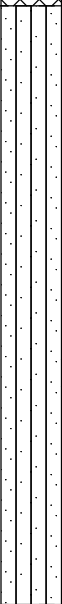
FILE NO.
PG3607

REMARKS

HOLE NO.
TP 43-15

BORINGS BY Backhoe

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction			
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %							
								20	40	60	80				
GROUND SURFACE						0	110.20								
FILL: Compact, brown silty sand with gravel, cobbles and boulders - rootlets in upper 150mm		G	1												
0.80															
Compact, brown SILTY SAND		G	2			1	109.20								
						2	108.20								
3.00						3	107.20								
End of Test Pit (TP dry upon completion)															
								20	40	60	80	100			
								Shear Strength (kPa)							
								▲ Undisturbed △ Remoulded							


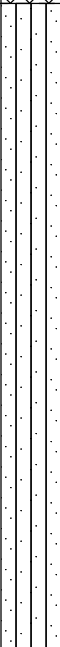
SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. TP 44-15

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Dark brown, silty sand with gravel, cobbles and boulders - rootlets in upper 100mm		G	1			0	107.80					
0.60												
Very dense, brown SILTY SAND with gravel, cobbles and boulders		G	2			1	106.80					
2						2	105.80					
3.00												
End of Test Pit (TP dry upon completion)						3	104.80					

DATUM Geodetic elevations interpolated from City of Ottawa basemap.



FILE NO. PG3607

REMARKS

HOLE NO. **TP 45-15**

BORINGS BY Backhoe

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	104.60					
FILL: Brown silty sand with gravel, cobbles and boulders - rootlets in upper 100mm		G	1									
0.70 ----- Dense to very dense, brown SILTY SAND with gravel, cobbles and boulders						1	103.60					
2 ----- 3.00 End of Test Pit (TP dry upon completion)		G	2			2	102.60					
						3	101.60					

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

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 46-15**

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	105.40						
Very dense, brown SILTY SAND with gravel, cobbles and boulders						1	104.40						
						2	103.40						
End of Test Pit (TP dry upon completion)						3	102.40						

20406080100

Shear Strength (kPa)

▲ Undisturbed△ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 47-15**

DATE December 1, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	106.00						
Dense to very dense, brown SILTY SAND with gravel, cobbles and occasional large boulders - rootlets in upper 100mm						1	105.00						
						2	104.00						
						3	103.00						
End of Test Pit (TP dry upon completion)	3.00												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded


SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 48-15**

DATE December 2, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	104.80						
Very dense, light brown SILTY SAND with gravel, cobbles and boulders - rootlets in upper 150mm		G	1			1	103.80						
	2.00		G	2		2	102.80						
Compact, brown SILTY SAND , trace gravel													
	3.00					3	101.80						
End of Test Pit (TP dry upon completion)													
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					


SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. TP 49-15

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	103.00						
Loose compact, brown SILTY SAND with roots in upper 300mm - grey by 1.3m depth		G	1			1	102.00						
						2							
						3							
						4							
						5							
						6							
						7							
						8							
						9							
						10							
End of Test Pit (TP dry upon completion)						3	100.00						

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 50-15**

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15					0	102.40					
Loose to compact, brown SILTY SAND - grey by 1.1m depth		G	1			1	101.40					
		G	2			2	100.40					
		G	3			3	99.40					
End of Test Pit	3.00											
(Open hole GWL @ 2.9m depth)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 51-15**

BORINGS BY Backhoe

DATE November 23, 2015

[illegible]

DATUM Geodetic elevations interpolated from City of Ottawa basemap.


FILE NO. PG3607

REMARKS

HOLE NO. **TP 52-15**

BORINGS BY Backhoe

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	103.10						
Loose to compact, brown SILTY SAND , some roots in upper 100mm - grey by 0.5m depth		G	1			1	102.10						
		G	2			2	101.10						
End of Test Pit (TP dry upon completion)						3	100.10						

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

FILE NO. PG3607

HOLE NO. **TP 53-15**

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	103.20					
Loose, brown SILTY SAND , trace gravel and cobbles. Roots in upper 400mm		G	1									
		G	2									
End of Test Pit (TP dry upon completion)	3.00					3	100.20					
								20 40 60 80 100 Shear Strength (kPa) ▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 54-15**

BORINGS BY Backhoe

DATE November 23, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	105.00						
Loose to compact, brown SILTY SAND with trace to some gravel, cobbles and roots - grey by 0.9m depth		G	1										
						1	104.00						
		G	2			2	103.00						
						3	102.00						
End of Test Pit (TP dry upon completion)	3.10												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 55-15**

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	105.30						
Compact, brown SILTY SAND - rootlets in upper 100mm - grey by 0.9m depth		G	1			1	104.30						
		G	2			2	103.30						
End of Test Pit (TP dry upon completion)	3.00					3	102.30						
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 56-15

BORINGS BY Backhoe

DATE November 30, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	106.50						
Compact, brown SILTY SAND - rootlets in upper 200mm - grey by 1.1m depth		G	1			1	105.50						
						2	104.50						
						3	103.50						
End of Test Pit (TP dry upon completion)	3.00												
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

Geotechnical Investigation Barrhaven South Urban Expansion Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 57-15**

BORINGS BY Backhoe

DATE November 24, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15		G	1		0	109.00					
Brown SILTY SAND - with gravel, cobbles and boulders from 1.0 to 1.3m depth - grey by 1.3m depth			G	2		1	108.00					
			G	3								
							2	107.00				
End of Test Pit (TP dry upon completion)	3.00					3	106.00					
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 58-15**

BORINGS BY Backhoe

DATE November 24, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15					0	107.60					
Red-brown to grey SILTY SAND with gravel, cobbles and boulders		G	1									
		G	2									
		G	3									
		G	4			1	106.60					
	1.20											
Grey SILTY SAND		G	5									
						2	105.60					
	2											
	3.00					3	104.60					
Grey SILTY SAND with gravel, cobbles and boulders	3.20											
End of Test Pit												
(TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 59-15**

DATE November 24, 2015

[illegible]

[illegible]

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 61-15

BORINGS BY Backhoe

DATE November 24, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	104.90						
Very dense, grey-brown SILTY SAND with gravel, cobbles and boulders						1	103.90						
						2	102.90						
End of Test Pit (TP dry upon completion)	2.20												
								Shear Strength (kPa)					
								20	40	60	80	100	
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 62-15

BORINGS BY Backhoe

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE						0	101.40	20	40	60	80	
TOPSOIL												
	0.30											
Brown SILTY SAND		G	1									
- grey by 0.9m depth						1	100.40					
		G	2									
						2	99.40					
		G	3									
						3	98.40					
End of Test Pit	3.00											
(Open hole GWL @ 2.5m depth)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 63-15**

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15					0	101.60					
Brown SILTY SAND , some clay		G	1									
		G	2									
						1	100.60					
End of Test Pit	3.00					2	99.60					
(TP dry upon completion)						3	98.60					

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

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 64-15**

DATE November 20, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. TP 65-15

BORINGS BY Backhoe

DATE November 20, 2015

[illegible]

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 66-15

BORINGS BY Backhoe

DATE December 2, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL	0.25	G	1			0	105.00					
Compact, brown SILTY SAND						1	104.00					
						2	103.00					
						3	102.00					
End of Test Pit (TP dry upon completion)	3.00	G	2									
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. TP 67-15

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	110.60						
Compact, brown SILTY SAND with gravel - grey by 2.3m depth		G	1			1	109.60						
						2	108.60						
		G	2			3	107.60						
End of Test Pit (TP dry upon completion)	3.00												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 68-15**

BORINGS BY Backhoe

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL ----- 0.10						0	107.30					
Loose SANDY SILT ----- 0.30		G	1									
		G	2									
						1	106.30					
Compact, brown SILTY SAND												
						2	105.30					
		G	3									
----- 3.00						3	104.30					
End of Test Pit												
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 69-15**

BORINGS BY Backhoe

DATE November 24, 2015

[illegible]

SOIL PROFILE AND TEST DATA

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 70-15**

BORINGS BY Backhoe

DATE November 24, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. TP 71-15

DATE November 24, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	103.10						
Dense, grey-brown SILTY SAND with gravel, cobbles and boulders		G	1										
		G	2										
						1	102.10						

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 72-15

BORINGS BY Backhoe

DATE November 24, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction			
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %							
								20	40	60	80				
GROUND SURFACE						0	101.70								
Brown SILTY SAND with gravel, cobbles and boulders, trace clay		G	1			1	100.70								
		G	2			2	99.70								
Brown SILTY SAND		G	3			3	98.70								
End of Test Pit (TP dry upon completion)															

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

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. TP 73-15

BORINGS BY Backhoe

DATE November 24, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction		
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %						
								20	40	60	80			
GROUND SURFACE						0	102.10							
Dark brown to grey-brown SILTY SAND with gravel, cobbles and boulders, trace clay						1	101.10							
		G	1											
		G	2											
						2	100.10							
		G	3											
End of Test Pit (TP dry upon completion)						3	99.10							

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation Barrhaven South Urban Expansion Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 74-15**

BORINGS BY Backhoe

DATE November 24, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. TP 75-15

DATE November 24, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction		
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %						
								20	40	60	80			
GROUND SURFACE						0	98.00							
Dark brown SILTY SAND with gravel and cobbles, trace clay - grey by 1.1m depth						1	97.00							
						2	96.00							
						2.90								
End of Test Pit (TP dry upon completion)														

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. TP 76-15

BORINGS BY Backhoe

DATE November 24, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 77-15**

BORINGS BY Backhoe

DATE November 24, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	98.40						
Grey SILTY SAND with gravel, cobbles and boulders													
End of Test Pit (TP dry upon completion)	3.00					3	95.40						
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 78-15

BORINGS BY Backhoe

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15					0	100.80					
Brown SILTY SAND - grey by 0.8m depth		G	1									
		G	2			1	99.80					
CLAYEY SILT	1.60											
		G	3			2	98.80					
		G	4									
	3.00					3	97.80					
End of Test Pit (TP dry upon completion)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 79-15

BORINGS BY Backhoe

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	100.80					
TOPSOIL												
	0.35											
		G	1									
						1	99.80					
						2	98.80					
		G	2									
	3.00					3	97.80					
End of Borehole (TP dry upon completion)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

Very stiff, brown **SILTY CLAY**

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 80-15

BORINGS BY Backhoe

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.20					0	101.10					
Loose to compact, orange-brown SILTY SAND		G	1									
- grey by 0.8m depth		G	2			1	100.10					
						2	99.10					
	2.50											
SILTY CLAY		G	3									
	3.00											
End of Test Pit						3	98.10					
(TP dry upon completion)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 81-15**

BORINGS BY Backhoe

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	101.80						
TOPSOIL													
	0.30												
Brown SILTY SAND		G	1										
	1.05					1	100.80						
Very stiff, brown SILTY CLAY						2	99.80						

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 82-15

BORINGS BY Backhoe

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	102.50					
Brown SILTY SAND - rootlets in upper 100mm - grey by 0.5m depth		G	1									
		G	2			1	101.50					
	1.55											
Stiff to very stiff, brown SILTY CLAY		G	3			2	100.50					
	3.00					3	99.50					
End of Test Pit (TP dry upon completion)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 83-15**

BORINGS BY Backhoe

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	104.90						
Orange SILTY SAND - grey by 0.7m depth		G	1										
		G	2			1	103.90						
						2	102.90						
						3	101.90						
End of Test Pit (TP dry upon completion)	3.00												
<div>Shear Strength (kPa) ▲ Undisturbed △ Remoulded</div>													

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 84-15**

BORINGS BY Backhoe

DATE November 20, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	108.00					
TOPSOIL												
- - - - - 0.30												
SILTY SAND with gravel		G	1									
- - - - - 0.60												
		G	2			1	107.00					
		G	3									
SILTY SAND		G	4									
- trace clay by 1.2m depth						2	106.00					
- - - - - 3.00						3	105.00					
End of Test Pit												
(TP dry upon completion)												

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 85-15**

DATE November 19, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15		G	1		0	106.20					
Grey-brown SILTY SAND with gravel, cobbles and boulders			G	2		1	105.20					
			G	3		2	104.20					
End of Test Pit	2.90											
(TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 86-15**

BORINGS BY Backhoe

DATE November 19, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15					0	103.00					
Brown SILTY SAND , some gravel and cobbles		G	1									
	0.90					1	102.00					
Grey SILTY SAND		G	2									
						2	101.00					
		G	3									
						3	100.00					
End of Test Pit	3.10											
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 87-15**

BORINGS BY Backhoe

DATE November 19, 2015

[illegible]

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 88-15**

BORINGS BY Backhoe

DATE November 19, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 89-15**

BORINGS BY Backhoe

DATE November 19, 2015

[illegible]

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 91-15**

DATE November 19, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	100.60						
Brown to grey SILTY SAND with gravel, cobbles and boulders						1	99.60						
						2	98.60						
						3	97.60						
End of Test Pit (TP dry upon completion)	3.00												
Shear Strength (kPa) ▲ Undisturbed △ Remoulded													

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. TP 92-15

DATE November 19, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	98.20						
Brown SILTY SAND with gravel, cobbles and boulders - grey by 1.0m depth		G	1										
		G	2										
		G	3										
End of Test Pit (TP dry upon completion)	3.00					3	95.20						
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 93-15**

DATE November 19, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Brown silty sand with gravel, cobbles and boulders, trace clay	0.25					0	98.60					
TOPSOIL	1.20	G	1			1	97.60					
Grey SILTY SAND, trace clay	1.90	G	2									
Grey SILTY SAND with gravel, cobbles and boulders, trace clay	2.60	G	3			2	96.60					
End of Test Pit (TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 94-15**

BORINGS BY Backhoe

DATE November 17, 2015

[illegible]

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 95-15

BORINGS BY Backhoe

DATE November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	99.90						
TOPSOIL	0.25												
Loose, brown SILTY SAND - grey by 0.8m depth		G	1										
		G	2			1	98.90						
		G	3										
		G	4			2	97.90						
End of Test Pit	2.70												
(Open hole GWL @ 1.6m depth)													
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP 96-15**

BORINGS BY Backhoe

DATE November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.12					0	100.00					
Loose, brown SILTY SAND -grey by 0.8m depth												
		G	1									
		G	2			1	99.00					
		G	3			2	98.00					
End of Test Pit	2.95											
(TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP 97-15

BORINGS BY Backhoe

DATE November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	100.20					
TOPSOIL	0.23											
Loose to compact, brown SILTY SAND , trace clay and gravel - grey by 1.1m depth		G	1									
		G	2									
		G	3									
End of Test Pit (TP dry upon completion)	3.00					3	97.20					
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 98-15**

DATE November 17, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP 99-15**

DATE November 17, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP100-15**

BORINGS BY Backhoe

DATE November 17, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP101-15**

BORINGS BY Backhoe

DATE November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL	0.18					0	102.10					
Brow SILTY SAND , trace gravel and cobbles	0.50											
Loose to compact, grey SILTY SAND		G	1			1	101.10					
		G	2									
		G	3			2	100.10					
End of Test Pit	2.90											
(TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP102-15**

BORINGS BY Backhoe

DATE November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15					0	103.00					
Brown SILTY SAND , trace gravel and cobbles	0.65	G	1									
		G	2									
						1	102.00					
Loose to compact, grey SILTY SAND , trace clay		G	3									
						2	101.00					
						3	100.00					
End of Test Pit	3.20											
(TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO.
PG3607

REMARKS

HOLE NO.
TP103-15

BORINGS BY Backhoe

DATE November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.20					0	105.50					
Compact, dark brown to grey SILTY SAND with gravel, cobbles and boulders		G	1			1	104.50					
		G	2									
Loose, grey SILTY SAND	1.50					2	103.50					
		G	3									
End of Test Pit (TP dry upon completion)	3.00					3	102.50					
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP104-15**

DATE November 18, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL						0	102.60					
Brown SILTY SAND , trace gravel, cobbles and boulders		G	1									
Grey SILTY SAND		G	2			1	101.60					
						2	100.60					
End of Test Pit (TP dry upon completion)		G	3			3	99.60					

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP105-15**

BORINGS BY Backhoe

DATE November 19, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.23					0	103.60					

Loose, brown SILTY SAND , some gravel, cobbles and boulders		G	1									
-----	1.20					1	102.60					
Grey SILTY SAND												
-----	2.20					2	101.60					
Loose grey SILTY SAND , some gravel, cobbles and boulders		G	2									
-----	2.70											
End of Test Pit												
(TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP106-15**

BORINGS BY Backhoe

DATE November 19, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.20					0	104.50					
Dark brown to grey SILTY SAND with gravel, cobbles and boulders												
		G	1									
		G	2			1	103.50					
Grey SILTY SAND						2	102.50					
		G	3									
End of Test Pit (TP dry upon completion)	3.10					3	101.50					
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP107-15**

DATE November 19, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	103.20					
Brown to grey SILTY SAND with gravel, cobbles and boulders		G	1									
		G	2									
		G	3									
End of Test Pit (TP dry upon completion)	3.00					3	100.20					

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP108-15**

BORINGS BY Backhoe

DATE November 19, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP109-15**

DATE November 19, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.10					0	99.00					
Brown to grey SILTY SAND with gravel, cobbles and boulders, trace clay		G	1			1	98.00					
	G	2										
End of Test Pit	2.00					2	97.00					
(TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP110-15**

DATE November 19, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE													
TOPSOIL	0.05					0	98.50						
Red-brown to grey SILTY SAND with gravel, cobbles and boulders, trace clay		G	1			1	97.50						
		G	2										
		G	3			2	96.50						
End of Test Pit	3.00					3	95.50						
(TP dry upon completion)													

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP111-15**

DATE November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	99.50						
TOPSOIL	0.20												
Compact, brown SILTY SAND - grey by 1.2m depth		G	1										
		G	2			1	98.50						
		G	3										
						2	97.50						
End of Test Pit	2.60												
(Open hole GWL @ 1.5m depth)													
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

SOIL PROFILE AND TEST DATA

Geotechnical Investigation Barrhaven South Urban Expansion Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP112-15**

BORINGS BY Backhoe

DATE November 18, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL	0.23					0	99.60					
Loose to compact, brown SILTY SAND - grey by 1.4m depth		G	1									
						1	98.60					
		G	2									
		G	3									
						2	97.60					
End of Test Pit	2.90											
(Open hole GWL @ 1.5m depth)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario

DATUM Geodetic elevations interpolated from City of Ottawa basemap.


FILE NO.
PG3607

REMARKS

HOLE NO.
TP113-15

BORINGS BY Backhoe

DATE November 18, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	100.00					
TOPSOIL	0.20											
Compact, brown SILTY SAND with clay - grey by 1.4m depth		G	1			1	99.00					▽
		G	2			2	98.00					
		G	3			3	97.00					
End of Test Pit	3.10					3	97.00					
(Open hole GWL @ 1.5m depth)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP114-15**

BORINGS BY Backhoe

DATE November 18, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	100.00						
TOPSOIL	0.25												
Loose to compact, grey-brown SILTY SAND - grey by 1.2m depth		G	1			1	99.00						
		G	2										
						2	98.00						
End of Test Pit	3.00	G	3			3	97.00						
(Open hole GWL @ 1.5m depth)													
								20	40	60	80	100	
								Shear Strength (kPa)					
								▲ Undisturbed △ Remoulded					

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP115-15**

BORINGS BY Backhoe

DATE November 18, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP116-15**

DATE November 18, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP117-15**

DATE November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction		
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %						
								20	40	60	80			
GROUND SURFACE														
TOPSOIL	0.17					0	101.30							
Brown SILTY SAND , trace clay - grey by 1.4m depth						1	100.30							
		G	1											
		G	2											
		G	3											
							2	99.30						
			G	4										
End of Test Pit	3.00					3	98.30							
(TP dry upon completion)														

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP118-15**

BORINGS BY Backhoe

DATE November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15					0	101.70					
Brown SILTY SAND - with trace clay and grey by 1.3m depth												
End of Test Pit (TP dry upon completion)	3.00					3	98.70					
<div>Shear Strength (kPa)</div> <div>▲ Undisturbed △ Remoulded</div>												

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

DATUM Geodetic elevations interpolated from City of Ottawa basemap.

FILE NO. PG3607

REMARKS

HOLE NO. **TP119-15**

BORINGS BY Backhoe

DATE November 17, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction	
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %					
								20	40	60	80		
GROUND SURFACE						0	102.80						
TOPSOIL	0.20		G	1									
Brown SILTY SAND , trace gravel - grey by 1.0m depth			G	2		1	101.80						
			G	3									
						2	100.80						
			G	4									
- boulder noted at 2.5m depth													
End of Test Pit	3.10					3	99.80						
(BH dry upon completion)													

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP120-15**

DATE November 18, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP121-15**

DATE November 18, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.23					0	102.40					
Loose to compact, brown SILTY SAND with gravel, cobbles and boulders - grey by 0.7m depth												
		G	1									
		G	2			1	101.40					
End of Test Pit	3.00	G	3			3	99.40					
(TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP122-15**

DATE November 18, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	102.10					
TOPSOIL	0.16											
Loose red-brown SILTY SAND , trace cobbles and gravel						1	101.10					
	1.20											
		G	1									
		G	2			2	100.10					
Loose, grey SILTY SAND												
	3.00											
End of Test Pit		G	3			3	99.10					
(TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP123-15**

DATE November 18, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction		
		TYPE	NUMBER	% RECOVERY	N VALUE or RQD			○ Water Content %						
								20	40	60	80			
GROUND SURFACE						0	100.50							
Loose, red to grey-brown SILTY SAND , some gravel, cobbles and boulders - gbye by 1.0m depth						1	99.50							▽
		G	1											
		G	2											
	1.80					2	98.50							
Loose, grey SILTY SAND														
	2.70													
End of Test Pit (Open hole GWL @ 1.8m depth)														

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP124-15**

DATE November 18, 2015

[illegible]

SOIL PROFILE AND TEST DATA

**Geotechnical Investigation
Barrhaven South Urban Expansion
Ottawa, Ontario**

FILE NO. PG3607

HOLE NO. **TP125-15**

DATE November 18, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL	0.10					0	98.10					
Compact, brown SILTY SAND , trace clay and gravel	0.30	G	1									
		G	2			1	97.10					
Compact, grey SILTY SAND with gravel, cobbles, boulders and clay						2	96.10					
		G	3									
End of Test Pit	3.00					3	95.10					
(Open hole GWL @ 2.6m depth)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

DATUM Ground surface elevations provided by J.D. Barnes Limited.

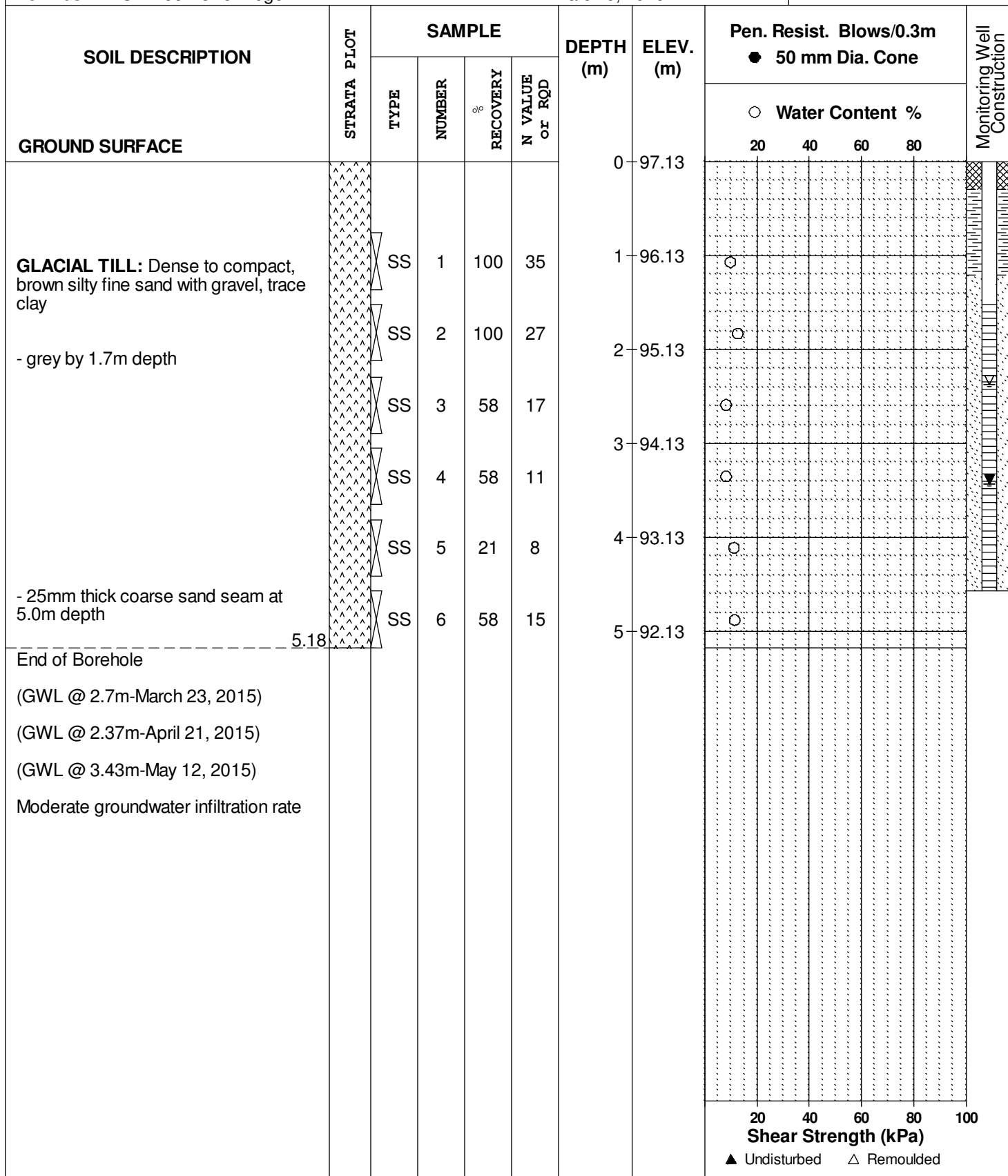
REMARKS

BORINGS BY CME 55 Power Auger

DATE March 6, 2015

FILE NO.
PG3450

HOLE NO.
BH 1-15



SOIL PROFILE AND TEST DATA

Hydrogeological Investigation
Residential Development - Half Moon Bay South
Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

REMARKS

BORINGS BY CME 55 Power Auger

DATE March 6, 2015

FILE NO.
PG3450

HOLE NO.
BH 2-15

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
Dense, brown SILTY fine to medium SAND						0	98.62					
- brown by 0.8m depth	1.20	SS	1	100	31	1	97.62	○				
Compact, brown SILTY FINE SAND		SS	2	92	23	2	96.62	○				
		SS	3	75	19	3	95.62	○				
	3.66	SS	4	100	24	4	94.62	○				
- running sand by 3.7m depth												
Compact, brown SILTY fine to medium SAND	4.57	SS	5	100	10	4	94.62	○				
End of Borehole												
(GWL @ 2.64m-March 23, 2015)												
(GWL @ 2.36m-April 21, 2015)												
(GWL @ 2.30m-May 12, 2015)												
High groundwater infiltration rate												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Hydrogeological Investigation
Residential Development - Half Moon Bay South
Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

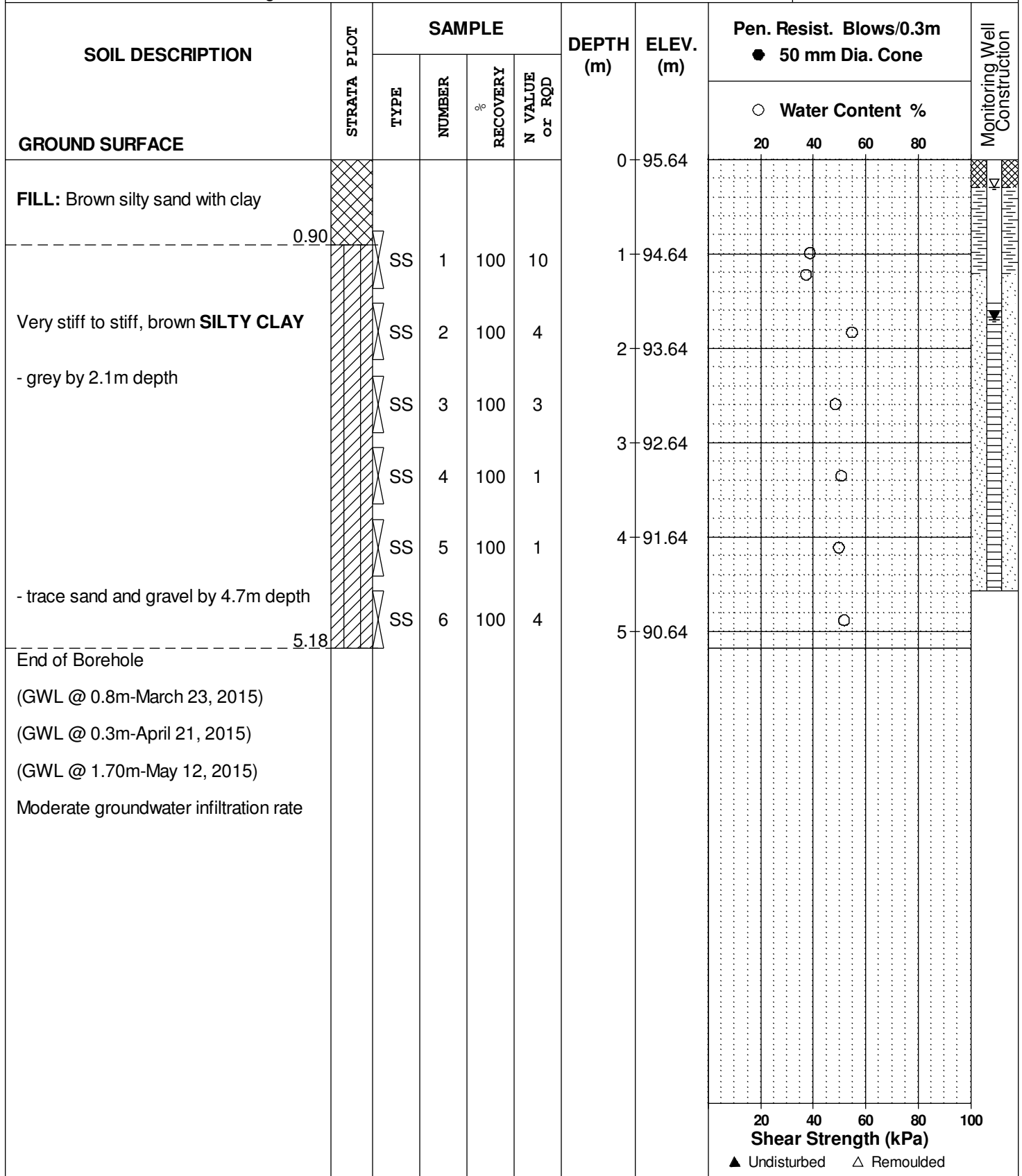
REMARKS

BORINGS BY CME 55 Power Auger

DATE March 6, 2015

FILE NO.
PG3450

HOLE NO.
BH 3-15



DATUM Ground surface elevations provided by J.D. Barnes Limited.

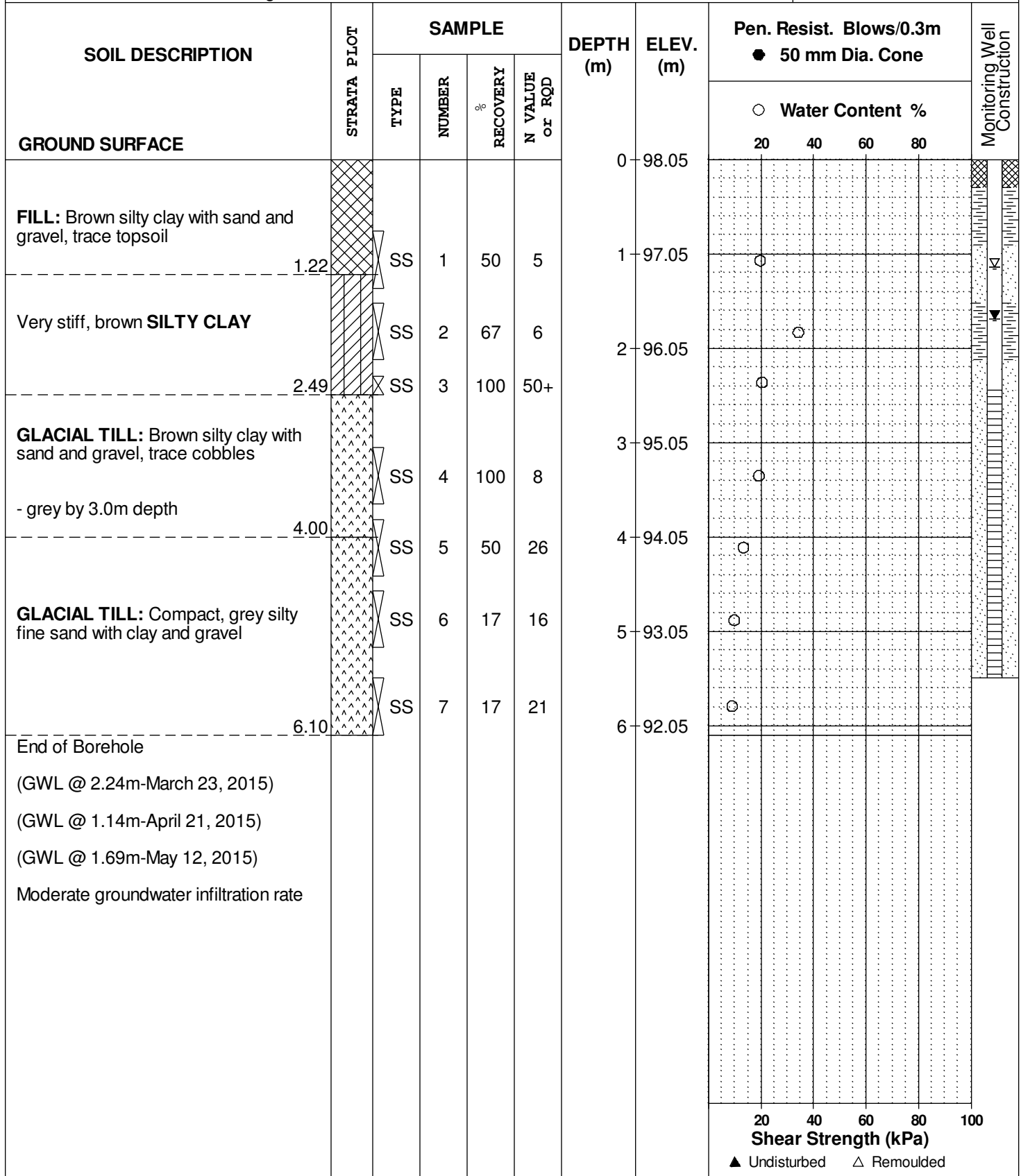
REMARKS

BORINGS BY CME 55 Power Auger

DATE March 6, 2015

FILE NO.
PG3450

HOLE NO.
BH 4-15



DATUM Ground surface elevations provided by J.D. Barnes Limited.

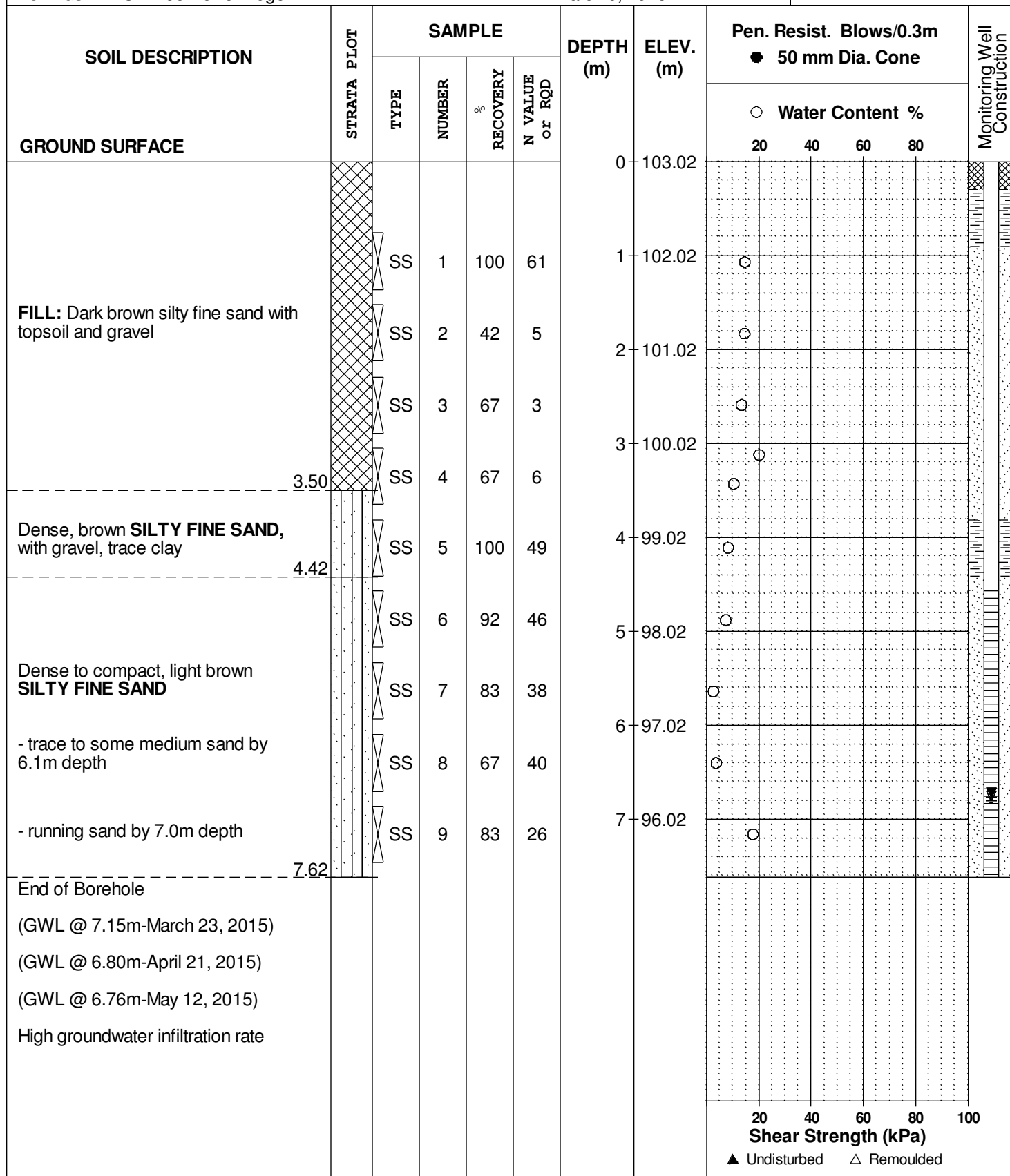
REMARKS

BORINGS BY CME 55 Power Auger

DATE March 6, 2015

FILE NO.
PG3450

HOLE NO.
BH 5-15



SOIL PROFILE AND TEST DATA

Hydrogeological Investigation
Residential Development - Half Moon Bay South
Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

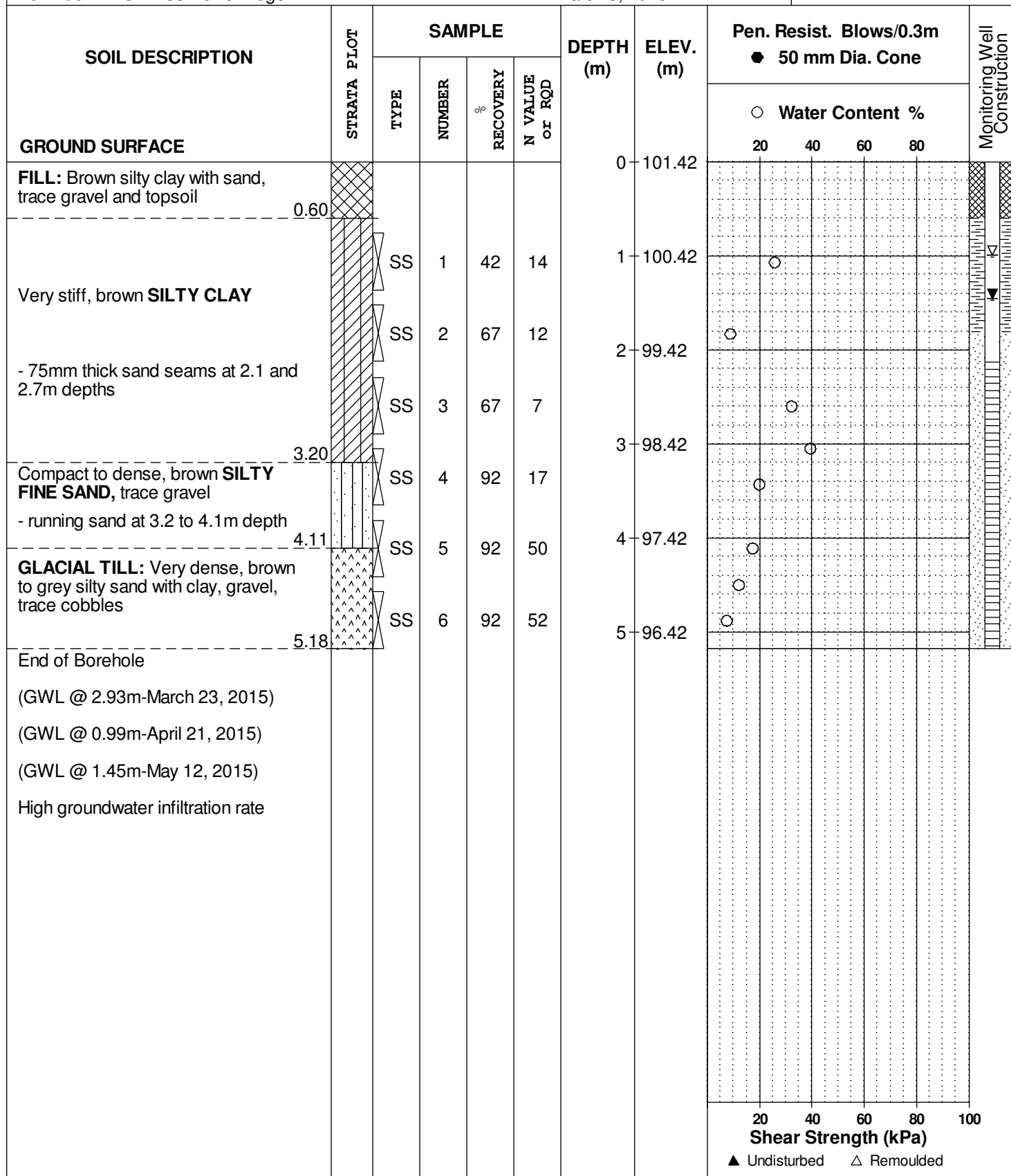
REMARKS

BORINGS BY CME 55 Power Auger

DATE March 5, 2015

FILE NO.
PG3450

HOLE NO.
BH 6-15



SOIL PROFILE AND TEST DATA

Hydrogeological Investigation
Residential Development - Half Moon Bay South
Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

REMARKS

BORINGS BY CME 55 Power Auger

DATE March 5, 2015

FILE NO.
PG3450

HOLE NO.
BH 7-15

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
FILL: Brown silty sand with gravel, trace clay and topsoil	0.60					0	100.16					
Compact to dense, light brown SILTY FINE SAND - brown by 2.9m depth		SS	1	50	14	1	99.16					
		SS	2	96	25	2	98.16					
		SS	3	92	37	3	97.16					
		SS	4	100	33	4	96.16					
		SS	5	92	20	5	95.16					
		SS	6	88	38	6	94.16					
End of Borehole	5.49											
(GWL @ 4.43m-March 23, 2015)												
(GWL @ 3.67m-April 21, 2015)												
(GWL @ 3.71m-May 12, 2015)												
High groundwater infiltration rate												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Hydrogeological Investigation Residential Development - Half Moon Bay South Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

FILE NO. PG3450

REMARKS

HOLE NO. **BH 8-15**

BORINGS BY CME 75 Power Auger

DATE May 7, 2015

[illegible]

SOIL PROFILE AND TEST DATA

Hydrogeological Investigation
Residential Development - Half Moon Bay South
Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

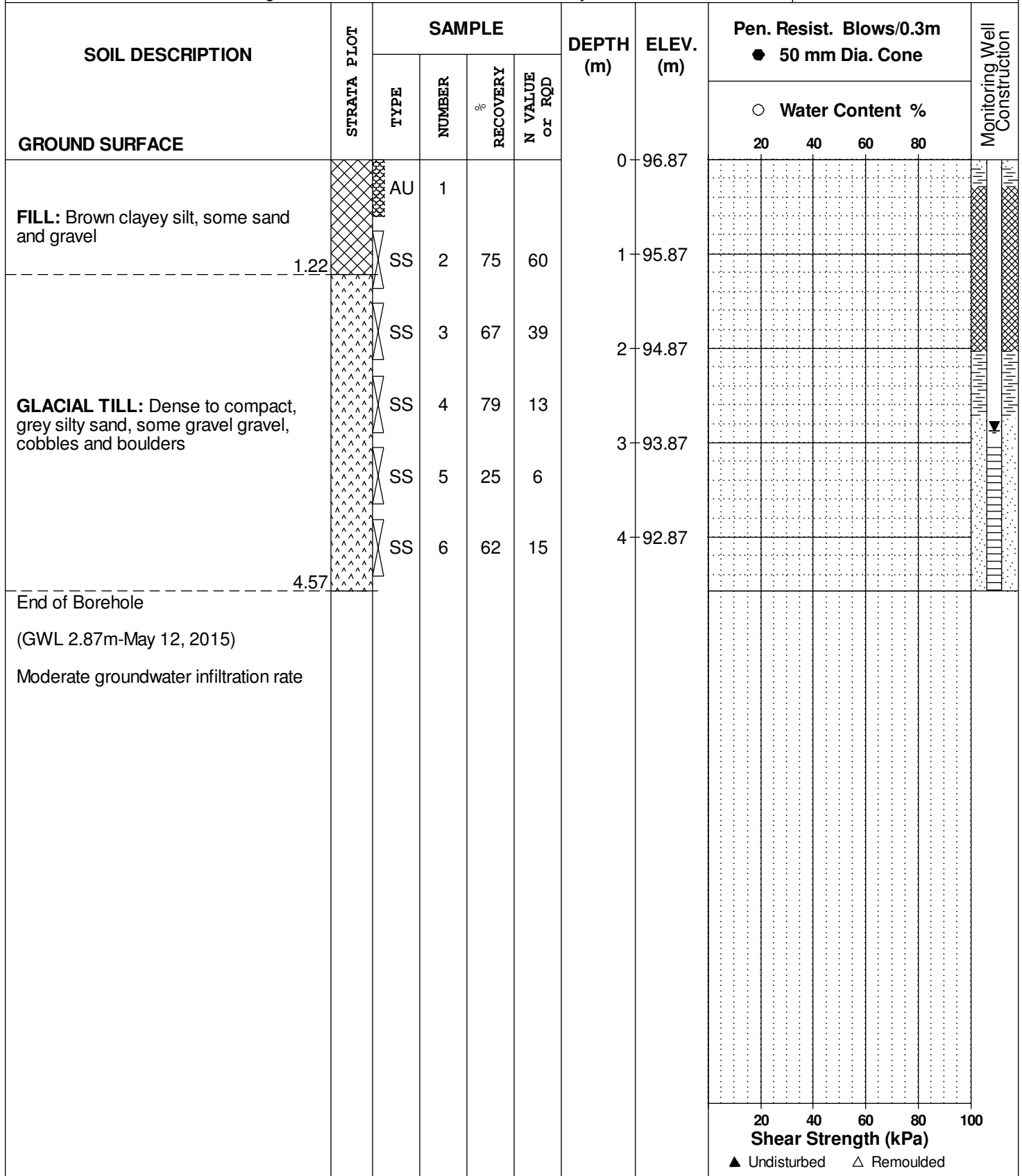
REMARKS

BORINGS BY CME 75 Power Auger

DATE May 7, 2015

FILE NO.
PG3450

HOLE NO.
BH 9-15



SOIL PROFILE AND TEST DATA

Hydrogeological Investigation Residential Development - Half Moon Bay South Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.





