Geotechnical Investigations And Slope Stability Analysis Final Report

6600 Mayfield Rd,
Brampton, ON

CLIENT

Khalsa Gurmat Academy Toronto

PNJ ENGINEERING INC.
Pavement · Materials · Geo-Environmental · Engineering

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

PNJ Engineering Inc. (PNJ) was retained by Khalsa Gurmat Academy Toronto (the Client) to undertake a geotechnical investigation and a stability analysis for the slope located at 6600 Mayfield Rd, Brampton, ON (the Site or Property). The Site location map is presented in ***Appendix B*** of this report.

The geotechnical investigation was conducted to assess the subsurface soil and groundwater conditions at the site through the drilling of two (2) sampled boreholes, which were converted to monitoring wells. The data obtained from the investigation was used to support the stability analysis of the slope located on the northeast side of the property. The slope stability analysis was carried out on three (3) cross-sections, shown in ***Appendix F*** of this report.

1.1 Site Description

The site is located approximately 350 meters northeast of the intersection of Innis Lake Road and Mayfield Road, Brampton, ON. The field investigation was carried out in the northeast section of the property, a few meters from the subject slope. The subject slope falls under the Toronto and Region Conservation Authority (TRCA) regulated areas and runs along the northeastern side of the property.

Based on visual observations, the face of the slope was found to be lightly vegetated with grass, trees, and shrubs. A creek was also observed at or near the toe of the slope, as shown in the figures in ***Section 8.0***. The slope ratio varied along its cross-sections, ranging from 1:2 (H:V) in some areas near the toe, to 3.5:1. More details regarding the slope condition at the time of the slope inspection are provided in ***Section 8.0: VISUAL ASSESSMENT OF SLOPE AND AREA.***

The site conditions at the time of drilling are depicted in the figures below.

Figure 1-1: Site condition (borehole BH1) – Facing southeast.

Figure 1-2: Drilling Area (borehole BH2) – Facing southeast.

2.0 SCOPE OF WORK

PNJ's scope of work involved the following tasks:

- **Pre-Planning activities:**
  - Preparation of a Site-specific health and safety plan (HASP).
  - Predrilling site access assessment and borehole Stakeout.
  - Completion of underground utilities locate clearance (public and private).
- **Field Activities**
  - Conducting a visual reconnaissance of the site, including a visual assessment of the existing slope in accordance with the Ontario Ministry of Natural Resources (MNR) guidelines.
  - Advancement of two (2) boreholes identified as BH1 and BH2 within the project area.
    - Converting both boreholes to monitoring wells
  - Performing Standard Penetration Test (SPT) and associated split spoon soil sampling in accordance with ASTM D1586.
  - Collection of soil samples
- **Laboratory testing:**
  - Geotechnical laboratory testing on selected soil samples, as described in ***Section 5.0***.
- **Reports:**
  - Completing slope stability modeling and analysis for the existing slope.
    - The analysis was carried out on three (3) cross-sections, A-A`, B-B`, and C-C`, shown ***Appendix F.***
  - Preparation of a geotechnical investigation and a slope stability analysis report (factual data, analysis, and recommendation), as outlined in the table of contents of this document.

3.0 PHYSIOGRAPHY

Based on the Physiography of Southern Ontario[1] and the surficial geology map[2], the Site is located within Bevelled Till Plains and comprises modern alluvial deposits and/or fine-textured glaciolacustrine deposits of silt and clay, with some to trace sand and gravel.

[1] L.J. Chapman and D.F. Putnam, (1984): Physiography of Southern Ontario, 2nd Edition, Ontario Geological Survey.
[2] Sharpe, D. R. 1980: Quaternary Geology of Toronto and Surrounding Area; Ontario Geological Survey Preliminary Map P. 2204, Geological Series. Scale 1:100 000. Compiled 1980.

The bedrock in this area mainly comprises the Georgian Bay Formation, consisting of shale, limestone, dolostone, and/or siltstone. The bedrock in this area can be encountered at shallow depths, approximately 2 meters below the surface.

4.0 METHOD OF INVESTIGATION

The field investigation methodologies for this investigation are presented in the following sections.

4.1 Safety Planning

Upon project initiation, a Site-specific Health and Safety Plan (HASP) was prepared for implementation during the field investigation program. The HASP presents the visually observed Site conditions to identify potential physical hazards to field personnel. Accordingly, the required personal protective equipment was also listed in the HASP. It is mandatory for all ***PNJ*** personnel involved in the field program to read the HASP and have a hard copy of the HASP available at the Site during the investigative work.

4.2 Borehole Location Clearance

PNJ completed a pre-drilling Site visit to review the Site conditions and access restrictions. Based on the limits of approach, the boreholes were marked at locations to avoid above ground and underground utilities or structures. All the boreholes were marked in the field based on the proposed borehole location plan.

Prior to initiating the subsurface investigation activities, all applicable utility companies (gas, hydro, network cables, water, wastewater, etc.) were contacted, to demarcate the location of their respective underground utilities and ensure that the service lines will not be damaged during the investigative works.

PNJ retained a private services locator (True North Locates Inc.) to locate any underground private utilities that could potentially be present at the Site.

4.3 Field Investigation

The fieldwork for the geotechnical investigation was performed on October 18, 2024, and consisted of advancing two (2) boreholes, BH1 and BH2, to an approximate depth 3.1 meters below ground surface (mbgs). Borehole locations and corresponding depths are listed in ***Table 4-1*** blow. The borehole location plan is presented in ***Appendix B***.

The boreholes were advanced using solid-stem drilling and soil samples were collected every 0.75 meters interval to 3 meters below ground surface (mbgs), and at 1.5 m interval thereafter to

the termination depth of the borehole. All soil sampling was conducted using a 50 mm outer diameter, split spoon sampler in accordance with the specifications of the Standard Penetration Test Method (ASTM D1586). In addition, at the drilled borehole locations, the compactness condition or consistency of the subsurface soil layers were assessed using the Standard Penetration Test (SPT) method, by recording the number of blows ('N' values) required to drive a conventional split barrel soil sampler, 0.3 m into the material and these are presented on the borehole logs in ***Appendix C*** as penetration index values.

PNJ technical representative logged the soil samples encountered in the borehole and examined the samples as they were obtained. The recovered soil samples were transferred to ***PNJ's*** geotechnical laboratory in Toronto, ON, where they were reviewed by a senior geotechnical engineer. The detailed description of the individual soil deposits, groundwater condition and ground stratigraphy as encountered at the borehole location are shown on the accompanying borehole logs presented in ***Appendix C***.

Groundwater and cave-in observations were made in the borehole upon completion of drilling. Details on the recorded groundwater are presented in ***Section 6.4*** of this report.

4.4 Borehole Location and Ground Surface Elevation

The investigated locations and associated ground surface elevations were collected by ***PNJ's*** field supervisor using handheld GPS upon completion of the fieldwork. The coordinates, ground surface elevations, and depths of the drilled boreholes are presented in the following table.

Table 4-1: Coordinates of Boreholes

Borehole ID	Approximate Easting (m)	Approximate Northing (m)	Approximate Ground Surface Elevation (m AMSL) *	Proposed Drill Depth (mbgs)	Actual Drilled Depth (mbgs)	Reason for Termination
BH1	600776	4850840	228.1	6.1	3.1	Auger refusal - bedrock
BH2	600734	4850881	228.7			

** Above Mean Sea Level*

It should be noted that the provided coordinates and elevations are approximate and are provided for geotechnical study purposes only and should not be used for construction purposes.

5.0 GEOTECHNICAL LABORATORY TESTS

The soil samples recovered from the split spoon sampler were properly sealed, labeled, and transported to ***PNJ's*** laboratory in Toronto, Ontario. Visual soil classifications made in the field

were verified by a Senior Geotechnical Engineer. Geotechnical laboratory testing was conducted on the collected samples, including hydrometer analyses on one (1) selected sample and moisture content determination on all recovered soil samples.

The results of water content tests and hydrometer testing are reported on the borehole stratigraphy logs, ***Appendix C***. The detailed results of the tested soil samples are provided in ***Appendix D***.