FILE NO. PG3450

REMARKS

HOLE NO. **BH10-15**

BORINGS BY CME 75 Power Auger

DATE May 7, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
Compact, brown SILTY SAND , trace gravel and cobbles		AU	1			0	96.91					
		SS	2	75	16	1	95.91					
Compact to loose, brown SAND , trace silt		SS	3	67	14	2	94.91					
		SS	4	92	8							
		SS	5	83	34	3	93.91					
GLACIAL TILL: Dense, grey silty sand, some gravel and cobbles												
End of Borehole												
(GWL 0.99m-May 12, 2015)												
High groundwater infiltration rate												

SOIL PROFILE AND TEST DATA

Hydrogeological Investigation
Residential Development - Half Moon Bay South
Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

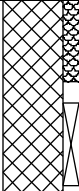
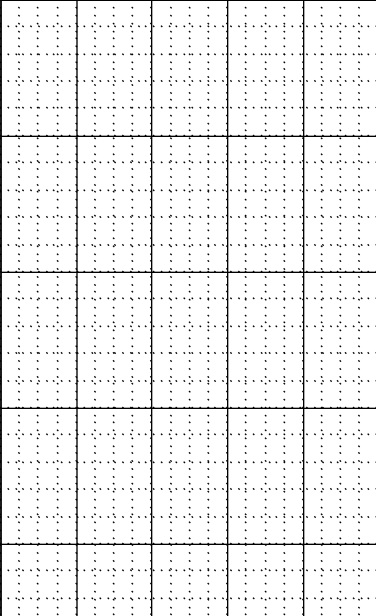
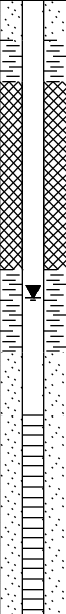
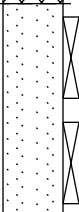
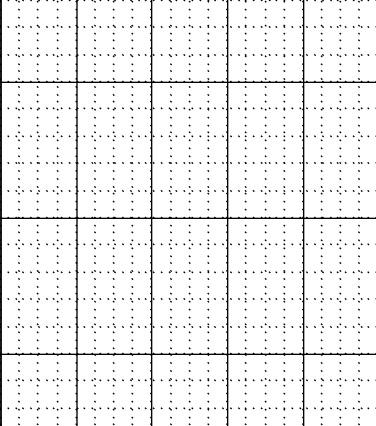
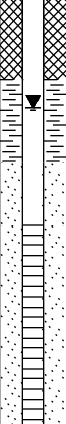

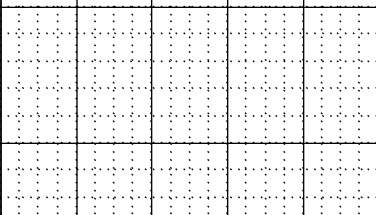
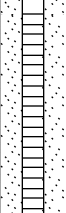
REMARKS

BORINGS BY CME 75 Power Auger

DATE May 8, 2015

FILE NO.
PG3450

HOLE NO.
BH11-15

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
FILL: Brown silty sand, some gravel, cobbles and boulders		AU	1			0	98.24					
		SS	2	62	13	1	97.24					
	1.42											
Compact, brown SAND, trace silt		SS	3	75	20	2	96.24					
		SS	4	79	22							
	3.05											
Compact to loose, brown SILTY SAND		SS	5	92	22	3	95.24					
		SS	6	100	6	4	94.24					
	4.57											
End of Borehole (GWL 2.19m-May 12, 2015) High groundwater infiltration rate												

SOIL PROFILE AND TEST DATA

Hydrogeological Investigation
Residential Development - Half Moon Bay South
Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

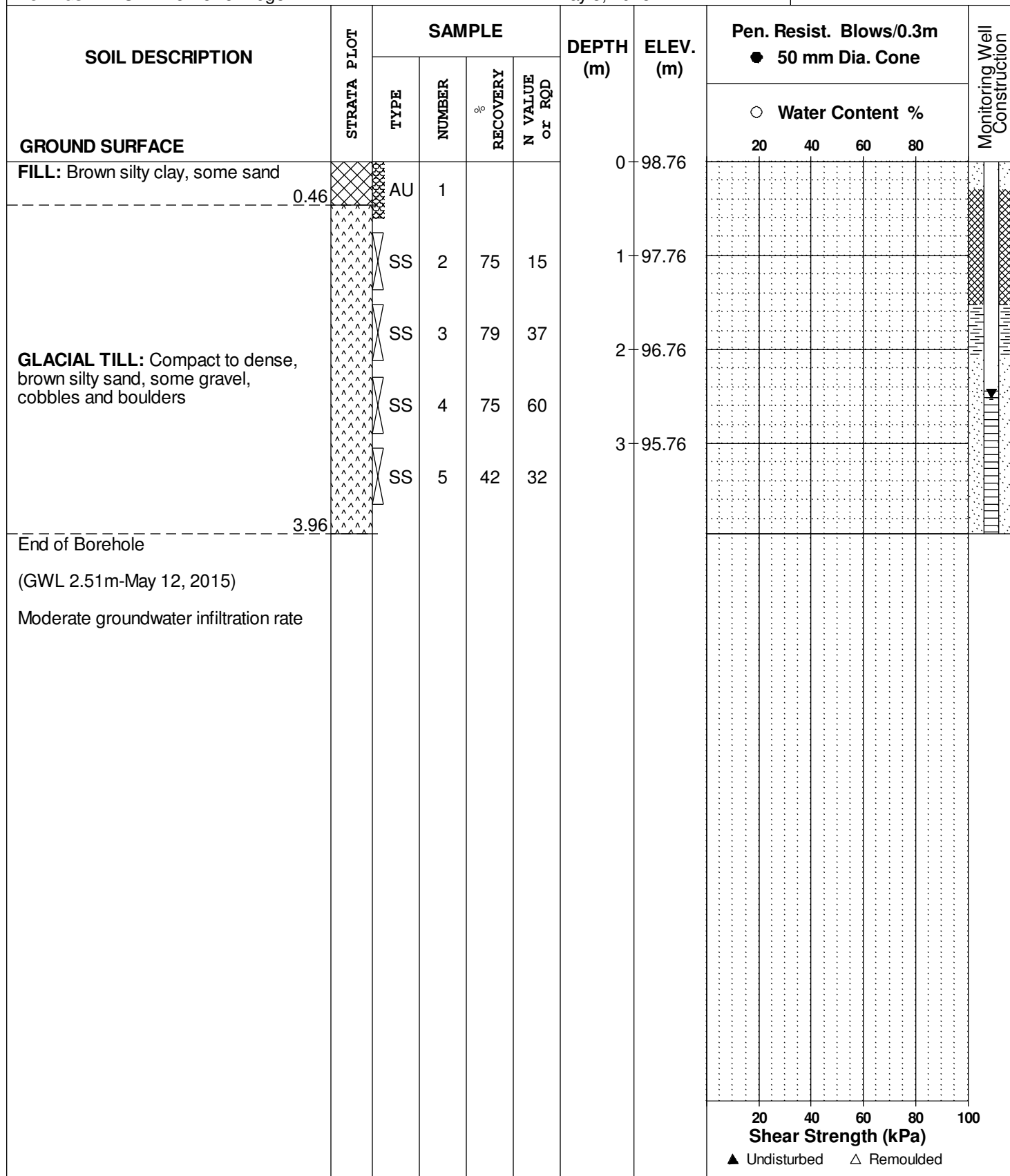
REMARKS

BORINGS BY CME 75 Power Auger

DATE May 8, 2015

FILE NO.
PG3450

HOLE NO.
BH12-15



SOIL PROFILE AND TEST DATA

Hydrogeological Investigation
Residential Development - Half Moon Bay South
Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

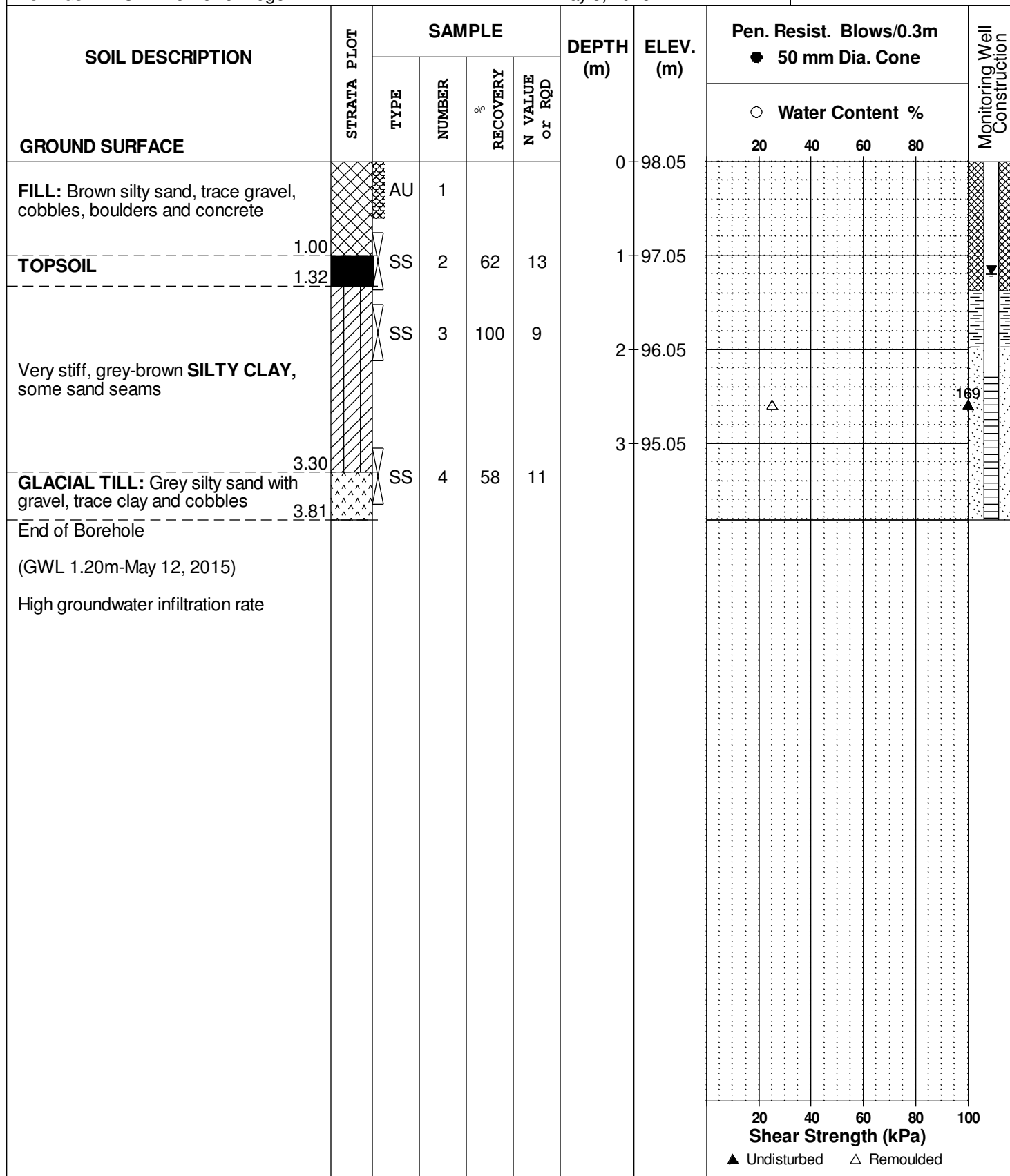
REMARKS

BORINGS BY CME 75 Power Auger

DATE May 8, 2015

FILE NO.
PG3450

HOLE NO.
BH13-15



SOIL PROFILE AND TEST DATA

Hydrogeological Investigation Residential Development - Half Moon Bay South Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

FILE NO. PG3450

REMARKS

HOLE NO. **BH14-15**

BORINGS BY CME 75 Power Auger

DATE May 8, 2015

[illegible]

SOIL PROFILE AND TEST DATA

Hydrogeological Investigation Residential Development - Half Moon Bay South Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

FILE NO. **PG3450**

REMARKS

HOLE NO. **BH15-15**

BORINGS BY CME 75 Power Auger

DATE May 8, 2015

[illegible]

SOIL PROFILE AND TEST DATA

Hydrogeological Investigation Residential Development - Half Moon Bay South Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

FILE NO. **PG3450**

REMARKS

HOLE NO. **BH16-15**

BORINGS BY CME 75 Power Auger

DATE May 8, 2015

[illegible]

SOIL PROFILE AND TEST DATA

Hydrogeological Investigation
Residential Development - Half Moon Bay South
Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.

REMARKS

BORINGS BY CME 75 Power Auger

DATE May 8, 2015

FILE NO.
PG3450

HOLE NO.
BH17-15

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0	96.92					
Brown SILTY SAND , some gravel and cobbles	0.76	AU	1									
Brown SILTY CLAY , some sand	1.07	SS	2	100	9	1	95.92					
GLACIAL TILL: Dense to compact, grey silty sand, some gravel and cobbles		SS	3	83	30	2	94.92					
		SS	4	42	13							
		SS	5	33	26	3	93.92					
End of Borehole	3.96											
(GWL 2.89m-May 12, 2015)												
Moderate groundwater infiltration rate												

SOIL PROFILE AND TEST DATA

Hydrogeological Investigation Residential Development - Half Moon Bay South Ottawa, Ontario

DATUM Ground surface elevations provided by J.D. Barnes Limited.



FILE NO. **PG3450**

REMARKS

HOLE NO. **BH18-15**

BORINGS BY CME 75 Power Auger

DATE May 8, 2015

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Monitoring Well Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
Very dense, brown SILTY SAND , trace gravel and cobbles		AU	1			0	98.02					
		SS	2	72	50+	1	97.02					
		SS	3	80	50+	2	96.02					
Dense to compact, grey SILTY SAND , some gravel	SS	4	75	25	3	95.02						
	SS	5	62	47	4	94.02						
	SS	6	75	20								
End of Borehole (GWL 3.23m-May 12, 2015) High groundwater infiltration rate												

DATUM

FILE NO.

PH1893

REMARKS

HOLE NO.

TP 1-11

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

[illegible]

SOIL PROFILE AND TEST DATA

Mineral Resource Aggregate Assessment
3882 Barnsdale Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

FILE NO.

PH1893

HOLE NO.

TP 2-11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL						0						
Loose, red-brown SAND, trace silt		G	3			0.30						
		G	4			0.70						
						1						
		G	5			2						
						3						
						4						
						5						
						6						
End of Test Pit						6.20						
(TP dry upon completion)												

Compact to dense, brown to grey
SANDY SILT/SILTY SAND

Shear Strength (kPa)
▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Mineral Resource Aggregate Assessment
3882 Barnsdale Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

FILE NO.

PH1893

HOLE NO.

TP 3-11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL	0.25					0						
Loose to compact, brown to grey SANDY SILT		G	6			1						
						2						
						3						
						4						
						5						
						6						
						7						
						8						
						9						
						10						
End of Test Pit	6.00					6						
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

DATUM

REMARKS

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

FILE NO.

PH1893

HOLE NO.

TP 4-11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL	0.30					0						
Loose to dense, red-brown to grey SANDY SILT/SILTY SAND		G	8			1						
		G	9			2						
						3						
						4						
						5						
						6						
End of Test Pit (TP dry upon completion)	6.00											

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Mineral Resource Aggregate Assessment
3882 Barnsdale Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

FILE NO.

PH1893

HOLE NO.

TP 5-11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL	0.20					0						
Compact, red-brown SILTY SAND-GRAVEL with cobbles	0.90	G	10			1						
						2						
						3						
Loose to compact, light brown FINE SAND		G	11			4						
						5						
						6						
End of Test Pit	6.00											
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

DATUM

REMARKS

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

FILE NO.

PH1893

HOLE NO.

TP 6-11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL						0						
0.30												
Loose, red-brown SILTY SAND-GRAVEL with cobbles		G	12									
0.90												
Loose, grey-brown SAND with gravel and shells		G	13			1						
1.20												
						2						
Loose, grey-brown FINE SAND , some silt		G	14									
						3						
3.90												
						4						
Compact to dense, grey-brown SANDY SILT/SILTY SAND		G	15			5						
6.00												
End of Test Pit						6						
(TP dry upon completion)												

DATUM

REMARKS

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

FILE NO.

PH1893

HOLE NO.

TP 7-11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL	0.31					0						
Compact, red-brown FINE SAND	1.10	G	16			1						
Very stiff, grey-brown CLAYEY SILT	2.50	G	17			2						
Compact to dense, grey-brown SANDY SILT/SILTY SAND	6.00	G	18			3						
End of Test Pit (TP dry upon completion)						4						
						5						
						6						
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Mineral Resource Aggregate Assessment
3882 Barnsdale Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

FILE NO.

PH1893

HOLE NO.

TP 8-11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL						0						
Loose, dark brown SILTY SAND with gravel and cobbles	0.40	G	19									
	0.80					1						
						2						
						3						
Loose, grey-brown FINE SAND		G	20			4						
						5						
	5.80											
End of Test Pit (TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Mineral Resource Aggregate Assessment
3882 Barnsdale Road
Ottawa, Ontario

DATUM

REMARKS

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

FILE NO.

PH1893

HOLE NO.

TP 9-11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.30											
Dense, dark brown to brown SAND-GRAVEL , some silt, cobbles and boulders		G	21			1						
						2						
						3						
End of Test Pit	3.70											
(TP dry upon completion)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATUM

REMARKS

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

FILE NO.

PH1893

HOLE NO.

TP10-11

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL						0						
Loose, red-brown SILTY SAND-GRAVEL with cobbles		G	22									
Compact, light brown SILTY SAND		G	23			1						
Dense, grey-brown SANDY SILT		G	24									
Compact, light brown FINE SAND		G	25			2						
Dense, grey-brown SILTY SAND , some gravel, cobbles and boulders		G	26			3						
End of Test Pit (TP dry upon completion)												

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

DATUM

FILE NO.

PH1893

REMARKS

HOLE NO.

TP11-11

BORINGS BY Hydraulic Shovel

DATE December 16, 2011

[illegible]

SOIL PROFILE AND TEST DATA

**Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario**

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 23, 03

FILE NO.

G9114

HOLE NO.

TP 1

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.20					0						
Stiff, grey SILTY CLAY		G	1			1						
	2.29					2						
GLACIAL TILL: Grey silty sand with gravel						3						
						4						
End of Test Pit	4.57	G	2									
(Open hole GWL @ 2.1m depth)												

Shear Strength (kPa)
 ▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe


DATE Oct 23, 03

FILE NO.

G9114

HOLE NO.

TP 2

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.18											
GLACIAL TILL: Dense, grey silty sand and gravel with cobbles		G	1			1						
						2						
End of Test Pit	2.90											
(TP dry upon completion)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

**Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario**

DATUM

FILE NO.

G9114

REMARKS

HOLE NO.

TP 3

BORINGS BY Backhoe

DATE Oct 23, 03

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15					0						
Brown SILTY SAND, some gravel	0.46											
Light brown fine SAND		G	1			1						
		G	2			2						
End of Test Pit	5.94											
(TP dry upon completion)												

20406080100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 23, 03

FILE NO.

G9114

HOLE NO.

TP 4

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.15											
Brown SILTY SAND, some gravel	0.60											
Light brown fine SAND		G	1			1						
						2						
						3						
		G	2			4						
						5						
End of Test Pit	5.94											
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 23, 03

FILE NO.

G9114

HOLE NO.

TP 5

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.15											
SAND-GRAVEL		G	1			1						
	2											
	3											
Brown fine to medium SAND		G	2			4						
	5											
End of Test Pit	5.94											
(TP dry upon completion)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 23, 03

FILE NO.

G9114

HOLE NO.

TP 6

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.15											
Red SAND, occasional gravel	0.76	G	1			1						
						2						
						3						
Brown fine SAND						4						
						5						
End of Test Pit	5.79											
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 29, 03

FILE NO.

G9114

HOLE NO.

TP 7

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.15											
Red SAND, some gravel						1						
	1.22											
SAND-GRAVEL						2						
						3						
	3.35											
Fine SAND						4						
						5						
	5.18											
Grey SILTY CLAY	5.49											
End of Test Pit												
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 29, 03

FILE NO.

G9114

HOLE NO.

TP 8

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.20											
Red SAND with gravel		G	1			1						
	1.83					2						
						3						
						4						
						5						
						6						
						7						
Light brown fine SAND		G	2									
	7.01											
End of Test Pit												
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 29, 03

FILE NO.

G9114

HOLE NO.

TP 9

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.15											
Reddish brown SAND-GRAVEL	1.22	G	1			1						
						2						
						3						
Light brown fine SAND						4						
						5						
	5.49	G	2									
Grey SILT	6.10	G	3			6						
End of Test Pit (TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 29, 03

FILE NO.

G9114

HOLE NO.

TP10

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
GROUND SURFACE								20	40	60	80	
TOPSOIL	0.20					0						
Reddish brown SAND-GRAVEL						1						
	2.13	G	1			2						
Fine to medium SAND						3						
	3.96	G	2									
End of Test Pit												
(Open hole GWL @ 2.1m depth)												
								20	40	60	80	100
								Shear Strength (kPa)				
								▲ Undisturbed △ Remoulded				

DATUM

FILE NO.

G9114

REMARKS

HOLE NO.

TP11

BORINGS BY Backhoe

DATE Oct 29, 03

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE												
TOPSOIL	0.15					0						
Red SILTY SAND-GRAVEL	1.22					1						
GLACIAL TILL: Silty sand and gravel, some clay	3.96	G	1			2						
End of Test Pit (TP dry upon completion)						3						

Shear Strength (kPa)
▲ Undisturbed △ Remoulded

DATUM

FILE NO.

G9114

REMARKS

HOLE NO.

TP12

BORINGS BY Backhoe

DATE Oct 29, 03

[illegible]

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 29, 03

FILE NO.

G9114

HOLE NO.

TP13

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.15											
Red SILTY SAND-GRAVEL	1.22	G	1			1						
						2						
						3						
						4						
Light brown fine to medium SAND		G	2			5						
						6						
End of Test Pit	6.70											
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 29, 03

FILE NO.

G9114

HOLE NO.

TP14

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.15											
SAND-GRAVEL		G	1			1						
	2											
	3											
End of Test Pit	3.35											
Refusal to excavation @ 3.35m depth												
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 29, 03

FILE NO.

G9114

HOLE NO.

TP15

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.15											
GLACIAL TILL: Very dense silty sand-gravel, some clay		G	1			1						
	2											
End of Test Pit	2.74											
Refusal to excavation @ 2.74m depth												
(TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

SOIL PROFILE AND TEST DATA

Aggregate Resource Investigation
Greenbank Road/Cedarview Road
Ottawa (Nepean), Ontario

DATUM

REMARKS

BORINGS BY Backhoe

DATE Oct 29, 03

FILE NO.

G9114

HOLE NO.

TP16

SOIL DESCRIPTION	STRATA PLOT	SAMPLE				DEPTH (m)	ELEV. (m)	Pen. Resist. Blows/0.3m ● 50 mm Dia. Cone				Piezometer Construction
		TYPE	NUMBER	RECOVERY %	N VALUE or RQD			○ Water Content %				
								20	40	60	80	
GROUND SURFACE						0						
TOPSOIL	0.15											
SILTY CLAY	0.60											
GLACIAL TILL: Very dense silty sand-gravel with clay		G	1			1						
	2											
	2.74											
End of Test Pit (TP dry upon completion)												

20 40 60 80 100

Shear Strength (kPa)

▲ Undisturbed △ Remoulded

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 strength of cohesionless soils is the relative density, 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.

Relative Density	'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 vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

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 is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

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 NXL size core. However, it can be used on smaller core sizes, such as BX, 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
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture 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 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 = $(D_{30})^2 / (D_{10} \times D_{60})$
Cu	-	Uniformity coefficient = D_{60} / D_{10}

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		Overconsolidation 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.
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SYMBOLS AND TERMS (continued)

STRATA PLOT



Topsoil



Asphalt



Fill



Peat



Sand



Silty Sand



Silt



Sandy Silt



Clay



Silty Clay



Clayey Silty Sand



Glacial Till



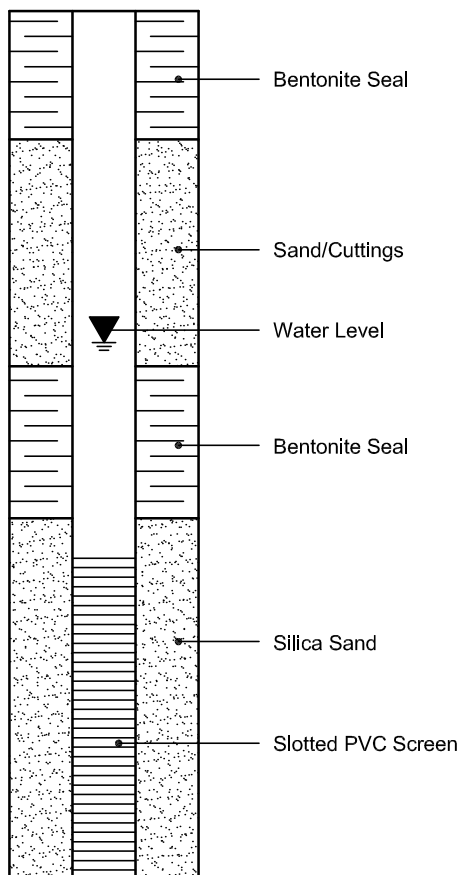
Shale



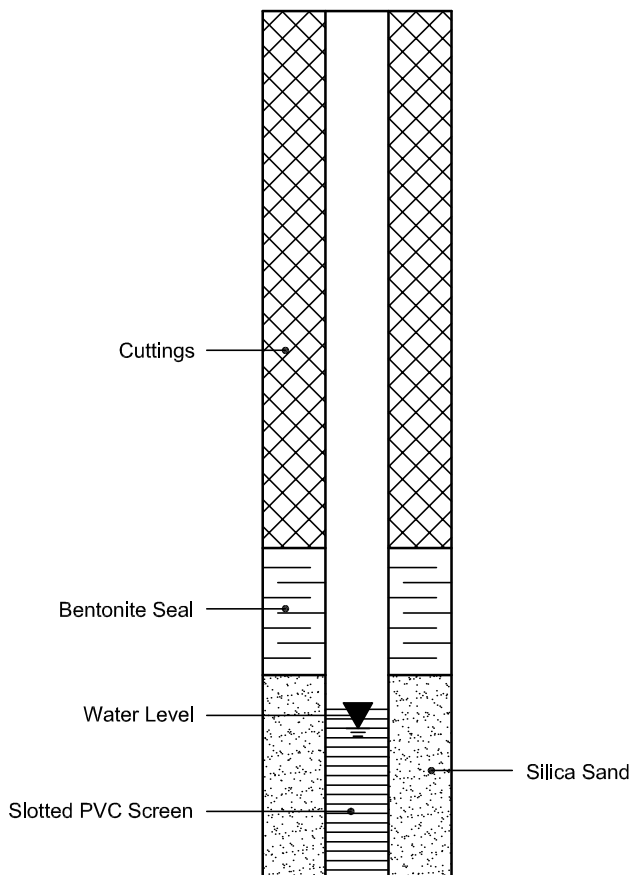
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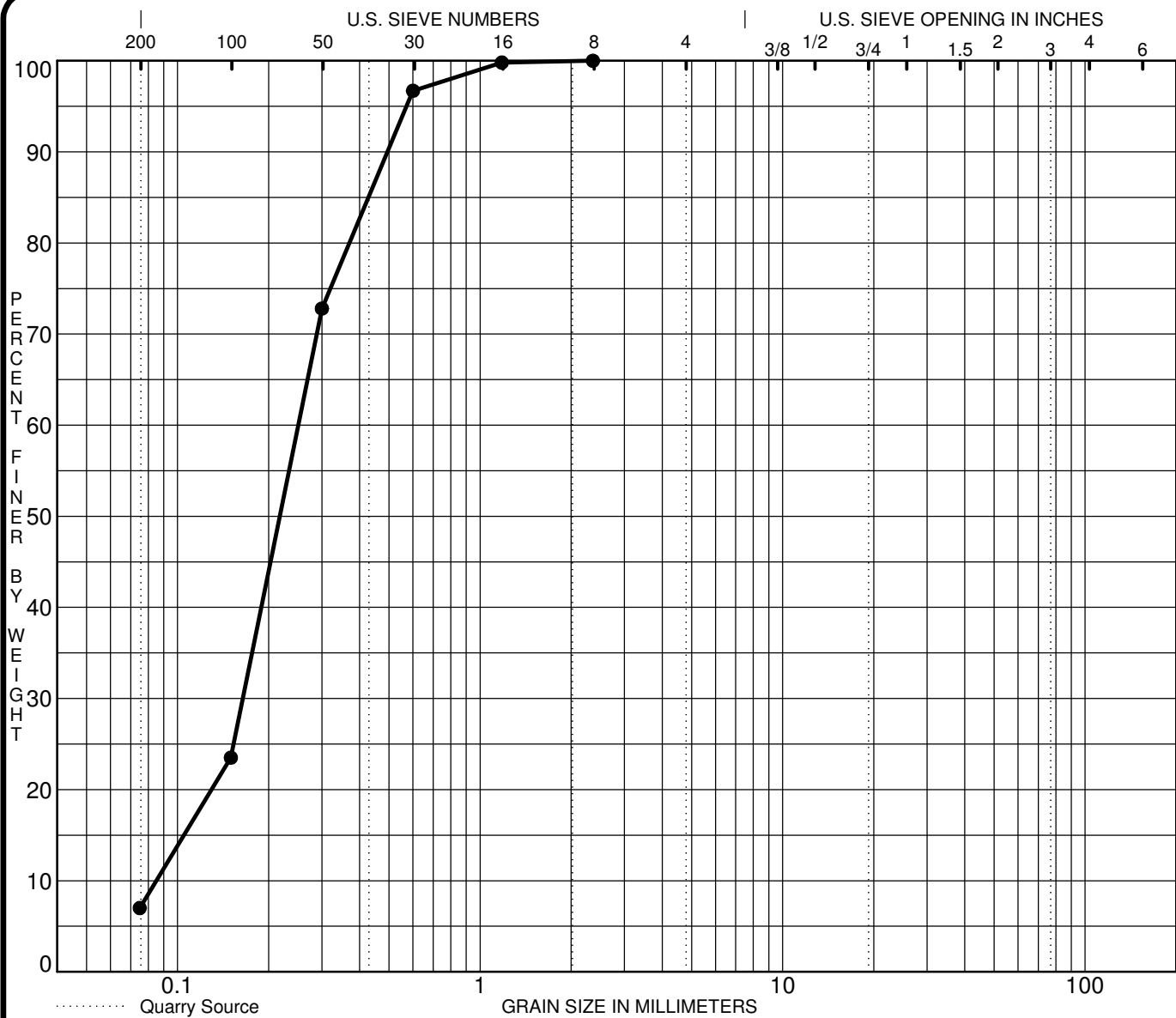
MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION





Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH 1-15	SS 9	(SP-SM) Poorly-graded SAND with silt								1.27	2.9
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH 1-15	SS 9	2.36	0.25	0.164	0.0851	0.0	93.0	7.0			
☒												
▲												
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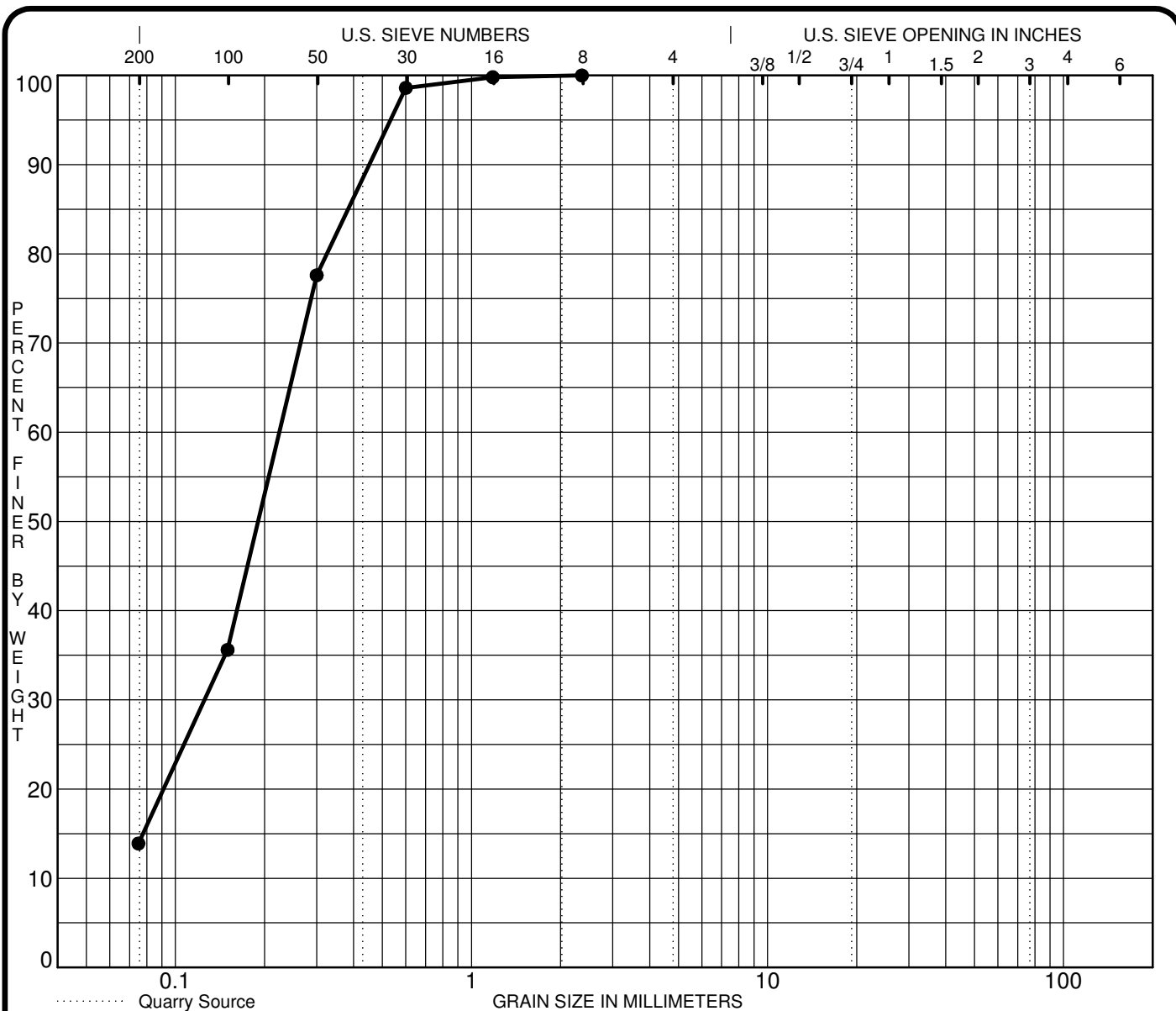
FILE NO. PG3607

DATE 10 Dec 15

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	BH 2-15 SS 7	(SM) SILTY SAND									
☒											
▲											
★											
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH 2-15 SS 7	2.36	0.22	0.125		0.0	86.1	13.9			
☒											
▲											
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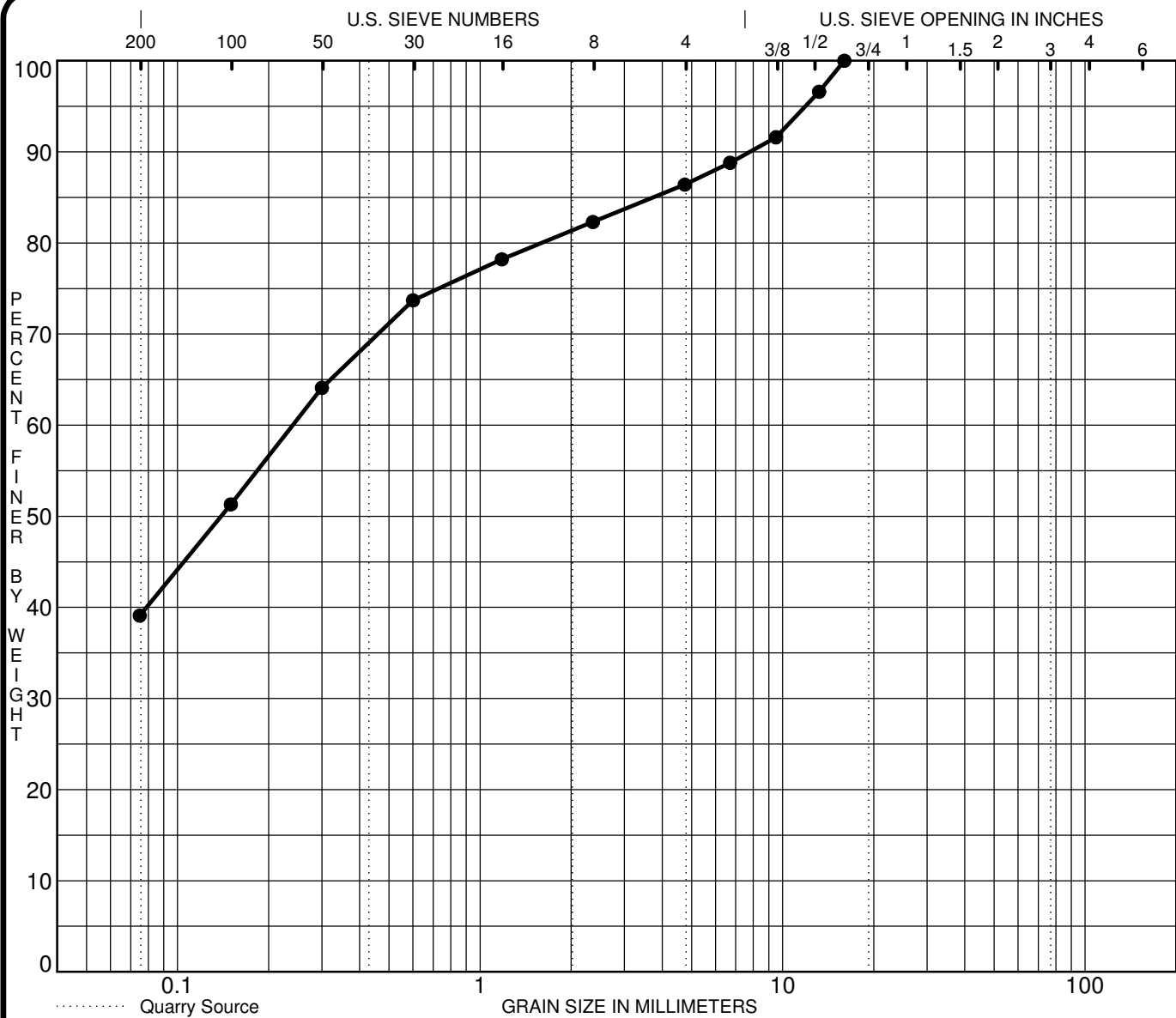
FILE NO. PG3607

DATE 30 Nov 15

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH 5-15	SS 10	(SM) SILTY SAND with gravel									
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH 5-15	SS 10	16.00	0.24			13.6	47.3	39.1			
☒												
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★												

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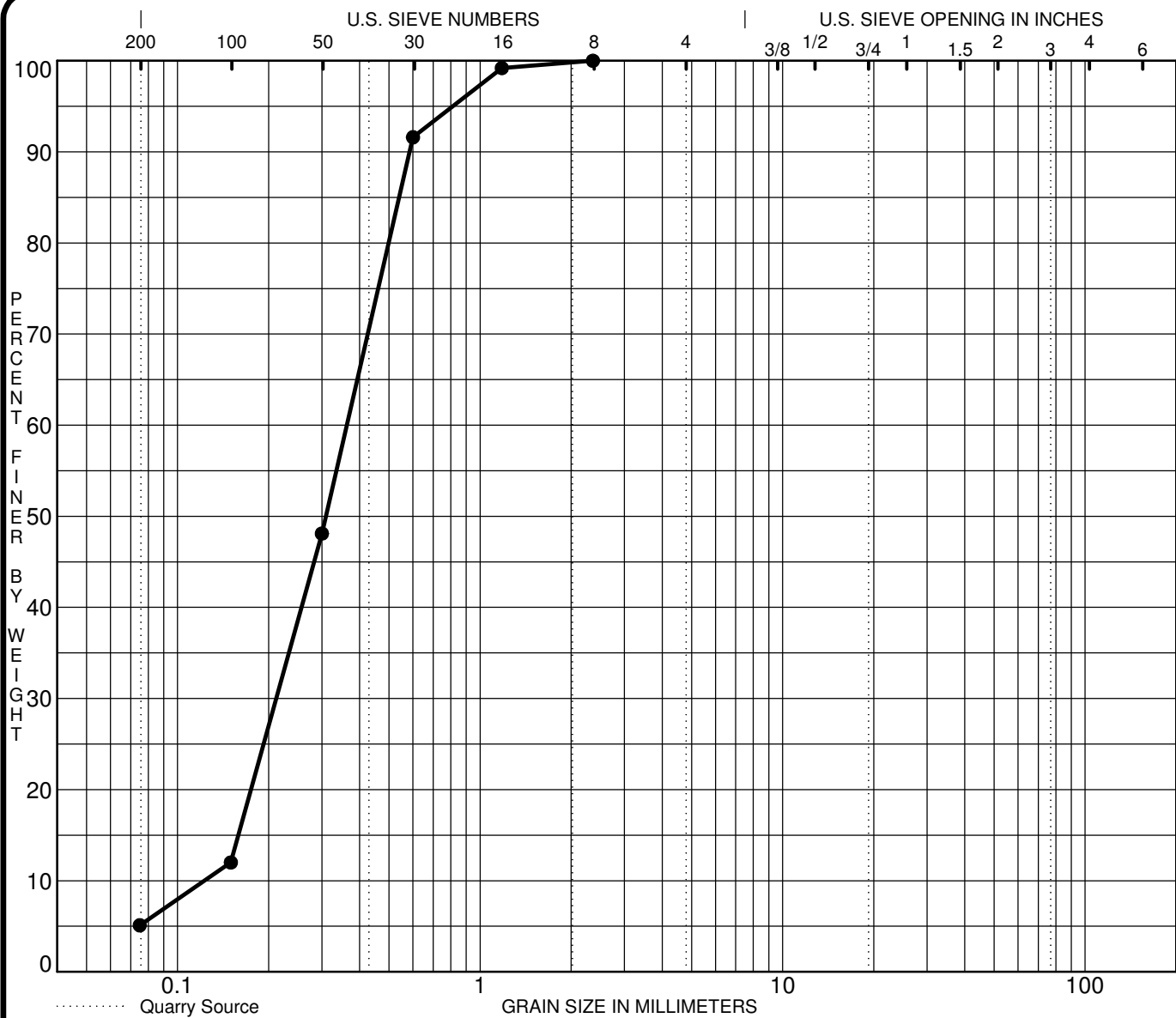
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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH 7-15	SS 6	(SP-SM) Poorly-graded SAND with silt								1.01	3.0
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH 7-15	SS 6	2.36	0.36	0.212	0.1227	0.0	94.9	5.1			
☒												
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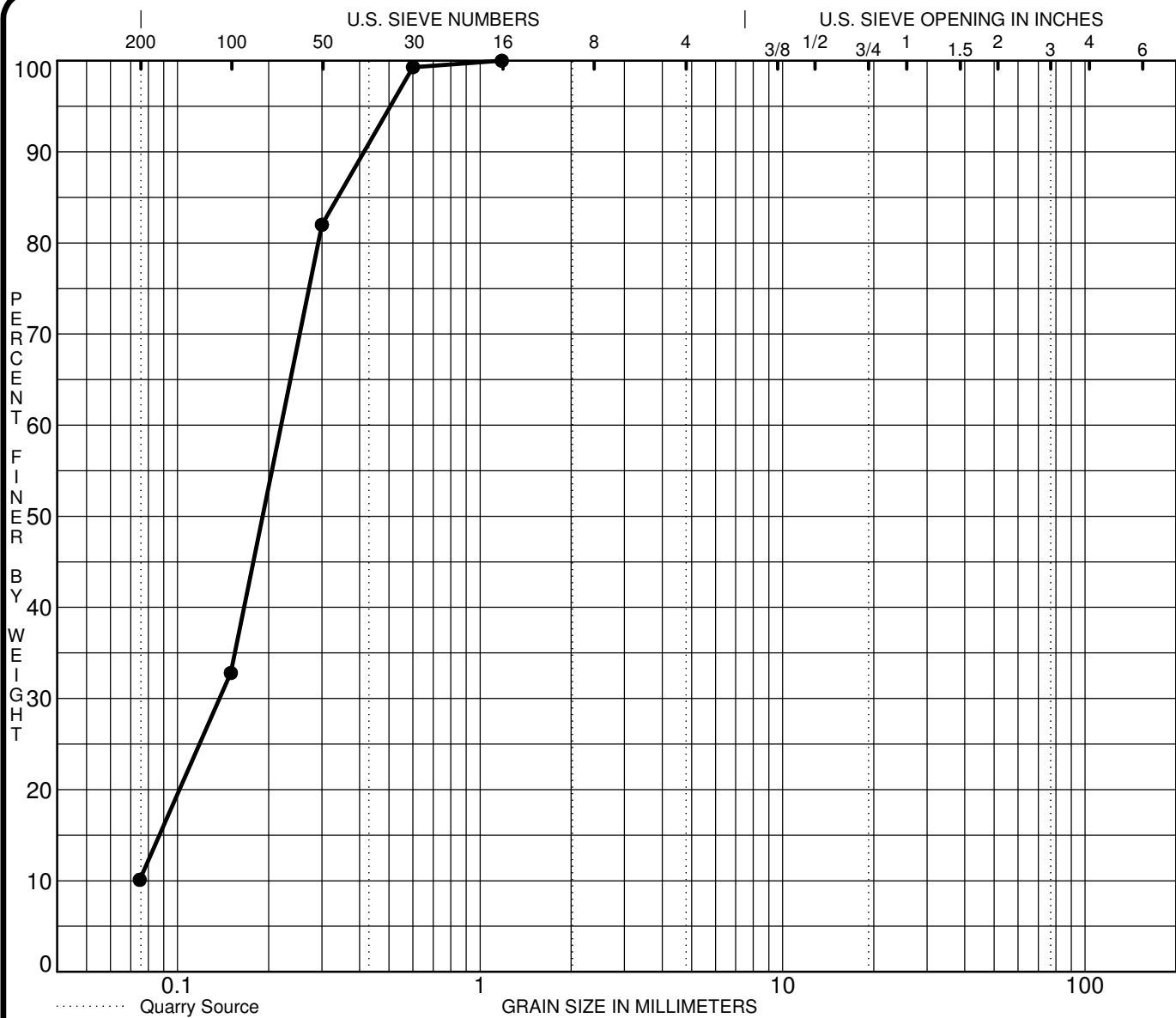
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GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH 9-15	SS 8	(SP-SM) Poorly-graded SAND with silt								1.15	2.9
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH 9-15	SS 8	1.18	0.22	0.138		0.0	89.9	10.1			
☒												
▲												
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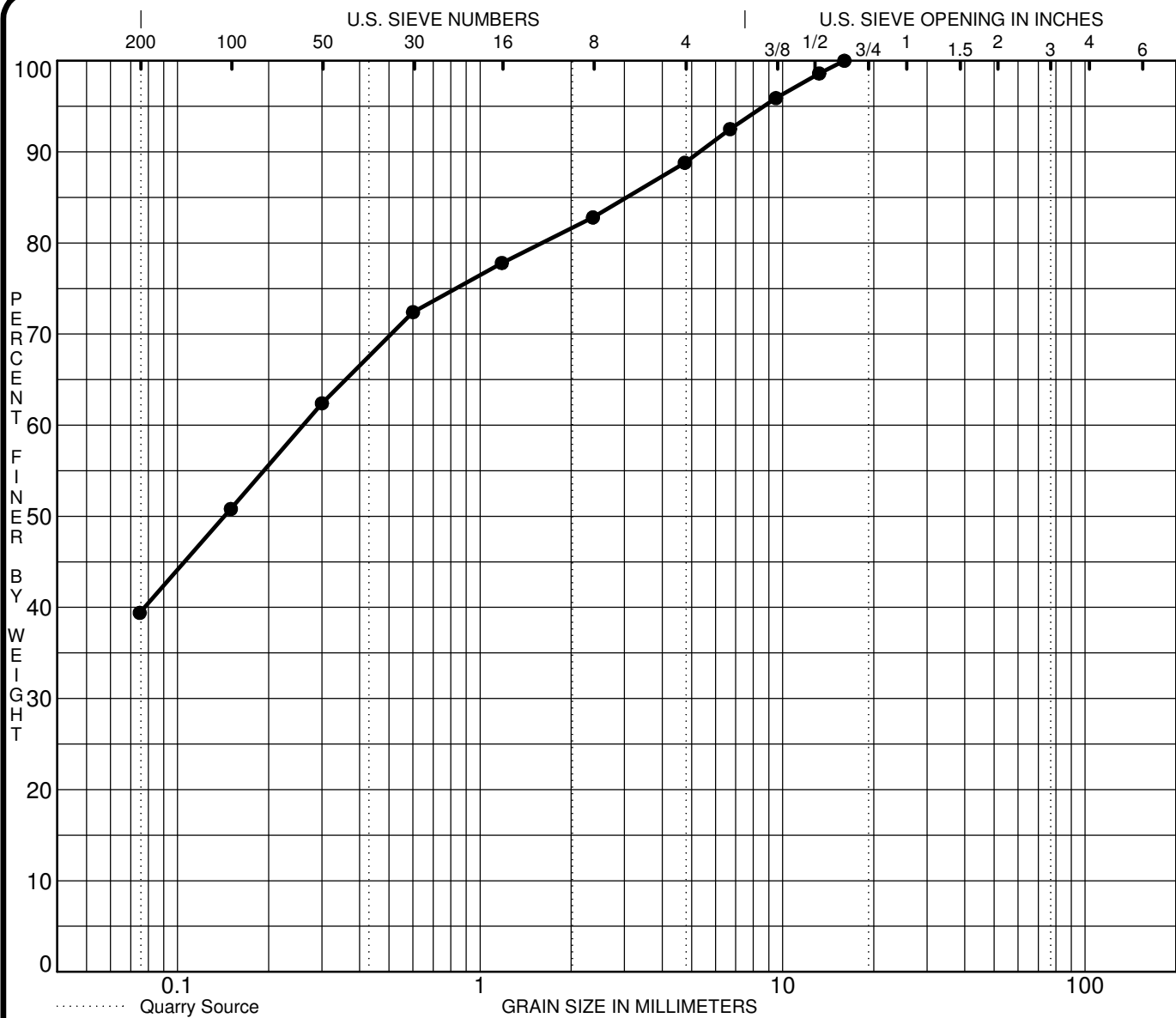
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GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	BH11-15 SS 8&9	(SM) SILTY SAND, some gravel									
☒											
▲											
★											
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	BH11-15 SS 8&9	16.00	0.26			11.2	49.4	39.4			
☒											
▲											
★											

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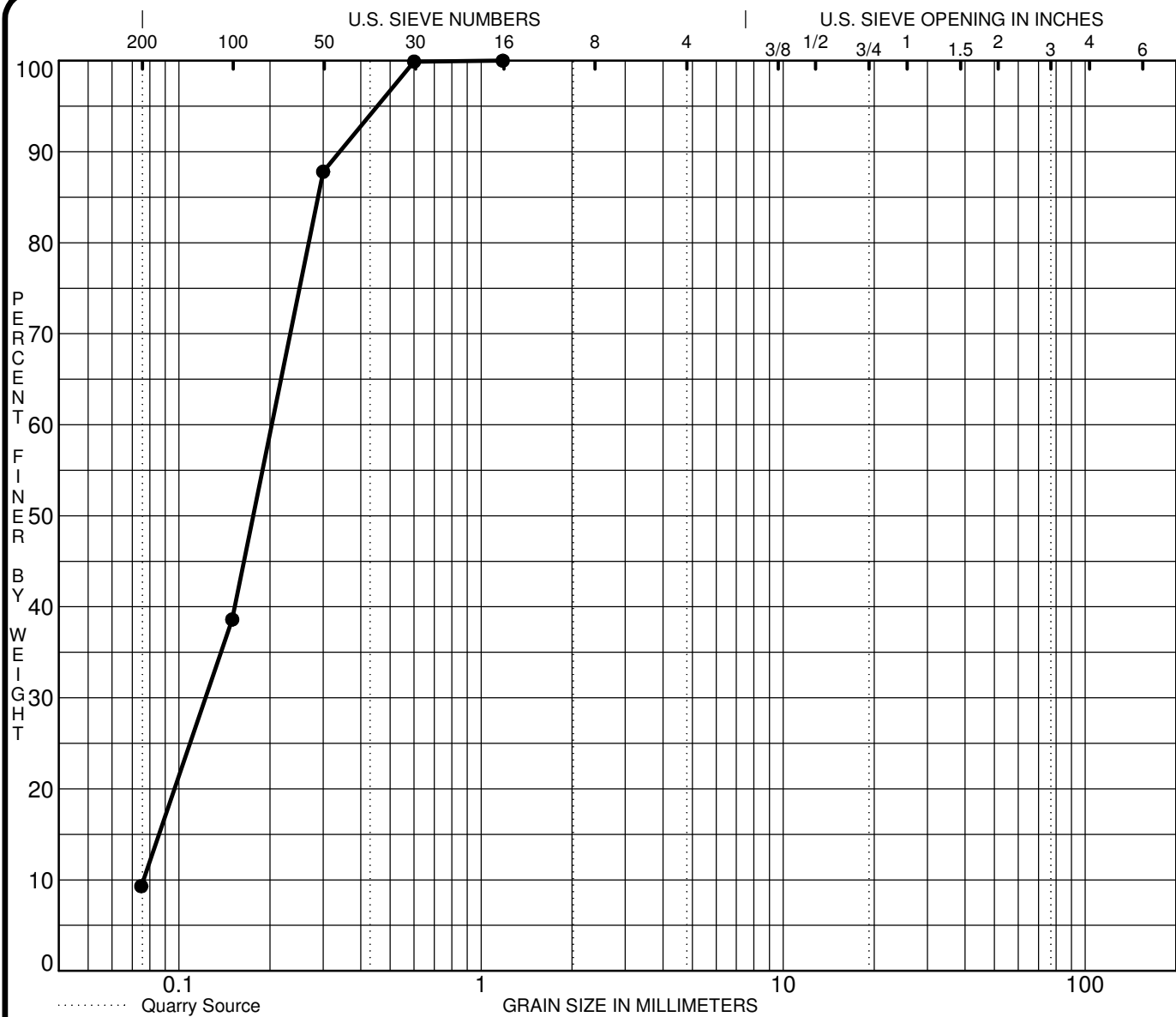
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GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH14-15	SS 11	(SP-SM) Poorly-graded SAND with silt								0.97	2.7
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH14-15	SS 11	1.18	0.20	0.122	0.0763	0.0	90.7	9.3			
☒												
▲												
★												

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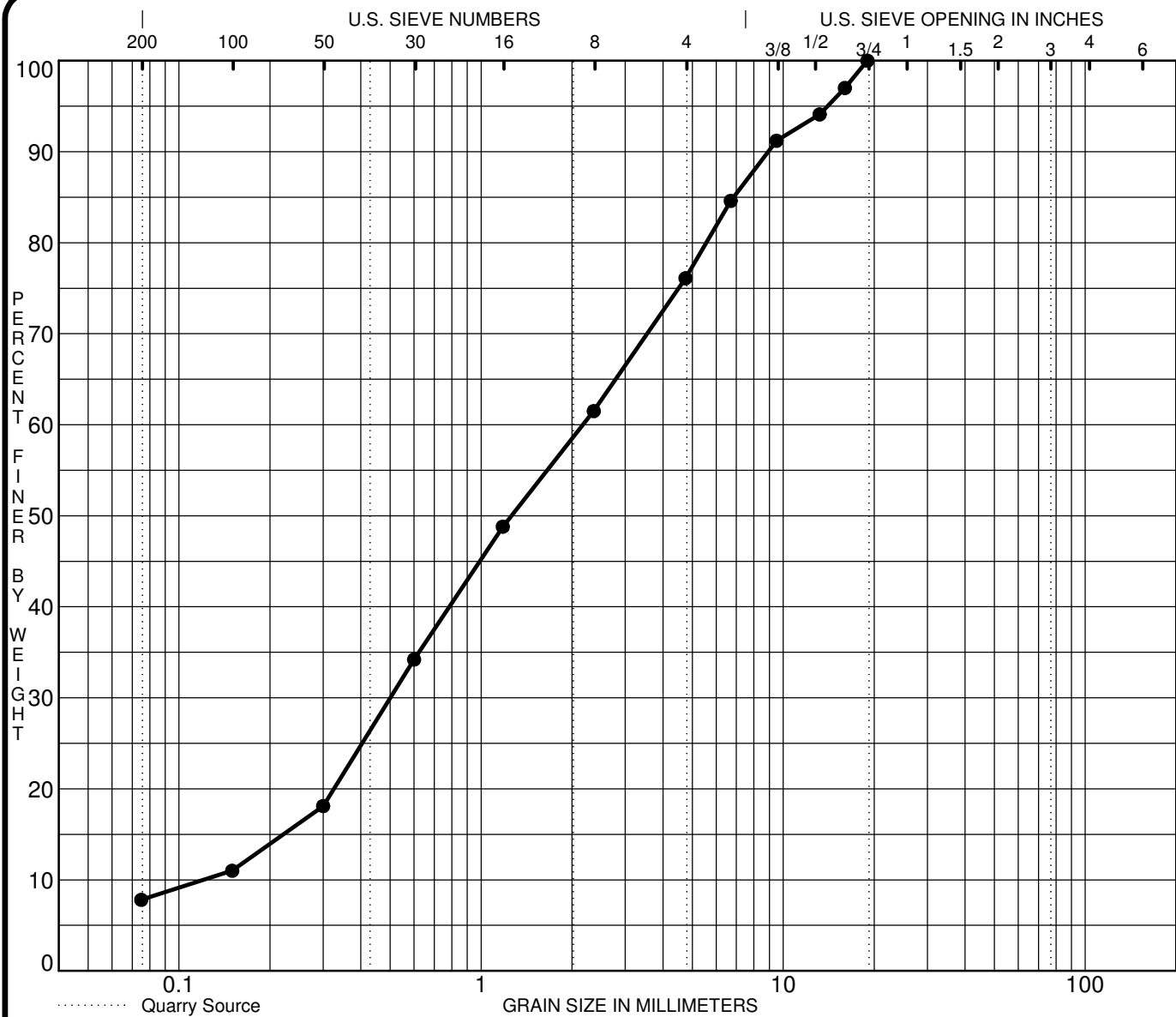
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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH17-15	SS 9	(SW-SM) Well-graded SAND with silt and gravel								0.95	18.0
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH17-15	SS 9	19.00	2.17	0.501	0.1208	23.9	68.3	7.8			
☒												
▲												
★												

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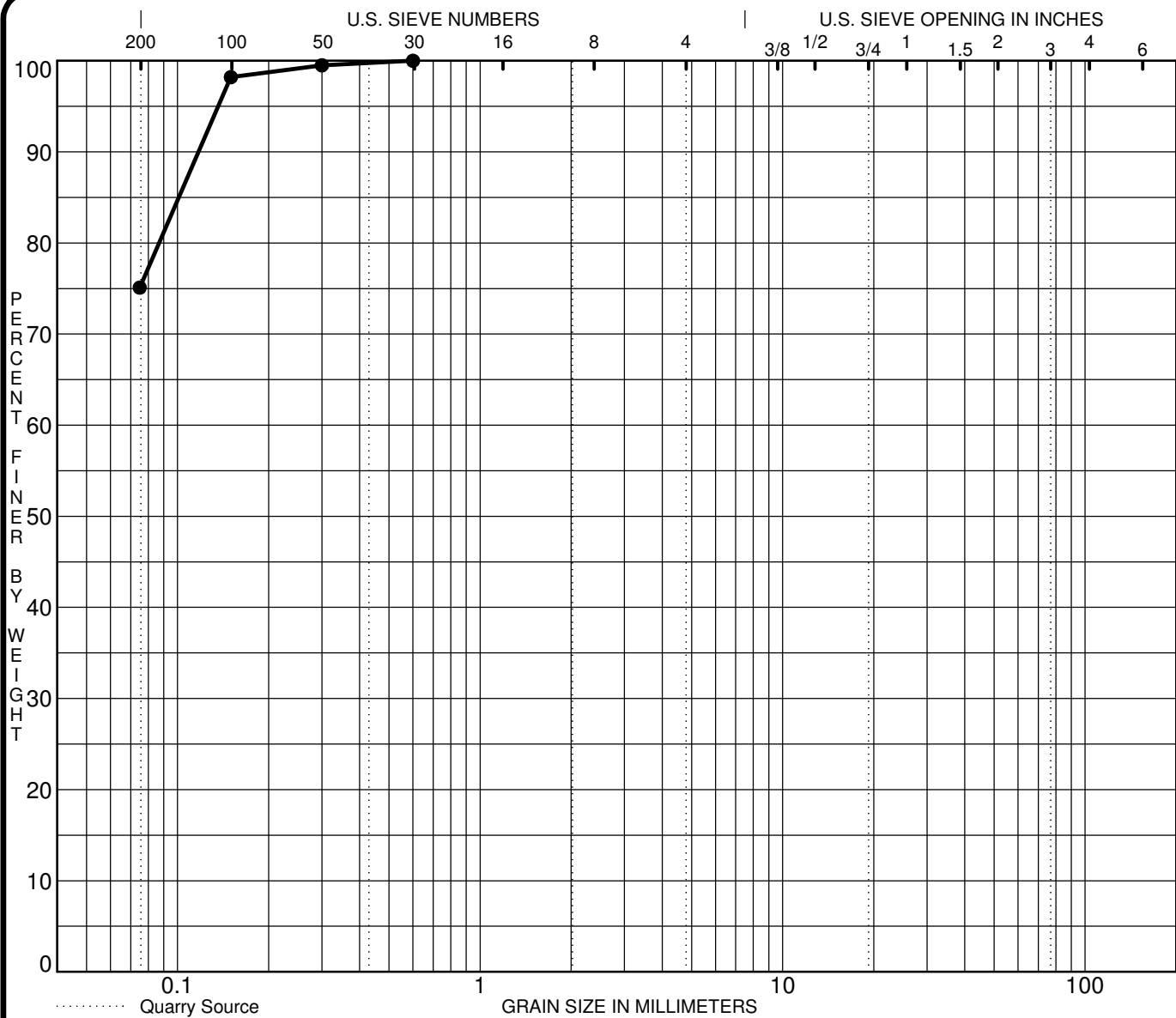
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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification				MC%	LL	PL	PI	Cc	Cu
● BH18-15SS 11&13	(ML) SILT with sand									
☒										
▲										
★										
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● BH18-15SS 11&13	0.60				0.0	24.9	75.1			
☒										
▲										
★										

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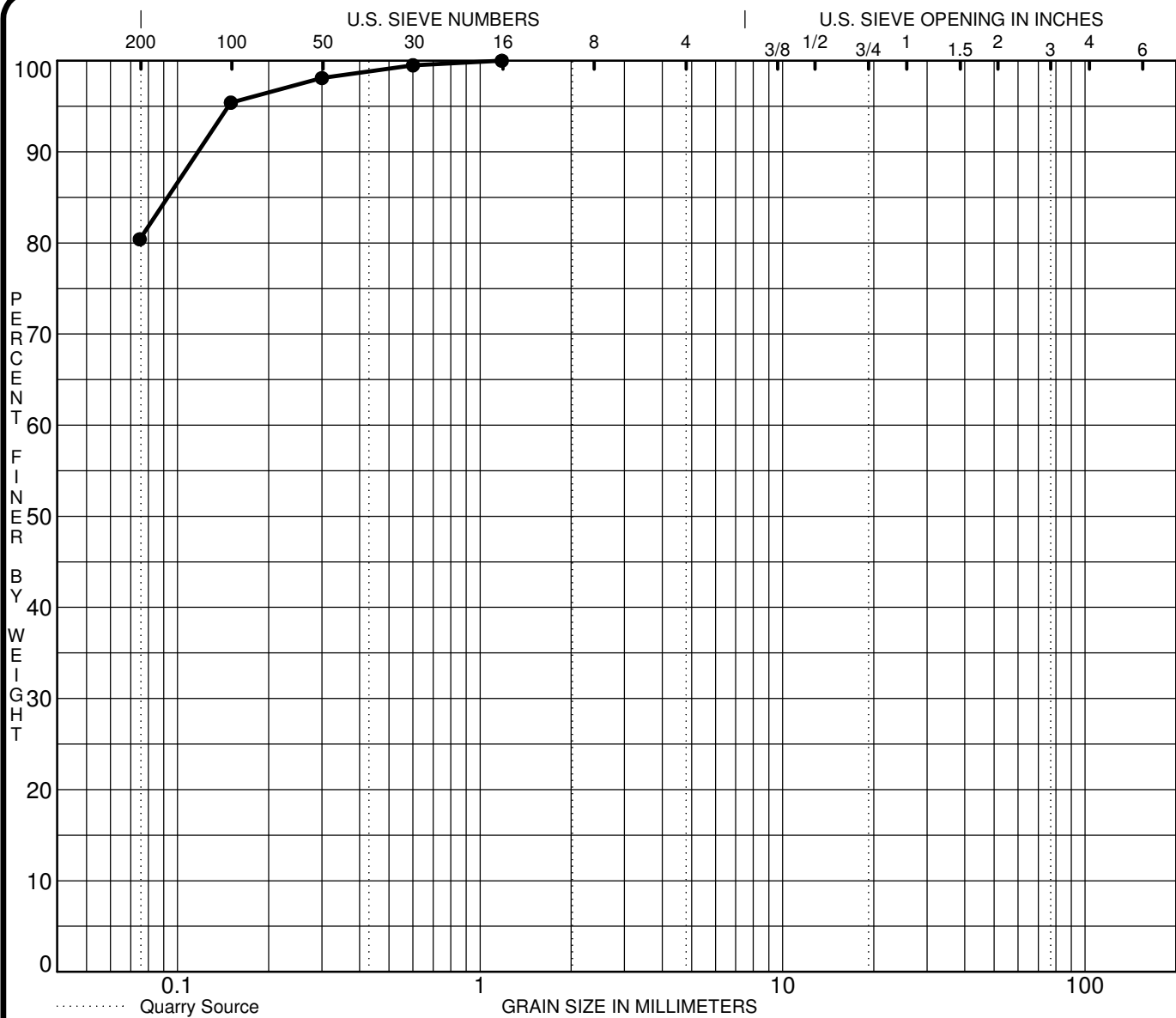
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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH19-15	SS 12	(ML) SILT with sand									
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	BH19-15	SS 12	1.18				0.0	19.6	80.4			
☒												
▲												
★												

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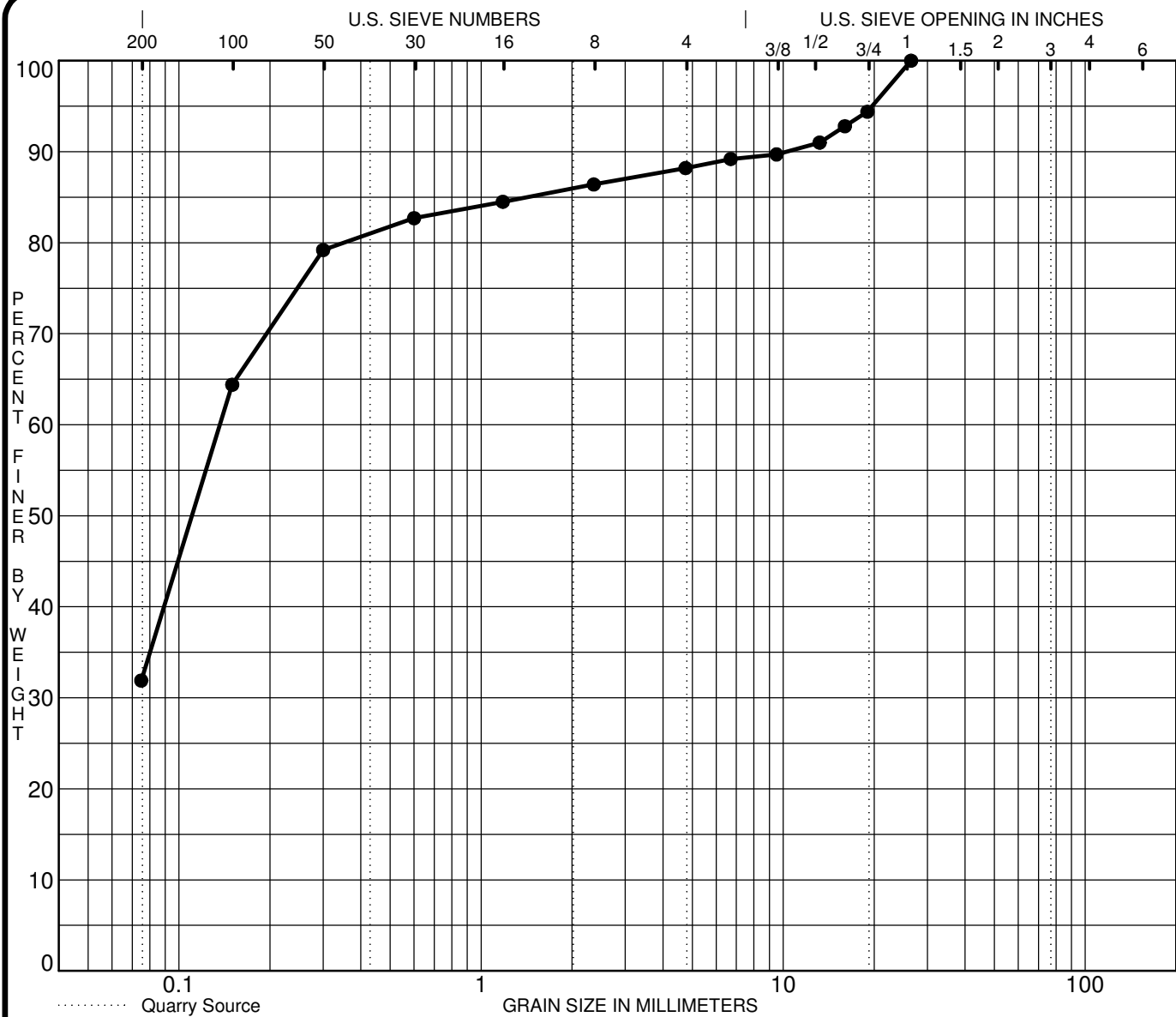
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GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification				MC%	LL	PL	PI	Cc	Cu
● BH21-15SS 10&11	(SM) SILTY SAND, some gravel									
☒										
▲										
★										
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● BH21-15SS 10&11	26.50	0.14			11.8	56.3	31.9			
☒										
▲										
★										

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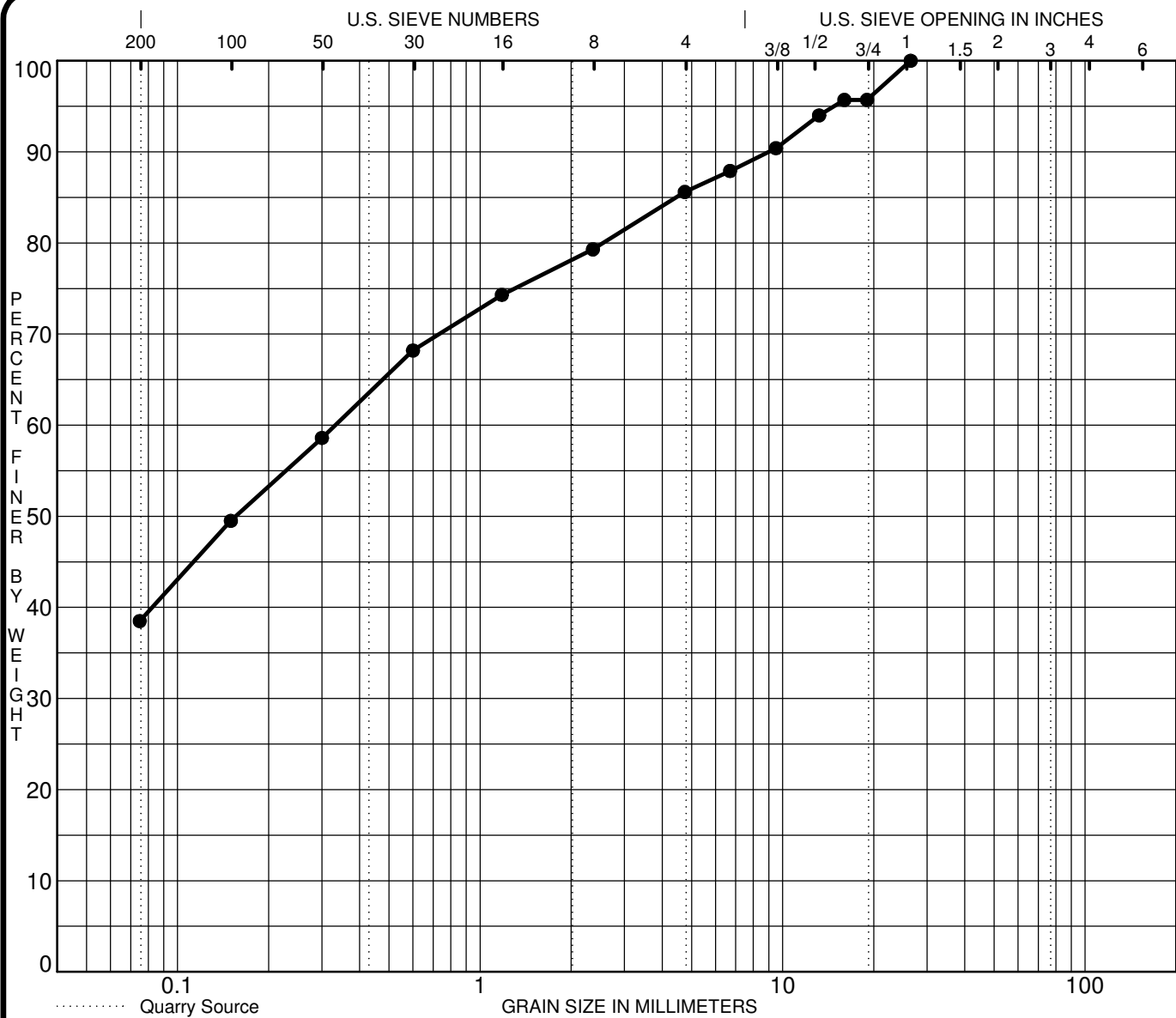
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DATE 9 Dec 15

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH24-15	SS 5	(SM) SILTY SAND, some gravel									
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH24-15	SS 5	26.50	0.33			14.4	47.1	38.5			
☒												
▲												
★												

CLIENT Regional Group of Companies

PROJECT Geotechnical Investigation - Barrhaven South

Urban Expansion

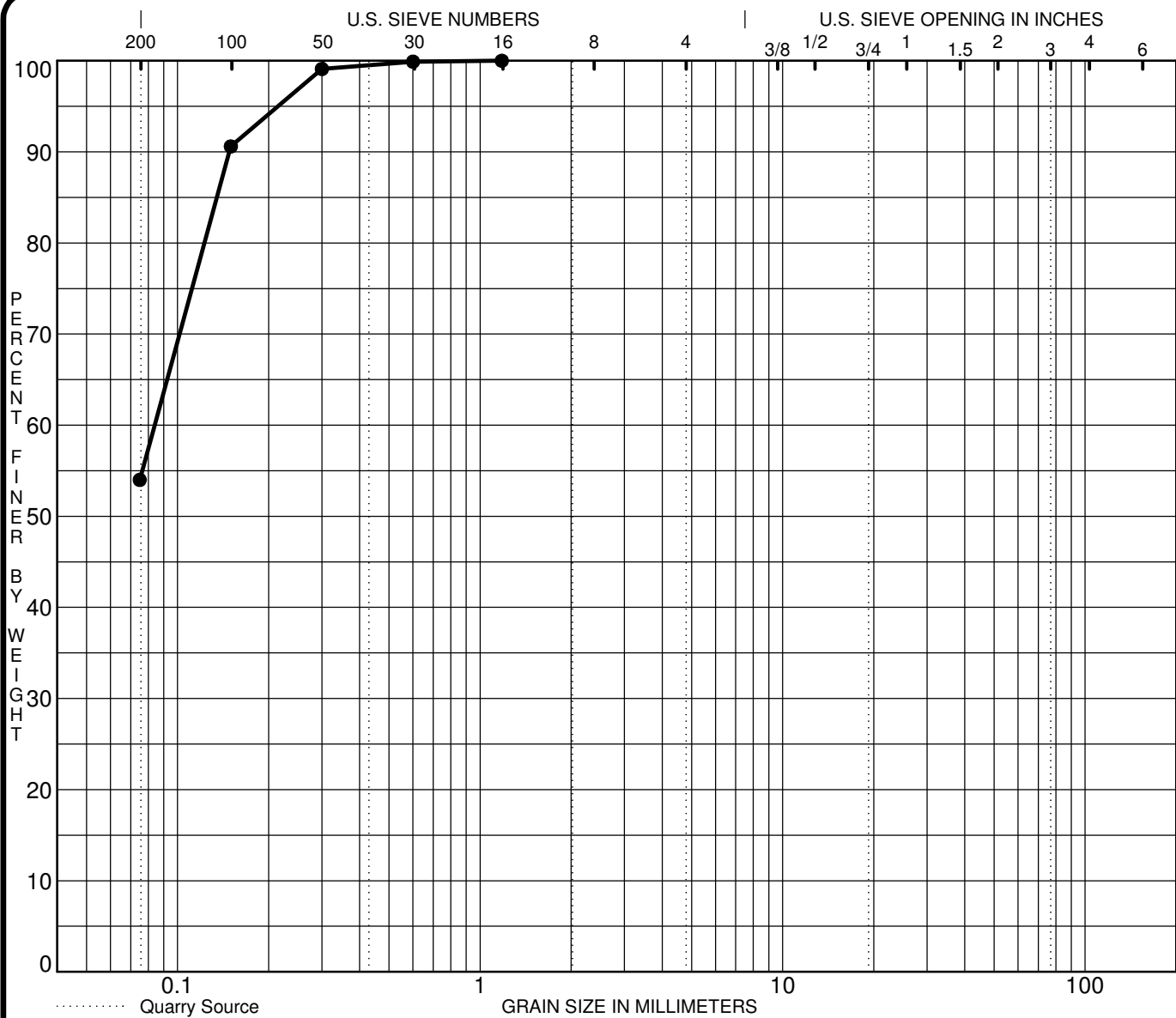
FILE NO. PG3607

DATE 27 Nov 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH25-15	SS 6	(ML) SANDY SILT									
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH25-15	SS 6	1.18	0.08			0.0	46.0	54.0			
☒												
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★												

CLIENT Regional Group of Companies

PROJECT Geotechnical Investigation - Barrhaven South

Urban Expansion

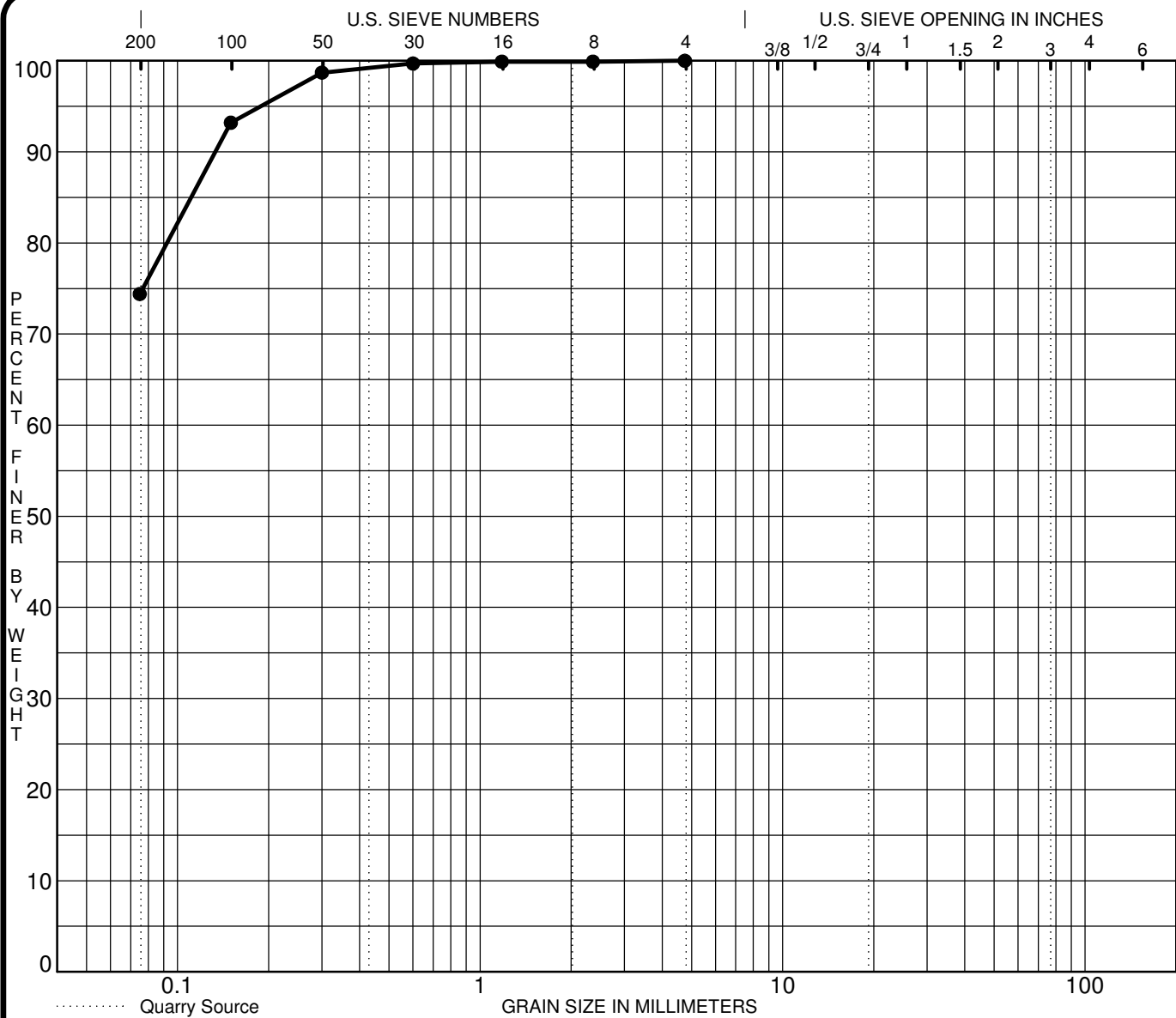
FILE NO. PG3607

DATE 1 Dec 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification				MC%	LL	PL	PI	Cc	Cu
● BH26-15 SS 7&8	(ML) SILT with sand									
☒										
▲										
★										
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● BH26-15 SS 7&8	4.75				0.0	25.6	74.4			
☒										
▲										
★										

CLIENT Regional Group of Companies

PROJECT Geotechnical Investigation - Barrhaven South

Urban Expansion

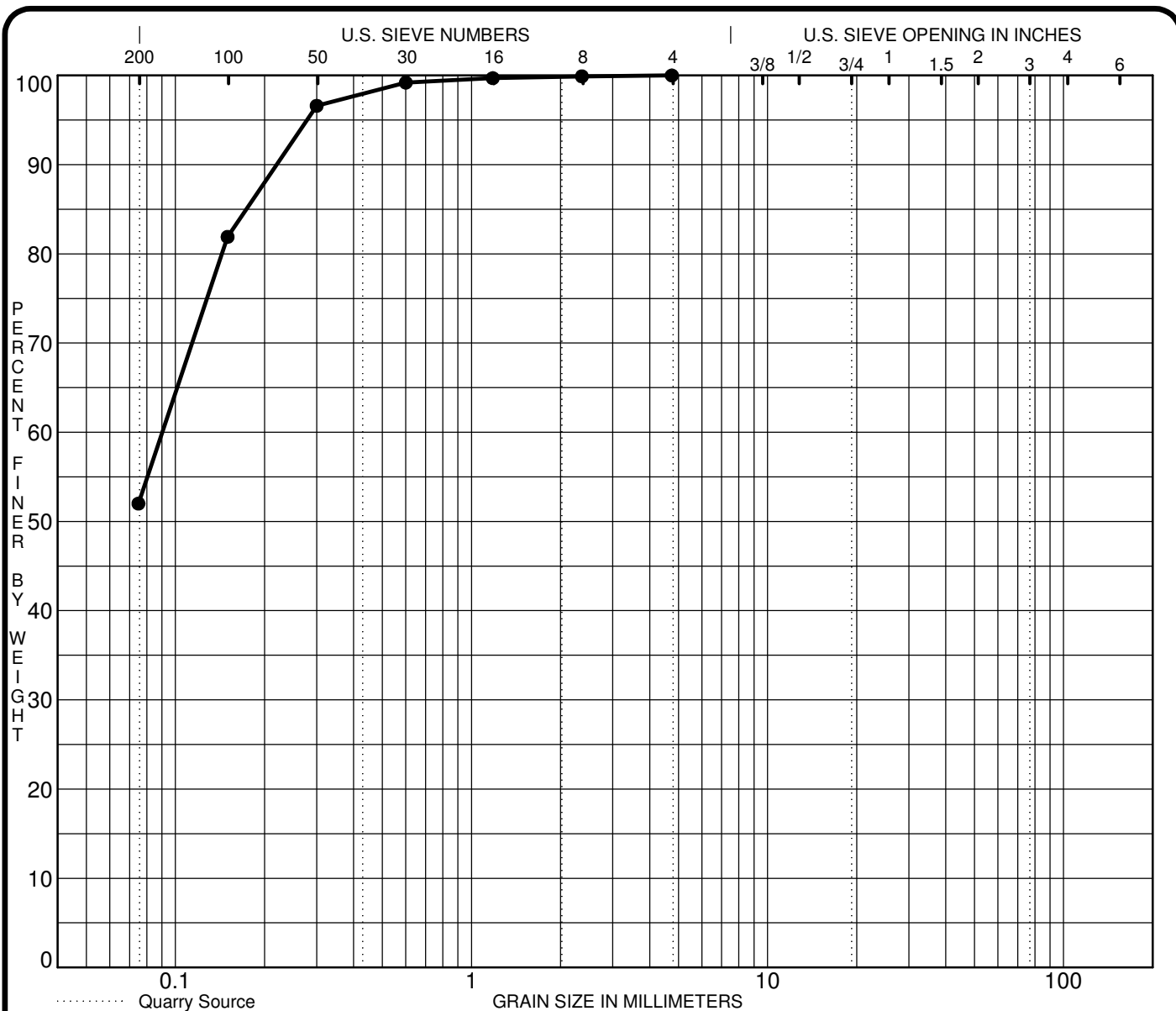
FILE NO. PG3607

DATE 8 Dec 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH27-15	SS 7	(ML) SANDY SILT									
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH27-15	SS 7	4.75	0.09			0.0	48.0	52.0			
☒												
▲												
★												

CLIENT Regional Group of Companies

PROJECT Geotechnical Investigation - Barrhaven South

Urban Expansion

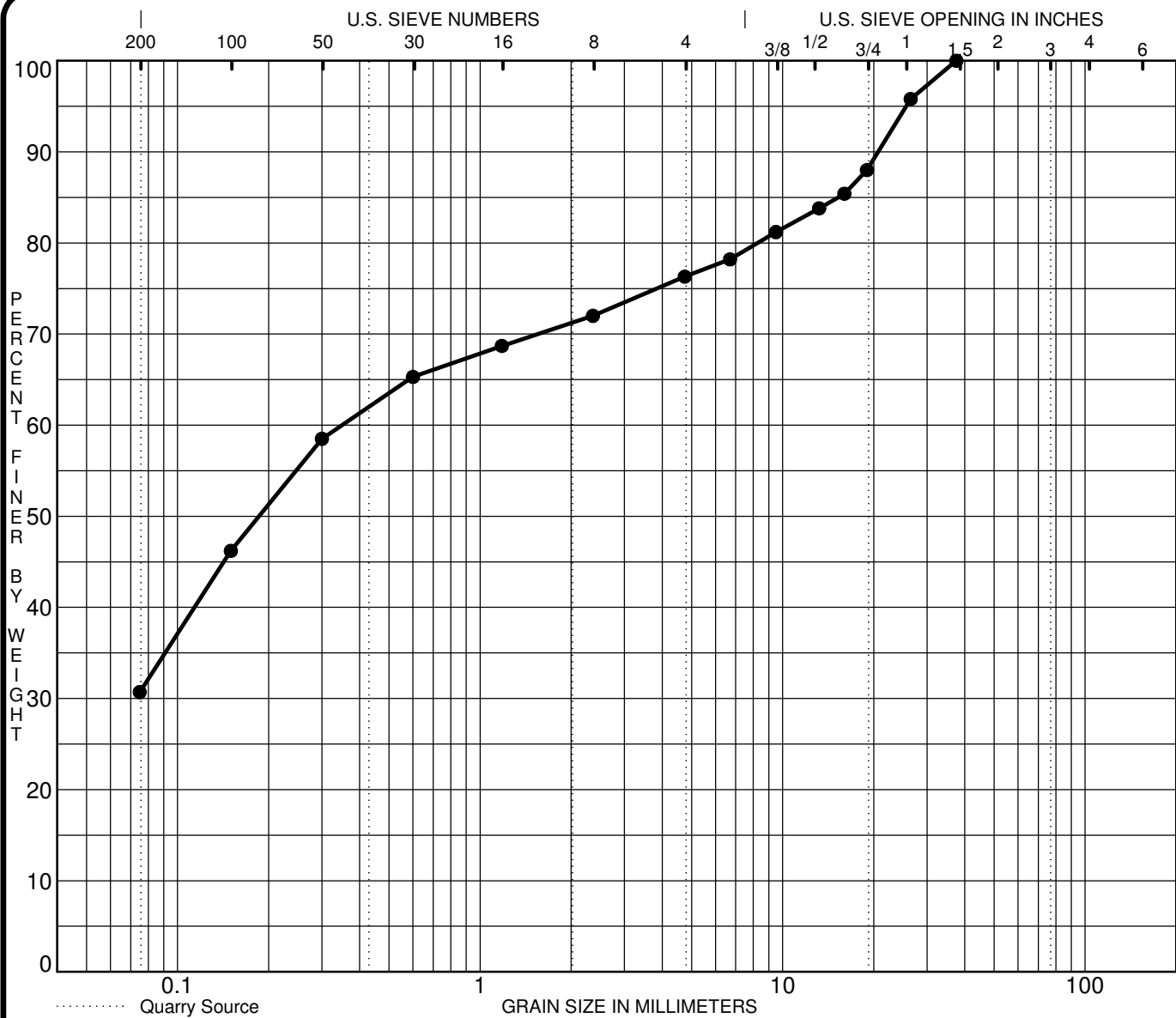
FILE NO. PG3607

DATE 1 Dec 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



CLIENT Regional Group of Companies

PROJECT Geotechnical Investigation - Barrhaven South

Urban Expansion

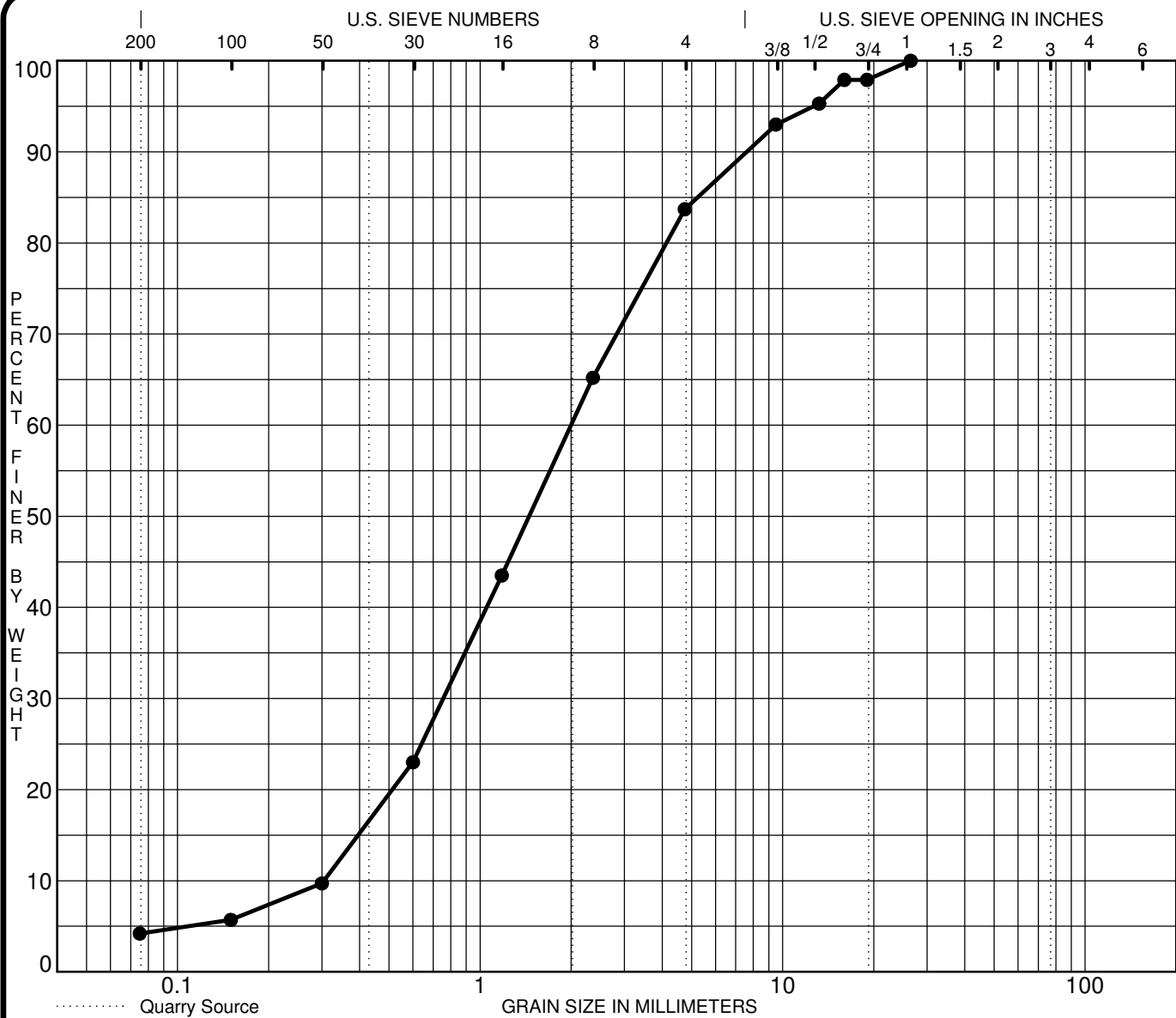
FILE NO. PG3607

DATE 9 Dec 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 7-15	G 2	(SP) Poorly-graded SAND with gravel								0.94	6.6
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 7-15	G 2	26.50	2.00	0.756	0.3047	16.3	79.5	4.2			
☒												
▲												
★												

CLIENT Regional Group of Companies

PROJECT Geotechnical Investigation - Barrhaven South

Urban Expansion

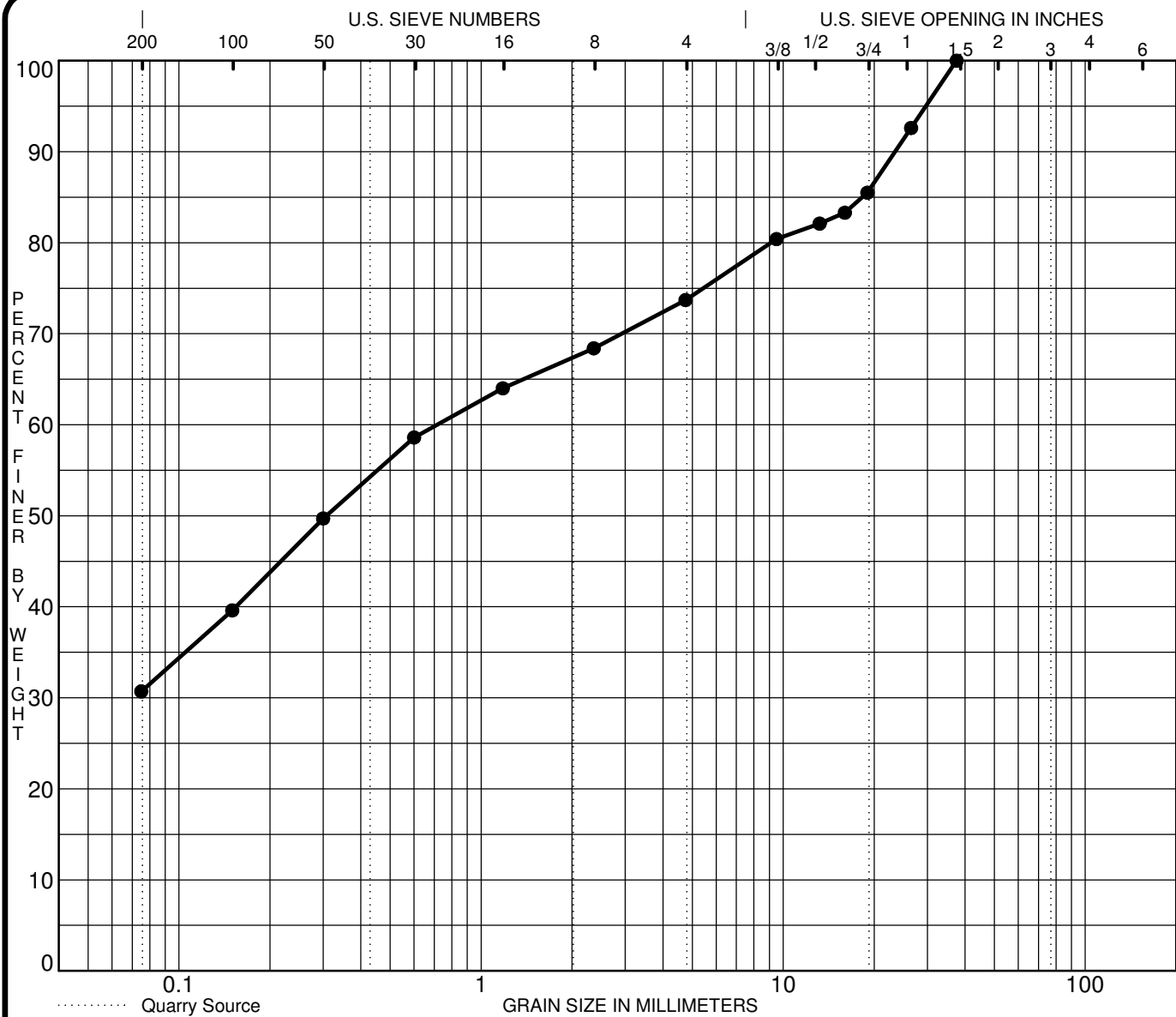
FILE NO. PG3607

DATE 1 Dec 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 20-15	G 3	(SM) SILTY SAND with gravel									
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	TP 20-15	G 3	37.50	0.71			26.3	43.0	30.7			
☒												
▲												
★												