Geotechnical laboratory testing was conducted in accordance with American Society for Testing and Materials (ASTM) applicable standards, while MTO LS-702[3] was used for hydrometer analysis of soils. The soil testing program and soil classification conformed to the latest edition of the following standards:

MTO LS-702 Standard Test Method for Particle Size Analysis of Soils (Hydrometer Analysis)

ASTM D2487 Standard Practice for Classification of Soils for engineering purposes (Unified Soil Classification System-USCS)

The Unified Soil Classification System (USCS) was used for soil description and classification.

6.0 SUBSURFACE CONDITONS

Based on the borehole data from this investigation, the site's general stratigraphy consisted of Fill material, primarily silt, which extended to approximately 0.7 mbgs. The Fill material was followed by a Peat layer containing some clayey silt soils and extended to approximately 1.5 mbgs. Following the Peat layer, a clayey silt layer approximately 0.5 m thick was encountered, overlying a shale bedrock. The boreholes were terminated at approximately 3.1 mbgs due to auger refusal in bedrock. The stratigraphic units are further discussed in the following sections. More details are also provided on the borehole logs in ***Appendix C*** of this report.

The following summary is to assist the designers of the project with an understanding of the anticipated soil conditions across the site. However, it should be noted that the boundaries of soil types indicated on the borehole logs are inferred from non-continuous soil sampling and observations made during drilling. These boundaries are intended to reflect transition zones for

[3] ASTM D422-63(2007)- “Standard Test Method for Particle-Size Analysis of Soils” has been withdrawn without replacement from January 2016. As such, the hydrometer testing method MTO LS-702 ‘Particle-Size Analysis of Soils’ was used for soil samples gradation analysis.

the purpose of geotechnical design, and therefore, should not be considered as exact planes of geological change.

6.1 Topsoil

Topsoil, approximately 100 mm thick, was encountered in borehole BH2 only. The thickness of the topsoil varies across the site and may not be consistent with what was encountered during drilling.

6.2 Fill Materials

6.2.1 Silt

A Fill layer primarily consisting of silt was encountered in both boreholes and extended to approximately 0.6 mbgs in borehole BH1 and 0.7 mbgs in borehole BH2. The fill also consisted of some sand, trace to some clay, and trace to some gravel. The fill material was generally brown in color and had a moisture content ranging from approximately 10% to 14%.

6.2.1 Peat-Like Material

Following the silt fill material described above, a layer composed primarily of peat-like material was encountered and extended to approximately 1.5 mbgs in both boreholes. In addition to the organic matters, this layer included clayey silt soils, some sand, and trace amounts of gravel. The layer's color was generally brown to dark brown, and had a moisture content ranging from approximately 18% to 32%.

6.3 Native Soils

6.3.1 Clayey Silt

This layer of Clayey Silt soils was observed immediately below the peat layer and extended to approximately 2 mbgs in both boreholes. The moisture content varied from approximately 16% to 20%.

The SPT performed within this soil stratum, yielded N-values ranging from 16 to 29 blows per 300 mm of penetration, indicating a dense to very dense relative density.

One sample was selected from this layer for hydrometer analysis. The test results are enclosed in ***Appendix D*** and summarized in ***Table 6-1*** below.

Table 6-1: *Grain size and Hydrometer Analysis*

Sample No.	Depth (mbgs)	Grain Sizes (%)				Soil Description	Estimated coefficient of permeability (k) (cm/sec.)
		Gravel	Sand	Silt	Clay		
BH1-SS3	6.2	2.5	17.0	50.9	29.6	Clayey Silt, some sand, trace gravel	2E-06

6.4 Bedrock

Shale bedrock was encountered at both boreholes from approximately 2.1 mbgs to termination depth of approximately 3.1 mbgs, due to auger refusal.

7.0 GROUNDWATER

The groundwater level and sidewall cave-ins were measured upon the completion of each borehole. Both boreholes were found dry and remained open immediately after drilling.

Both boreholes were converted into monitoring wells, and water level readings were subsequently recorded at later dates after drilling, as shown in the table below. All monitoring well were found dry.

Table 7-1: *Groundwater Readings in Monitoring Wells*

Well/Borehole ID	Date	Time	Well Depth (m)	Stick-up (m)	Water Level (m) Ground level
BH1	18/10/2024	9:15	3.1	0.75	N/A (Dry)
	21/10/2024	16:30	3.1	0.75	
	21/11/2024	15:05	3.1	0.76	
BH2	18/10/2024	10:45	3.1	0.76	
	21/10/2024	16:45	3.1	0.76	
	21/11/2024	15:25	3.1	0.76	

8.0 VISUAL ASSESSMENT OF SLOPE AND AREA

8.1 Slope Assessment

A visual inspection of the subject slope was carried out on October 4, 2024. Information pertaining to the existing slope features such as slope profile, slope drainage, water course features, vegetation cover, structures in the vicinity of the slope, erosion features and slope site features were obtained during visual assessment.

The face of the slope was lightly vegetated with grass, trees, and shrubs. The trees appeared straight and vertical, indicating no evidence of landslides or other exerting forces on the trees such as exerted by sliding snow covers. Tree logs, corrugated metal sheets, as well as other elements were observed at cross-section B-B` as shown in ***Figure 1-1***. The gradient of the slope varied along the cross-section as shown in ***Appendix F,*** and is as follow:

- Cross-section A-A`: varied from 2:1 (H:V) near top of slope, to 3.5:1 near the toe
- Cross-section B-B`: varied from 3:1 (H:V) near top of slope, to 1:2 near the toe
- Cross-section C-C`: varied from 1:1 (H:V) near top of slope, to 1.7:1 near the toe

A creek was also observed near or at the toe of the slope as shown in the figures below.

The visual examination of the slope's *toe and face* did not reveal evidence of active erosion, nor signs of slope instabilities or failures, such as tension cracks, slope movements, soil creep, bulging, heave, or subsidence. However, signs of failure were visible at the top of the slope at all cross-sections, where the fill material had slightly bulged and started creeping downward.

During the inspection, the slope area was dry with no visible water seepage or previous seepage paths.

Figure 8-1: Creek at cross-section A-A` - Facing southeast.

Figure 8-2: At cross-section B-B` - Facing southeast.

Figure 8-3: Creek at cross-section B-B` - Facing southeast.

Figure 8-4: At cross-section C-C` - Facing southwest.

8.2 Slope Stability Rating

During the slope inspection visit, ***PNJ*** completed Slope Stability Rating Forms for the three (3) cross-sections, A-A`, B-B`, and C-C` shown in ***Appendix F***. The forms were completed based on the site topographic map, and the visual inspection of the slope conditions and nearby areas affecting the slope.

The Slope Rating forms were completed in accordance with the requirements of the Ontario Ministry of Natural Resources (MNR) Technical Guidelines. The ratings are provided in ***Appendix E***. Based on our assessment, a Slope Stability Rating of 44 was calculated for cross-sections A-A` and C-C`, while a rating of 40 was calculated for cross-section B-B`. According to the criteria established by the MNR, a Slope Stability Rating greater than 35 indicates a “Moderate Potential” of instability. For the “Moderate Potential” case, the MNR guideline requires boreholes, piezometers, lab tests, surveying, and a detailed report.

9.0 SLOPE STABILITY ANALYSIS

9.1 Software

PNJ utilized Slide2, a 2D limit equilibrium slope stability modeling software developed by Rocscience Inc., to model and evaluate the factor of safety for the cross-section of the slope using the Bishop method of slices.

9.2 Slope Configuration

The slope stability analysis was carried out on three (3) cross-sections of the slope. The slope stratigraphy and soil properties were estimated based on data obtained from the geotechnical investigation discussed above.

The slope geometries were based on the topographic map and the cross-sections provided by the client, which are included in ***Appendix F.***

9.3 Required Minimum Safety Factor Values (FS min)

The factor of safety (FOS) in slope stability analysis is defined as the ratio of available shear strength to the applied stresses along a potential failure plane. A factor of safety greater than 1 indicates stable conditions, while a value equal to or less than 1 will represent incipient failure/unstable conditions. The minimum factor of safety allowed depends on the hazards associated with a failure, the analysis method, the reliability of the measured or assumed parameters, and the estimated pore pressures.

Considering the potential losses due to slope movements, a long-term minimum safety factor value (FS min) of 1.5 is recommended for the purpose of this project. It should be noted that MNR guidelines recommend a minimum Factor of Safety between 1.3 to 1.5 for Active land-use such as habitable or occupied structures near slope which include residential, commercial and industrial buildings, and retaining walls [4].