CLIENT Regional Group of Companies

PROJECT Geotechnical Investigation - Barrhaven South

Urban Expansion

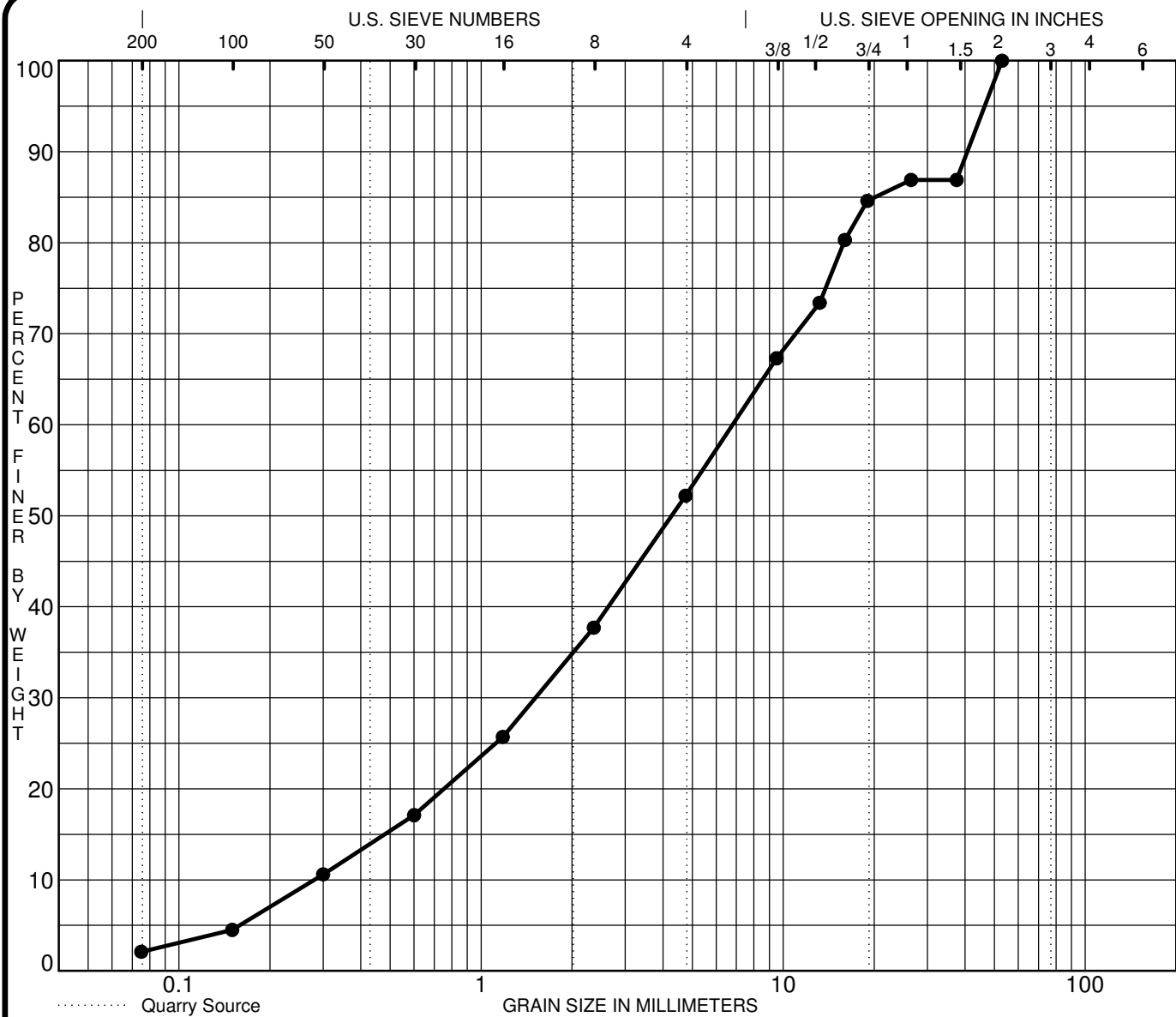
FILE NO. PG3607

DATE 2 Dec 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 31A-15	G 2	(SW) Well-graded SAND with gravel								1.20	24.2
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 31A-15	G 2	53.00	6.80	1.513	0.2802	47.8	50.1	2.1			
☒												
▲												
★												

CLIENT Regional Group of Companies

PROJECT Geotechnical Investigation - Barrhaven South

Urban Expansion

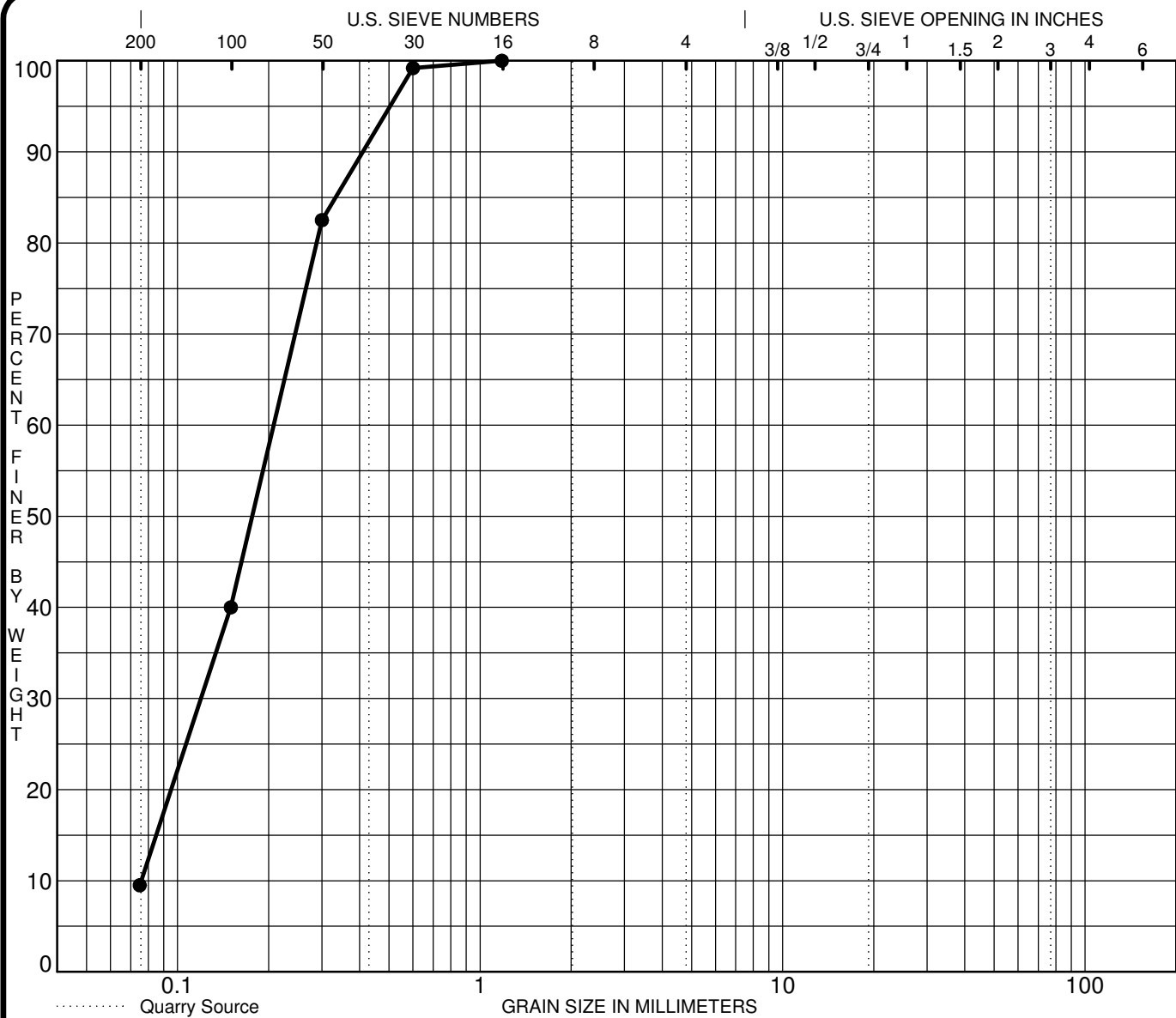
FILE NO. PG3607

DATE 1 Dec 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 35-15	G 2	(SP-SM) Poorly-graded SAND with silt								0.91	2.7
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 35-15	G 2	1.18	0.21	0.120	0.0759	0.0	90.5	9.5			
☒												
▲												
★												

CLIENT Regional Group of Companies

PROJECT Geotechnical Investigation - Barrhaven South

Urban Expansion

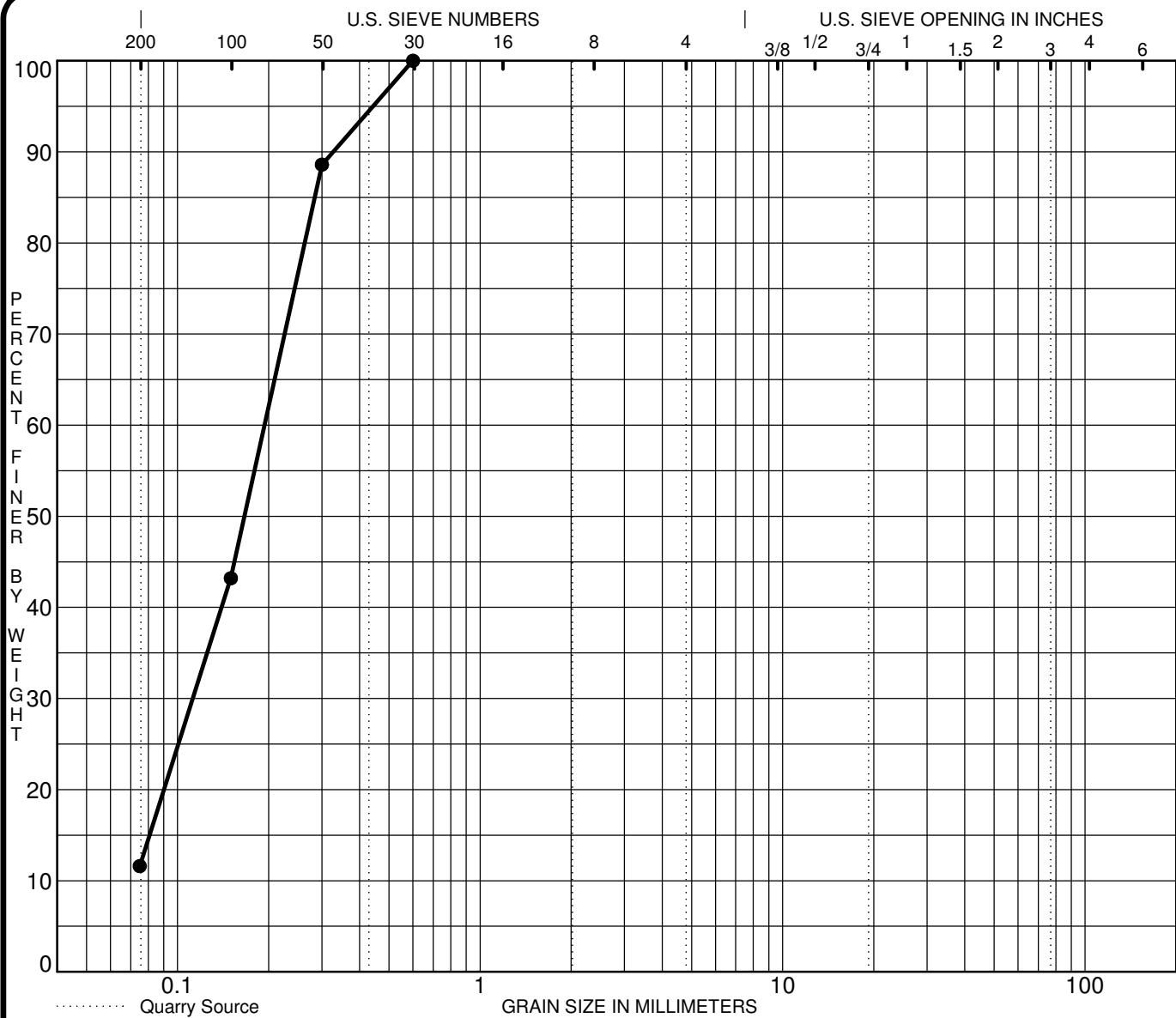
FILE NO. PG3607

DATE 23 Nov 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 55-15	G 2	(SP-SM) Poorly-graded SAND with silt								0.90	2.7
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 55-15	G 2	0.60	0.19	0.112		0.0	88.4	11.6			
☒												
▲												
★												

CLIENT Regional Group of Companies

PROJECT Geotechnical Investigation - Barrhaven South

Urban Expansion

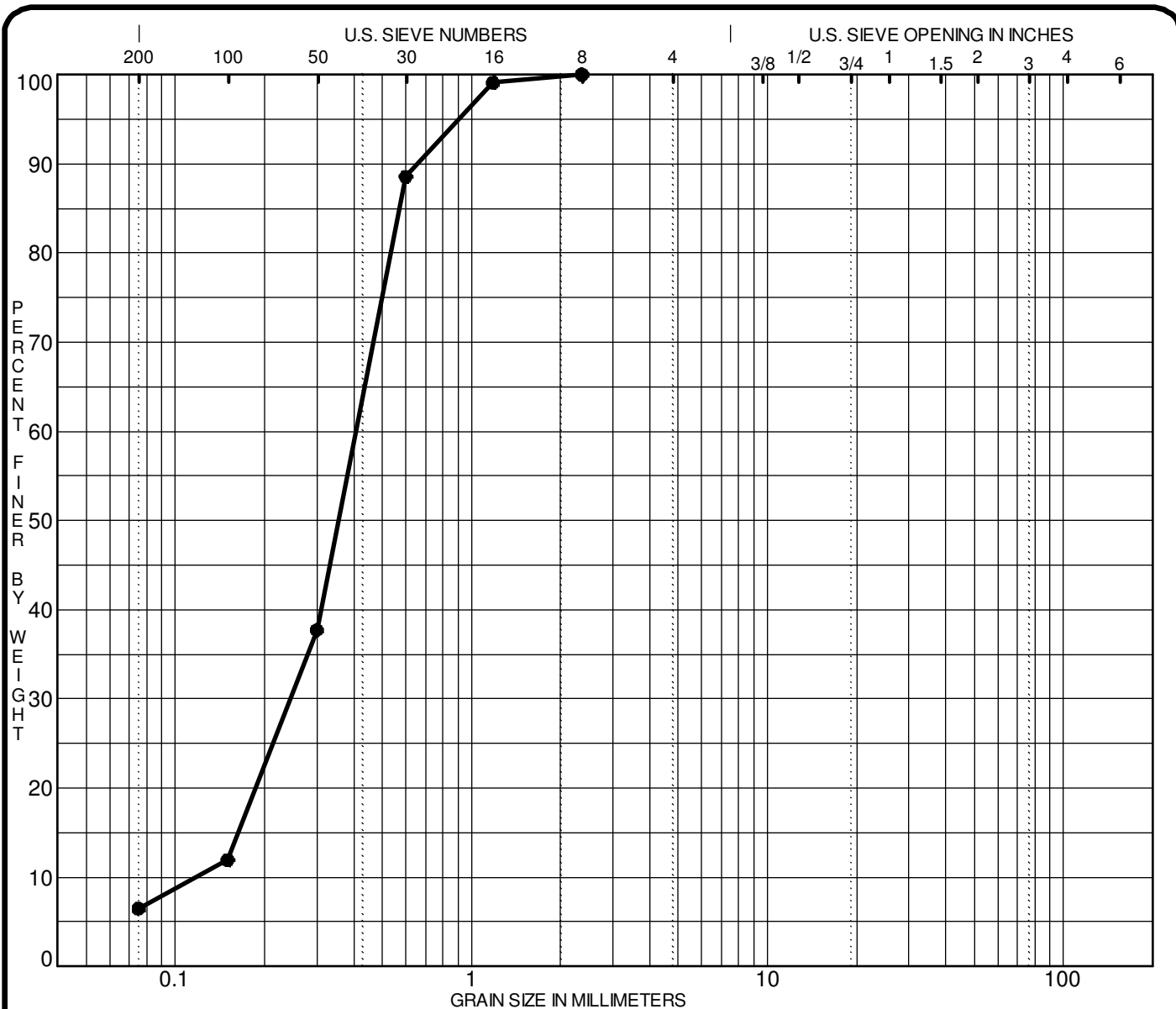
FILE NO. PG3607

DATE 30 Nov 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	BH 5-15	SS 9	Poorly graded fine to medium SAND (SP)				18				1.24	3.5
☒												
▲												
★			Based on ASTM D 2487									
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	BH 5-15	SS 9	2.36	0.41	0.244	0.1178	0.0	93.5	6.5			
☒												
▲												
★												

CLIENT Mattamy Homes

PROJECT Hydrogeological Investigation - Residential

Development - Half Moon Bay South

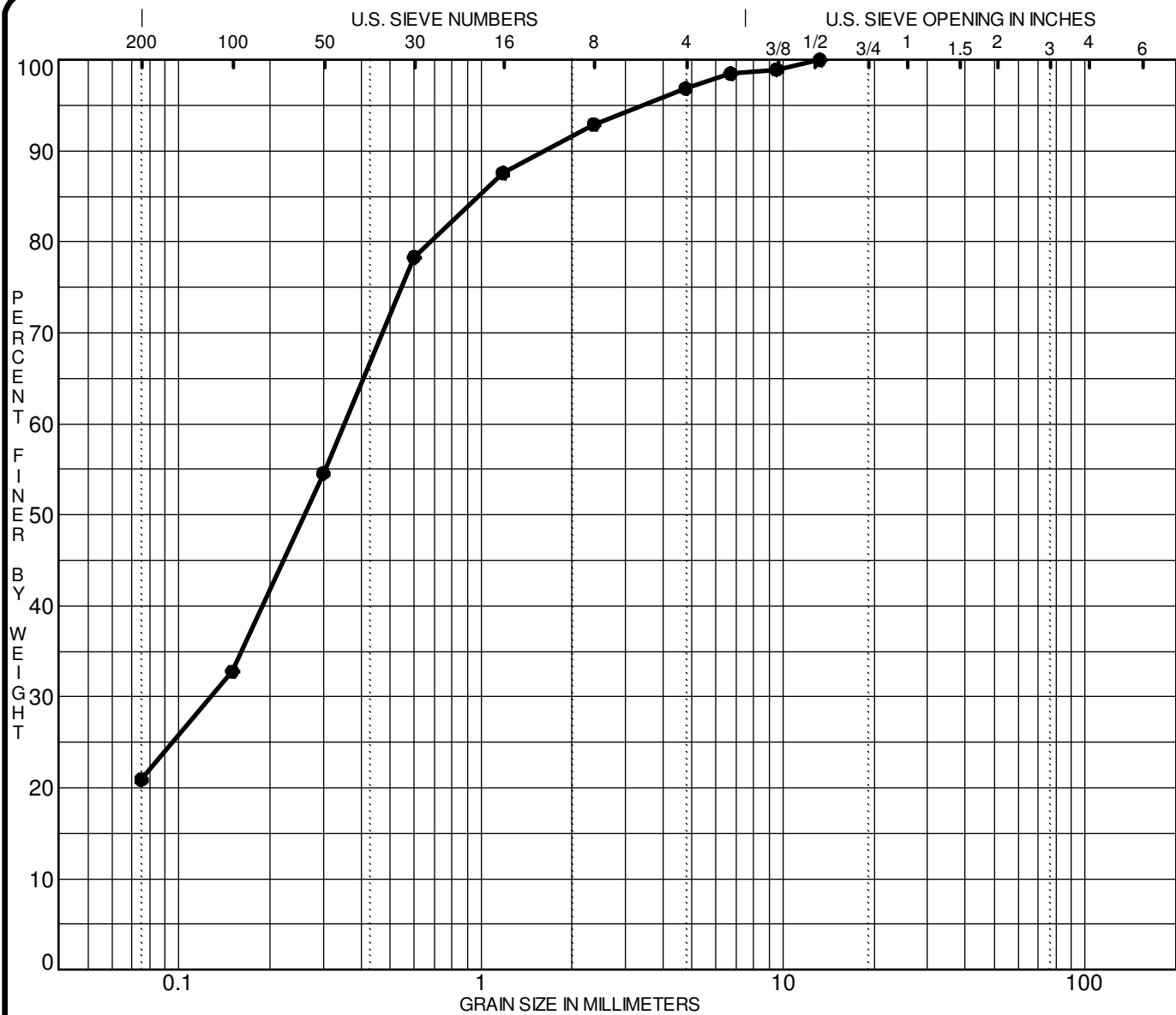
FILE NO. PG3450

DATE 6 Mar 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification				MC%	LL	PL	PI	Cc	Cu
● BH 6-15 SS4-SS5	SILTY CLAYEY SAND, trace gravel (SC-SM)				20					
☒										
▲										
★	Based on ASTM D 2487									
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
● BH 6-15 SS4-SS5	13.20	0.35	0.128		3.1	76.0	20.9			
☒										
▲										
★										

CLIENT Mattamy Homes

PROJECT Hydrogeological Investigation - Residential

Development - Half Moon Bay South

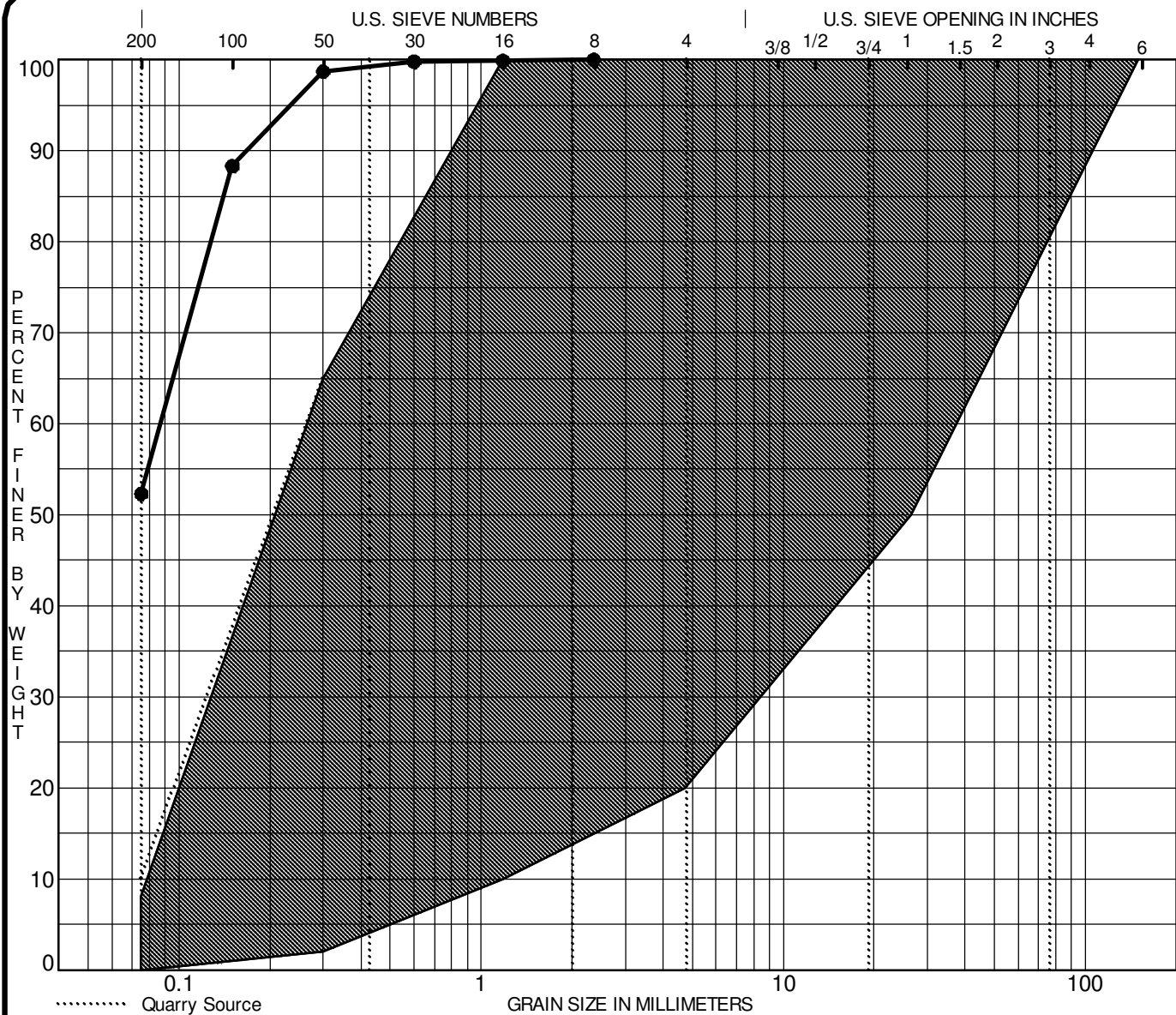
FILE NO. PG3450

DATE 5 Mar 15

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 1-11	G2	SILTY SAND									
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 1-11	G2	2.36	0.09			0.0	47.7	52.3			
☒												
▲												
★												

CLIENT Minto Communities Inc.

PROJECT Mineral Resource Aggregate Assessment - 3882

Barnsdale Road

FILE NO. PH1893

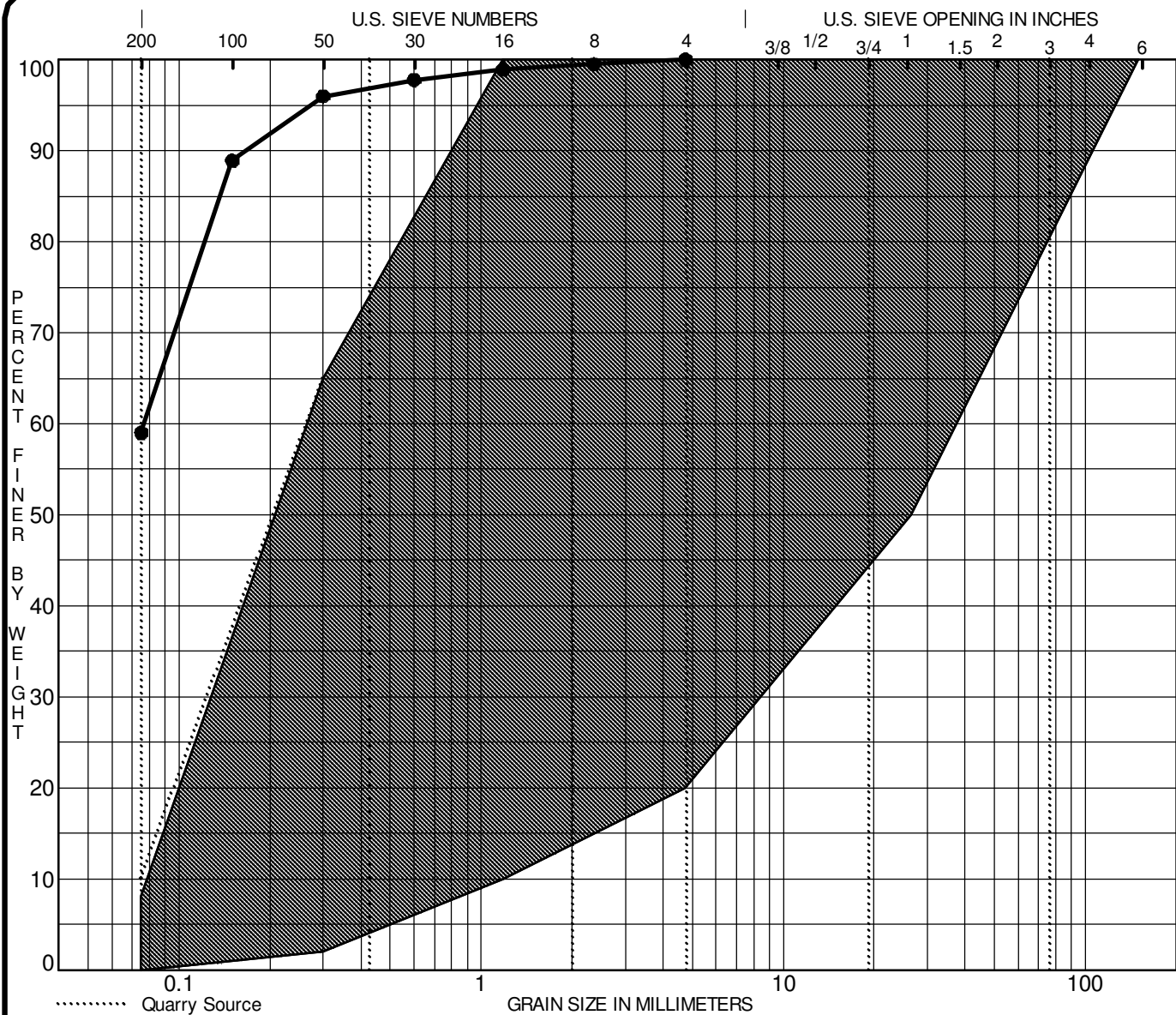
DATE 16 Dec 11

patersongroup

Consulting
Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE
DISTRIBUTION**



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 3-11	G6	SANDY SILT									
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 3-11	G6	4.75	0.08			0.0	41.0	59.0			
☒												
▲												
★												

CLIENT Minto Communities Inc.

PROJECT Mineral Resource Aggregate Assessment - 3882

Barnsdale Road

FILE NO. PH1893

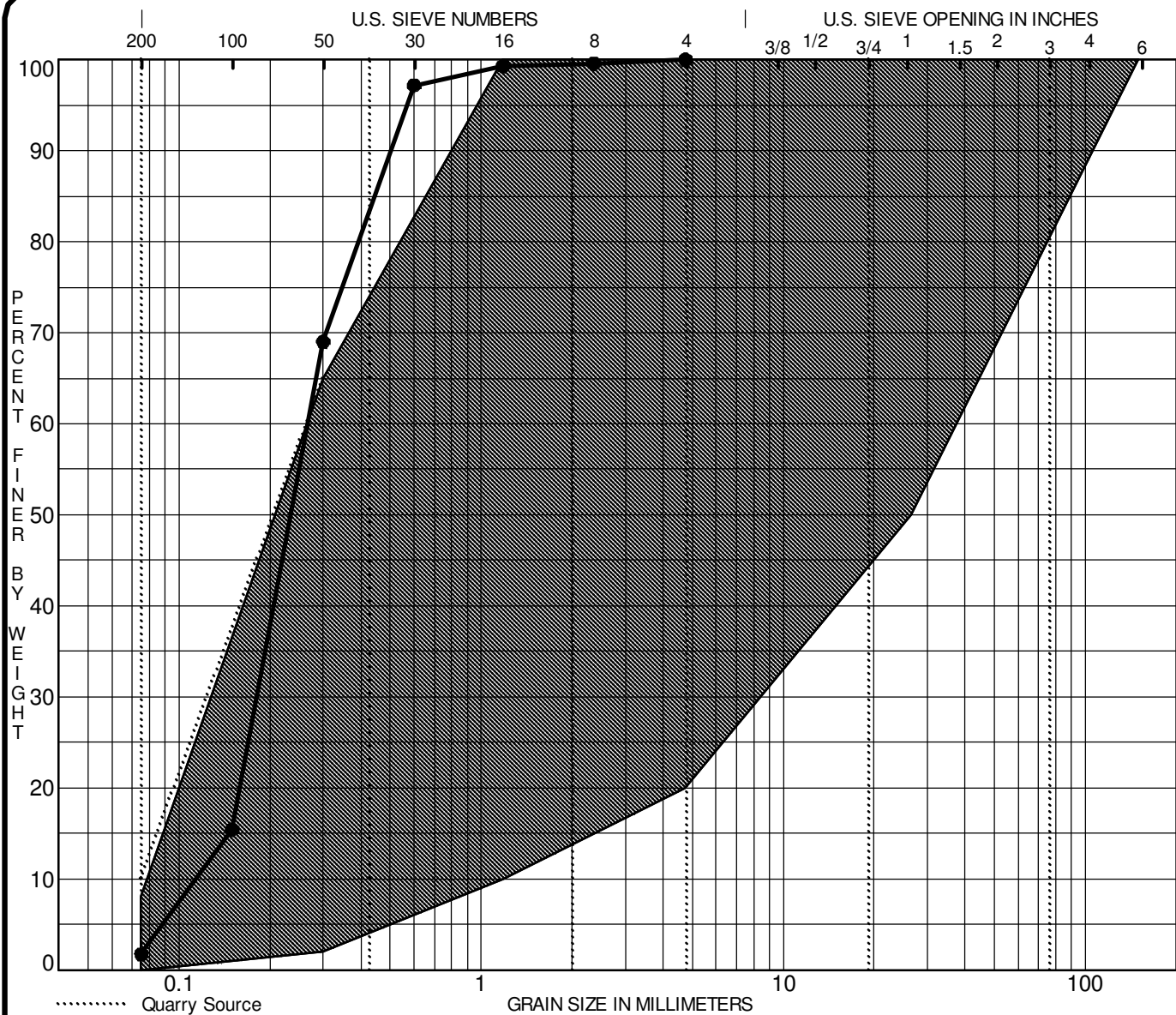
DATE 16 Dec 11

patersongroup

Consulting
Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE
DISTRIBUTION**



Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 5-11	G11	FINE SAND								1.08	2.3
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 5-11	G11	4.75	0.27	0.181	0.1141	0.0	98.3	1.7			
☒												
▲												
★												

CLIENT Minto Communities Inc.

PROJECT Mineral Resource Aggregate Assessment - 3882

Barnsdale Road

FILE NO. PH1893

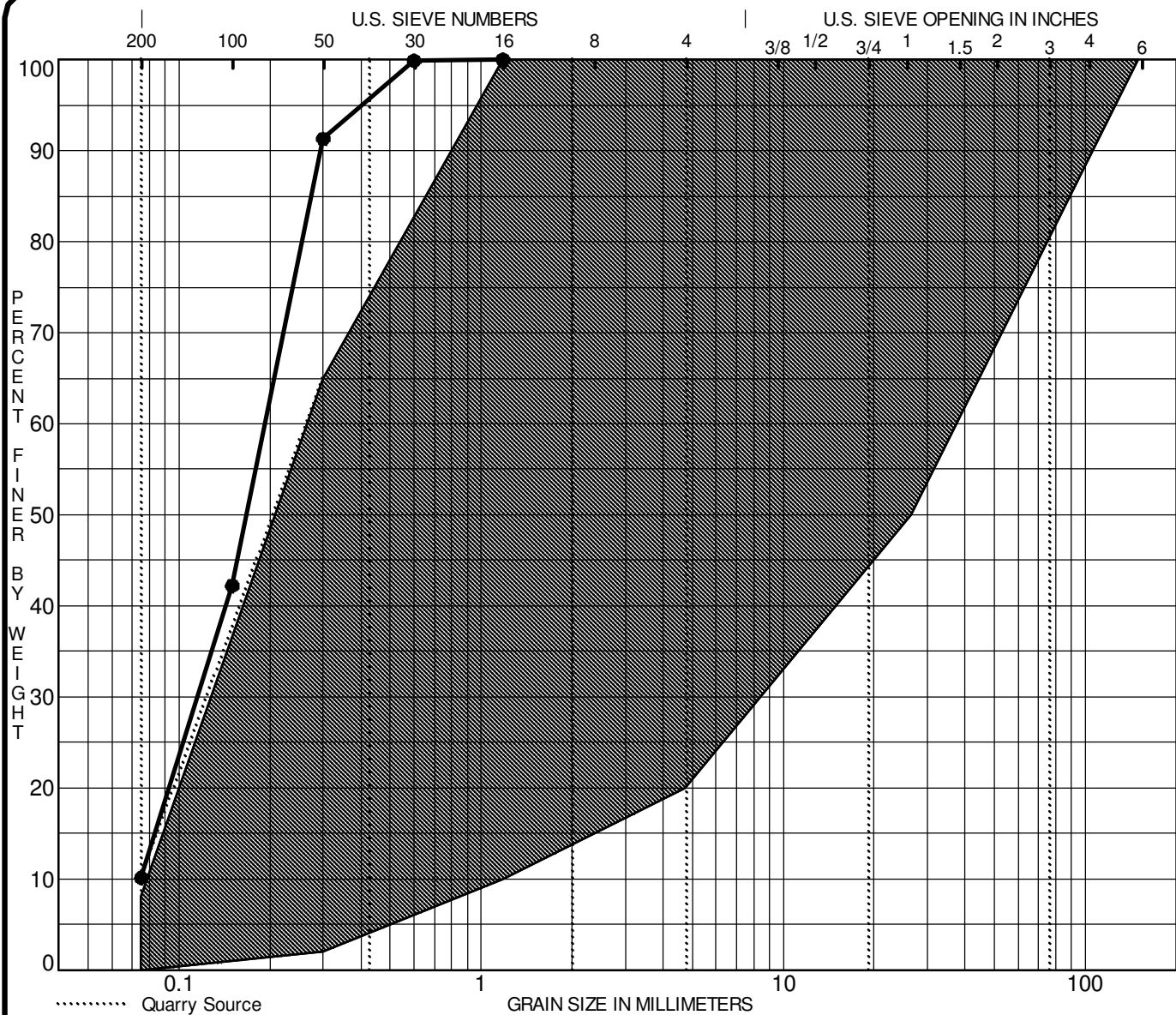
DATE 16 Dec 11

patersongroup

Consulting
Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE
DISTRIBUTION**



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 6-11	G14	FINE SAND, some silt								0.92	2.6
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	TP 6-11	G14	1.18	0.19	0.115		0.0	89.9	10.1			
☒												
▲												
★												

CLIENT Minto Communities Inc.

PROJECT Mineral Resource Aggregate Assessment - 3882

Barnsdale Road

FILE NO. PH1893

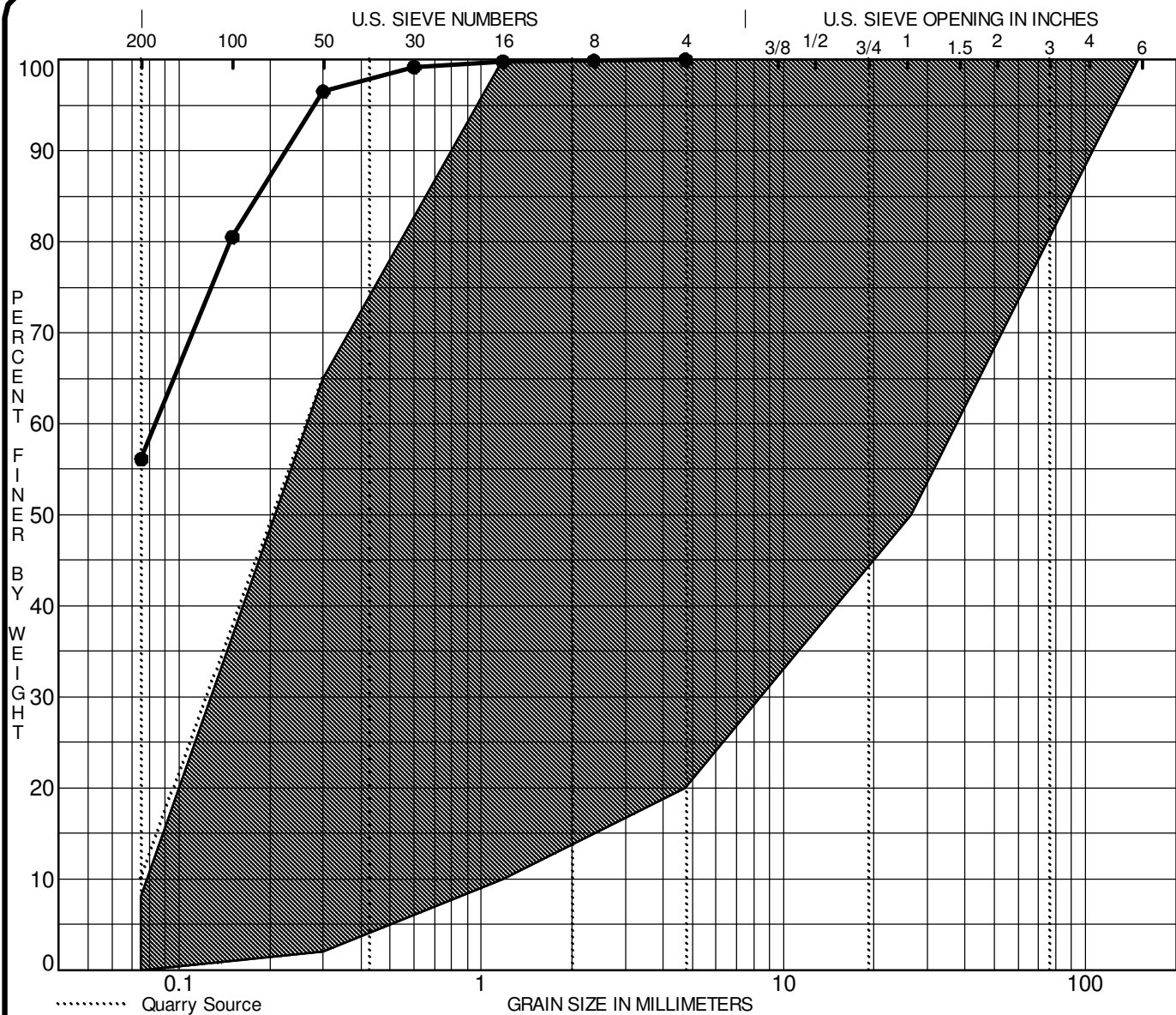
DATE 16 Dec 11

patersongroup

Consulting
Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE
DISTRIBUTION**



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 7-11	G18	SANDY SILT/SILTY SAND									
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	TP 7-11	G18	4.75	0.08			0.0	43.9	56.1			
☒												
▲												
★												

CLIENT Minto Communities Inc.

PROJECT Mineral Resource Aggregate Assessment - 3882

Barnsdale Road

FILE NO. PH1893

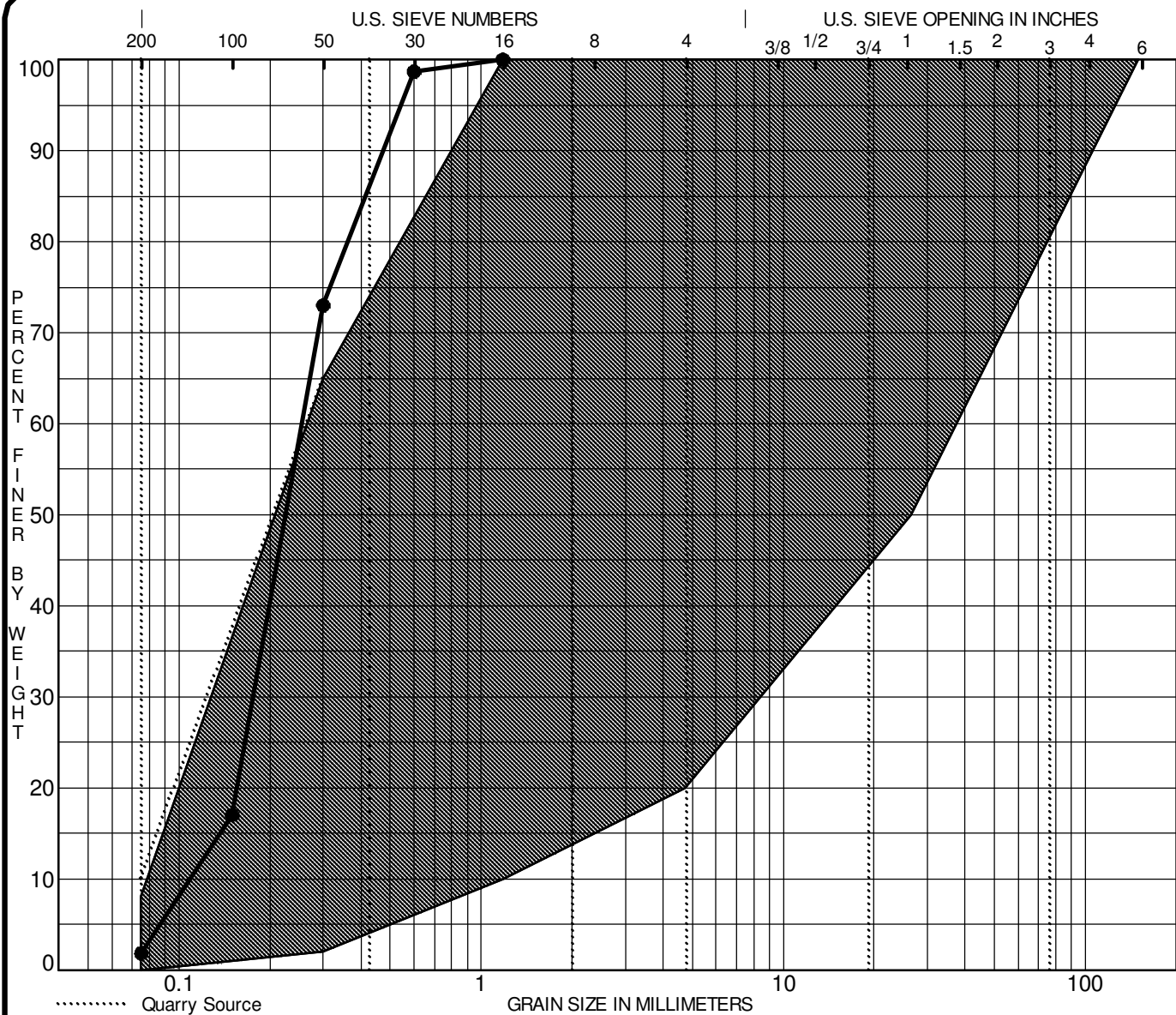
DATE 16 Dec 11

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Consulting
Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE
DISTRIBUTION**



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 8-11 G20	FINE SAND								1.11	2.3
☒											
▲											
★											
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 8-11 G20	1.18	0.26	0.176	0.1090	0.0	98.2	1.8			
☒											
▲											
★											

CLIENT Minto Communities Inc.

PROJECT Mineral Resource Aggregate Assessment - 3882

Barnsdale Road

FILE NO. PH1893

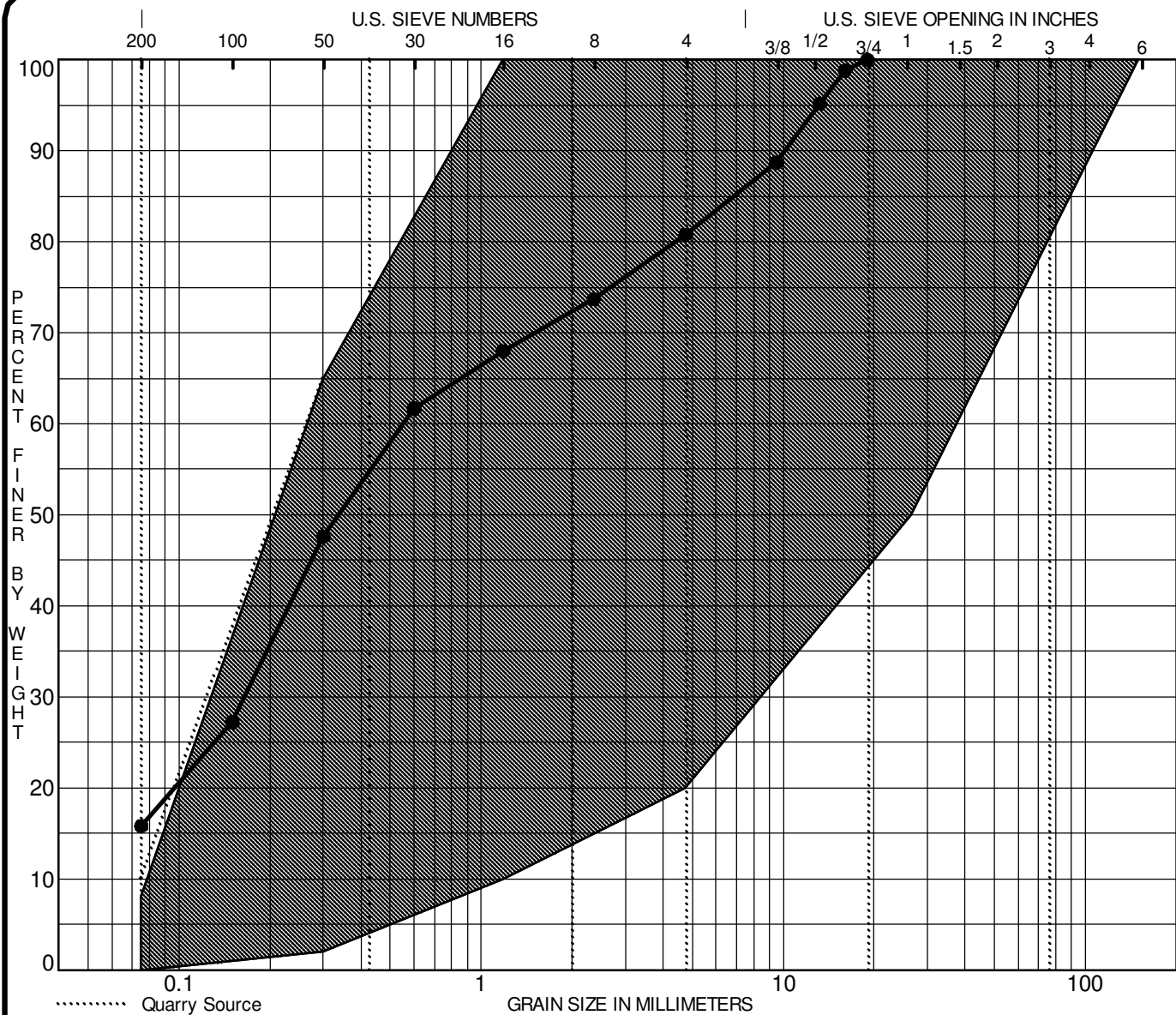
DATE 16 Dec 11

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Consulting
Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE
DISTRIBUTION**



Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 9-11 G21	SAND-GRAVEL, some silt									
☒											
▲											
★											
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 9-11 G21	19.00	0.55	0.165		19.2	65.0	15.8			
☒											
▲											
★											

CLIENT Minto Communities Inc.

PROJECT Mineral Resource Aggregate Assessment - 3882

Barnsdale Road

FILE NO. PH1893

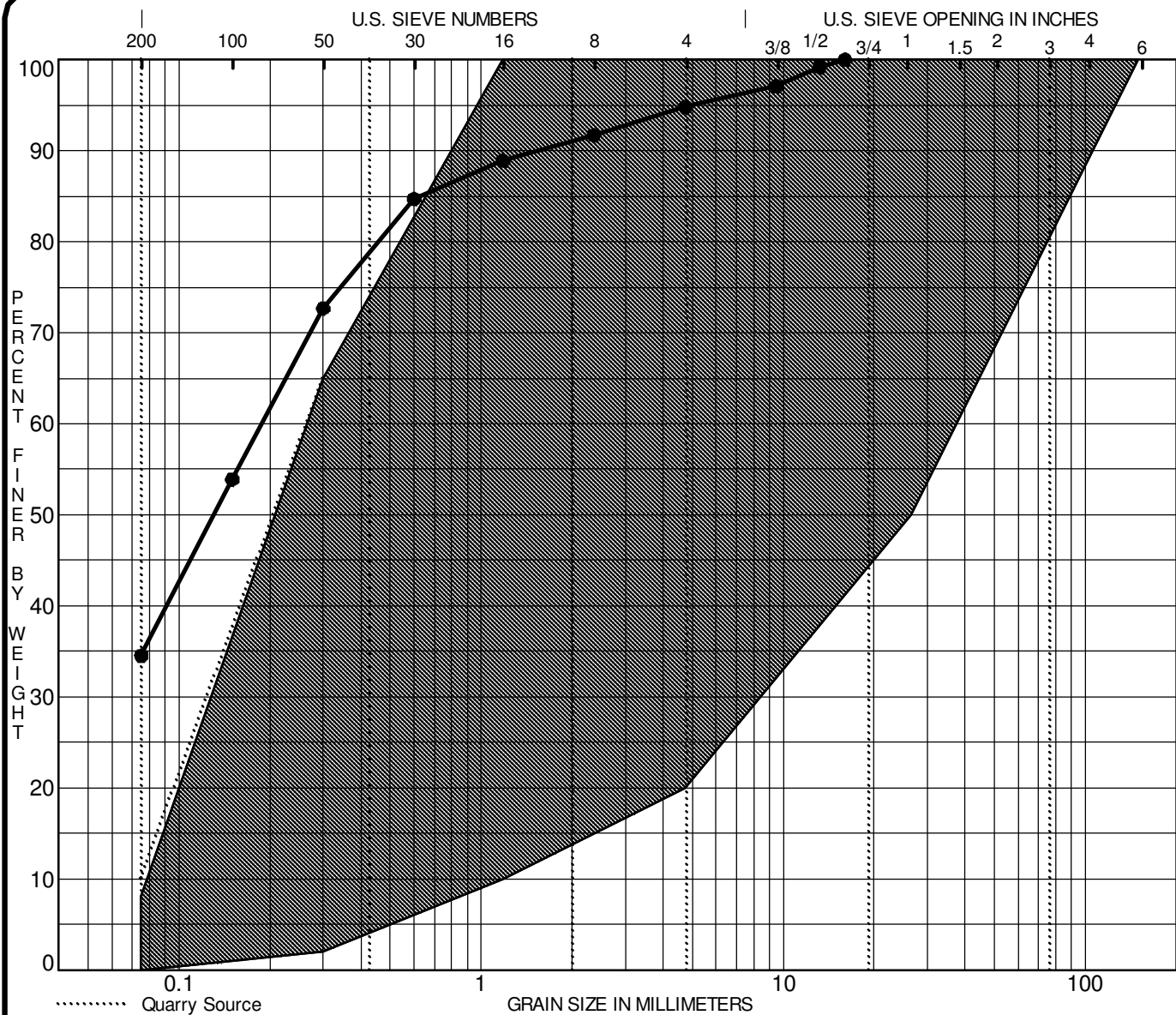
DATE 16 Dec 11

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Consulting
Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE
DISTRIBUTION**



Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP10-11	G26	SILTY SAND									
☒												
▲												
★												
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP10-11	G26	16.00	0.19			5.2	60.3	34.5			
☒												
▲												
★												

CLIENT Minto Communities Inc.

PROJECT Mineral Resource Aggregate Assessment - 3882

Barnsdale Road

FILE NO. PH1893

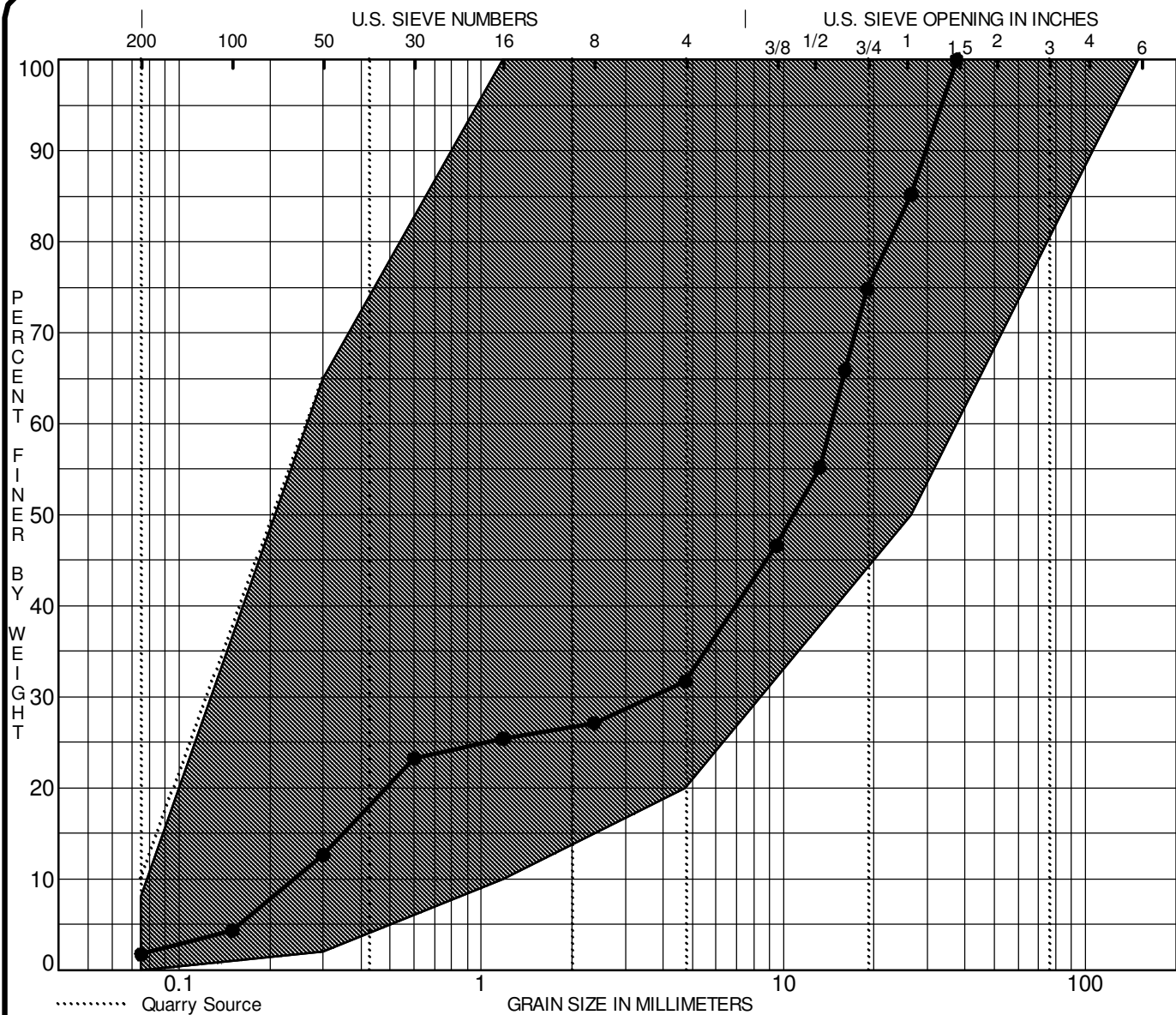
DATE 16 Dec 11

patersongroup

Consulting
Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE
DISTRIBUTION**



Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	TP11-11 G28	SAND-GRAVEL								3.87	59.6
☒											
▲											
★											
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP11-11 G28	37.50	14.39	3.668	0.2414	68.3	30.0	1.7			
☒											
▲											
★											

CLIENT Minto Communities Inc.

PROJECT Mineral Resource Aggregate Assessment - 3882

Barnsdale Road

FILE NO. PH1893

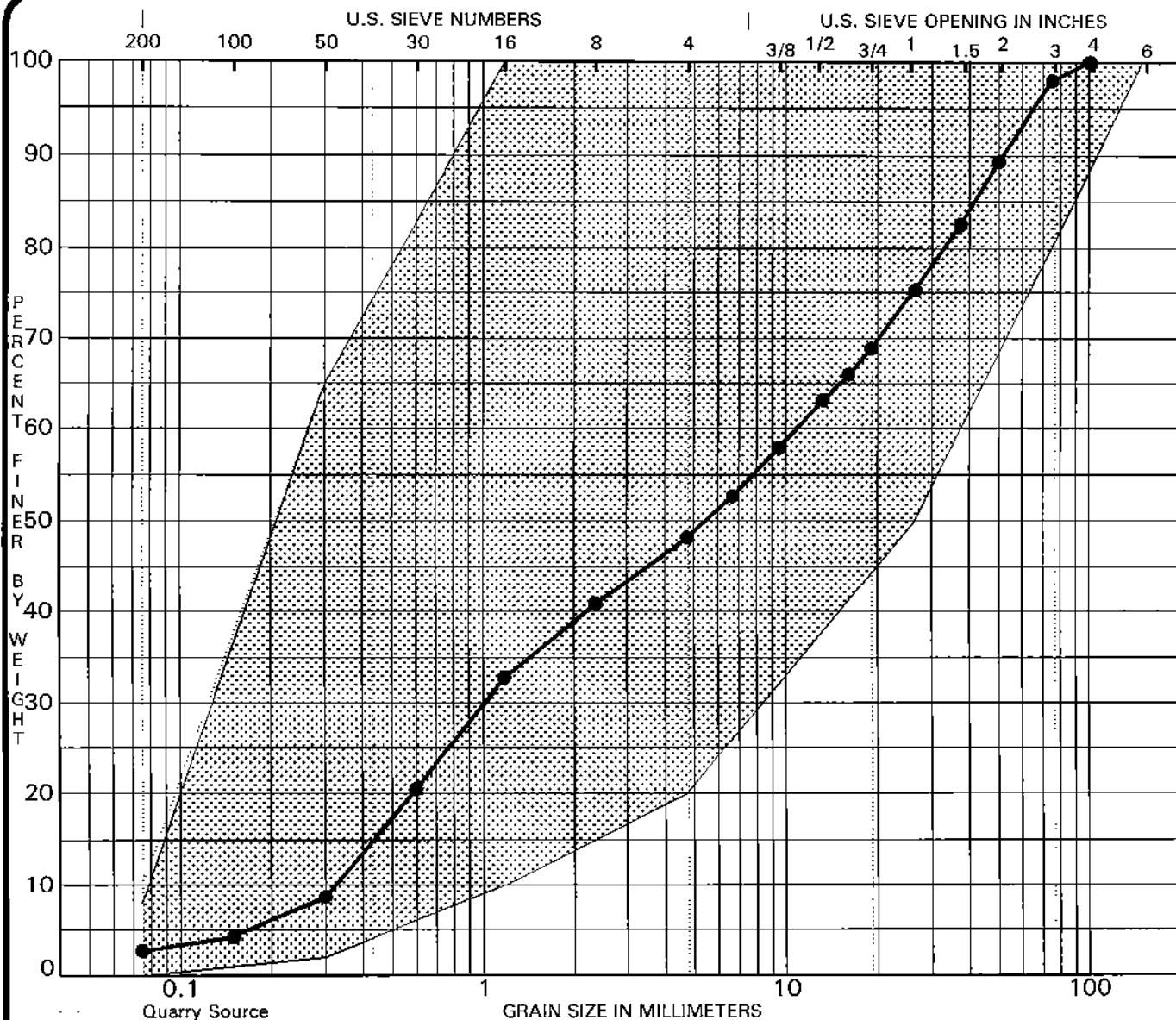
DATE 16 Dec 11

patersongroup

Consulting
Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

**GRAIN SIZE
DISTRIBUTION**



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 5 G 1	GRANULAR B TYPE I									
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	TP 5 G 1	100.00	10.82	1.012	0.3238	49.8	45.4				

CLIENT Mr. Dan Paquette

FILE NO. G9114

PROJECT Aggregate Resource Investigation - Greenbank
Road/Cedarview Road

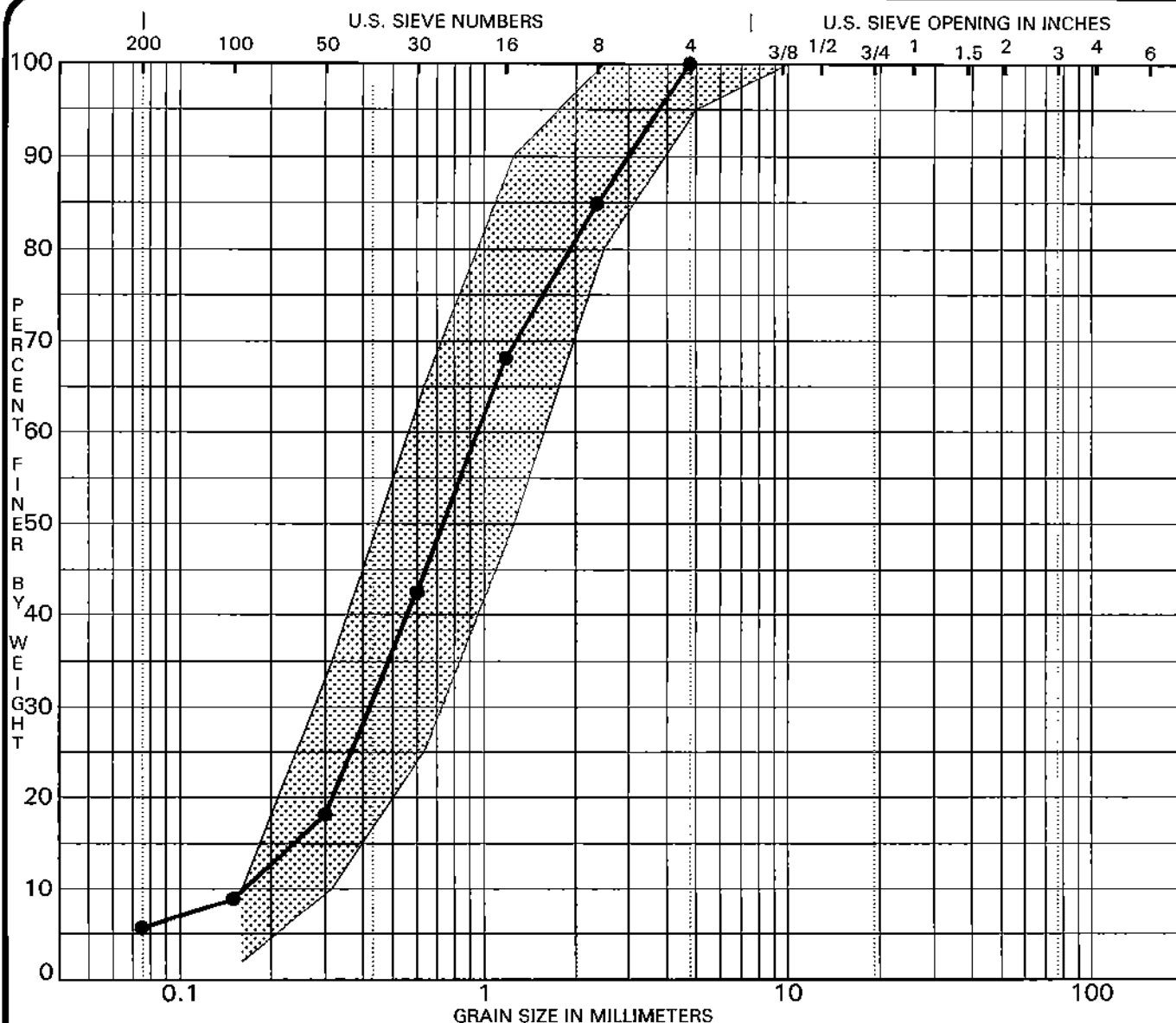
DATE 23 OCT 03



GRAIN SIZE DISTRIBUTION - OPSS GRANULAR B TYPE I

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT		SAND			GRAVEL				COBBLES		
		fine	medium	coarse	fine	coarse					
Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 5 G 1	SAND (after screening on 4.75mm)								1.14	5.8
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	TP 5 G 1	4.75	0.95	0.421	0.1630	0.0	94.3	5.7			

CLIENT Mr. Dan Paquette

FILE NO. G9114

PROJECT Aggregate Resource Investigation - Greenbank
Road/Cedarview Road

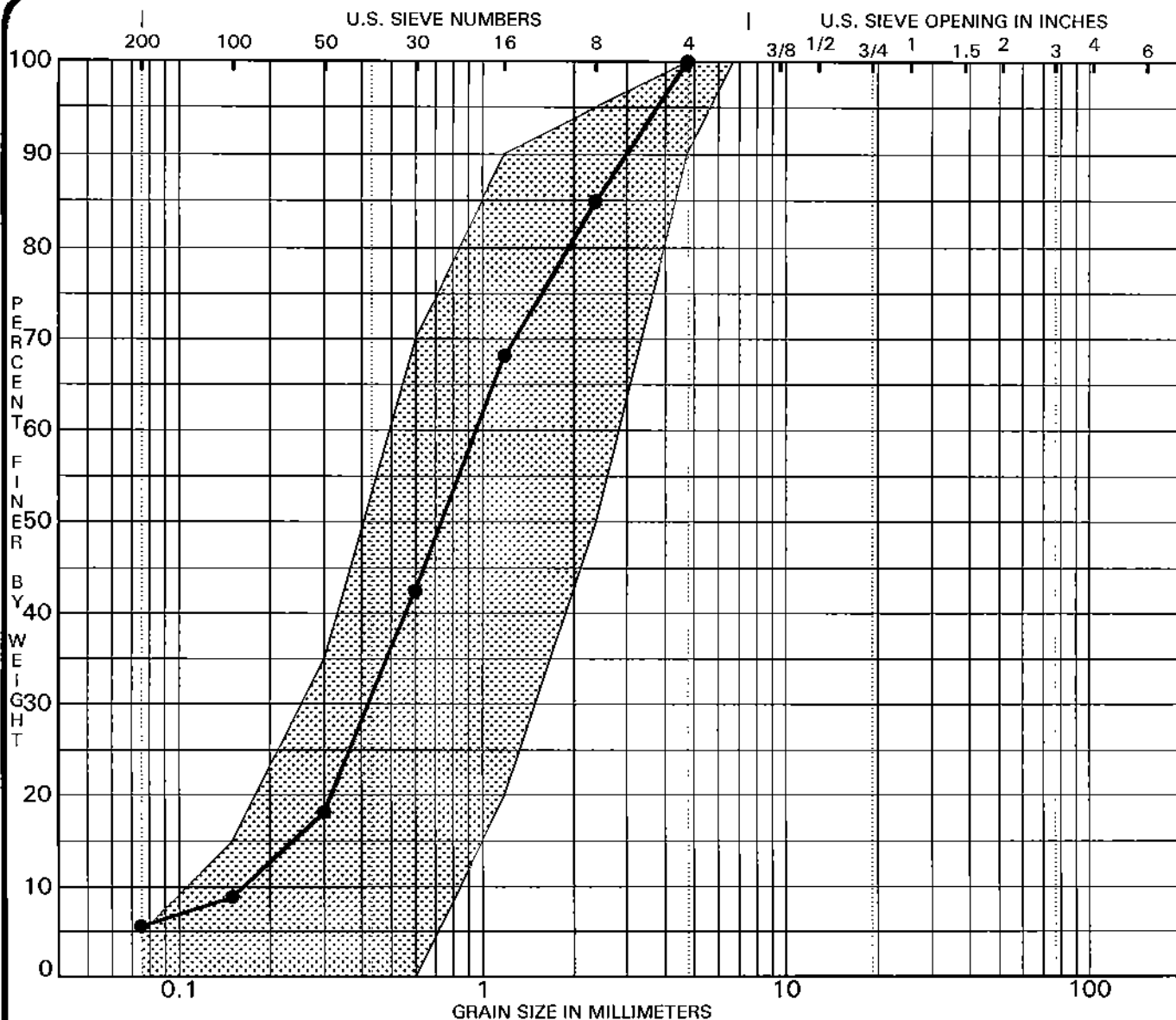
DATE 23 OCT 03



CSA-A23.1-M90-CONCRETE FINE AGGREGATE

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT	SAND			GRAVEL		COBBLES				
	fine	medium	coarse	fine	coarse					
Specimen Identification		Classification			MC%	LL	PL	PI	Cc	Cu
●	TP 5	G 1	SAND (after screening on 4.75mm)						1.14	5.8
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay	
●	TP 5	G 1	4.75	0.95	0.421	0.1630	0.0	94.3	5.7	

CLIENT Mr. Dan Paquette

FILE NO. G9114

PROJECT Aggregate Resource Investigation - Greenbank Road/Cedarview Road

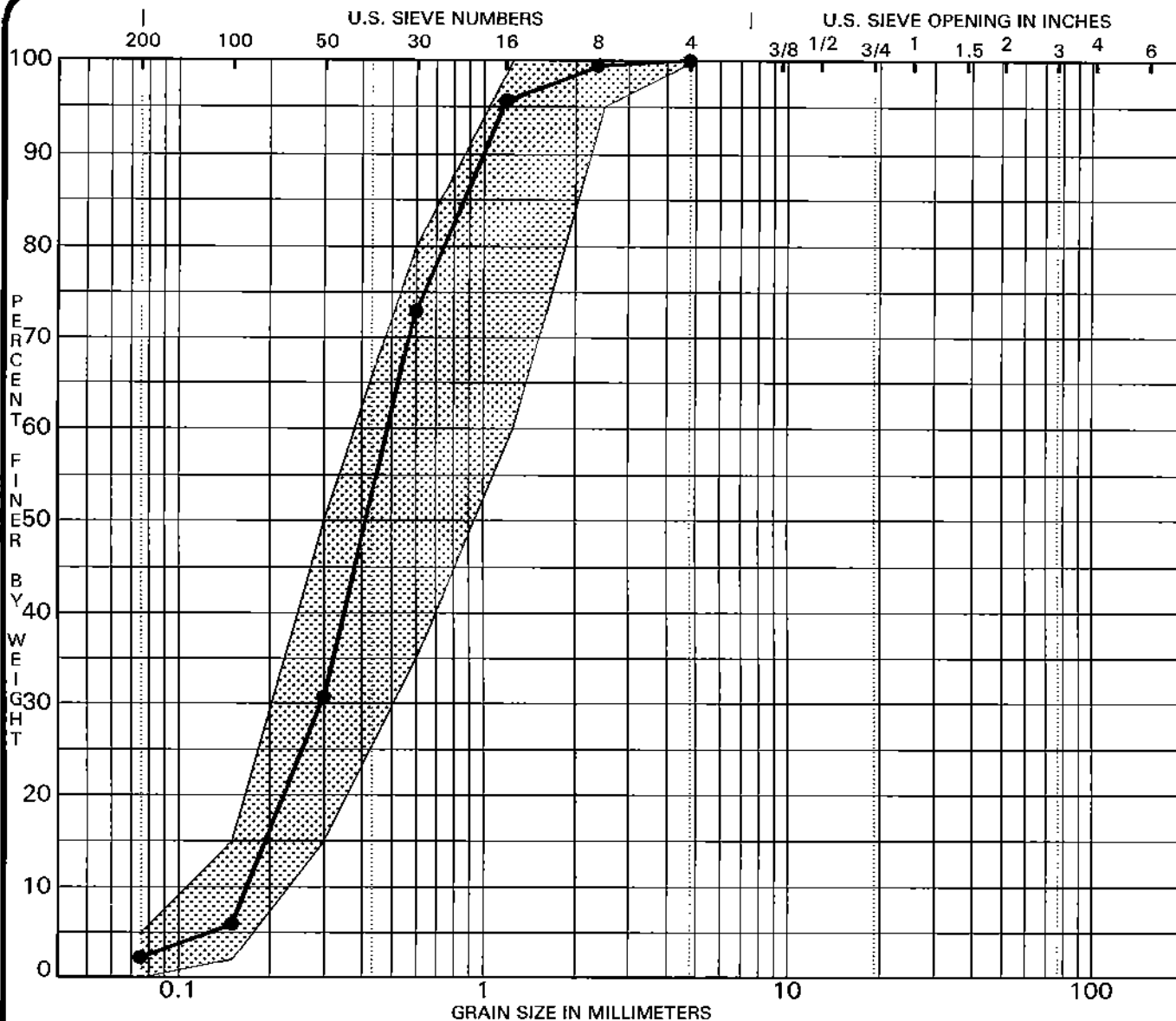
DATE 23 OCT 03



GRAIN SIZE DISTRIBUTION - WINTER SAND

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC %	LL	PL	PI	Cc	Cu
●	TP 5	G 2	SAND								1.06	2.9
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	TP 5	G 2	4.75	0.49	0.294	0.1678	0.0	97.7	2.3			

CLIENT Mr. Dan Paquette

FILE NO. G9114

PROJECT Aggregate Resource Investigation - Greenbank
Road/Cedarview Road

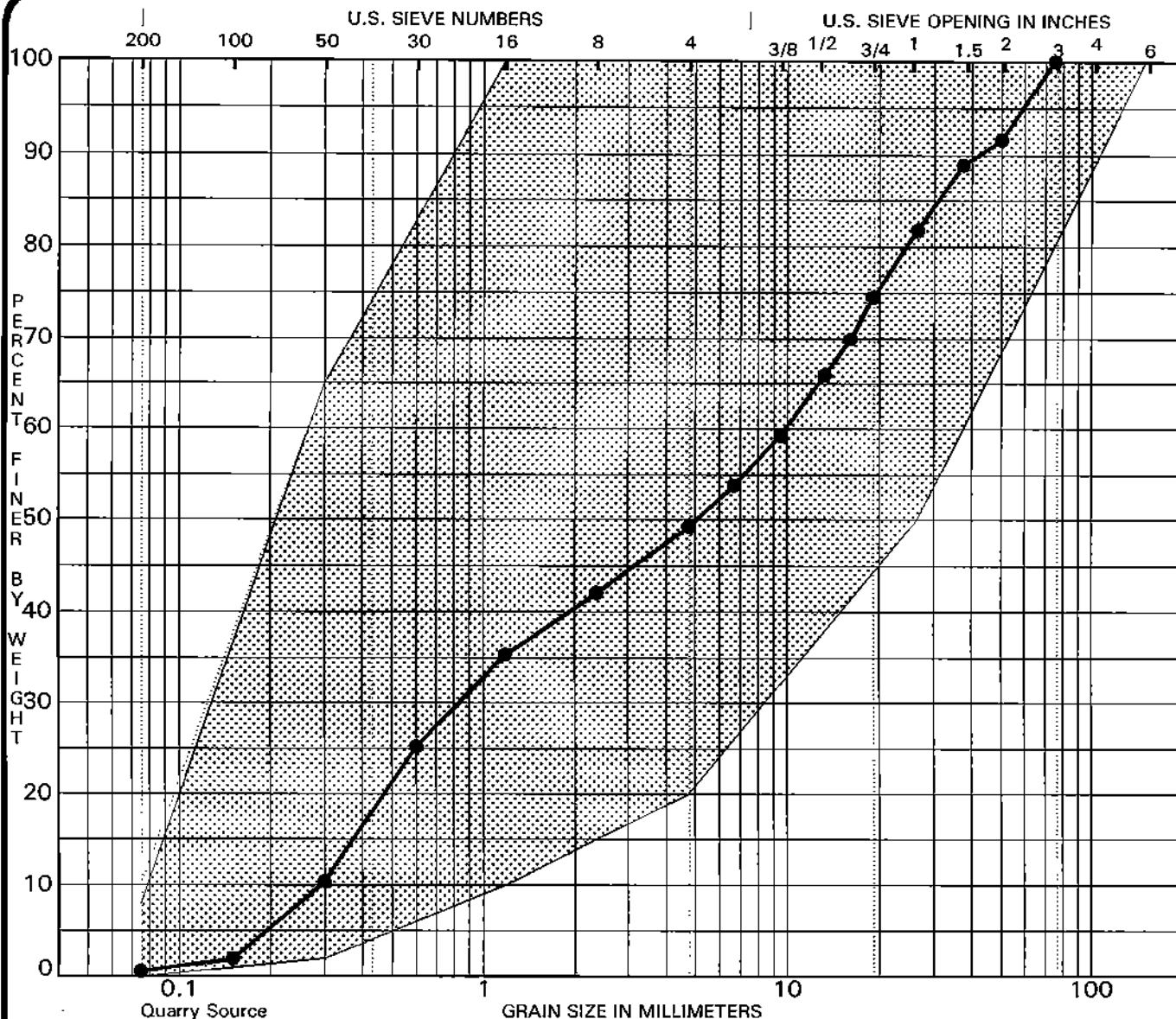
DATE 23 OCT 03



CSA-A82.56M-1976 AGGREGATE FOR MASONRY MORTAR

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification		Classification				MC %	LL	PL	PI	Cc	Cu
●	TP 7 G 1	GRANULAR B TYPE I								0.24	33.9
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 7 G 1	75.00	9.84	0.828	0.2903	50.8	48.6				

CLIENT Mr. Dan Paquette

PROJECT Aggregate Resource Investigation - Greenbank
Road/Cedarview Road

FILE NO. G9114

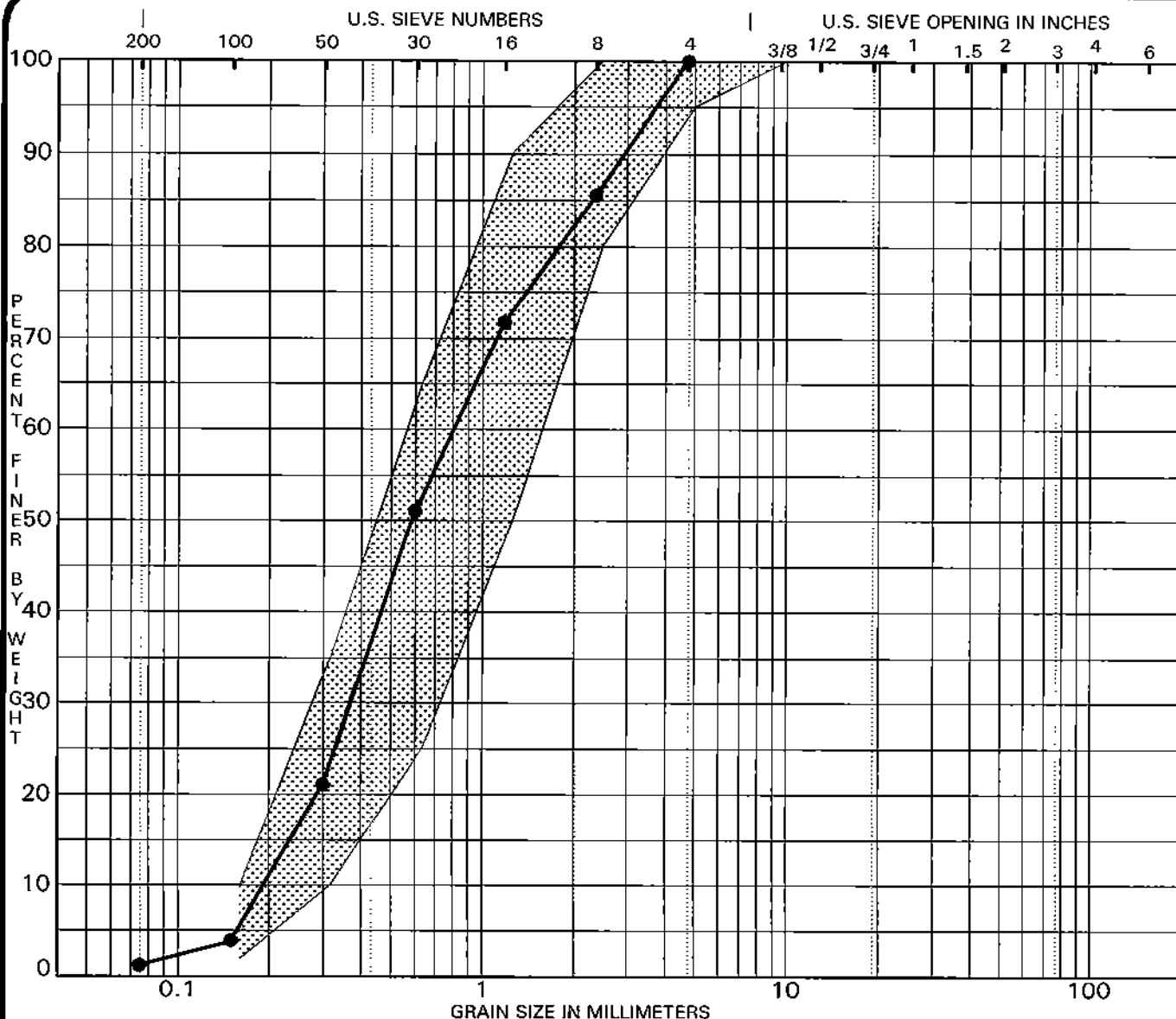
DATE 29 OCT 03



GRAIN SIZE DISTRIBUTION - OPSS GRANULAR B TYPE I

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 7	G 1	SAND (after screening on 4.75mm)							0.88	4.2
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP 7	G 1	4.75	0.80	0.369	0.1913	0.0	98.7	1.3		

CLIENT Mr. Dan Paquette

FILE NO. G9114

PROJECT Aggregate Resource Investigation - Greenbank
Road/Cedarview Road

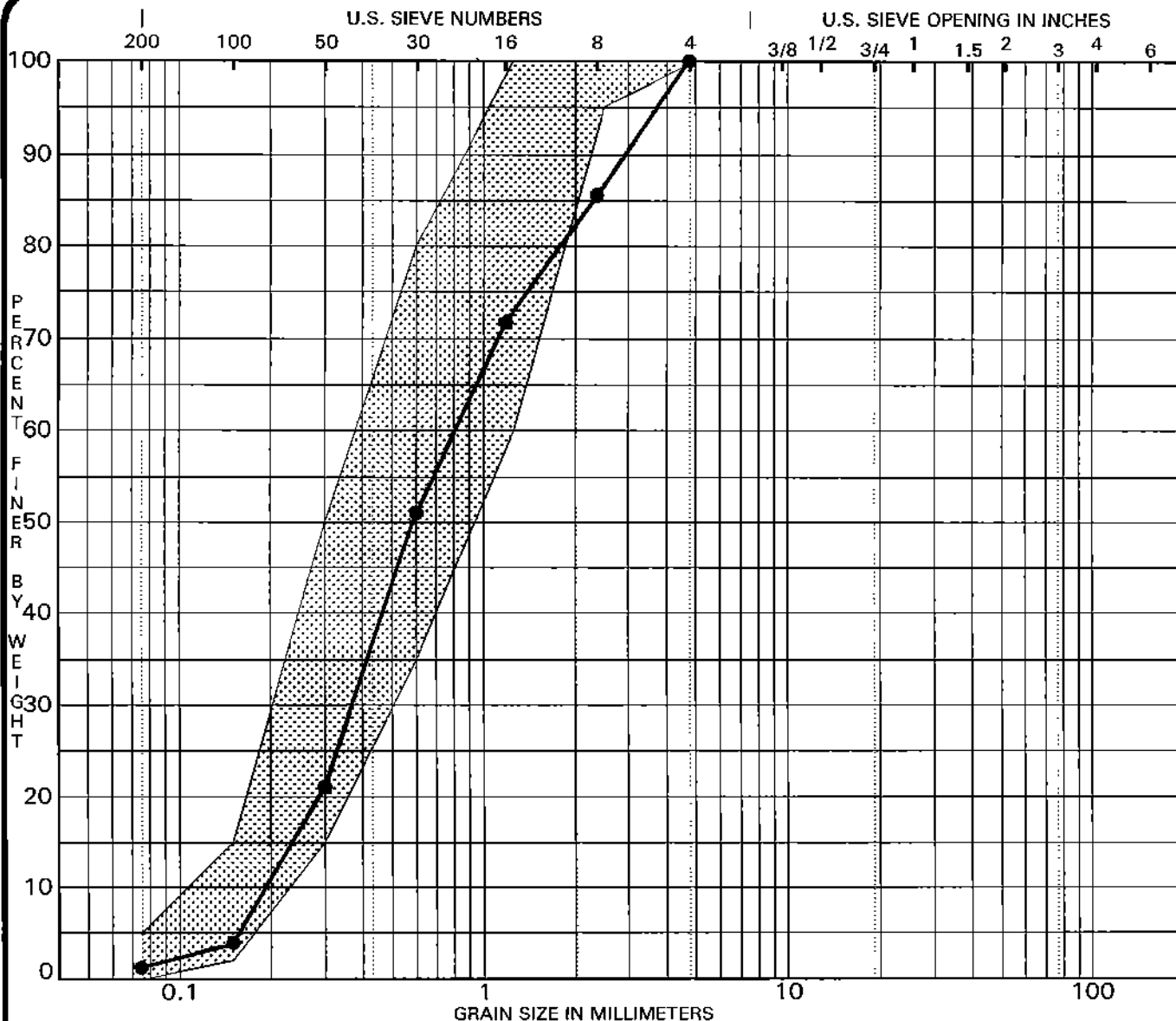
DATE 29 OCT 03



CSA-A23.1-M90-CONCRETE FINE AGGREGATE

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 7 G 1	SAND (after screening on 4.75mm)								0.88	4.2
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	TP 7 G 1	4.75	0.80	0.369	0.1913	0.0	98.7	1.3			

CLIENT Mr. Dan Paquette

FILE NO. G9114

PROJECT Aggregate Resource Investigation - Greenbank

DATE 29 OCT 03

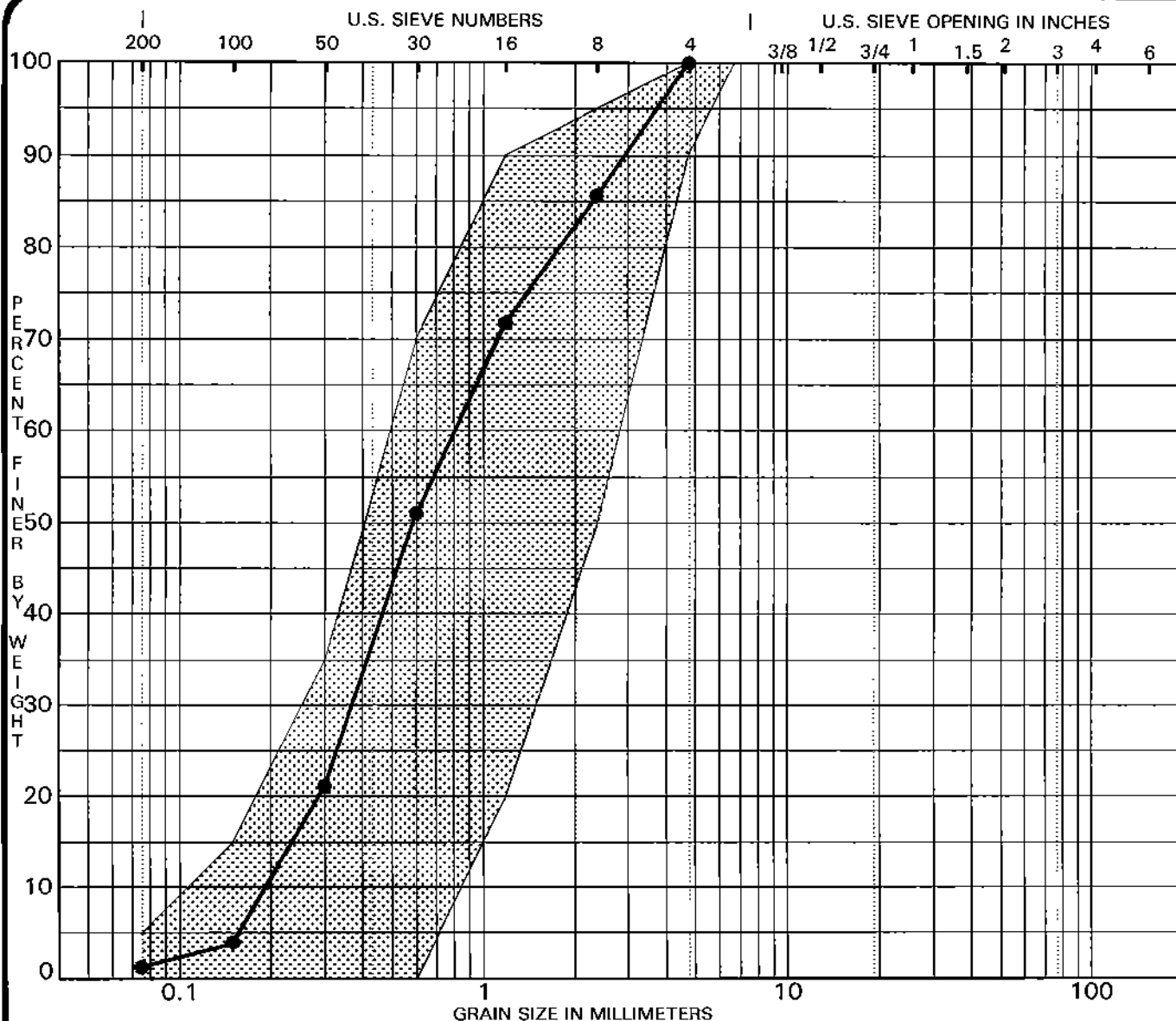
Road/Cedarview Road



CSA-A82.56M-1976 AGGREGATE FOR MASONRY MORTAR

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT		SAND			GRAVEL			COBBLES			
		fine	medium	coarse	fine	coarse					
Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	TP 7 G 1	SAND (after screening on 4.75mm)								0.88	4.2
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	TP 7 G 1	4.75	0.80	0.369	0.1913	0.0	98.7	1.3			

CLIENT Mr. Dan Paquette

FILE NO. G9114

PROJECT Aggregate Resource Investigation - Greenbank Road/Cedarview Road

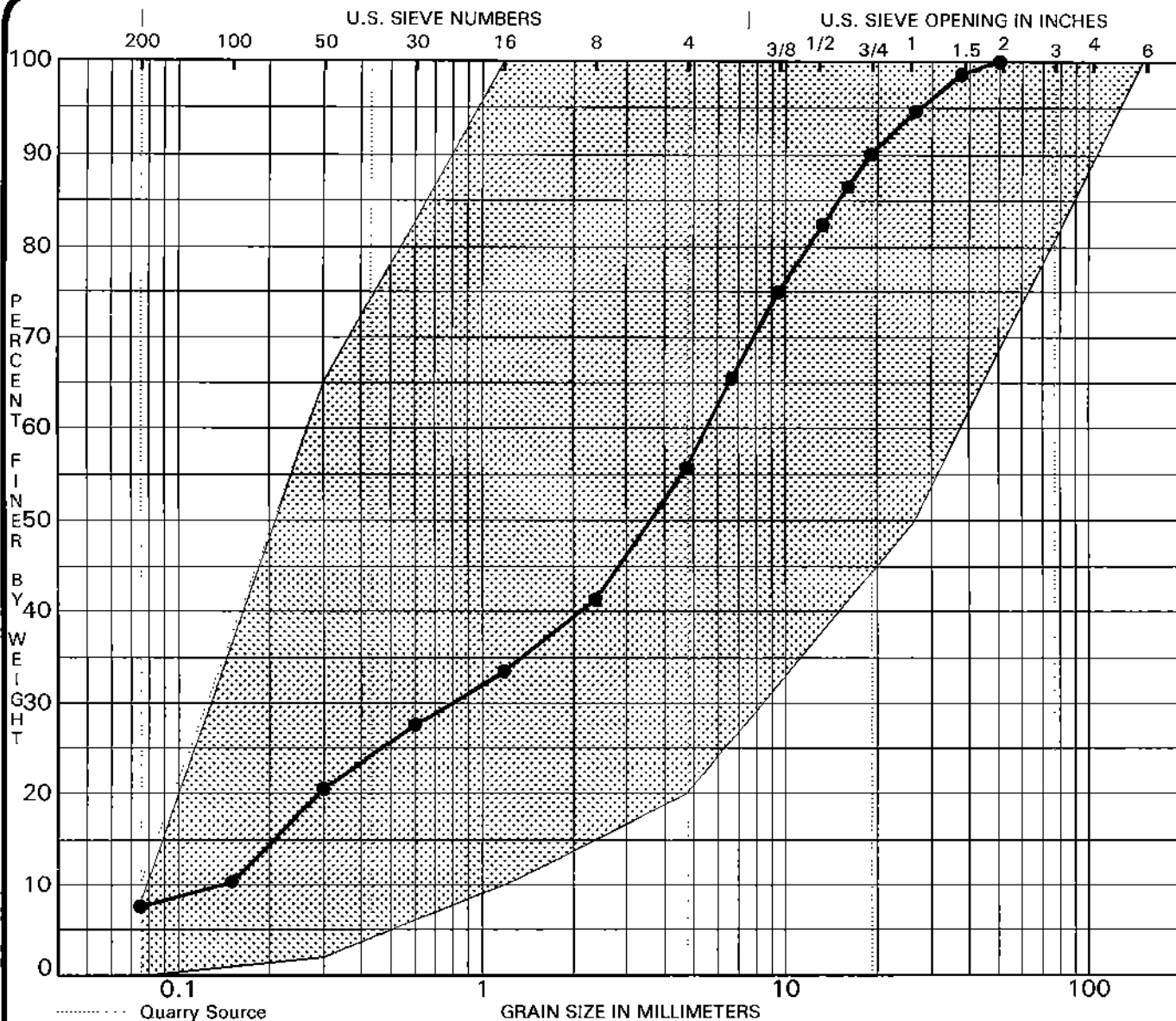
DATE 29 OCT 03



GRAIN SIZE DISTRIBUTION - WINTER SAND

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP10 G 1	50.00	5.52	0.790	0.1359	44.3	48.1		

CLIENT Mr. Dan Paquette

FILE NO. G9114

PROJECT Aggregate Resource Investigation - Greenbank Road/Cedarview Road

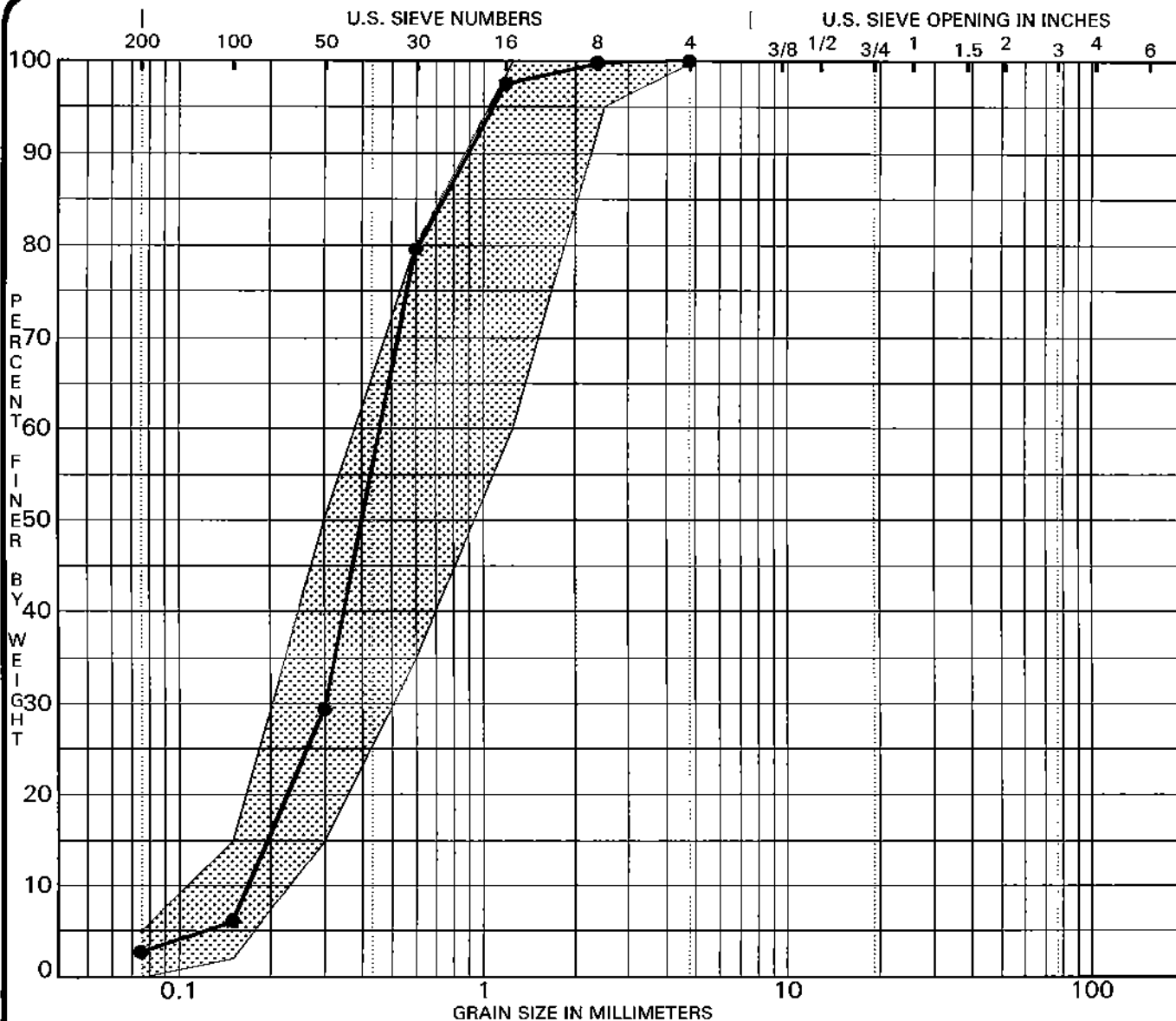
DATE 29 OCT 03



GRAIN SIZE DISTRIBUTION - OPSS GRANULAR B TYPE I

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP10	G 2	SAND								1.19	2.7
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt		%Clay	
●	TP10	G 2	4.75	0.46	0.303	0.1680	0.0	97.2	2.8			