10.0 ENGINEERING DISCUSSION

A total of three (3) cross-sections A-A`, B-B`, and C-C` (***Appendix F***) of the slope were selected for the stability analyses. This section provides geotechnical discussions regarding the slope stability analysis conducted, based on the existing slope conditions.

[4] Technical Guide – River & Stream Systems: Erosion Hazard Limit, Section 4.3.3.1 Design Minimum Factors of Safety – Table 4.3. Ontario Ministry of Natural Resources, 2002

10.1 Results of the Stability Analysis and Discussion

The table below summarizes the computed minimum factor of safety for each scenario.

Table 10-1: Summary of Slope Stability Results & Recommended Setback

Cross-Section	Minimum FOS	Toe Erosion Allowance [1]	Distance From Existing Top of Slope to LTSTS [2]	Erosion Access Allowance [1]	Total Recommended Setback
A-A`	1.4	1 m	2.3 m	6 m	8.3 m
B-B`	2.0		1.0 m		7.0 m
C-C`	1.1		2.9 m		8.9 m

1- In accordance with the MNR Guidelines[5]

2- Approximate distance from existing top of slope to Long Term Stable Top of Slope (LTSTS). This includes the toe erosion allowance. The LTSTS is shown on the drawing presented in ***Appendix H***

The graphical outputs of the slope stability analyses are presented in ***Appendix G*** of this report. A review of the results shows that, given the assumed engineering parameters of the subsurface conditions are representative of the site, a Factor of Safety (FOS) of less than 1.5 was computed for cross-sections A-A` and C-C`, while cross-section B-B` has a FOS greater than the recommended FOS of 1.5. Therefore, the slope in its existing condition, particularly at cross-sections A-A and C-C`, did not achieve the minimum recommended FOS of 1.5 as discussed in ***Section 9.3.***

Based on site observations and the data collected during this investigation, a toe erosion allowance of 1 meter was considered as per MNR guidelines for shallow bedrock or bedrock outcrops (soft rock).

The total recommended setback line, toe erosion allowance, the distance from the existing top of slope to LTSTS, and the erosion access allowance are depicted on the topographic map included in ***Appendix H***.

11.0 GRADING PLAN AND EROSION AND SEDIMENT CONTROL PLAN

The proposed remedial grading and restoration plans, including the Erosion and Sediment Control (ESC) plan are presented in ***Appendix J*** of this report.

[5] MNR (2002): Technical Guide – River & Stream Systems: Erosion Hazard Limit, Section 3.4 Erosion Access Allowance

The grading plans show the approximate area of the recently placed fill, as well as five (5) cross-sections, labeled A-A through E-E, along the fill area. These cross-sections show the approximate depth of the recently placed fill.

Additionally, the plans in ***Appendix J*** show the proposed location for stockpiling the fill to be removed, cross-sections of the proposed stockpile, and its estimated volume.

11.1 ESTIMATION OF THE NEW FILL AREA AND VOLUME

The area and volume of the recently placed fill were estimated by comparing topographic data from two sources for the subject site:

1) The current topographic survey (dated 2024) by Alex Marton Ltd. (dated Feb. 8, 2024 and reflecting the presently-existing surface elevation throughout and adjacent-to the Site)
2) Topographic Data obtained from a topographic data set called 'GTA2014', provided by Natural Resources Canada ('NRCAN') and downloaded from the provider 'Equator.net'.

Both sources of topographic data (elevations) were loaded into Autodesk AutoCAD Civil3D 2025, and a 'TIN' Surface was derived from each data source. The two resulting 'TIN' Surfaces were compared utilizing a 'Comparison Surface' in Civil3D. Further, cross-sections were developed referencing both the NRCAN 2014 data, and 2024 data. The depth-of-fill was measured from the cross-sections. The 'Comparison Surface' was used to visualize the depth of fill (difference in elevation), between the 2014 and 2024 data sets, which thus informed the area over-which fill was placed within the Site. Further, the volume of fill was calculated utilizing the Comparison Surface.

Based on the above, the estimated volume of the recently placed fill material to be removed is approximately 2,115.73 m^3.

12.0 VALLEY CORRIDOR RESTORATION PLAN

The Valley Corridor Restoration Plan, provided in ***Appendix K***, includes native trees and shrubs along the slope and slope buffer as well as a native stabilization seed mix. In conformance with TRCA guidelines woody shrubs are spaced at 1 meter on center and trees are spaced at 5 meters on center. An upland meadow seed mix is recommended to stabilize the slope. For more details, including the full plant list, planting details, and seed mix details, refer to drawing No. L100, presented in ***Appendix K*** of this report.

13.0 REGULATORY FLOODPLAIN

As per TRCA requirements, the Regulatory Floodplain was plotted as a continuous line on the current topographical survey as presented in ***Appendix L*** of this report. The plotted flood line

shows that the total recommended setback provided in ***Section 10.1*** above, is more than 10 meters from the flood hazard.

14.0 RESTORATION WORK MONITORING

As per the TRCA comment number 5, presented in ***Appendix I*** of this report, a geotechnical engineer should be present on-site periodically to supervise the slope restoration works. Following the completion of the restoration work, the geotechnical engineer should submit a review letter to confirm that the removal of fill and restoration work conducted at the site is satisfactory.

As per TRCA requirements, a letter confirming that a geotechnical engineer will be retained should be submitted to TRCA prior to construction.

15.0 LIMITATIONS OF REPORT

The Limitations of Report, as quoted in ***Appendix A***, are an integral part of this report.

Yours respectfully,

PNJ Engineering Inc.

Muaad Alrawhani., *P. Eng.*
Geotechnical Engineer
Geotechnical & Geoenvironmental Services

Abid Sahi., *M.A.Sc., P.Geo., P.Eng., QP$_{ESA}$*
Principal
Manager Geotechnical & Geoenvironmental Services

APPENDICES

APPENDIX A

LIMITATIONS OF THE REPORT

LIMITATIONS OF REPORT

This report is intended solely for Khalsa Gurmat Academy Toronto (Client) and their designers and is prohibited for use by others without PNJ's prior written consent. This report is considered PNJ's professional work product and shall remain the sole property of PNJ. Any unauthorized reuse, redistribution of or reliance on the report shall be at the Client and recipient's sole risk, without liability to PNJ. No portion of this report may be used as a separate entity; it is to be read in its entirety and shall include all supporting drawings and appendices.

The description provided in this report are based on our present understanding of the project, the current site use, ground surface elevation and conditions, and are based on the work scope approved by the Client and described in the report. The services were performed in a manner consistent with the level of care and skill ordinarily exercised by members of geotechnical engineering professions currently practicing under similar conditions. No other representations, and no warranties or representations of any kind, either expressed or implied, are made. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties.