CLIENT Mr. Dan Paquette

FILE NO. G9114

PROJECT Aggregate Resource Investigation - Greenbank

DATE 29 OCT 03

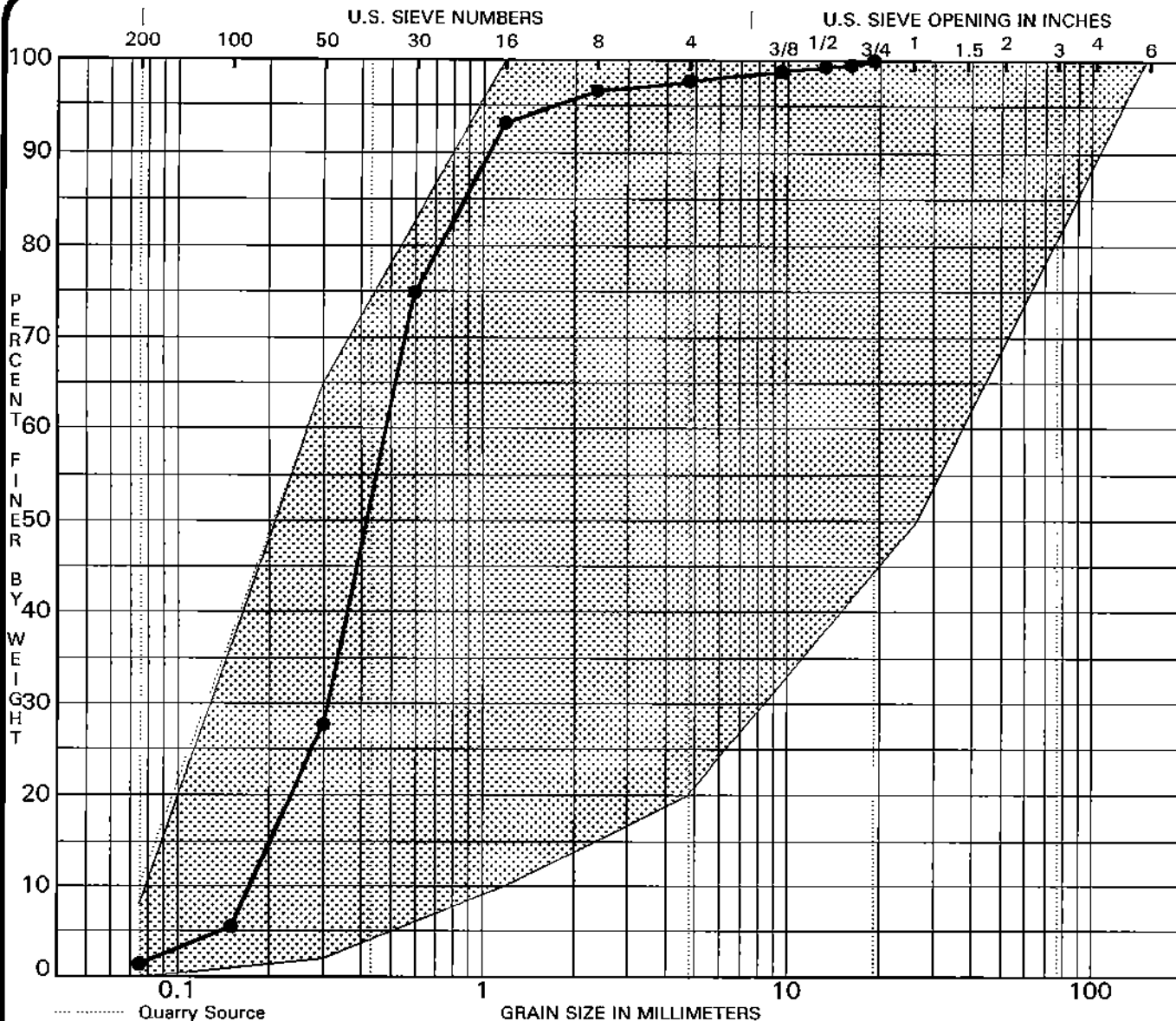
Road/Cedarview Road



CSA-A82.56M-1976 AGGREGATE FOR MASONRY MORTAR

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification			Classification				MC%	LL	PL	PI	Cc	Cu
●	TP13	G 2	GRANULAR B TYPE I								1.16	2.8
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	TP13	G 2	19.00	0.48	0.310	0.1726	2.3	96.3				

CLIENT Mr. Dan Paquette

FILE NO. G9114

PROJECT Aggregate Resource Investigation - Greenbank
Road/Cedarview Road

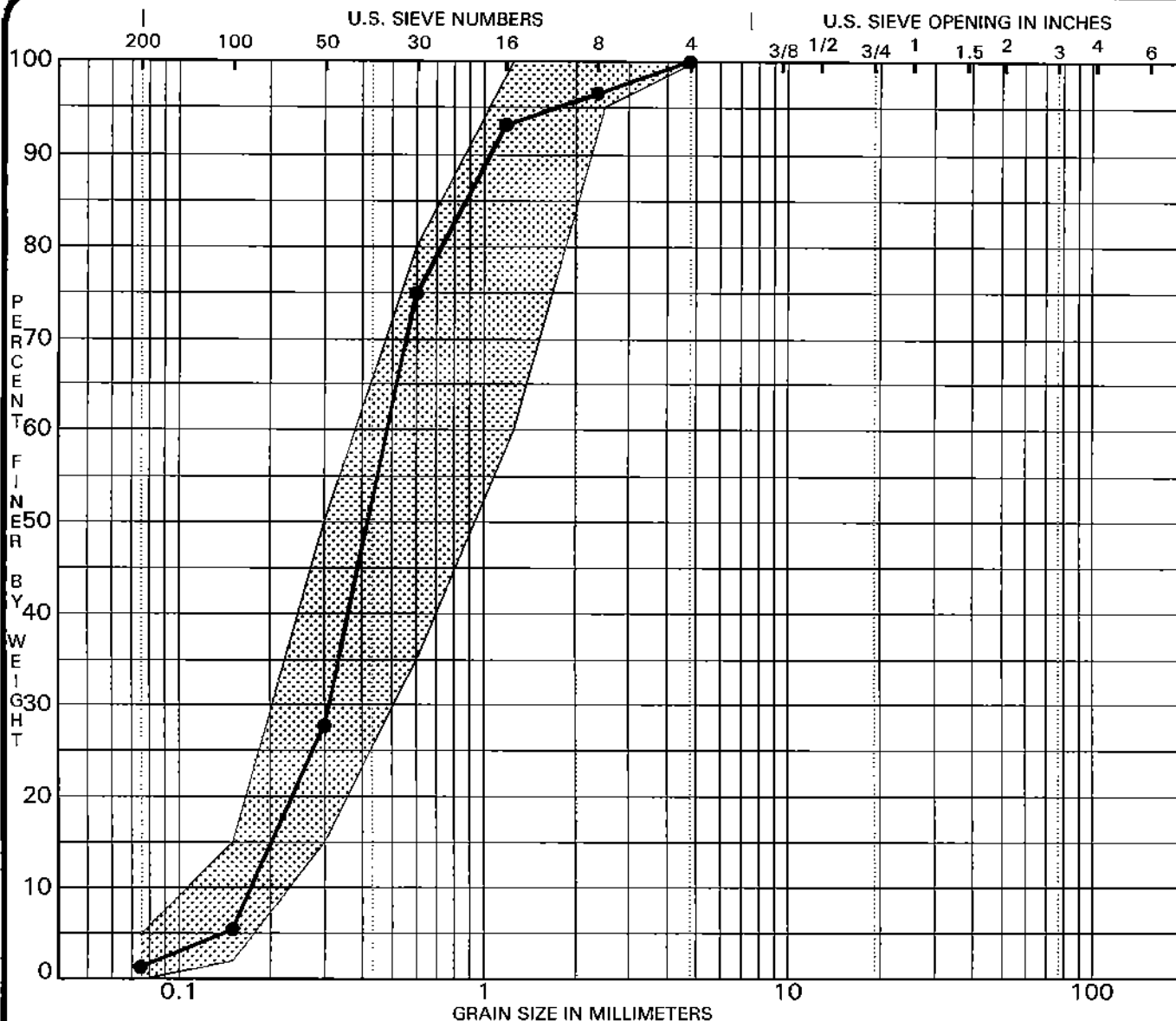
DATE 29 OCT 03



GRAIN SIZE DISTRIBUTION - OPSS GRANULAR B TYPE I

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT		SAND			GRAVEL		COBBLES				
		fine	medium	coarse	fine	coarse					
Specimen Identification		Classification				MC%	LL	PL	PI	Cc	Cu
●	TP13 G 2	SAND (after screening on 4.75mm)								1.16	2.8
Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	TP13 G 2	4.75	0.48	0.310	0.1726	0.0	98.6	1.4			

CLIENT Mr. Dan Paquette

FILE NO. G9114

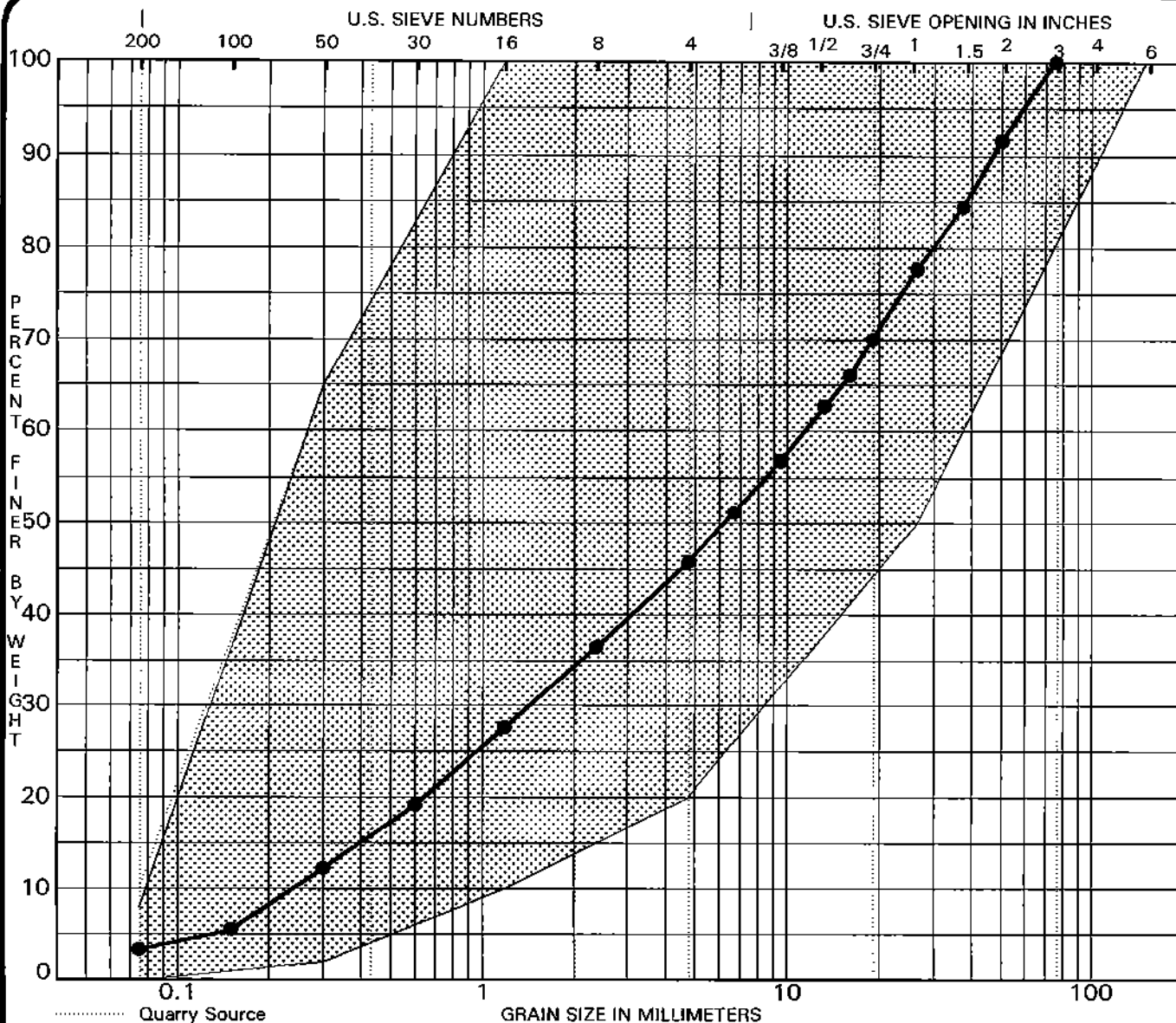
PROJECT Aggregate Resource Investigation - Greenbank Road/Cedarview Road

DATE 29 OCT 03



CSA-A82.56M-1976 AGGREGATE FOR MASONRY MORTAR
JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7



SILT	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification				MC%	LL	PL	PI	Cc	Cu
● TP14 G 1	GRANULAR B TYPE I								0.75	47.7

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● TP14 G 1	75.00	11.36	1.423	0.2381	54.2	42.4		

CLIENT Mr. Dan Paquette

PROJECT Aggregate Resource Investigation - Greenbank Road/Cedarview Road

FILE NO. G9114

DATE 29 OCT 03

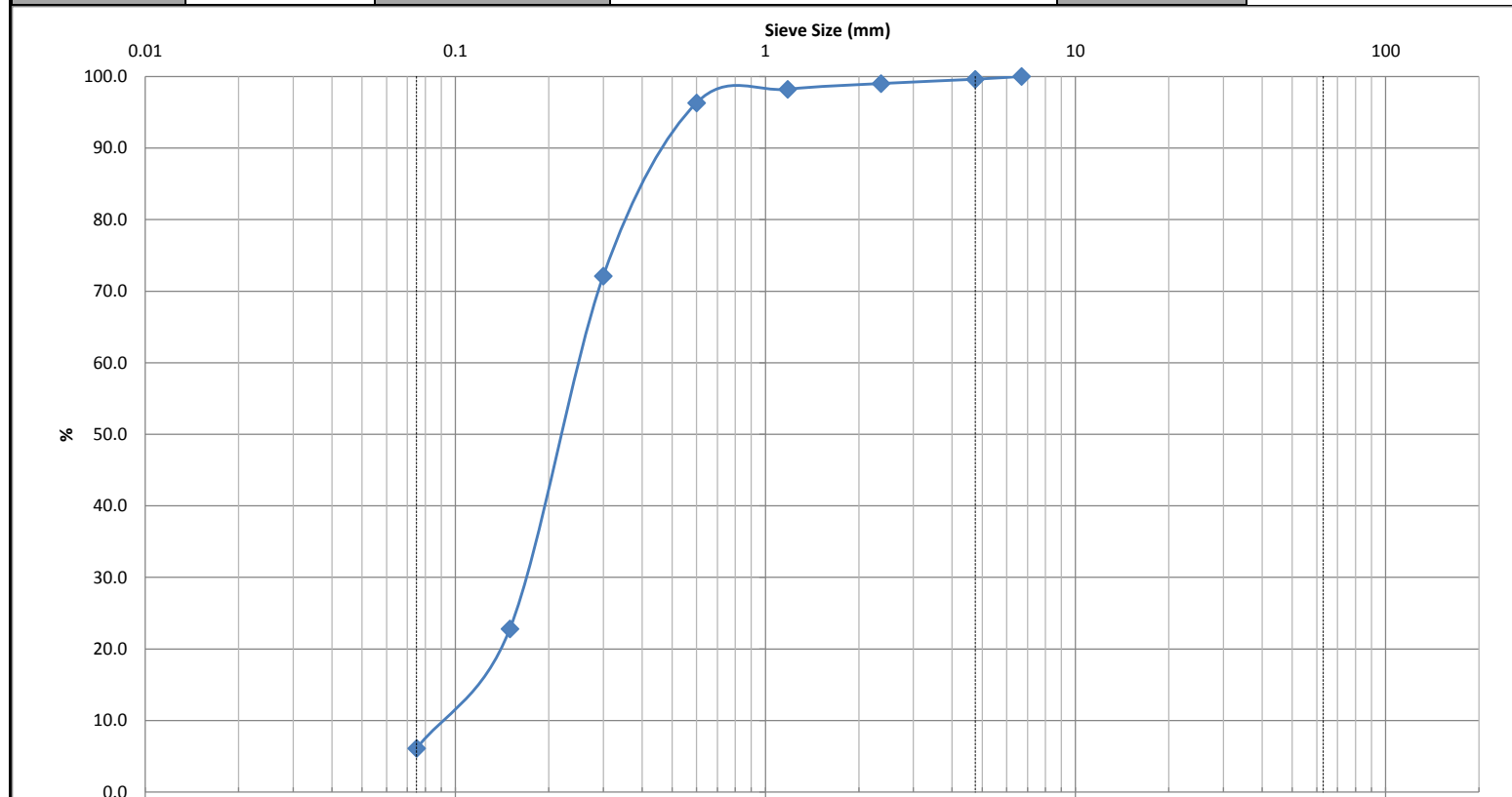


GRAIN SIZE DISTRIBUTION - OPSS GRANULAR B TYPE I

JOHN D. PATERSON & ASSOCIATES LTD.

Unit 1, 28 Concourse Gate, Nepean, Ontario K2E 7T7

CLIENT:	Minto Barrhaven	DESCRIPTION:	Granular	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	SAND	LAB NO:	85581
PROJECT:	CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
DATE SAMPLED:	15-Jul-16	PIT OR QUARRY:	-	DATE TESTED:	20-Jul-16
SAMPLED BY:	NZ	SOURCE LOCATION:	-	DATE REPORTED:	23-Jul-16
		SAMPLE LOCATION:	SA1	TESTED BY:	-



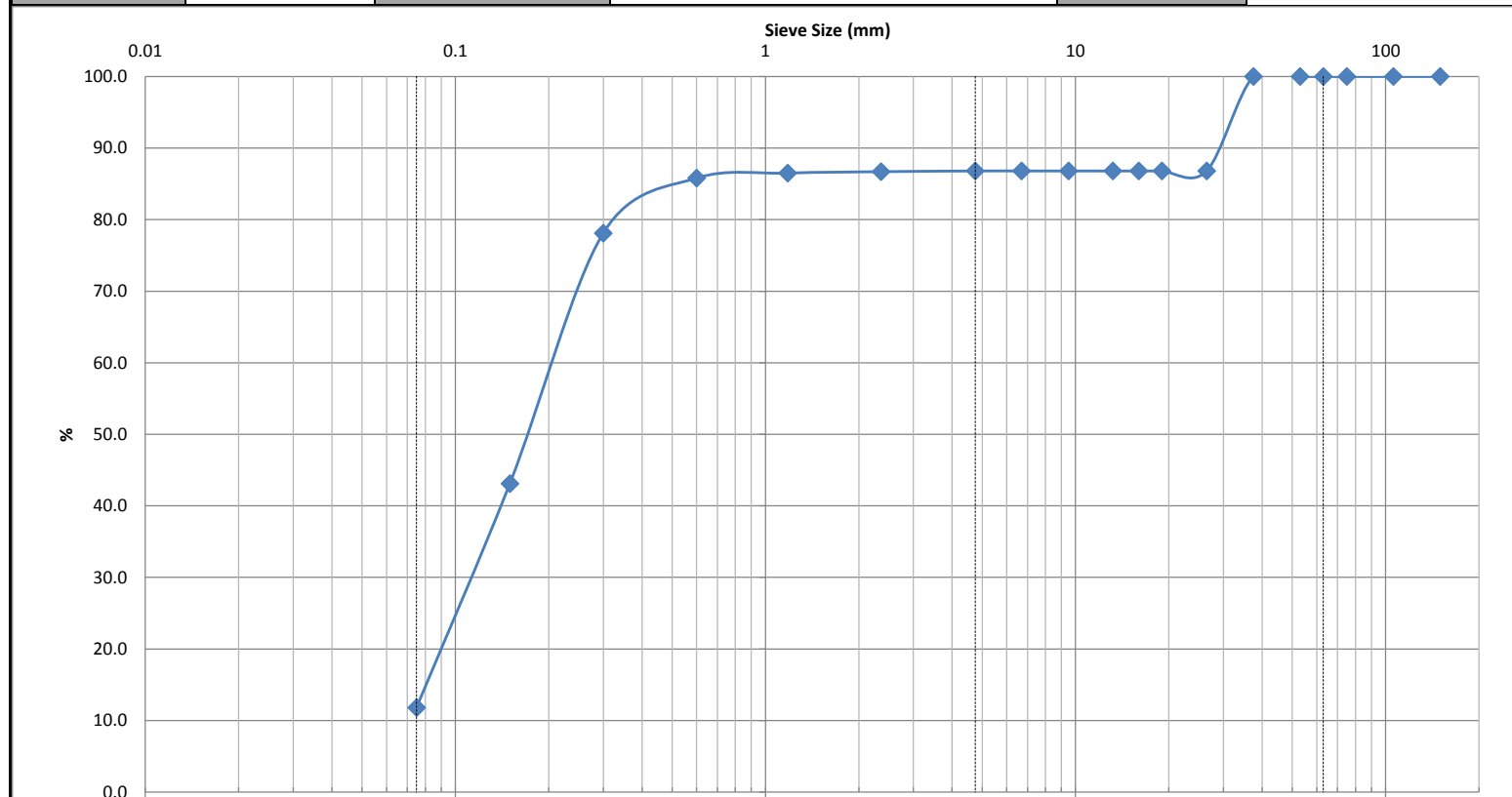
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	7.9	0.25	0.17	0.075	0.4	93.5	6.1				

Comments	
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Law R...

John...

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85583
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	18-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	20-Jul-16
DATE SAMPLED:	15-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	23-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA2	TESTED BY:	CB/AK



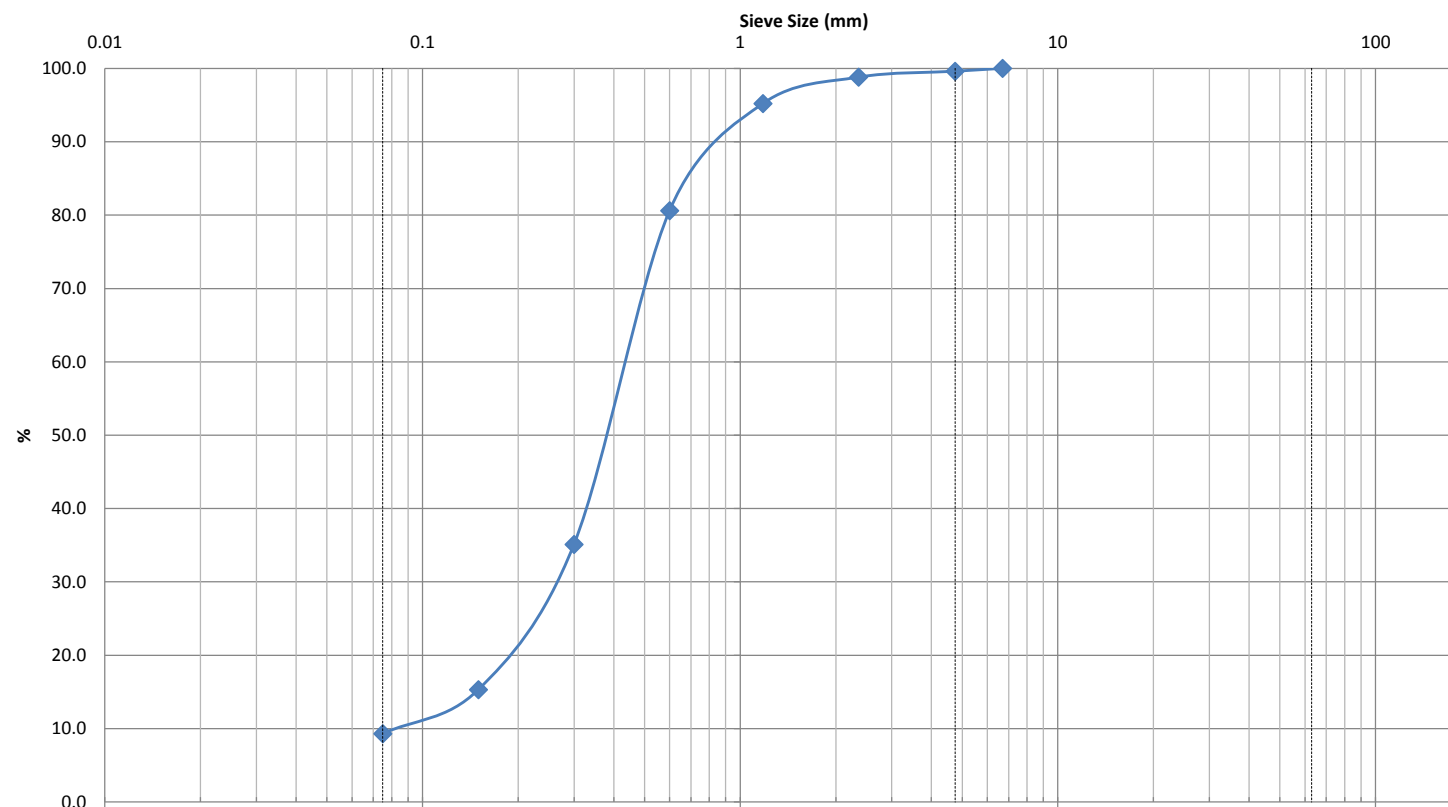
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	38	0.21	0.13	0.07	13.2	75.0	11.8				

Comments	
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Law R...

John...

CLIENT:	Minto Barrhaven	DESCRIPTION:	Granular	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	SAND	LAB NO:	85582
PROJECT:	CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	20-Jul-16
DATE SAMPLED:	15-Jul-16	SOURCE LOCATION:	-	DATE REPORTED:	23-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA3	TESTED BY:	0

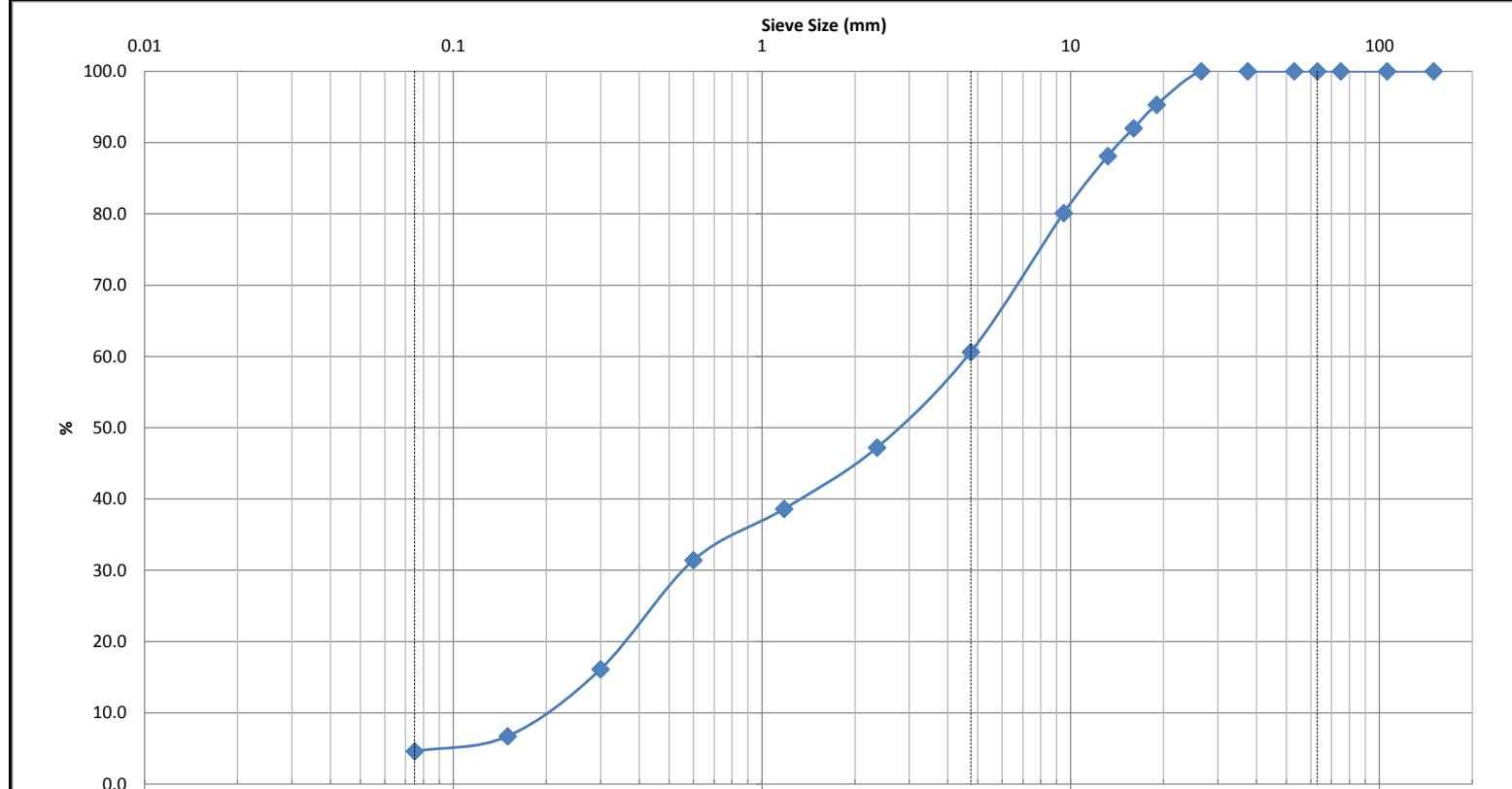


	Silt and Clay			Sand			Gravel		Cobble			
				Fine	Medium	Coarse	Fine	Coarse				
Identification	Soil Classification						MC(%)	LL	PL	PI	Cc	Cu
											2.16	6.0
	D100	D60	D30	D10	Gravel (%)		Sand (%)		Silt (%)		Clay (%)	
	7.9	0.45	0.27	0.075	0.4		90.3		9.3			
Comments												

Low Run

John

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85585
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	15-Jul-16
DATE SAMPLED:	14-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	18-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA4	TESTED BY:	CB/AK



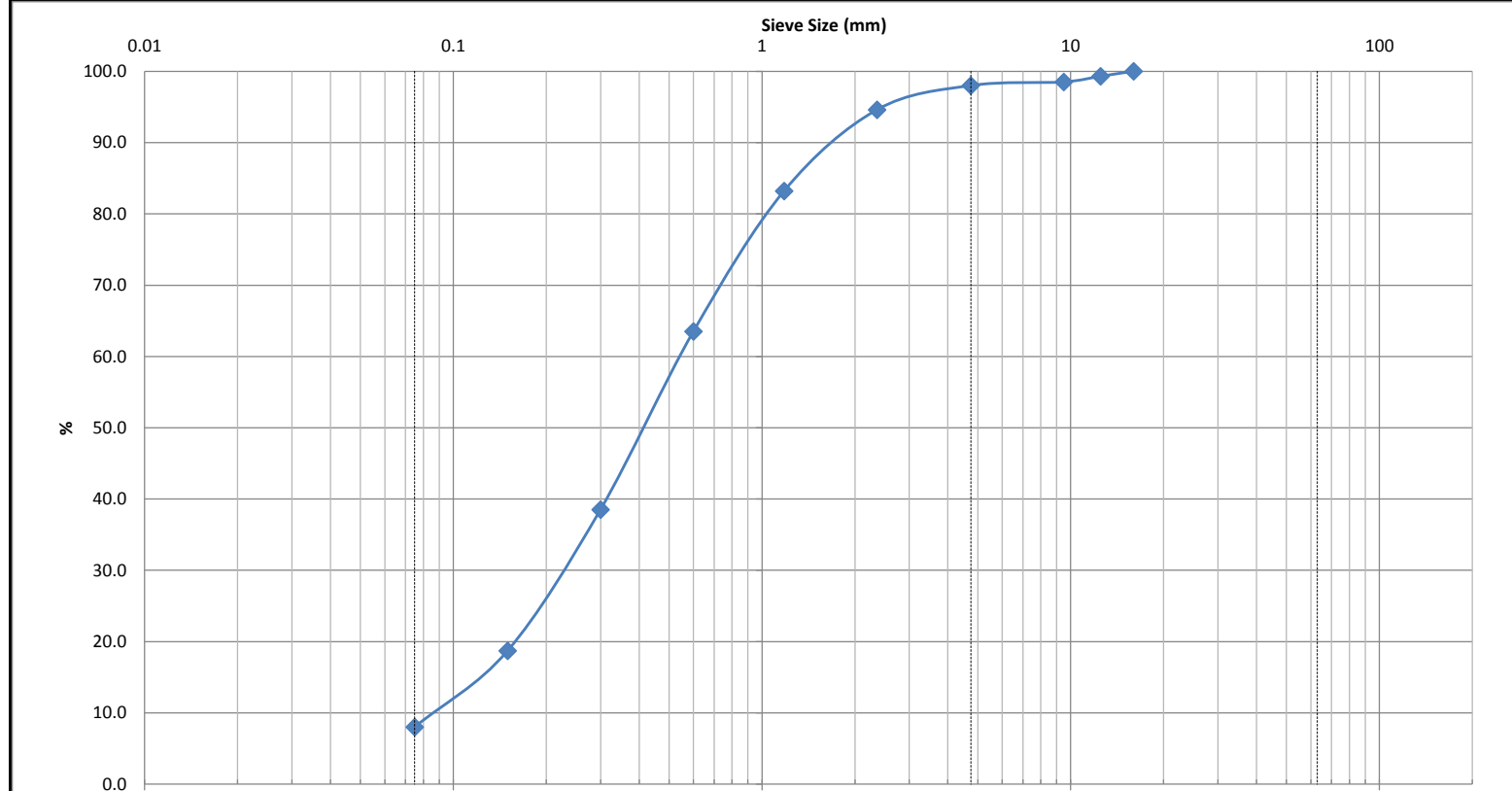
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	27	4.7	0.55	0.075	39.4	56.0	4.6			0.86	62.7

Comments	
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Law R...

John A...

CLIENT:	Minto Barrhaven	DESCRIPTION:	Granular	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	SAND	LAB NO:	85584
PROJECT:	CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
DATE SAMPLED:	15-Jul-16	PIT OR QUARRY:	-	DATE TESTED:	20-Jul-16
SAMPLED BY:	NZ	SOURCE LOCATION:	-	DATE REPORTED:	23-Jul-16
		SAMPLE LOCATION:	SA5	TESTED BY:	0



	Silt and Clay	Sand			Gravel		Cobble
		Fine	Medium	Coarse	Fine	Coarse	

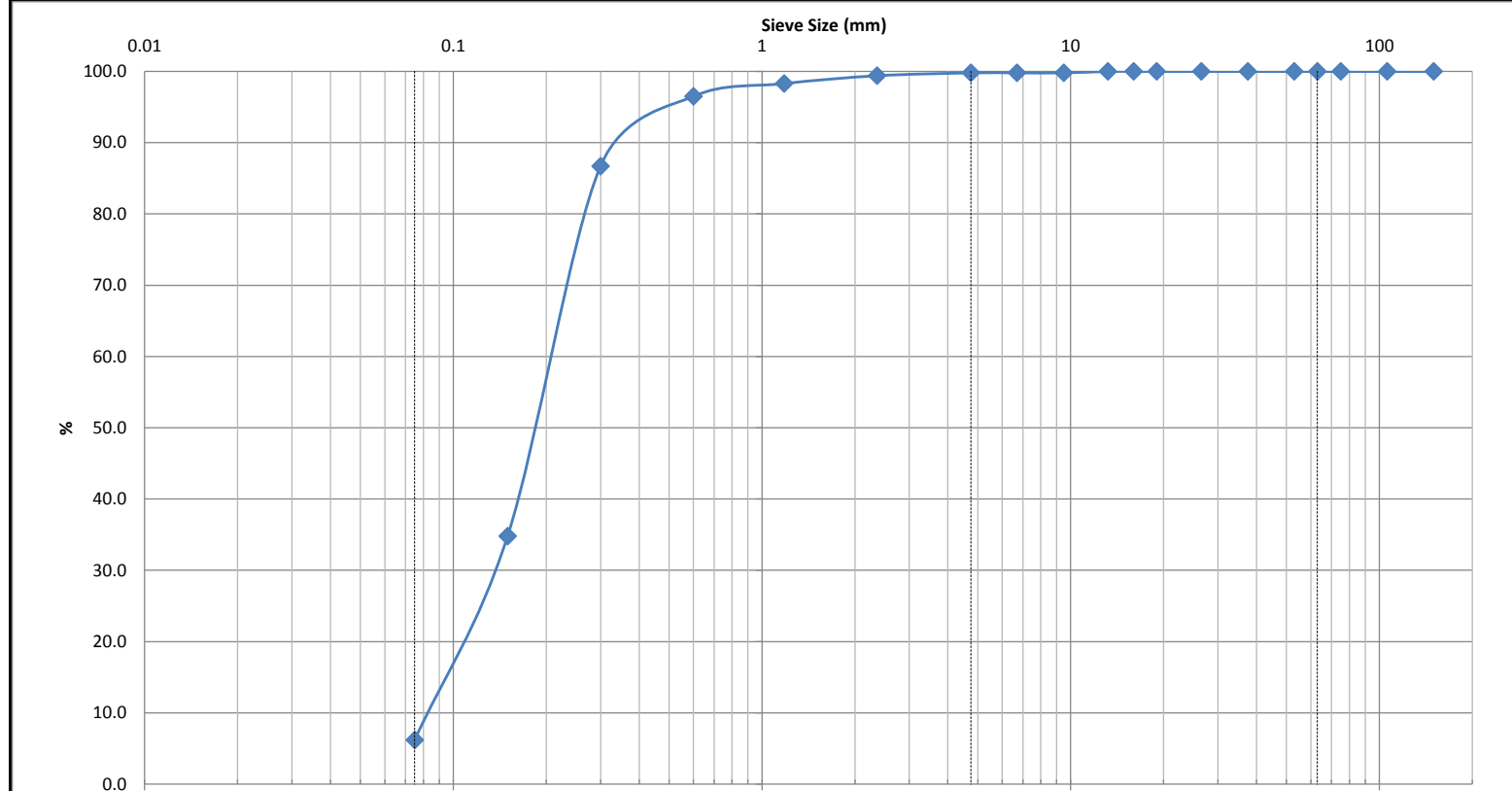
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
										1.28	7.3
	D100	D60	D30	D10	Gravel (%)	Sand (%)		Silt (%)		Clay (%)	
	16.5	0.55	0.23	0.075	2.0	90.0		8.0			

Comments	
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Law R...

John...

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85587
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	15-Jul-16
DATE SAMPLED:	14-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	18-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA6	TESTED BY:	CB/AK

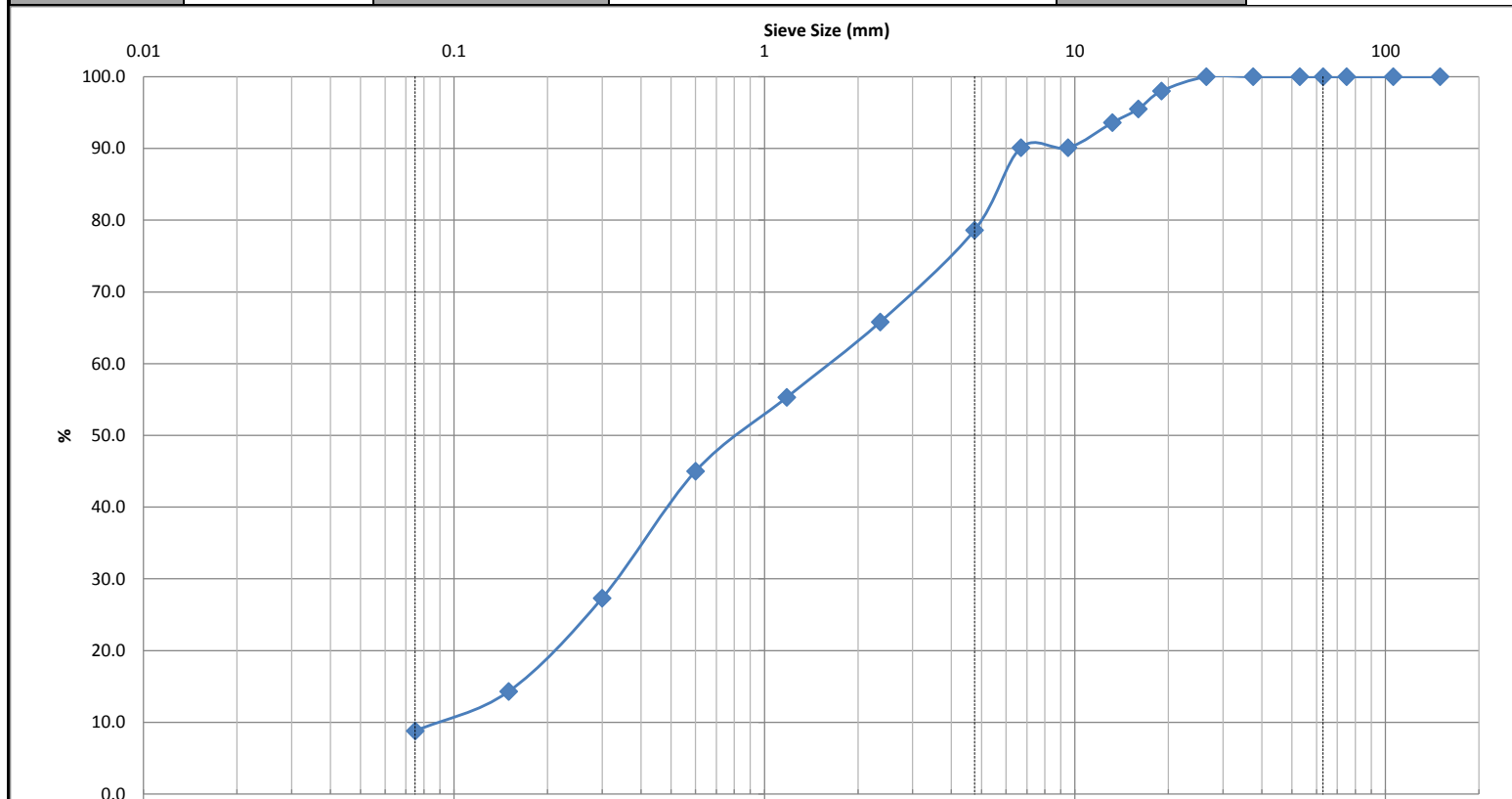


Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	4.9	0.22	0.15	0.082	0.2	93.6	6.2				
Comments											

Low Run

Tested

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85586
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	15-Jul-16
DATE SAMPLED:	14-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	18-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA7	TESTED BY:	CB/AK



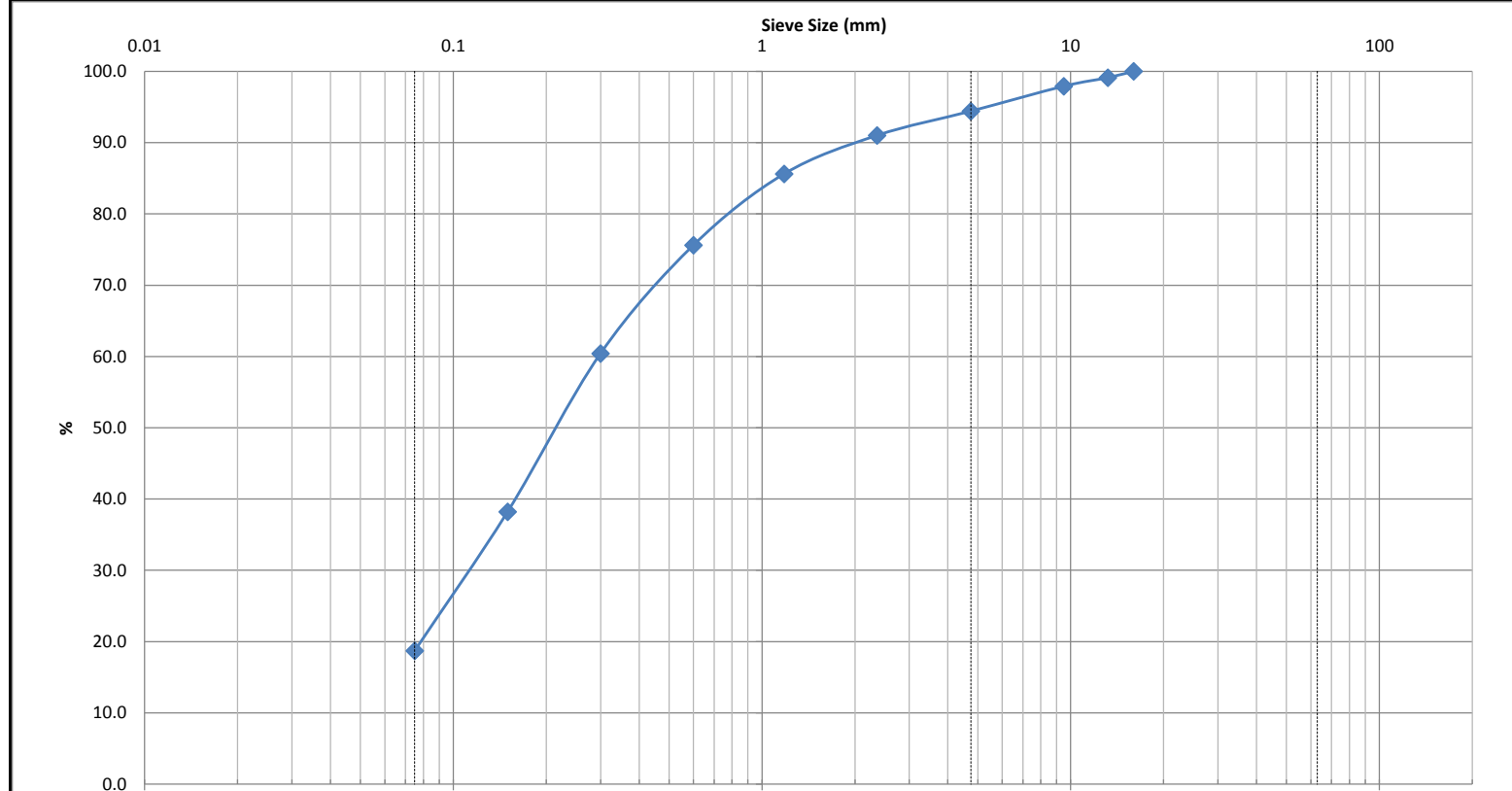
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	28	1.6	0.33	0.075	21.4	69.8	8.8			0.91	21.3

Comments	
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Law Run

John

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85588
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	15-Jul-16
DATE SAMPLED:	14-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	18-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA8	TESTED BY:	CB/AK



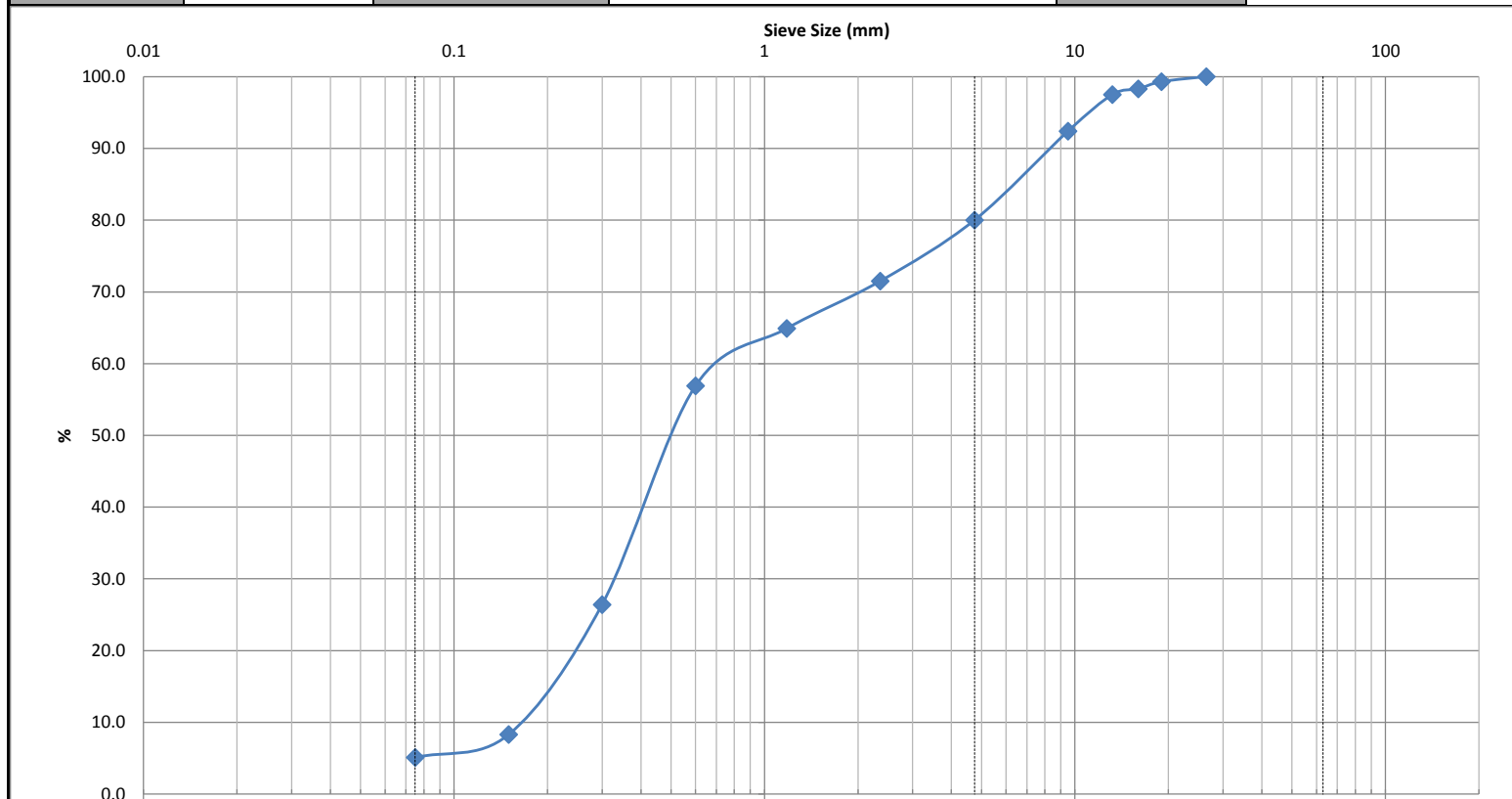
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	17.5	0.3	0.12	0.04	5.6	75.7	18.7				

Comments	
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Low Run

Test

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85593
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	15-Jul-16
DATE SAMPLED:	14-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	18-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA9	TESTED BY:	CB/AK



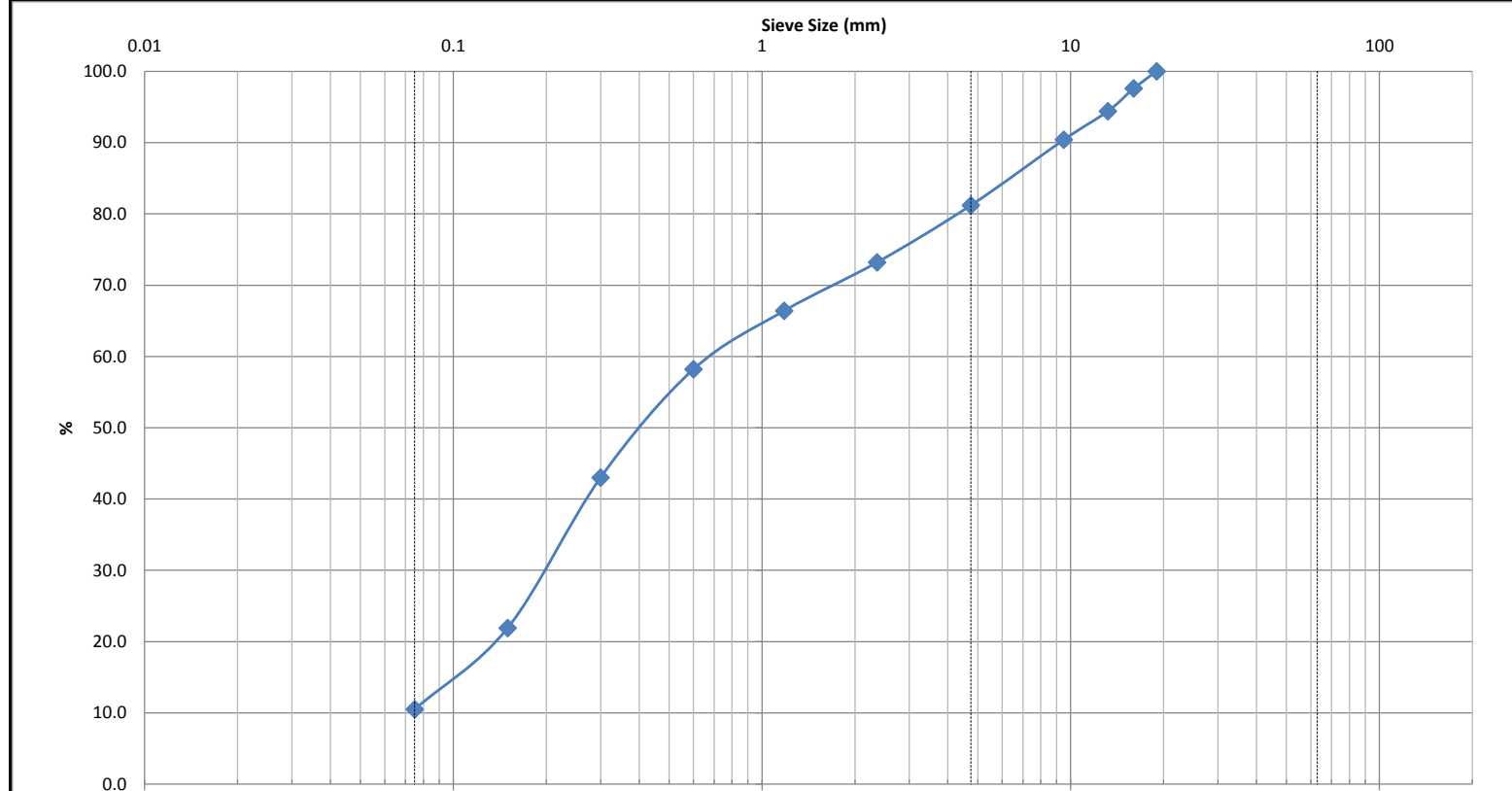
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	28	0.7	0.33	0.16	20.0	74.9	5.1			0.97	4.4

Comments	
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Law R...