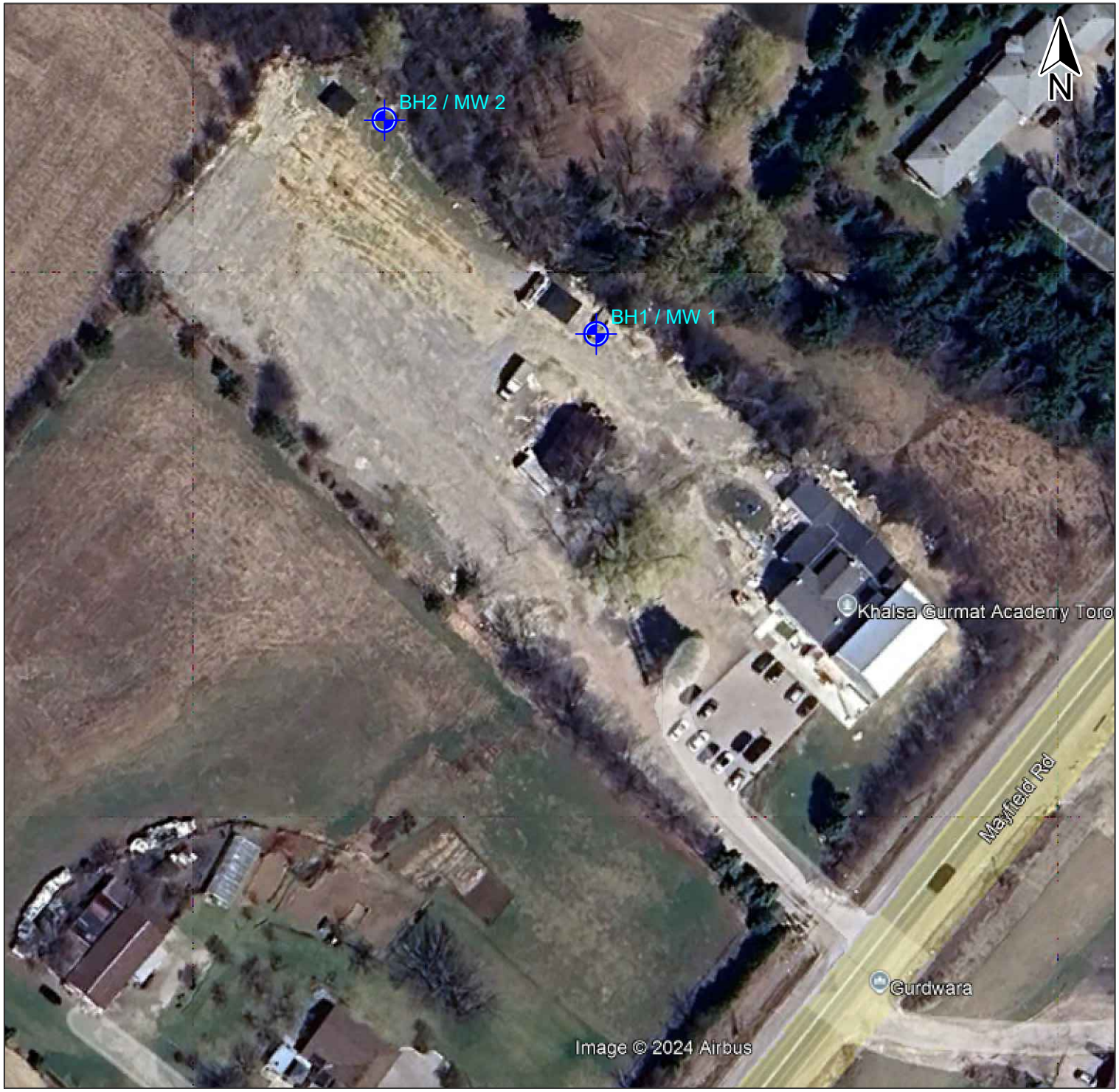
All details of design and construction are rarely known at the time of completion of a geotechnical study. The recommendations and comments made in the study report are based on our completed subsurface investigation and resulting understanding of the project, as defined at the time of the study. We should be retained to review our recommendations when the drawings and specifications are complete. Without this review, PNJ will not be liable for any misunderstanding of our recommendations or their application and adaptation into the final design.

By issuing this report, PNJ is the geotechnical engineer of record. It is recommended that PNJ be retained during construction of all foundations and during earthwork operations to confirm the conditions of the subsoil are confirm if the encountered soils are like those observed during our study. The intent of this requirement is to verify that conditions encountered during construction are consistent with the findings in the report and that inherent knowledge developed as part of our study is correctly carried forward to at the construction phases.

It is important to emphasize that a soil investigation is, in fact, a random sampling of a site and the comments included in this report are based on the results obtained at the test locations only. The subsurface conditions confirmed at the test locations may vary at other locations. The subsurface conditions can also be significantly modified by the construction activities on site (e.g., excavation, dewatering and drainage, blasting, pile driving, etc.). These conditions can also be modified by exposure of soils or bedrock to humidity, dry periods, or frost. Soil and groundwater conditions between and beyond the test locations may differ both horizontally and vertically from those encountered at the test locations and conditions may become apparent during construction which could not be detected or anticipated at the time of our investigation. Should any conditions at the site be encountered which differ from those found at the test locations, we request that we be notified immediately for a reassessment of our recommendations. If changed conditions are identified during construction, no matter how minor, the recommendations in this report shall be considered invalid until sufficient review and written assessment of these conditions is completed by PNJ.

APPENDIX B

SITE AND BOREHOLE LOCATION PLAN



LEGEND

Borehole / Monitoring Well Location

NOTES

-

REFERENCES

- Google Maps

TITLE

Borehole / MW Location Plan

PROJECT

6600 Mayfield - Geotechnical & Slope Analysis

ADDRESS

6600 Mayfield Rd., Brampton, ON

CLIENT

Khalsa Gurmat Academy Toronto

DRAWING NO.	BHLP-1
DATE	DEC 6 2024
PREPARED BY	MA
REVIEWED BY	AS

PNJ ENGINEERING INC.
Pavement - Materials - Geo-Environmental - Engineering
70 Galaxy Blvd Suite 100, Toronto, ON M9W 4Y6
Tel: 905.597.8383 Fax:905.597.0825
www.pnjeng.com

PROJECT NO. 24-1202-01 REV.0

APPENDIX C

BOREHOLE LOG SHEETS

PNJ ENGINEERING INC.

Notes on Borehole and Test Pit Reports

Soil description :

Each subsurface stratum is described using the following terminology. The relative density of granular soils is determined by the Standard Penetration Index ("N" value), while the consistency of clayey sols is measured by the value of undrained shear strength (Cu).

Classification (Unified system)

Clay	< 0.002 mm		
Silt	0.002 to 0.075 mm		
Sand	0.075 to 4.75 mm	fine	0.075 to 4.25 mm
		medium	0.425 to 2.0 mm
		coarse	2.0 to 4.75 mm
Gravel	4.75 to 75 mm	fine	4.75 to 19 mm
		coarse	19 to 75 mm
Cobbles	75 to 300 mm		
Boulders	>300 mm		

Terminology

"trace"	1-10%
"some"	10-20%
adjective (silty, sandy)	20-35%
"and"	35-50%

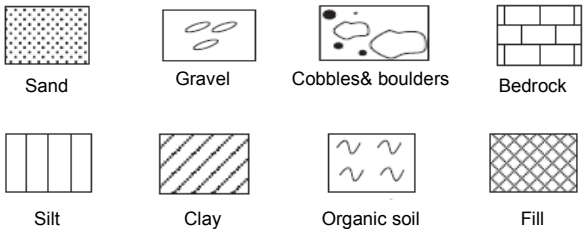
Relative density of granular soils	Standard penetration index "N" value (BLOWS/ft – 300 mm)
Very loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very dense	>50

Consistency of cohesive soils	Undrained shear strength (Cu) (P.S.F)	(kPa)
Very soft	<250	<12
Soft	250-500	12-25
Firm	500-1000	25-50
Stiff	1000-2000	50-100
Very stiff	2000-4000	100-200
Hard	>4000	>200

Rock quality designation

"RQD" (%) Value	Quality
<25	Very poor
25-50	Poor
50-75	Fair
75-90	Good
>90	Excellent

STRATIGRAPHIC LEGEND



Samples:

Type and Number

The type of sample recovered is shown on the log by the abbreviation listed hereafter. The numbering of samples is sequential for each type of sample.

SS: Split spoon
SSE, GSE, AGE: Environmental sampling
ST: Shelby tube
PS: Piston sample (Osterberg)
AG: Auger
RC: Rock core
GS: Grab sample

Recovery

The recovery, shown as a percentage, is the ratio of length of the sample obtained to the distance the sampler was driven/pushed into the soil

RQD

The "Rock Quality Designation" or "RQD" value, expressed as percentage, is the ratio of the total length of all core fragments of 4 inches (10 cm) or more to the total length of the run.

IN-SITU TESTS:

N: Standard penetration index
R: Refusal to penetration
N_c: Dynamic cone penetration index
Cu: Undrained shear strength
Pr: Pressure meter
k: Permeability
ABS: Absorption (Packer test)

LABORATORY TESTS:

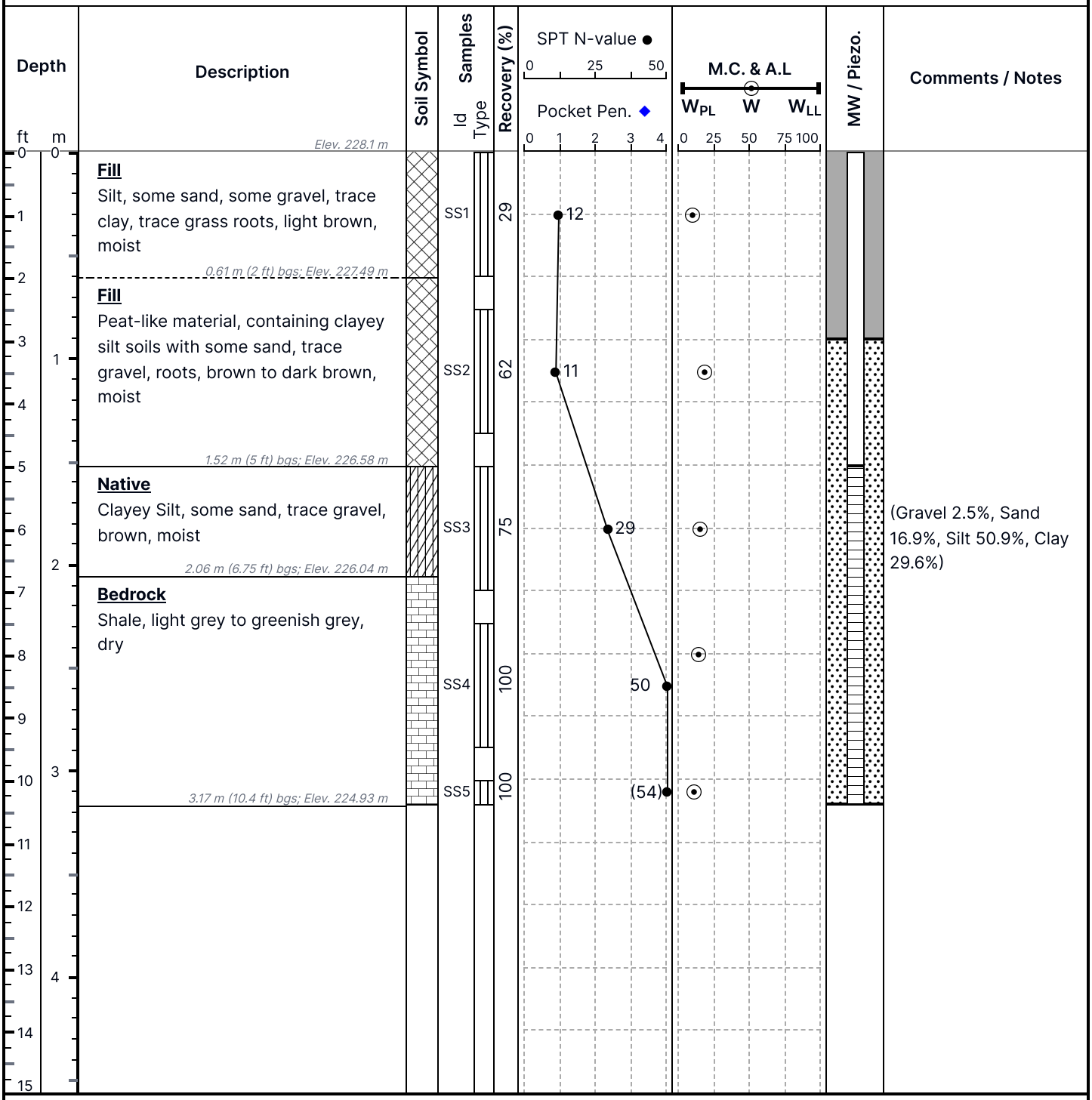
I_p: Plasticity index
W_l: Liquid limit
Wp: Plastic limit
H: Hydrometer analysis
GSA: Grain size analysis
A: Atterberg limits
w: Water content
γ: Unit weight
C: Consolidation
CS: Swedish fall cone
CHEM: Chemical analysis
O.V.: Organic vapor

BOREHOLE: BH1

6600 Mayfield Rd. Brampton, ON

Start Date: 2024-10-18
End Date: 2024-10-18

Elevation: 228.1 m AMSL
600776 E, 4850840 N (NAD83-17)



Notes: - Borehole was open and dry.

PNJ ENGINEERING INC.
Pavement · Materials · Geo-Environmental · Engineering

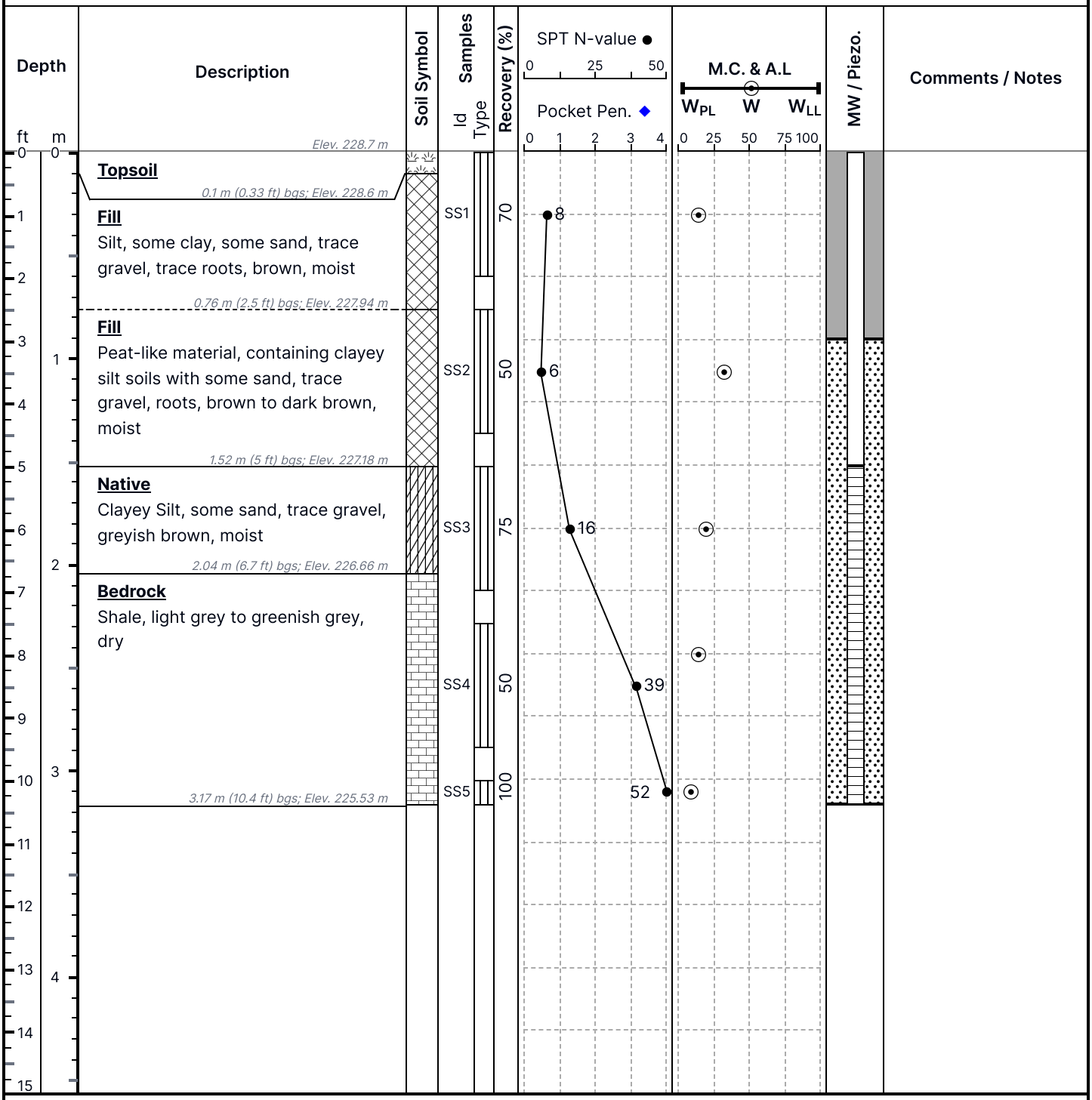
Logged By: MM	Contractor: DrillTech Drilling Ltd.	Client: KGAT	
Approved By: AS	Drilling Details: Solid Stem	Project Title: GeoSlope Stability	
Project Eng.: Abid Sahi., P.Eng.		Project No.: 24-1202-01	Page 1/1

BOREHOLE: BH2

6600 Mayfield Rd. Brampton, ON

Start Date: 2024-10-18
End Date: 2024-10-18

Elevation: 228.7 m AMSL
600734 E, 4850881 N (NAD83-17)



Notes: - Borehole was open and dry.