John...

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85592
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	15-Jul-16
DATE SAMPLED:	14-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	18-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA10	TESTED BY:	CB/AK



	Silt and Clay	Sand			Gravel		Cobble
		Fine	Medium	Coarse	Fine	Coarse	

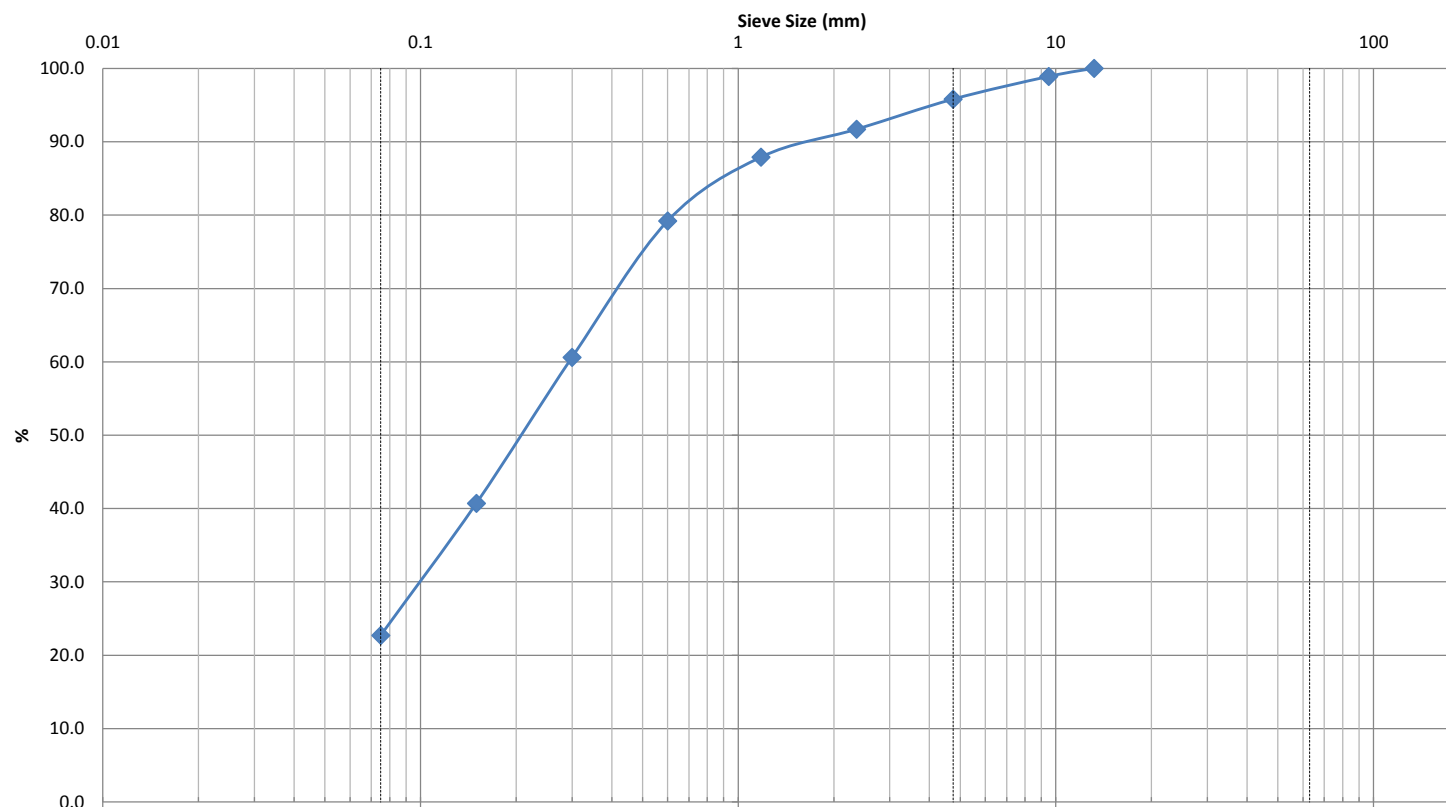
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
										0.82	8.7
	D100	D60	D30	D10	Gravel (%)	Sand (%)		Silt (%)		Clay (%)	
	19	0.65	0.2	0.075	18.8	70.7		10.5			

Comments	
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Law R...

John...

CLIENT:	Minto Barrhaven	DESCRIPTION:	Granular	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	SAND	LAB NO:	85591
PROJECT:	CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
DATE SAMPLED:	15-Jul-16	PIT OR QUARRY:	-	DATE TESTED:	20-Jul-16
SAMPLED BY:	NZ	SOURCE LOCATION:	-	DATE REPORTED:	23-Jul-16
		SAMPLE LOCATION:	SA11	TESTED BY:	0

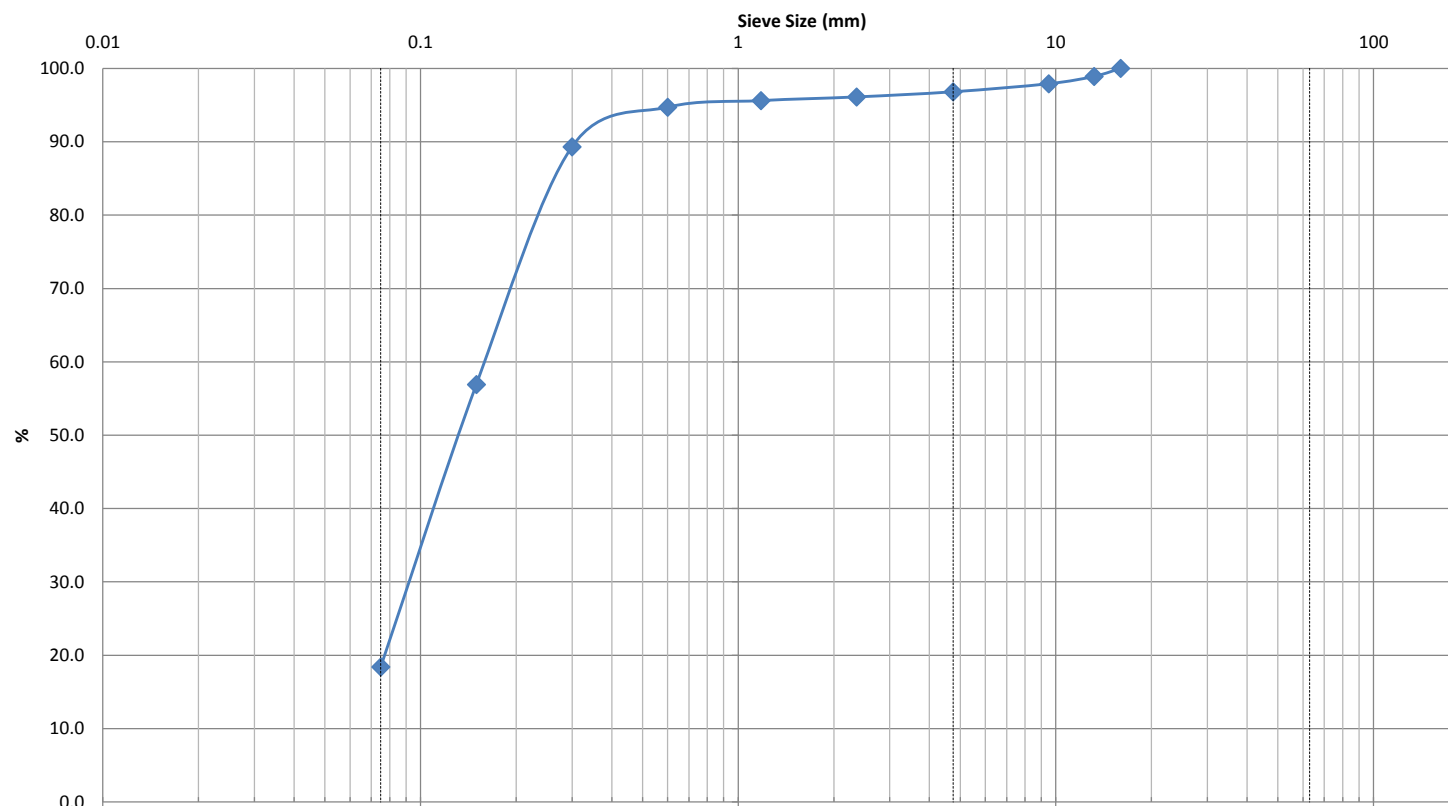


	Silt and Clay			Sand			Gravel		Cobble			
				Fine	Medium	Coarse	Fine	Coarse				
Identification	Soil Classification						MC(%)	LL	PL	PI	Cc	Cu
											0.83	7.5
	D100	D60	D30	D10	Gravel (%)		Sand (%)		Silt (%)		Clay (%)	
	14	0.3	0.1	0.04	4.2		73.1		22.7			
Comments												

Law R...

John...

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85590
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	15-Jul-16
DATE SAMPLED:	14-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	18-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA12	TESTED BY:	CB/AK

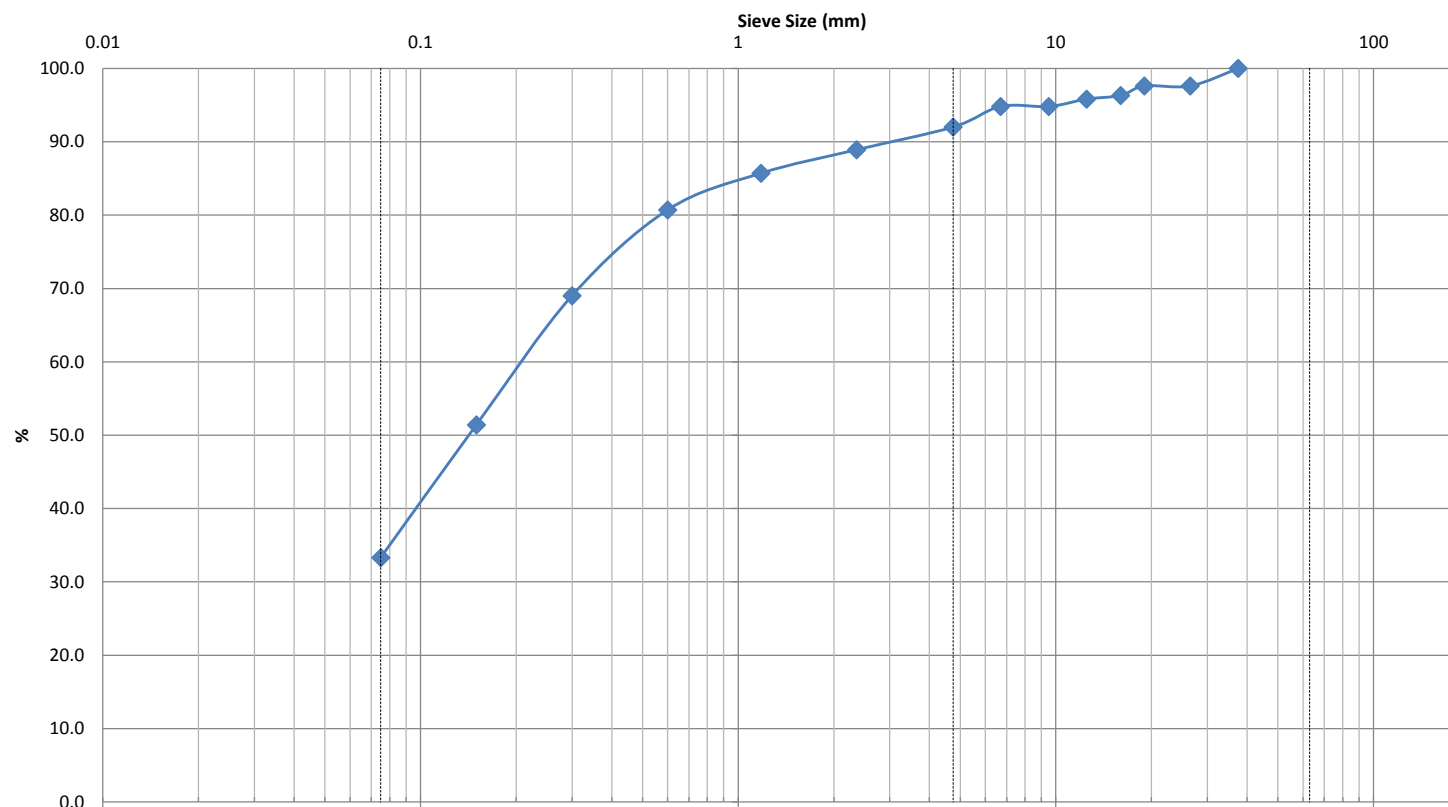


Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	17	0.17	0.09	0.07	3.2	78.4	18.4				
Comments											

Low Run

John

CLIENT:	Minto Barrhaven	DESCRIPTION:	Granular	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	SAND	LAB NO:	85589
PROJECT:	CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
DATE SAMPLED:	15-Jul-16	PIT OR QUARRY:	-	DATE TESTED:	20-Jul-16
SAMPLED BY:	NZ	SOURCE LOCATION:	-	DATE REPORTED:	23-Jul-16
		SAMPLE LOCATION:	SA13	TESTED BY:	0

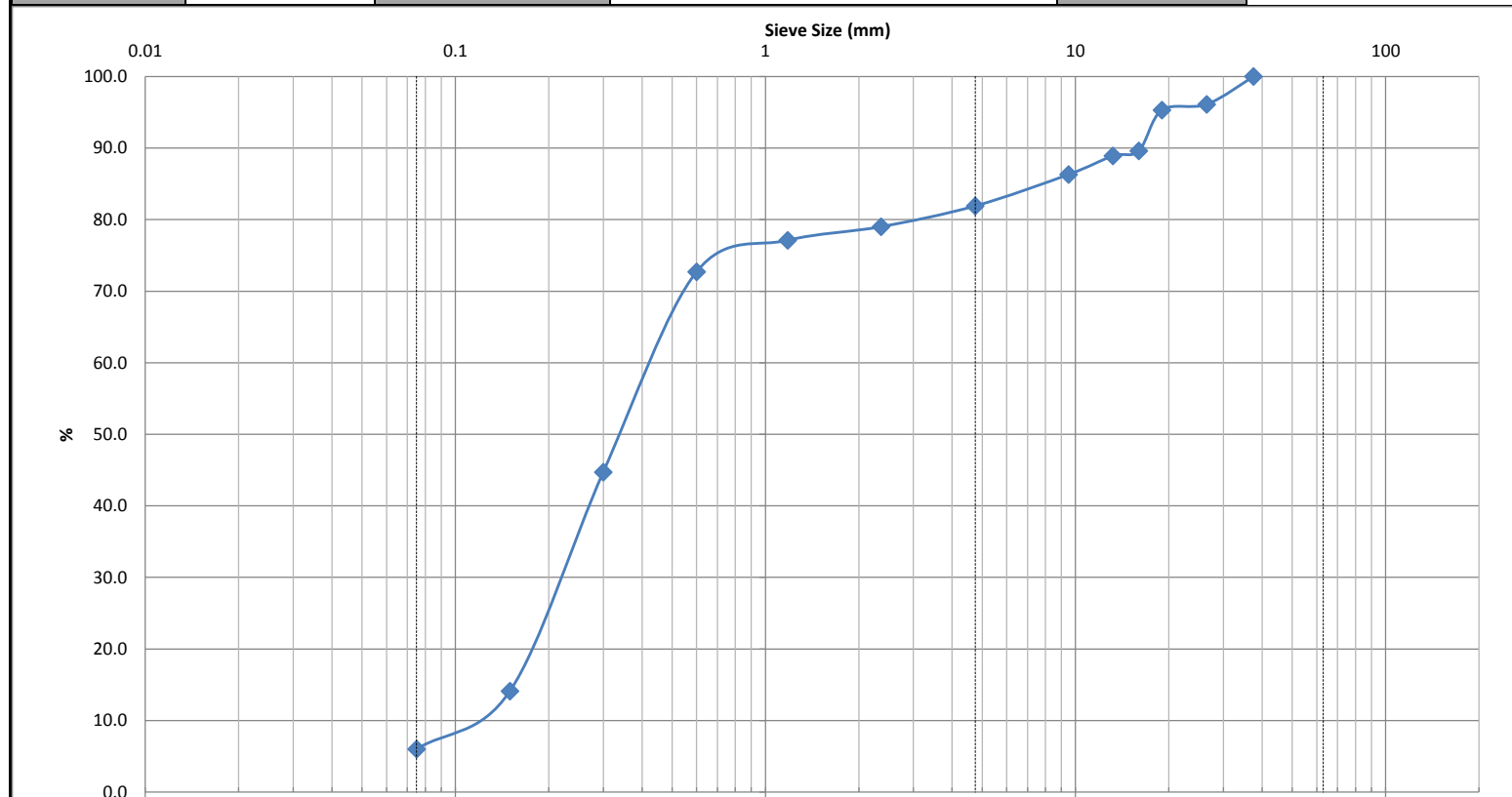


Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	38	0.21	0.065	0.03	8.0	58.7	33.3				
Comments											

Low Run

John

CLIENT:	Minto Barrhaven	DESCRIPTION:	Granular	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	SAND	LAB NO:	85594
PROJECT:	CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
DATE SAMPLED:	15-Jul-16	PIT OR QUARRY:	-	DATE TESTED:	20-Jul-16
SAMPLED BY:	NZ	SOURCE LOCATION:	-	DATE REPORTED:	23-Jul-16
		SAMPLE LOCATION:	SA14	TESTED BY:	0



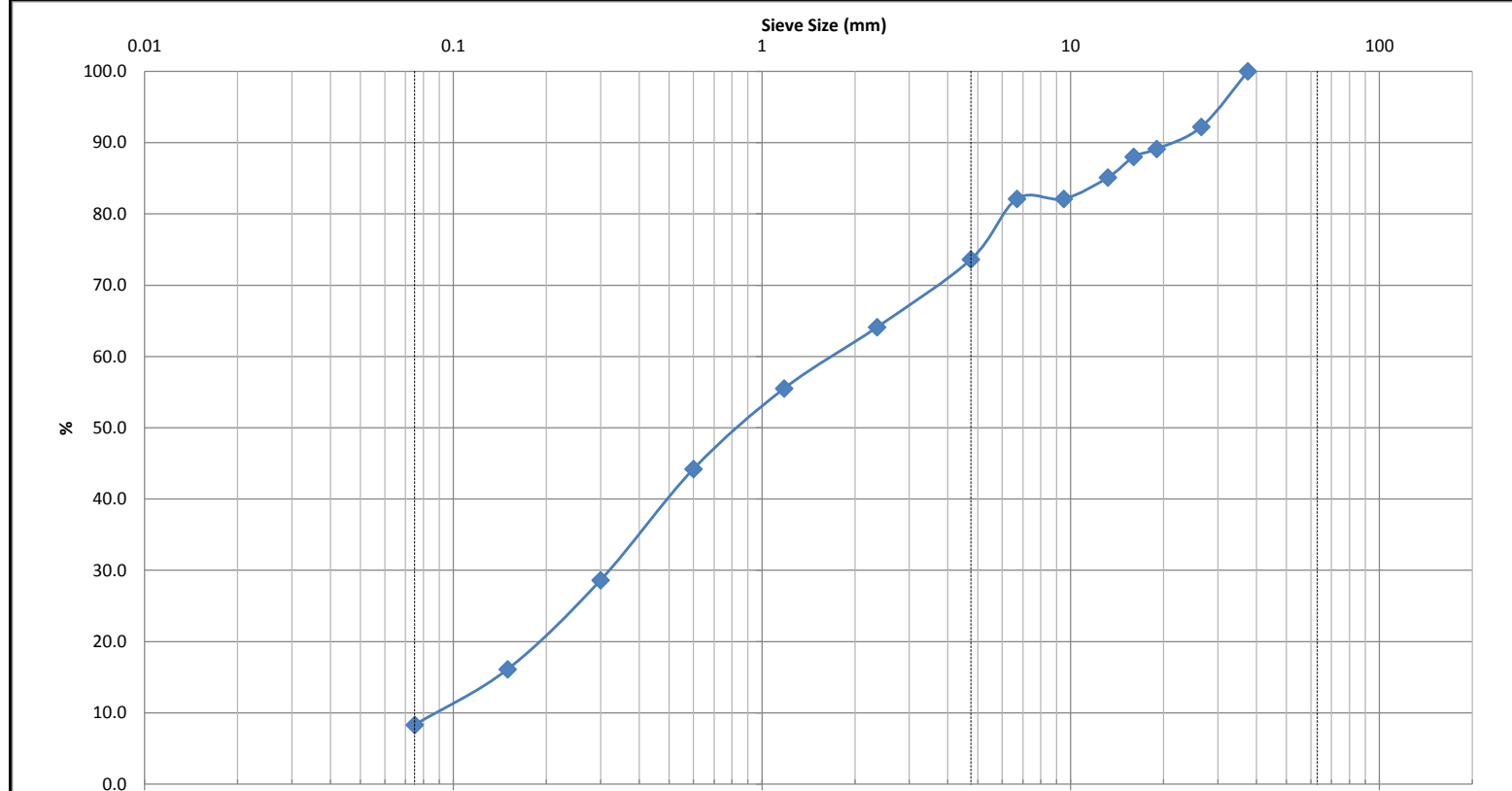
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	38	0.41	0.21	0.075	18.1	75.9	6.0				

Comments	
----------	--

Law Run

John

CLIENT:	Minto Barrhaven	DESCRIPTION:	Granular	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	SAND	LAB NO:	85595
PROJECT:	CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	20-Jul-16
DATE SAMPLED:	15-Jul-16	SOURCE LOCATION:	-	DATE REPORTED:	23-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA15	TESTED BY:	0



	Silt and Clay	Sand			Gravel		Cobble
		Fine	Medium	Coarse	Fine	Coarse	

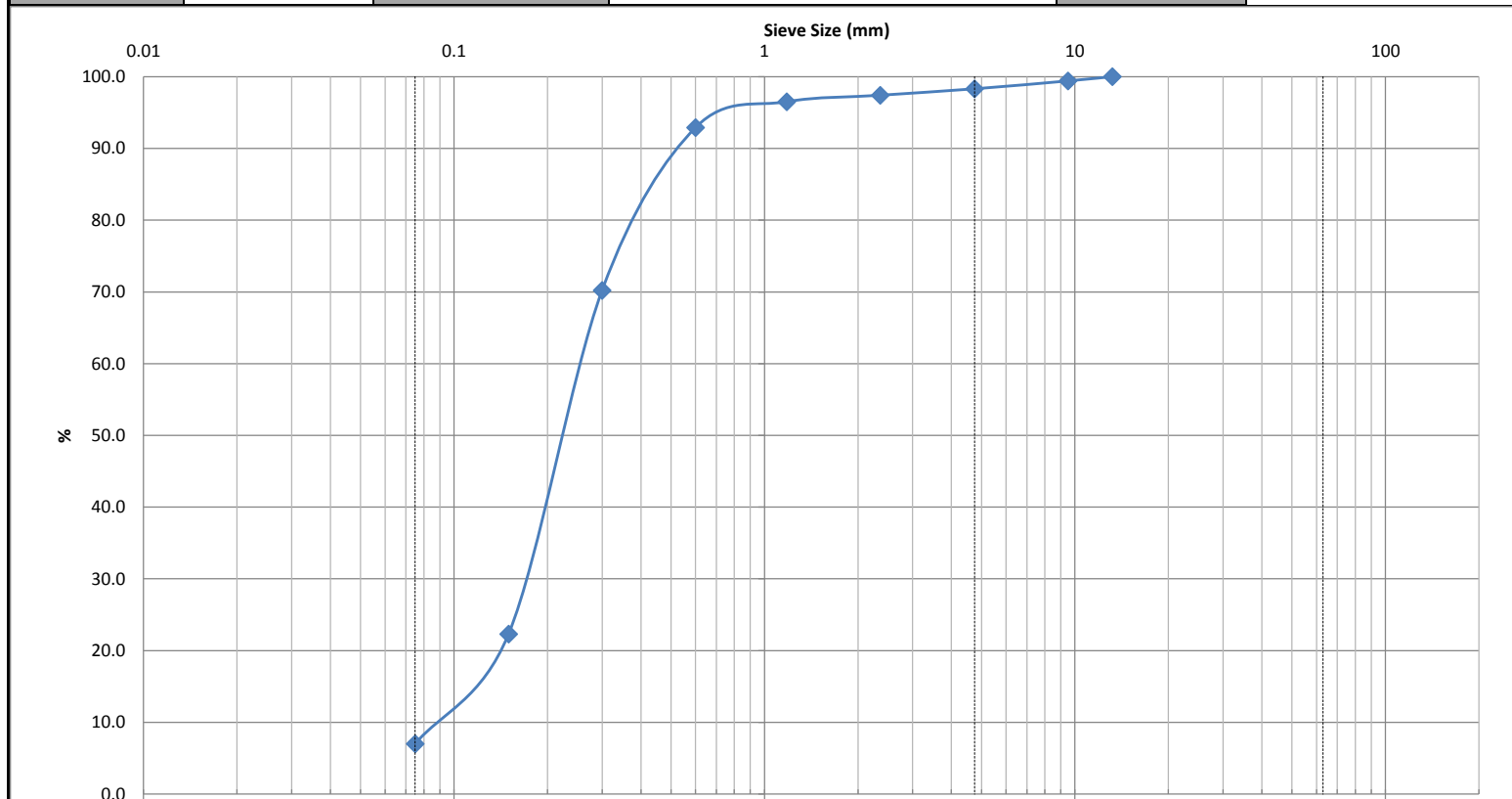
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
										1.00	13.2
	D100	D60	D30	D10	Gravel (%)	Sand (%)		Silt (%)		Clay (%)	
	38	1.16	0.32	0.088	26.4	65.3		8.3			

Comments	
----------	--

Law R...

John...

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85596
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	15-Jul-16
DATE SAMPLED:	14-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	18-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA16	TESTED BY:	CB/AK



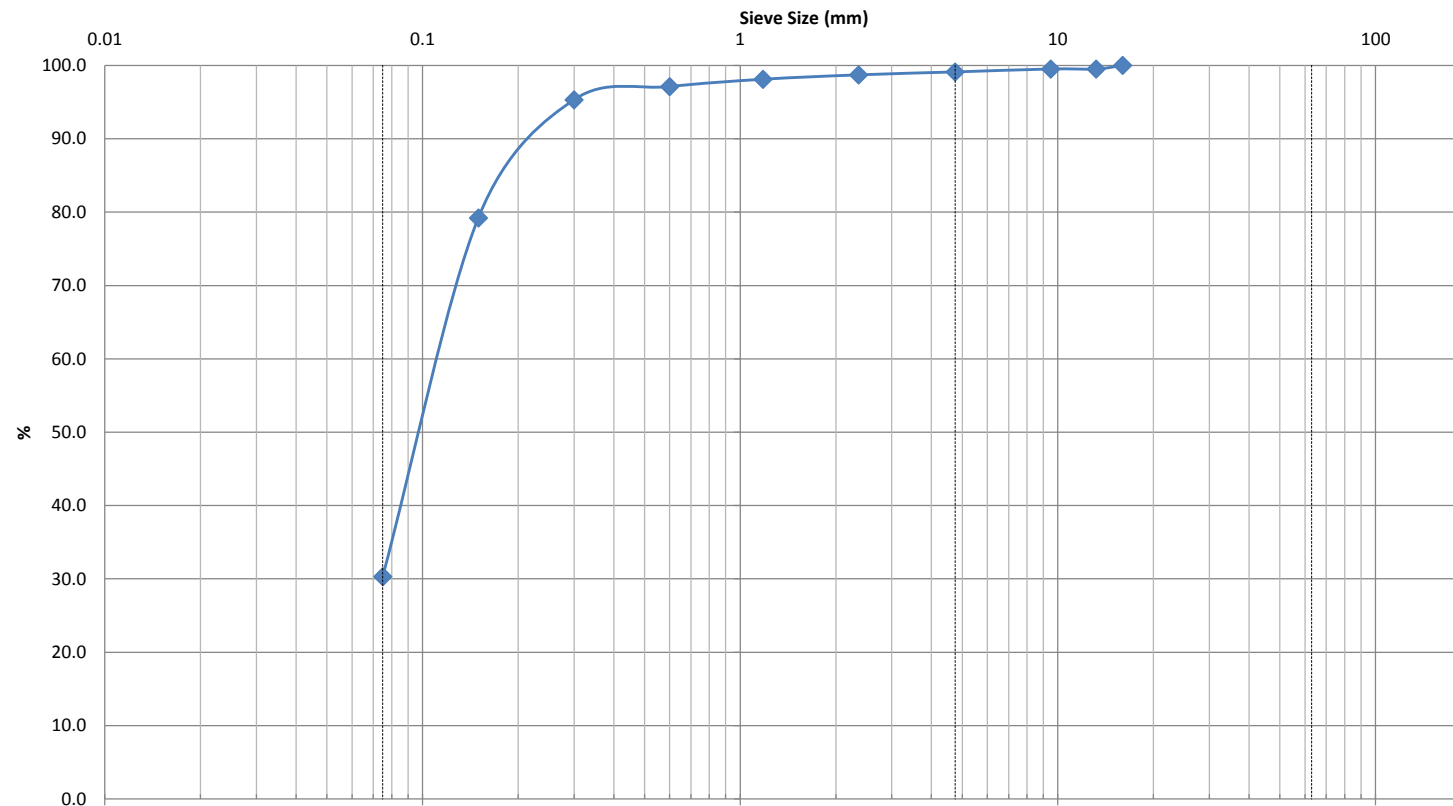
Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	13.5	0.26	0.18	0.09	1.7	91.3	7.0				

Comments	
----------	--

Law R...

John...

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85597
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	15-Jul-16
DATE SAMPLED:	14-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	18-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA17	TESTED BY:	CB/AK

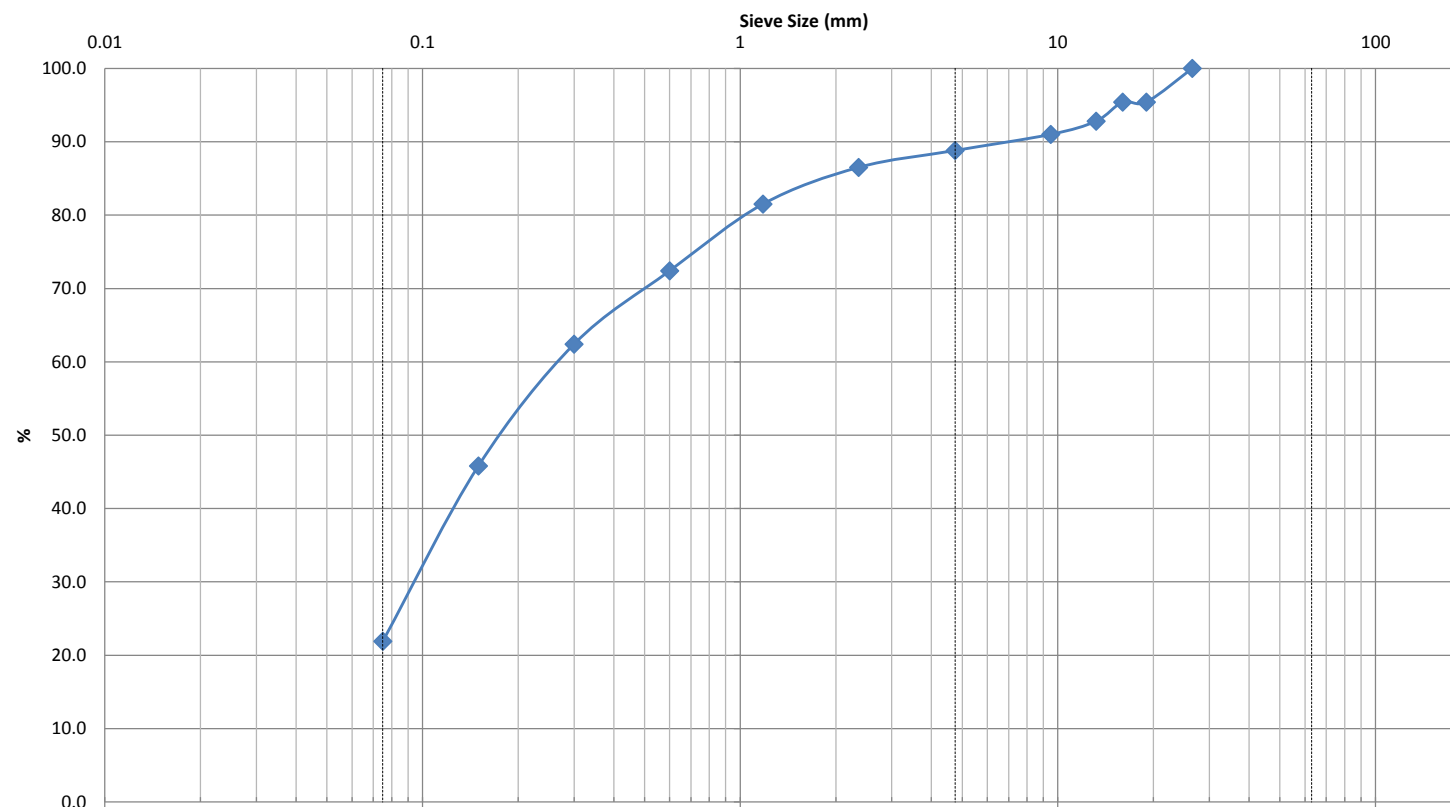


Identification	Soil Classification					MC(%)	LL	PL	PI	Cc	Cu
	D100	D60	D30	D10	Gravel (%)	Sand (%)	Silt (%)	Clay (%)			
	16	0.12	0.075	0.06	0.9	68.8	30.3				
Comments											

Low Run

Test

CLIENT:	Minto Development	DESCRIPTION:	Native	FILE NO:	PG3757
CONTRACT NO.:	-	SPECIFICATION:	-	LAB NO:	85598
PROJECT:	Barrhaven South CDP	INTENDED USE:	-	DATE RECEIVED:	14-Jul-16
		PIT OR QUARRY:	-	DATE TESTED:	15-Jul-16
DATE SAMPLED:	13-Jul-16	SOURCE LOCATION:	Borehole	DATE REPORTED:	18-Jul-16
SAMPLED BY:	NZ	SAMPLE LOCATION:	SA18	TESTED BY:	CB/AK



	Silt and Clay			Sand			Gravel		Cobble			
				Fine	Medium	Coarse	Fine	Coarse				
Identification	Soil Classification						MC(%)	LL	PL	PI	Cc	Cu
											0.67	5.4
	D100	D60	D30	D10	Gravel (%)		Sand (%)		Silt (%)		Clay (%)	
	28	0.27	0.095	0.05	11.2		66.9		21.9			
Comments												