PNJ ENGINEERING INC.
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Logged By: MM	Contractor: DrillTech Drilling Ltd.	Client: KGAT	
Approved By: AS	Drilling Details: Solid Stem	Project Title: GeoSlope Stability	
Project Eng.: Abid Sahi., P.Eng.		Project No.: 24-1202-01	Page 1/1

APPENDIX D

GEOTECHNICAL LABORATORY TEST RESULTS

PNJ ENGINEERING INC.
Pavement · Materials · Geo-Environmental · Engineering
70 Galaxy Blvd., Suite 100
Toronto, Ontario M9W 4Y6
Tel: 905 597 8383 • Fax: 905 597 0825

Moisture Content

PNJ Project #: 24-1202-01 - KGAT - GeoSlope Stability - 6600 Mayfield Rd., Brampton

Borehole ID: BH1

Item No.	Sample No.	Depth		Container No.	Weight			Moisture Content (%)
		From	To		Wet (Soil+Tare)	Dry (Soil+Tare)	Tare	
1	SS1				51.8	47.8	6.8	9.8
2	SS2				94.8	83.3	20.0	18.2
3	SS3				82.4	72.4	7.1	15.3
4	SS4				53.1	47.3	7.0	14.4
5	SS5				80.8	74.8	20.5	11.0

PNJ ENGINEERING INC.
Pavement · Materials · Geo-Environmental · Engineering
70 Galaxy Blvd., Suite 100
Toronto, Ontario M9W 4Y6
Tel: 905 597 8383 • Fax: 905 597 0825

Moisture Content

PNJ Project #: 24-1202-01 - KGAT - GeoSlope Stability - 6600 Mayfield Rd., Brampton

Borehole ID: BH2

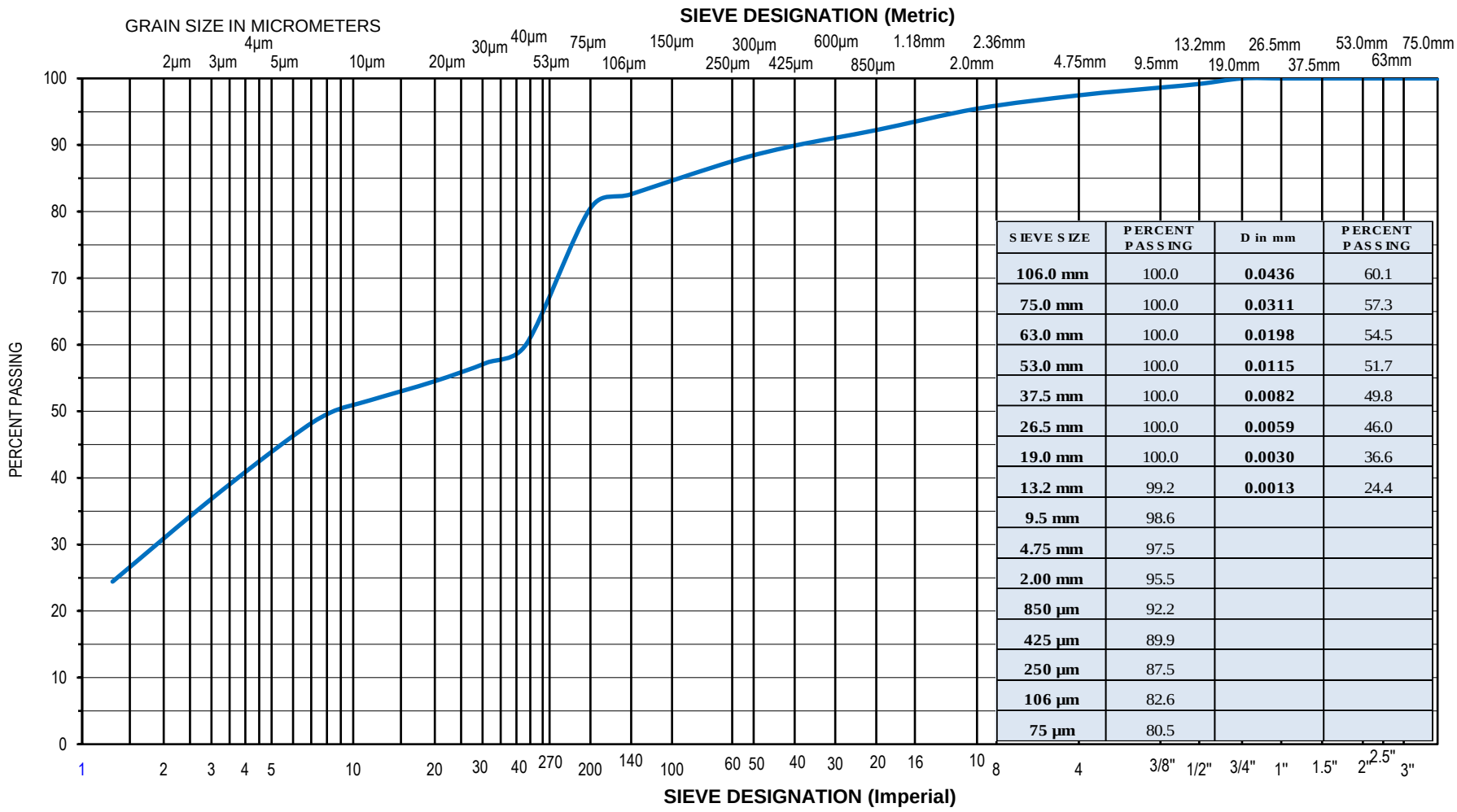
Item No.	Sample No.	Depth		Container No.	Weight			Moisture Content (%)
		From	To		Wet (Soil+Tare)	Dry (Soil+Tare)	Tare	
1	SS1				61.6	55.0	7.0	13.8
2	SS2				65.8	51.4	7.0	32.4
3	SS3				76.0	64.6	7.0	19.8
4	SS4				62.5	55.6	6.9	14.2
5	SS5				54.0	50.0	6.9	9.3

PNJ ENGINEERING INC.
Pavement · Materials · Geo-Environmental · Engineering

Particle Size Analysis of Soils

MTO LS-700, 702, 703/704, 705

CLAY & SILT	SAND			GRAVEL	
	Fine	Medium	Coarse	Fine	Coarse



SIEVE SIZE	PERCENT PASSING	D in mm	PERCENT PASSING
106.0 mm	100.0	0.0436	60.1
75.0 mm	100.0	0.0311	57.3
63.0 mm	100.0	0.0198	54.5
53.0 mm	100.0	0.0115	51.7
37.5 mm	100.0	0.0082	49.8
26.5 mm	100.0	0.0059	46.0
19.0 mm	100.0	0.0030	36.6
13.2 mm	99.2	0.0013	24.4
9.5 mm	98.6		
4.75 mm	97.5		
2.00 mm	95.5		
850 µm	92.2		
425 µm	89.9		
250 µm	87.5		
106 µm	82.6		
75 µm	80.5		

% Fines		% Sand			% Gravel	
Clay	Silt	Fine	Medium	Coarse	Fine	Coarse
29.6	50.9	9.4	5.5	2.0	2.5	0.0

Client:	KGAT	**Lab No.:**	14361	**D10:**	n/a	**D30:**	0.00205	**D60:**	0.0431	**LL:**	n/a
Project:	GeoSlope Stability	**Project No.:**	24-1202-01	**D20:**	n/a	**D50:**	0.0086			**PL:**	n/a
Location:	6600 Mayfield Rd., Brampton	**Borehole:**	BH1	**Classification:**	n/a			**In-situ Moisture:**	15.3%	**PI:**	n/a
Date:	October 25, 2024	**Sample:**	SS3	**Sample Description:**		**SILT, with clay, some sand, trace gravel**					

APPENDIX E

MNR SLOPE STABILITY FORM

PNJ ENGINEERING INC.
Pavement - Materials - Geo-Environmental - Engineering

Location:	**6600 Mayfield Rd, Brampton, ON**	Project No.	**24-1202-01**
Section:	A-A`	Inspection Date:	**October 4, 2024**
Inspected By:	**MM, AS**	Weather:	Sunny, 18 °C