Low Run

John

APPENDIX 2

FIGURE 1 - KEY PLAN

FIGURES 2 TO 7 - SLOPE STABILITY SECTIONS

PHOTOGRAPHS FROM FIELD INVESTIGATION

DRAWING PG3607-1 - TEST HOLE LOCATION PLAN

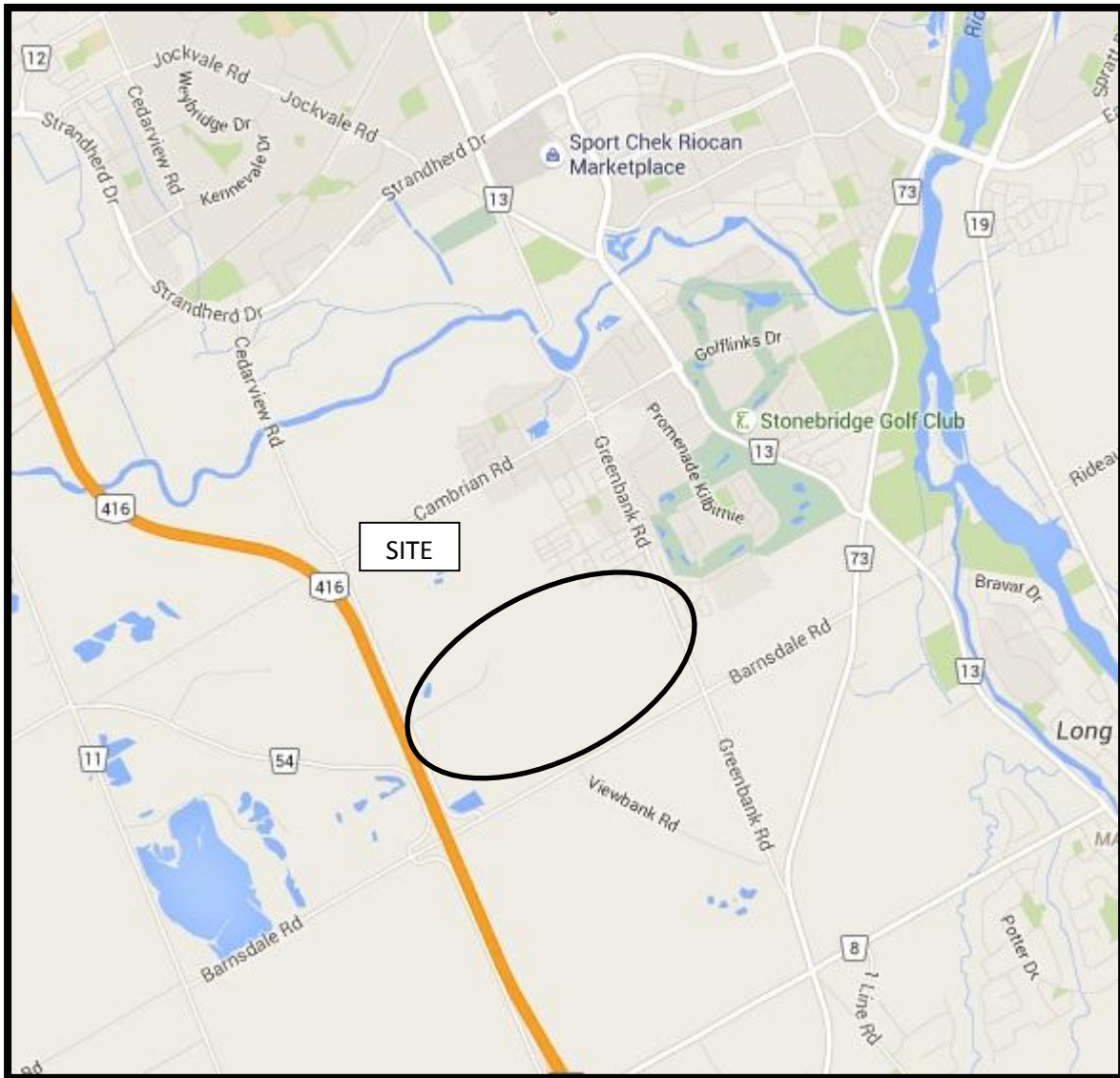
DRAWING PG3607-2 - SURFICIAL GEOLOGY

DRAWING PG3607-3 - REGIONAL BEDROCK MAPPING

DRAWING PG3607-4 - DRIFT THICKNESS

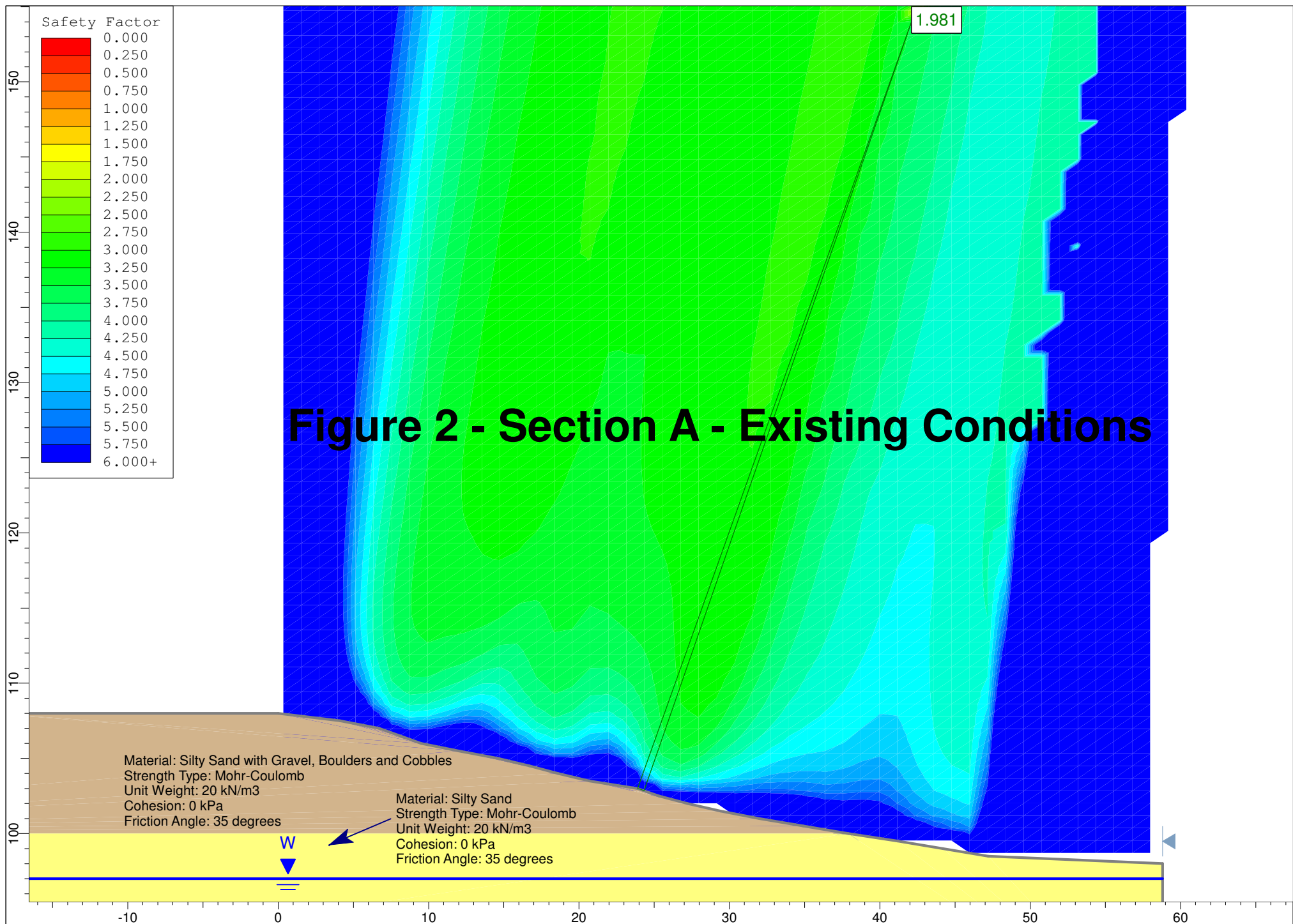
**DRAWING PG3607-5 - AGGREGATE RESOURCES INVENTORY OF THE CITY OF
OTTAWA**

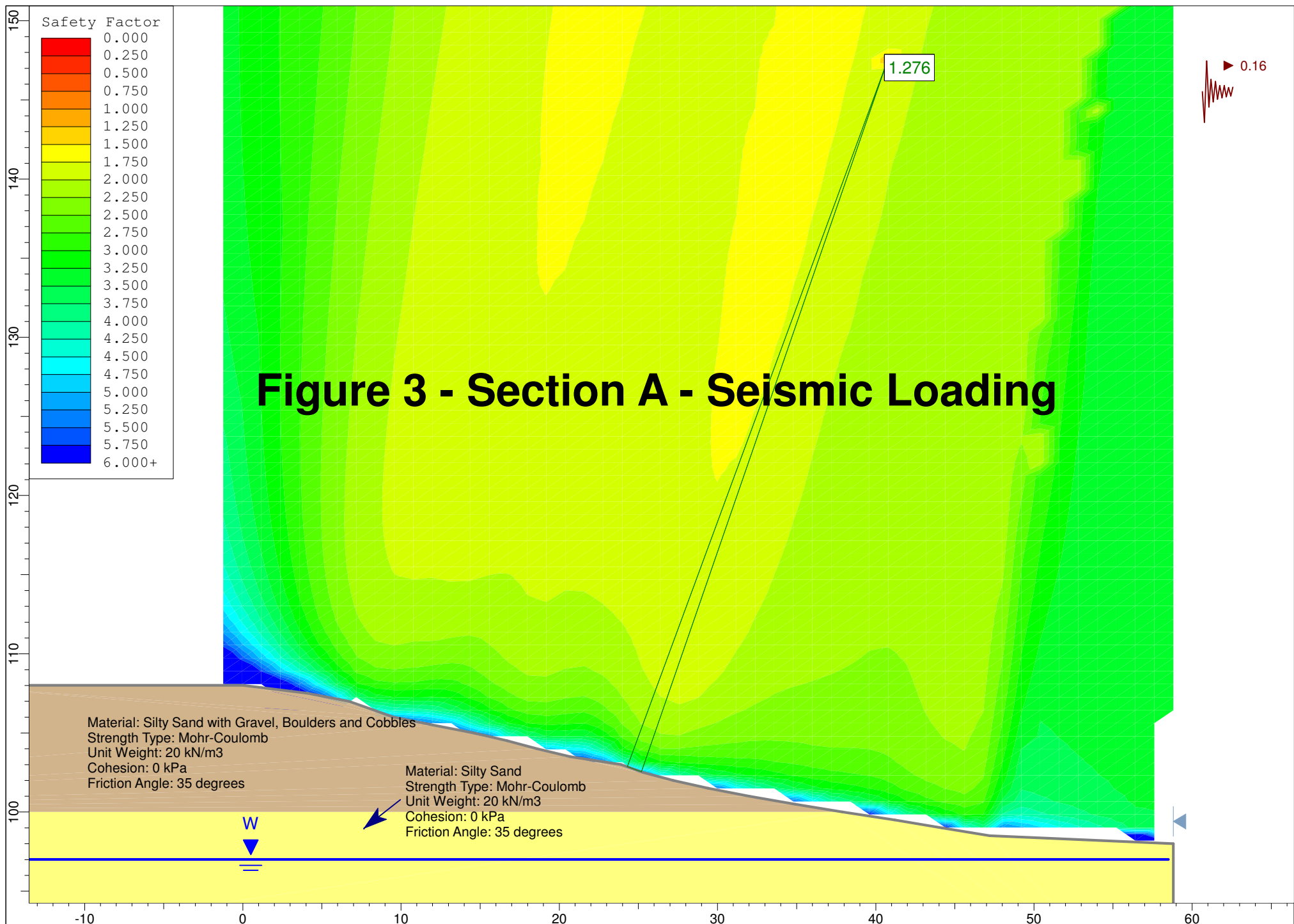
DRAWING PG3607-6 - SEISMIC SITE CLASS

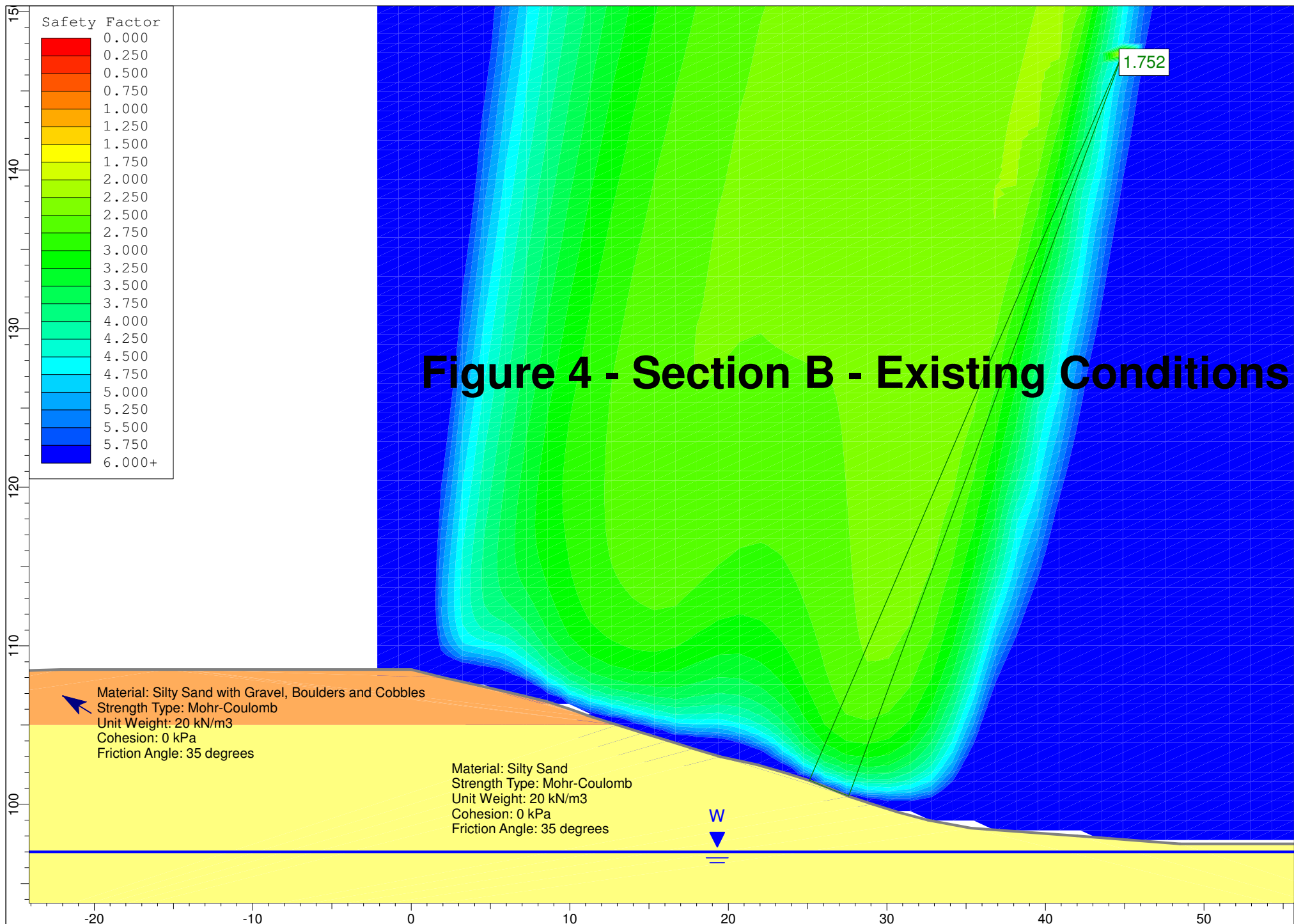


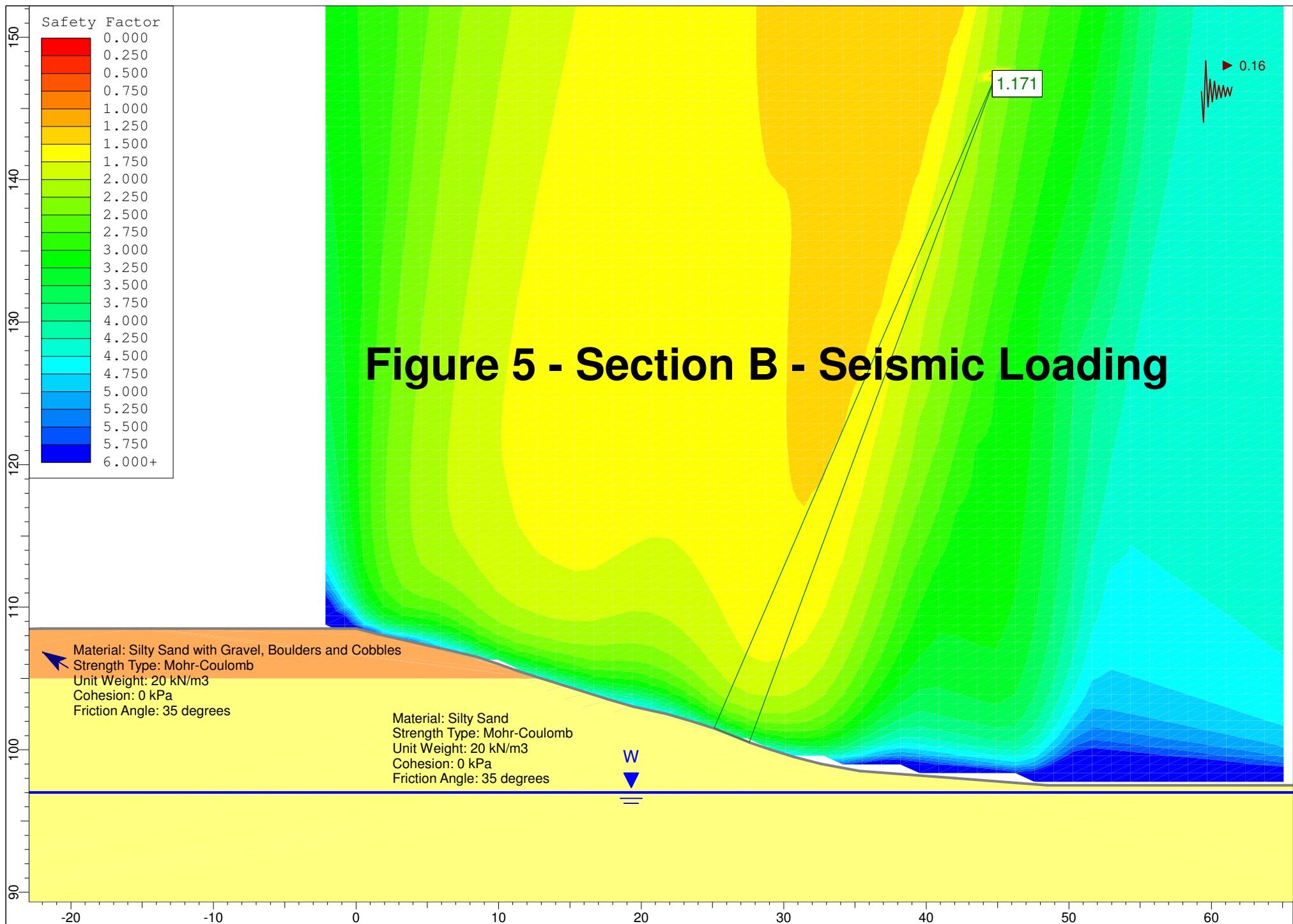
Source: Google Maps

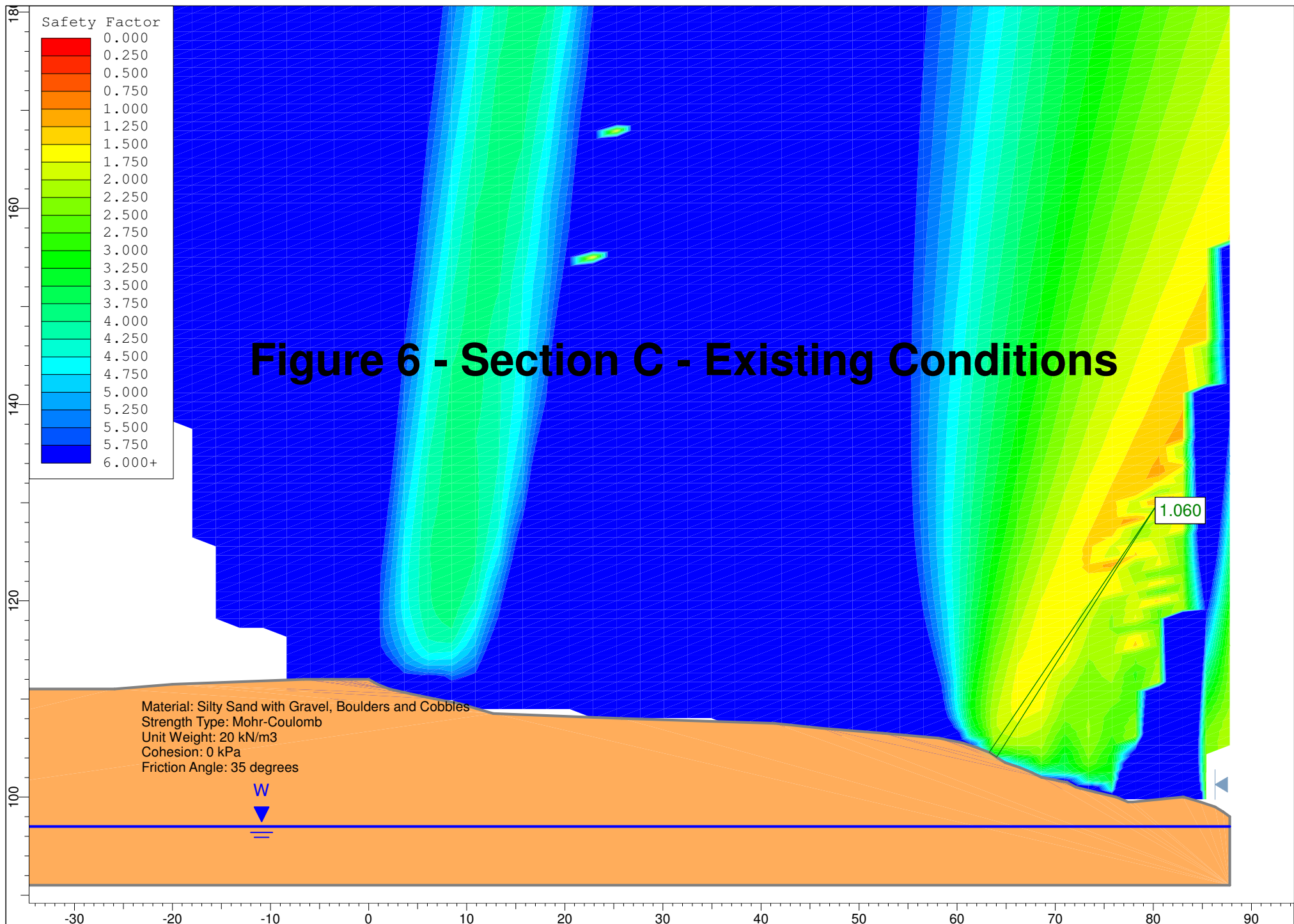
FIGURE 1
KEY PLAN

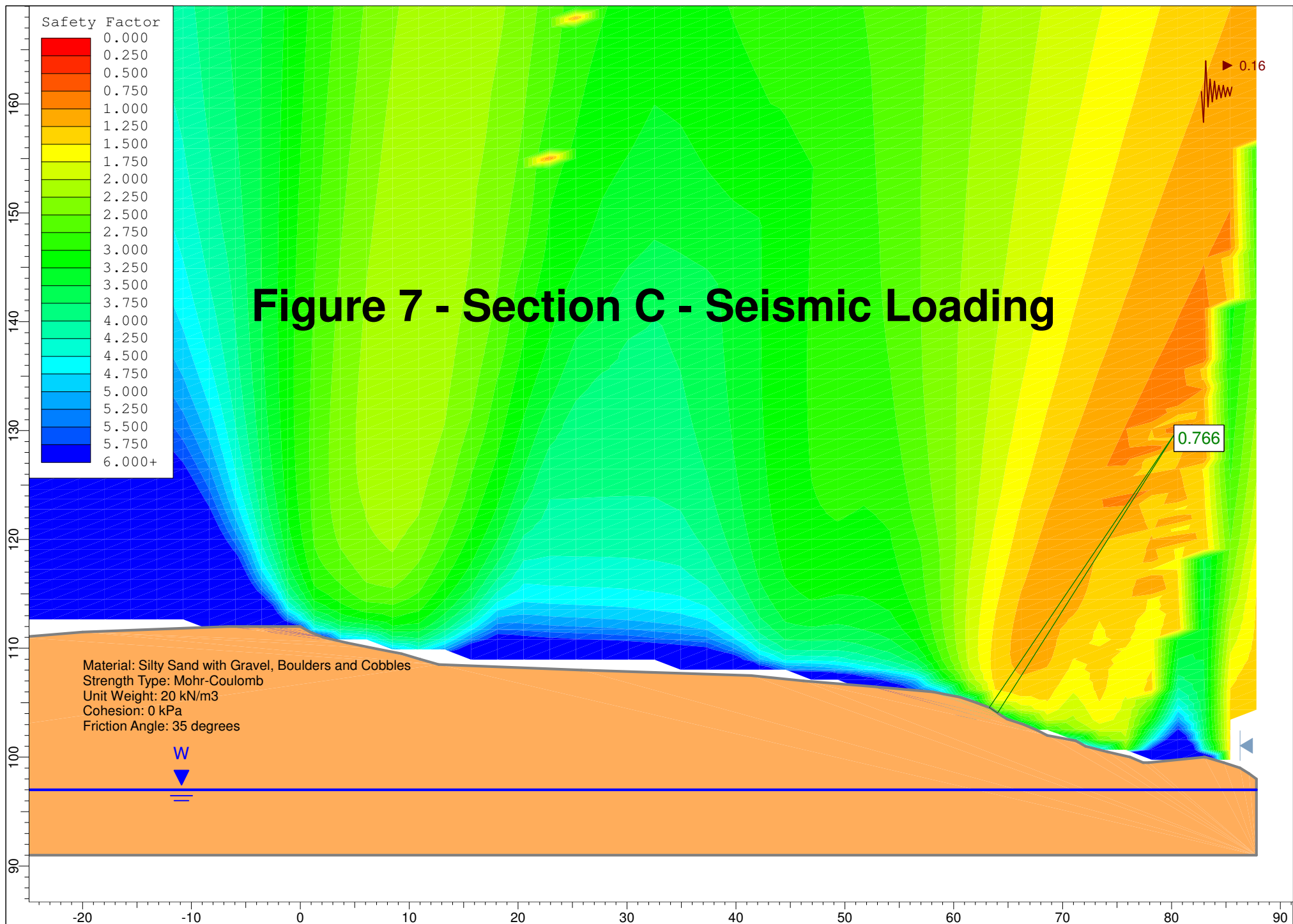












Photographs from Field Investigation

Photo 1: Looking south at BH 3-15 (November 30, 2015).



Photo 2: Looking east at TP 20-15 (December 2, 2015).



Photographs from Field Investigation

Photo 3: Looking southeast from TP 4-15 (December 2, 2015).



Photo 4: Subsoil profile at TP 38-15 (December 1, 2015).



Photographs from Field Investigation

Photo 5: Looking south from TP 57-15 (November 24, 2015).



Photo 6: Looking northwest from TP 61-15 (November 24, 2015).



Photographs from Field Investigation

Photo 7: Looking south at TP 69-15 (November 24, 2015).



Photo 8: Ground surface at TP 82-15 (September 20, 2015).



Photographs from Field Investigation

Photo 9: Looking north from TP 93-15 (November 19, 2015).



Photo 10: Looking east from TP 94-15 (November 17, 2015).



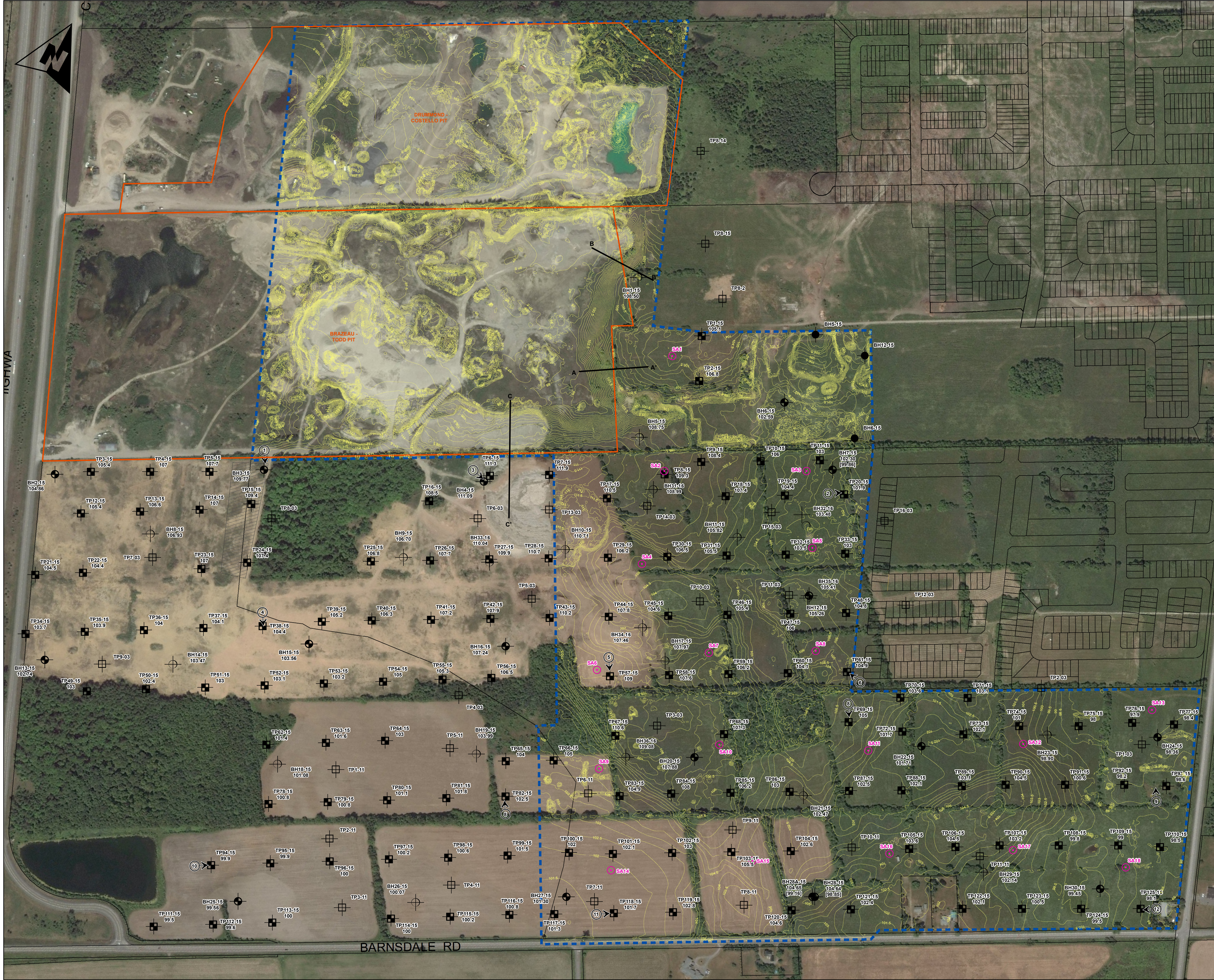
Photographs from Field Investigation

Photo 11: Looking east from TP 118-15 (November 17, 2015).



Photo 12: Looking west from TP 125-15 (November 18, 2015).








LEGEND

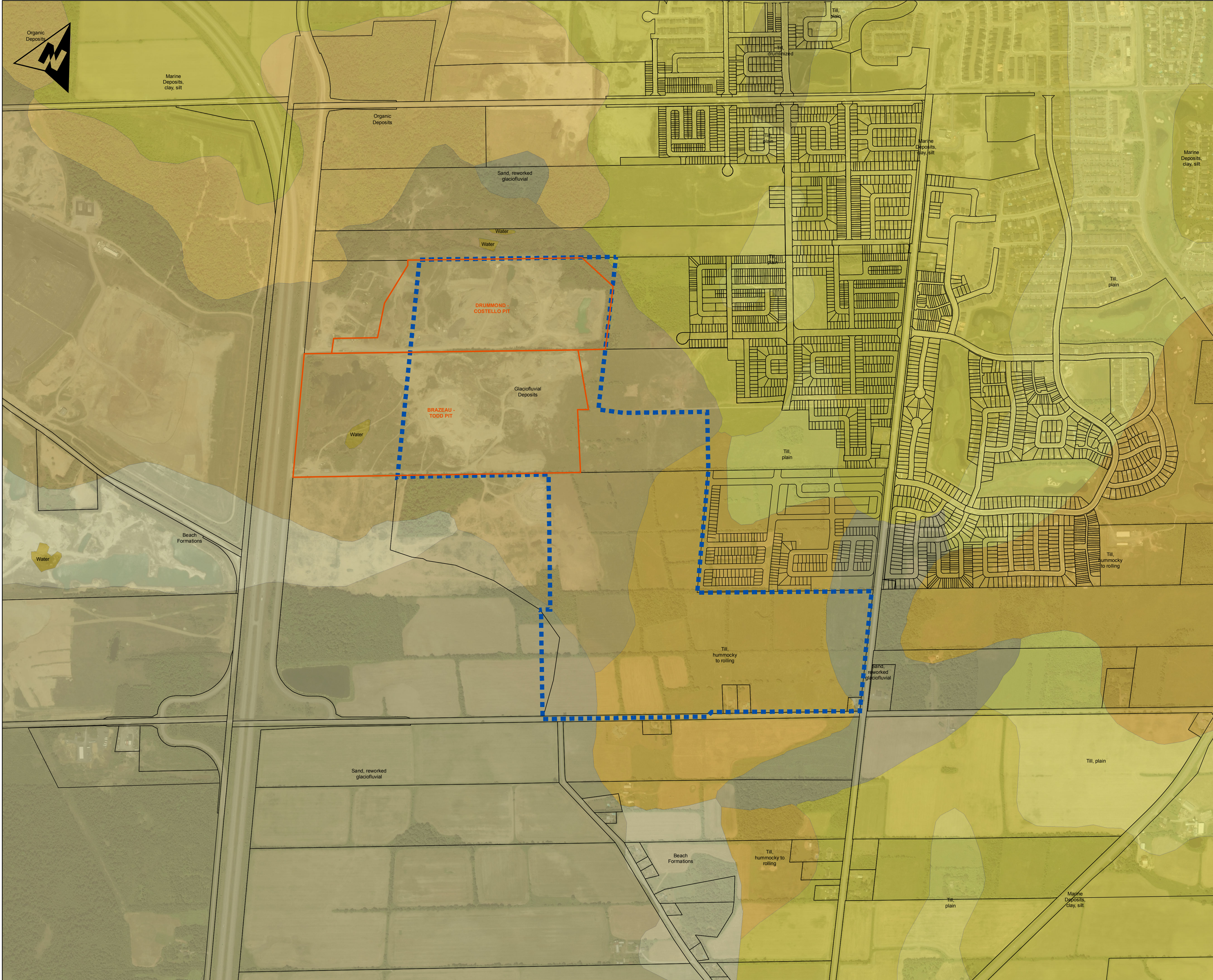
- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION WITH MONITORING WELL, CURRENT INVESTIGATION
- TEST PIT LOCAITON, CURRENT INVESTIGATION
- TEST PIT LOCATION, PREVIOUS INVESTIGATION
- BORE HOLE LOCATION, PREVIOUS
- SHALLOW SIEVE ANALYSIS LOCATIONS
- 99.51 GROUND SURFACE ELEVATION (M)
- (101.35) PRACTICAL REFUSAL TO AUGERING ELEVATION (M)
- COMMUNITY DESIGN PLAN BOUNDARY
- APPROXIMATE FILL PILE LOCATION
- PHOTOGRAPH LOCATION AND DIRECTION
- SLOPE STABILITY SECTION
- BOUNDARY OF AREA LICENSED UNDER THE AGGREGATE RESOURCES ACT

SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

TEST PIT SURFACE ELEVATIONS INTERPOLATED FROM CITY OF OTTAWA 0.5 M CONTOUR MAPPING.

BOREHOLE LOCATIONS AND GROUND SURFACE ELEVATIONS AT BOREHOLE LOCATIONS PROVIDED BY STANTEC. GROUND SURFACE ELEVATIONS ARE REFERENCED TO A GEODEDIC DATUM

11/08/16	ADDITIONAL BOREHOLES AND SIEVE ANALYSIS	1
DD/MM/YY	DESCRIPTION	REV.
DESIGNED BY:	MK	STAMP
DRAWN BY:	BM	
CHECKED BY:	DG	
SCALE:	1:3,000	
DATE:	11/08/2016	
CLIENT:		
 MINTO COMMUNITIES		
PROJECT LOCATION:		
BARRHAVEN SOUTH URBAN EXPANSION AREA CDP OTTAWA, ON		
DRAWING:		
TEST HOLE LOCATION PLAN		
DRAWING NUMBER:	PG3607-1	REVISION NUMBER:
		1
		
 154 Colonnade Road South, Ottawa, Ontario K2E 7J5		



LEGEND

--- COMMUNITY DESIGN PLAN BOUNDARY

--- BOUNDARY OF AREA LICENSED UNDER THE AGGREGATE RESOURCES ACT

SURFICIAL GEOLOGY

- Beach Formations
- Deltaic and Estuarine Deposits
- Erosional Terraces
- Floodplains, sand, silt, clay
- Fluvial Terraces, sand, silt
- Glaciofluvial Deposits
- Marine Deposits, clay, silt
- Organic Deposits
- Paleozoic Bedrock
- Precambrian Bedrock
- Reworked Marine Sediments
- Sand Dunes
- Sand, reworked glaciofluvial
- Till, drumlinized
- Till, hummocky to rolling
- Till, plain
- Water

SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

SURFICIAL GEOLOGY FROM NATURAL RESOURCES CANADA - URBAN GEOLOGY OF THE NATIONAL CAPITAL REGION

DD/MM/YY	DESCRIPTION	REV.
08/09/16	UPDATED CDP BOUNDARY	1

DESIGNED BY: MK


DRAWN BY: BM

CHECKED BY: DG

SCALE: 1:6,000

DATE: 08/09/2016

CLIENT:

 MINTO COMMUNITIES

PROJECT LOCATION:

BARRHAVEN SOUTH URBAN EXPANSION AREA CDP
OTTAWA, ON


DRAWING:

SURFICIAL
GEOLOGY

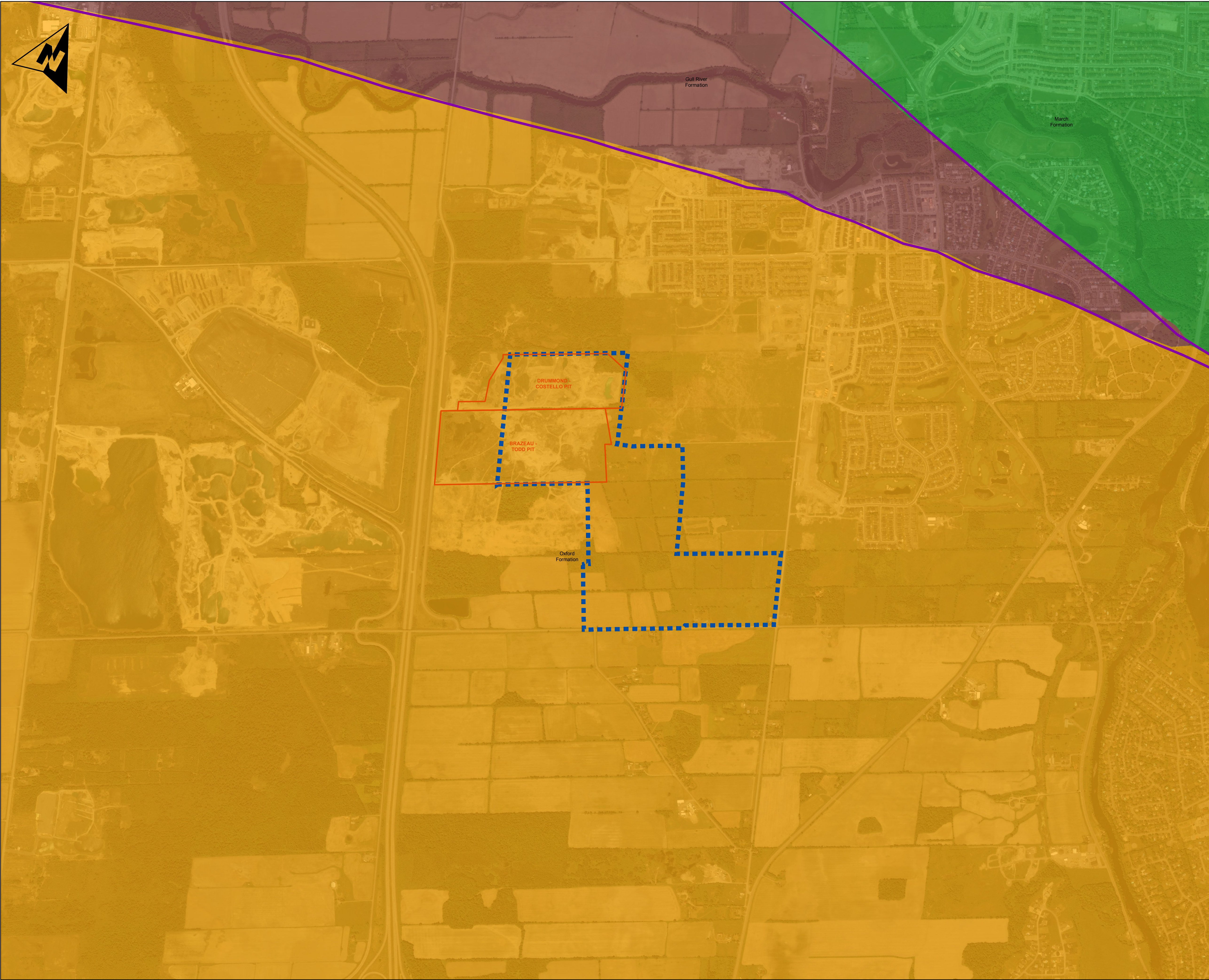
DRAWING NUMBER: PG3607-2

REVISION NUMBER: 1

0 80 160 320 480 640 m



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consulting engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5



LEGEND

- COMMUNITY DESIGN PLAN BOUNDARY
- BOUNDARY OF AREA LICENSED UNDER THE AGGREGATE RESOURCES ACT
- FAULT

BEDROCK

- GULL RIVER FORMATION
- MARCH FORMATION
- OXFORD FORMATION

SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

SURFICIAL GEOLOGY FROM NATURAL RESOURCES CANADA - URBAN GEOLOGY OF THE NATIONAL CAPITAL REGION

08/09/16	UPDATED CDP BOUNDARY	1
DD/MM/YY	DESCRIPTION	REV.

DESIGNED BY:	MK	STAMP
DRAWN BY:	BM	
CHECKED BY:	DG	
SCALE:	1:10,000	
DATE:	08/09/2016	

CLIENT:



MINTO COMMUNITIES

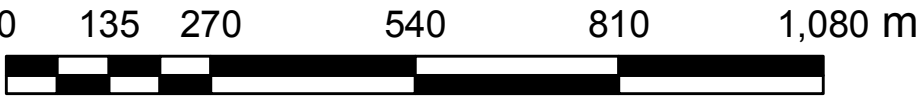
PROJECT LOCATION:

BARRHAVEN SOUTH URBAN EXPANSION AREA CDP
OTTAWA, ON

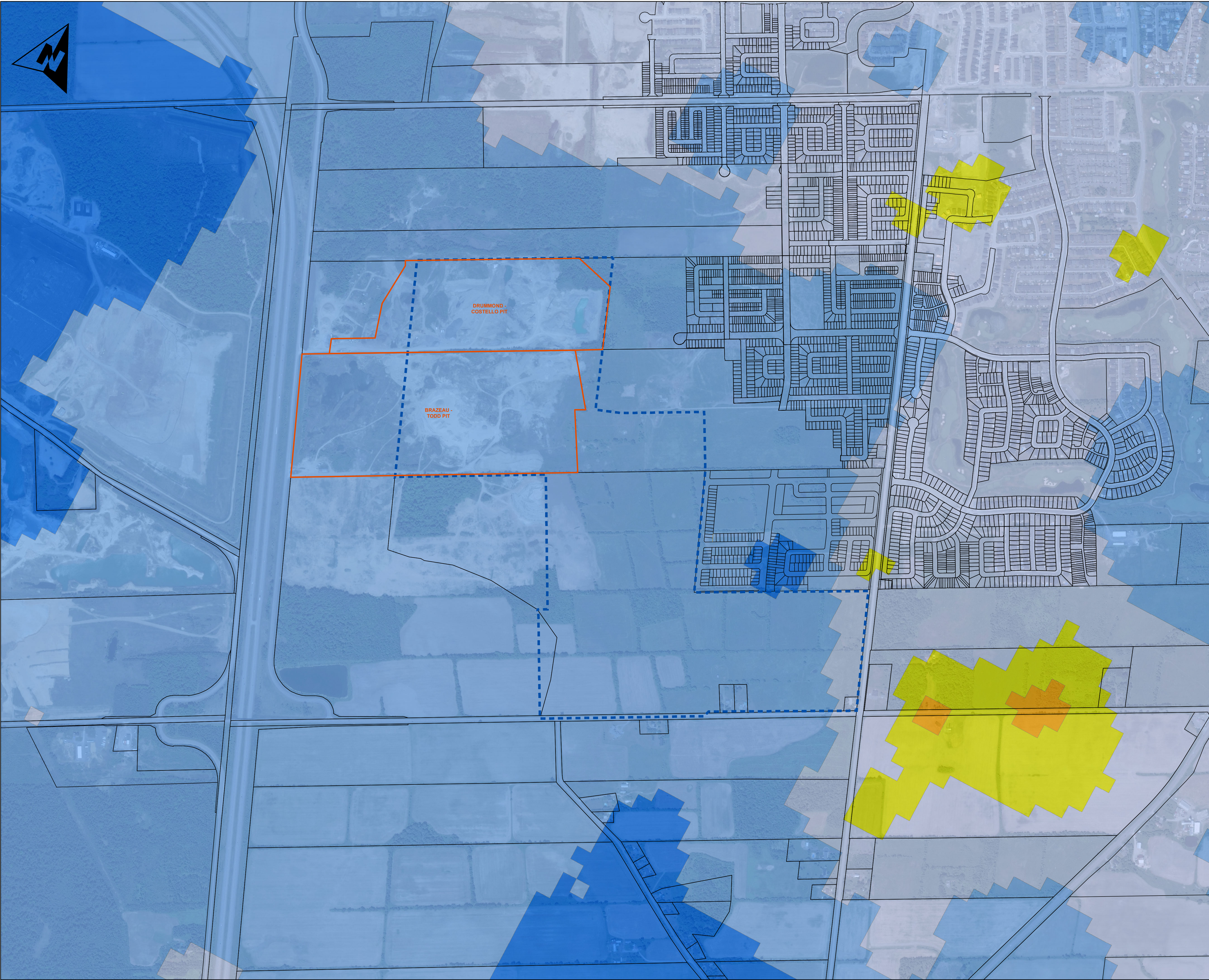
DRAWING:

REGIONAL BEDROCK
MAPPING

DRAWING NUMBER:	REVISION NUMBER:
PG3607-3	1



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LEGEND

- COMMUNITY DESIGN PLAN BOUNDARY
- BOUNDARY OF AREA LICENSED UNDER THE AGGREGATE RESOURCES ACT

DRIFT THICKNESS (m)


- 0 to 1
- 1 to 2
- 2 to 3
- 3 to 5
- 5 to 10
- 10 to 15
- 15 to 25
- 25 to 50
- 50 to 100
- 100 to 200

SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

DRIFT THICKNESS FROM NATURAL RESOURCES CANADA - URBAN GEOLOGY OF THE NATIONAL CAPITAL REGION

08/09/16	UPDATED CDP BOUNDARY	1
DD/MM/YY	DESCRIPTION	REV.
DESIGNED BY:	MK	STAMP
DRAWN BY:	BM	
CHECKED BY:	DG	
SCALE:	1:6,000	
DATE:	09/09/2016	

CLIENT:



MINTO COMMUNITIES

PROJECT LOCATION:


BARRHAVEN SOUTH URBAN EXPANSION AREA CDP
OTTAWA, ON

DRAWING:

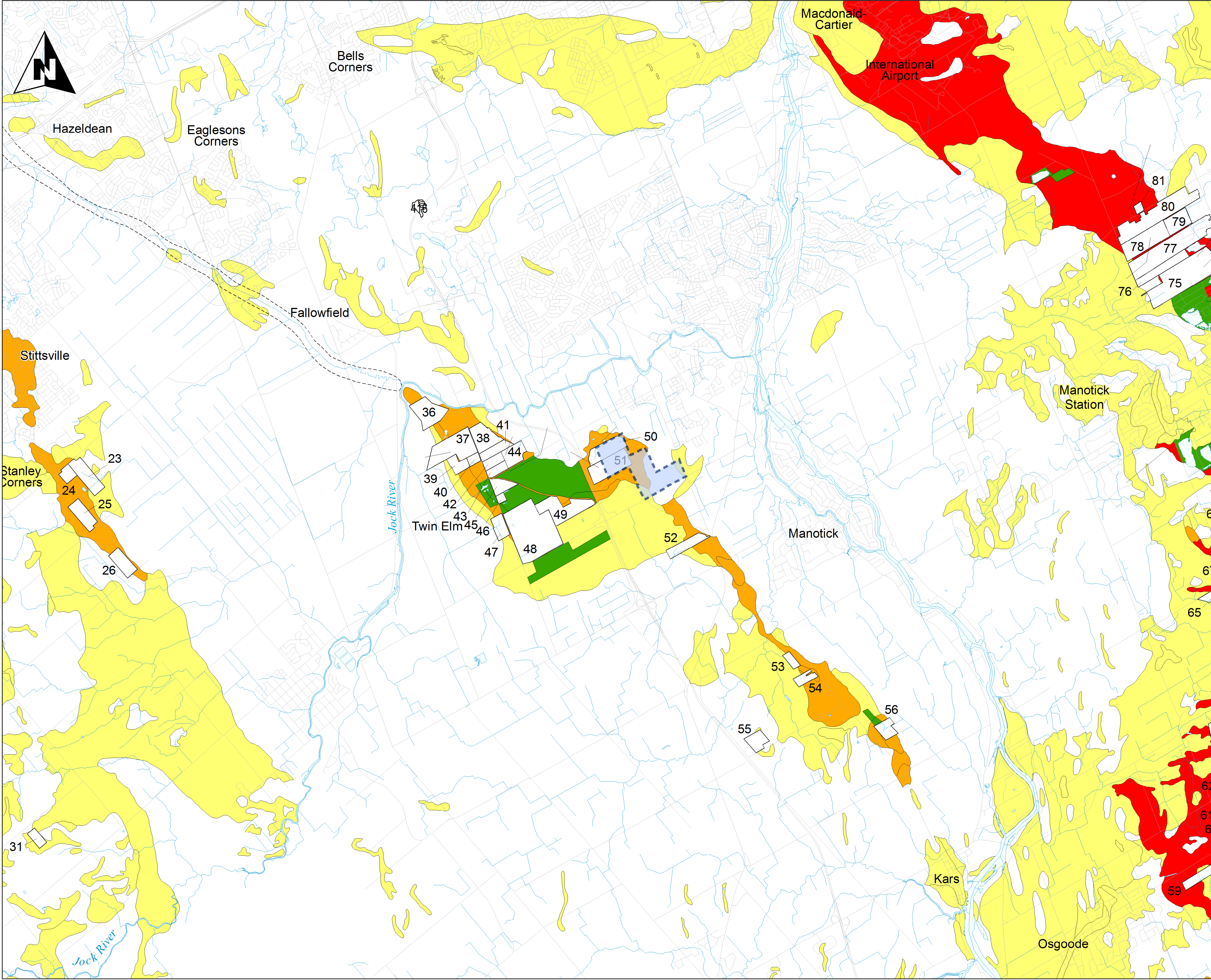
DRIFT
THICKNESS

DRAWING NUMBER:	PG3607-4	REVISION NUMBER:	1
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0 80 160 320 480 640 m



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LEGEND

- CDP BOUNDARY
- LICENCED PROPERTY BOUNDARY, PROPERTY NUMBER SHOWN


SAND AND GRAVEL RESOURCES

- SELECTED SAND AND GRAVEL RESOURCE AREA, PRIMARY SIGNIFICANCE
- SAND AND GRAVEL DEPOSITS THAT HAVE BEEN SUBSTANTIALLY EXTRACTED IN THE PAST, BUT WHERE LIMITED RESOURCES MAY STILL BE AVAILABLE
- SELECTED SAND AND GRAVEL RESOURCE AREA, SECONDARY SIGNIFICANCE
- SAND AND GRAVEL DEPOSIT, TERTIARY SIGNIFICANCE

SERVICE LAYER CREDITS:

LEE, V.L. 2013. AGGREGATE RESOURCES INVENTORY OF THE CITY OF OTTAWA, SOUTHERN ONTARIO; ONTARIO GEOLOGICAL SURVEY, AGGREGATE RESOURCES INVENTORY PAPER 191, 80P.

DD/MM/YY	DESCRIPTION	REV.
DESIGNED BY:	MK	STAMP
DRAWN BY:	BM	
CHECKED BY:	DG	
SCALE:	1:40,000	
DATE:	11/08/2016	



MINTO COMMUNITIES

PROJECT LOCATION:


BARRHAVEN SOUTH URBAN EXPANSION AREA CDP
OTTAWA, ON

DRAWING:

AGGREGATE RESOURCES INVENTORY
OF THE CITY OF OTTAWA

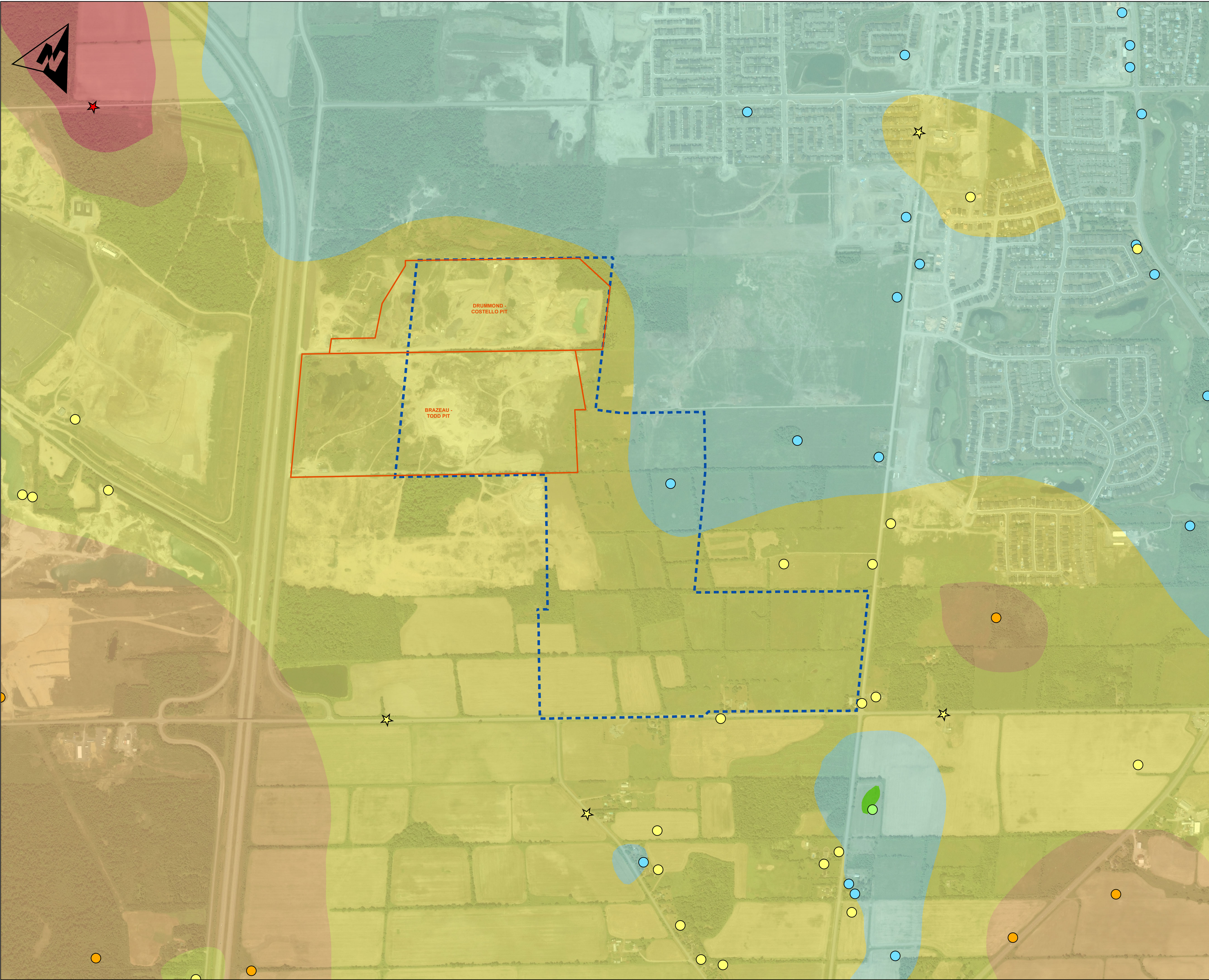
DRAWING NUMBER:	REVISION NUMBER:
PG3607-5	

0 500 1,000 2,000 3,000 4,000 m



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LEGEND

--- COMMUNITY DESIGN PLAN BOUNDARY

--- BOUNDARY OF AREA LICENSED UNDER THE AGGREGATE RESOURCES ACT

SEISMIC SITE CLASS

A B C D E

REFLECTION-REFRACTION GEOPHYSICAL SURVEY SITE

SEISMIC SITE CLASS

A B C D E

WATER WELL BOREHOLE LOCATION


SEISMIC SITE CLASS

A B C D E

SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGN, AND THE GIS USER COMMUNITY

SEISMIC SITE CLASS FROM CITY OF OTTAWA SEISMIC SITE CLASSIFICATION MAP FROM COMBINED GEOLOGICAL GEOPHYSICAL DATA

DD/MM/YY	DESCRIPTION	REV.
DESIGNED BY:	MK	STAMP
DRAWN BY:	BM	
CHECKED BY:	DG	
SCALE:	1:6,000	
DATE:	09/12/2016	



MINTO COMMUNITIES

PROJECT LOCATION:

BARRHAVEN SOUTH URBAN EXPANSION AREA CDP
OTTAWA, ON


DRAWING:

SEISMIC SITE CLASS

DRAWING NUMBER:
PG3607-6

REVISION NUMBER:

080160320480640 m



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