Inspection Task		Rating Value
1. SLOPE INCLINATION		
Degrees	**Horizontal:Vertical**	
a) 18 or less	3:1 or flatter	0
b) 18 to 26	2:1 to more than 3:1	6
c) more than 26	Steeper than 2:1	16
2. SOIL STRATIGRAPHY		
a) Shale, Limestone, Granite (Bedrock)		0
b) Sand, Gravel		6
c) Glacial Till		9
d) Clay, Silt		12
e) Fill		16
f) Leda Clay		24
3. SEEPAGE FROM SLOPE FACE		
a) None or near bottom only		0
b) Near mid-slope only		6
c) Near crest only or from several levels		12
4. SLOPE HEIGHT		
a) 2 m or less		0
b) 2.1 to 5 m		2
c) 5.1 to 10 m		4
d) more than 10 m		8
5. VEGETATION COVER ON SLOPE FACE		
a) Well vegetated, heavy shrubs or forested with mature trees		0
b) Light Vegetation; Mostly grass, weeds, occasional trees, shrubs		4
c) No vegetaion, bare		8
6. TABLE LAND DRAINAGE		
a) Table land flat, no apparent drainage over slope		0
b) Minor drainage over slope, no active erosion		2
c) Drainage over slope, active erosion, gullies		4
7. PROXIMITY OF WATERCOURSE TO SLOPE TOE		
a) 15 m or more from slope toe		0
b) Less than 15 m from slope toe		6
8. PREVIOUS LANSLIDE ACTIVITY		
a) No		0
b) Yes		6
	RATING VALUES TOTAL	**44**

SLOPE INSTABILITY RATING		INVESTIGATION REQUIREMENTS
1. Low Potential	<24	Site inspection only, confirmation, report letter
2. Slight Potential	25 - 35	Site inspection and surveying, preliminary study, detailed report
3. Moderate Potential	>35	Boreholes, piezometers, lab tests, surveying detailed report

Notes:

a) Choose only one rating value from each category; compare total rating value with above requirements

b) If there is a waterbody (stream, creek, river, pond, bay, lake) at the slope toe, the potential for toe ersoion and undercutting should be evaluated in detail and protection provided if required.

c) For leda clay and rock slopes, additional evaluation must be carried out

PNJ ENGINEERING INC.
Pavement - Materials - Geo-Environmental - Engineering

Location:	**6600 Mayfield Rd, Brampton, ON**	Project No.	**24-1202-01**
Section:	B-B`	Inspection Date:	**October 4, 2024**
Inspected By:	**MM, AS**	Weather:	Sunny, 18 °C

Inspection Task		Rating Value
1. SLOPE INCLINATION		
Degrees	**Horizontal:Vertical**	
a) 18 or less	3:1 or flatter	0
b) 18 to 26	2:1 to more than 3:1	6
c) more than 26	Steeper than 2:1	16
2. SOIL STRATIGRAPHY		
a) Shale, Limestone, Granite (Bedrock)		0
b) Sand, Gravel		6
c) Glacial Till		9
d) Clay, Silt		12
e) Fill		16
f) Leda Clay		24
3. SEEPAGE FROM SLOPE FACE		
a) None or near bottom only		0
b) Near mid-slope only		6
c) Near crest only or from several levels		12
4. SLOPE HEIGHT		
a) 2 m or less		0
b) 2.1 to 5 m		2
c) 5.1 to 10 m		4
d) more than 10 m		8
5. VEGETATION COVER ON SLOPE FACE		
a) Well vegetated, heavy shrubs or forested with mature trees		0
b) Light Vegetation; Mostly grass, weeds, occasional trees, shrubs		4
c) No vegetaion, bare		8
6. TABLE LAND DRAINAGE		
a) Table land flat, no apparent drainage over slope		0
b) Minor drainage over slope, no active erosion		2
c) Drainage over slope, active erosion, gullies		4
7. PROXIMITY OF WATERCOURSE TO SLOPE TOE		
a) 15 m or more from slope toe		0
b) Less than 15 m from slope toe		6
8. PREVIOUS LANSLIDE ACTIVITY		
a) No		0
b) Yes		6
	RATING VALUES TOTAL	**40**

SLOPE INSTABILITY RATING		INVESTIGATION REQUIREMENTS
1. Low Potential	<24	Site inspection only, confirmation, report letter
2. Slight Potential	25 - 35	Site inspection and surveying, preliminary study, detailed report
3. Moderate Potential	>35	Boreholes, piezometers, lab tests, surveying detailed report

Notes:

a) Choose only one rating value from each category; compare total rating value with above requirements

b) If there is a waterbody (stream, creek, river, pond, bay, lake) at the slope toe, the potential for toe ersoion and undercutting should be evaluated in detail and protection provided if required.

c) For leda clay and rock slopes, additional evaluation must be carried out

PNJ ENGINEERING INC.
Pavement - Materials - Geo-Environmental - Engineering

Location:	**6600 Mayfield Rd, Brampton, ON**	Project No.	**24-1202-01**
Section:	C-C`	Inspection Date:	**October 4, 2024**
Inspected By:	**MM, AS**	Weather:	Sunny, 18 °C

Inspection Task		Rating Value
1. SLOPE INCLINATION		
Degrees	**Horizontal:Vertical**	
a) 18 or less	3:1 or flatter	0
b) 18 to 26	2:1 to more than 3:1	6
c) more than 26	Steeper than 2:1	16
2. SOIL STRATIGRAPHY		
a) Shale, Limestone, Granite (Bedrock)		0
b) Sand, Gravel		6
c) Glacial Till		9
d) Clay, Silt		12
e) Fill		16
f) Leda Clay		24
3. SEEPAGE FROM SLOPE FACE		
a) None or near bottom only		0
b) Near mid-slope only		6
c) Near crest only or from several levels		12
4. SLOPE HEIGHT		
a) 2 m or less		0
b) 2.1 to 5 m		2
c) 5.1 to 10 m		4
d) more than 10 m		8
5. VEGETATION COVER ON SLOPE FACE		
a) Well vegetated, heavy shrubs or forested with mature trees		0
b) Light Vegetation; Mostly grass, weeds, occasional trees, shrubs		4
c) No vegetaion, bare		8
6. TABLE LAND DRAINAGE		
a) Table land flat, no apparent drainage over slope		0
b) Minor drainage over slope, no active erosion		2
c) Drainage over slope, active erosion, gullies		4
7. PROXIMITY OF WATERCOURSE TO SLOPE TOE		
a) 15 m or more from slope toe		0
b) Less than 15 m from slope toe		6
8. PREVIOUS LANSLIDE ACTIVITY		
a) No		0
b) Yes		6
	RATING VALUES TOTAL	**44**

SLOPE INSTABILITY RATING		INVESTIGATION REQUIREMENTS
1. Low Potential	<24	Site inspection only, confirmation, report letter
2. Slight Potential	25 - 35	Site inspection and surveying, preliminary study, detailed report
3. Moderate Potential	>35	Boreholes, piezometers, lab tests, surveying detailed report

Notes:

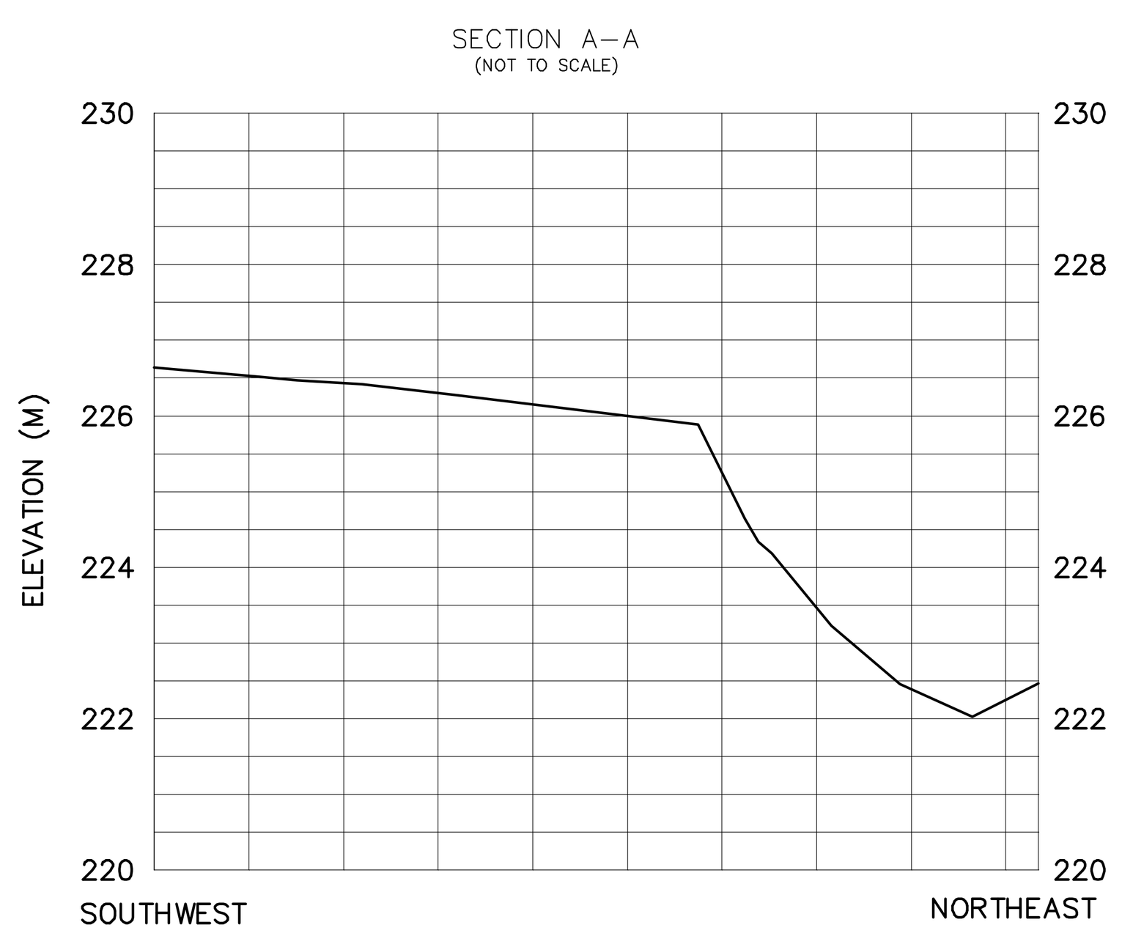
a) Choose only one rating value from each category; compare total rating value with above requirements

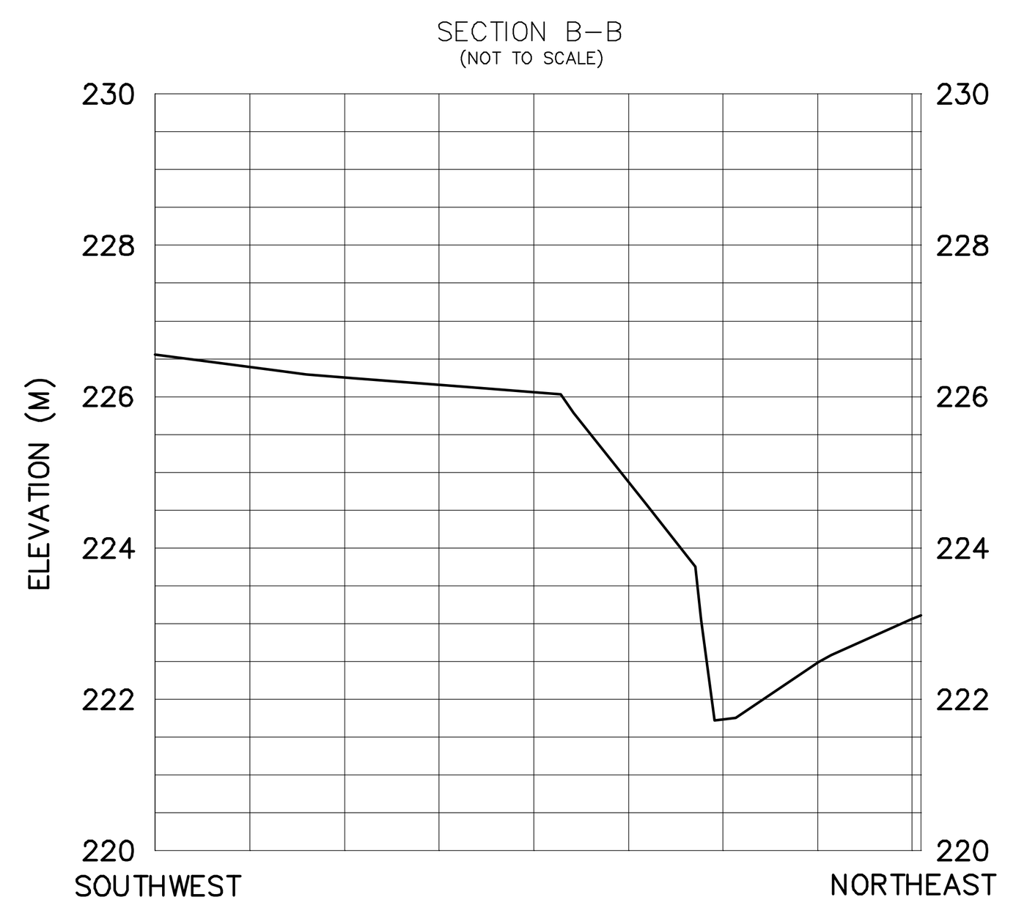
b) If there is a waterbody (stream, creek, river, pond, bay, lake) at the slope toe, the potential for toe ersoion and undercutting should be evaluated in detail and protection provided if required.

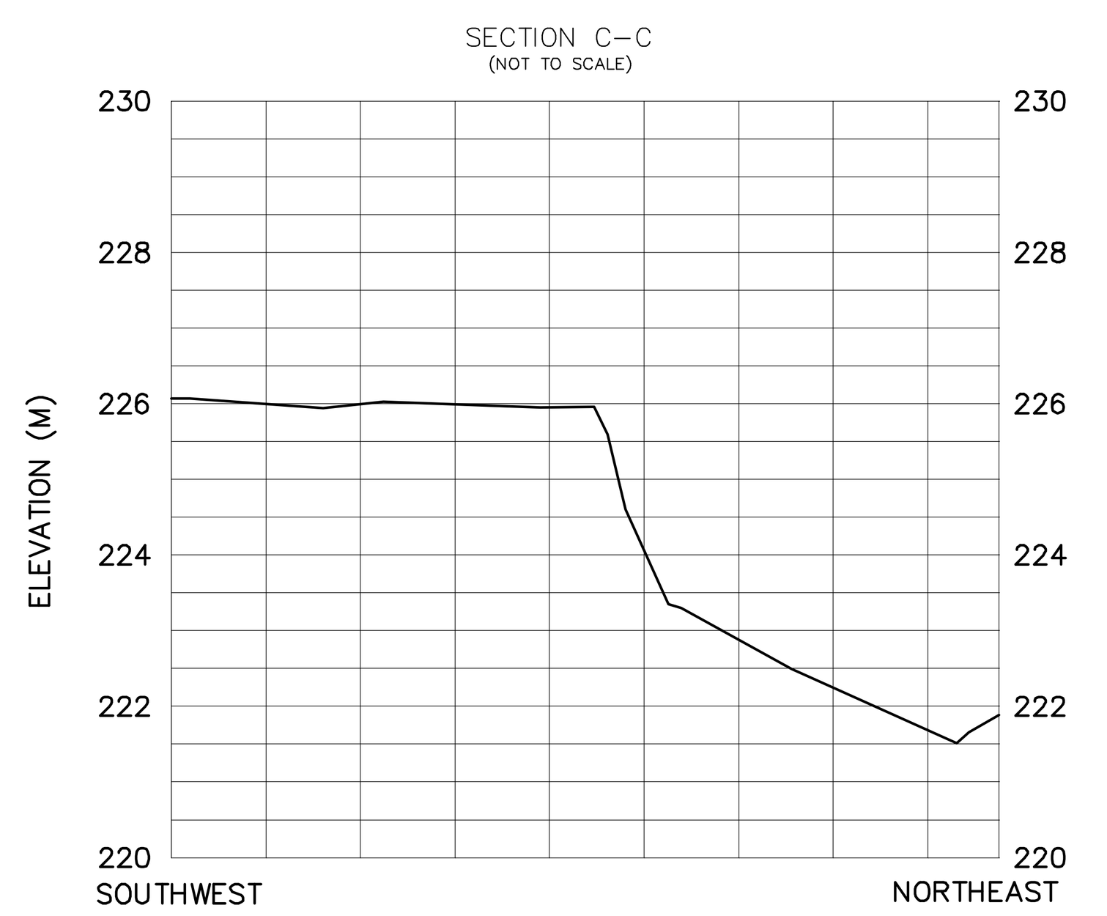
c) For leda clay and rock slopes, additional evaluation must be carried out

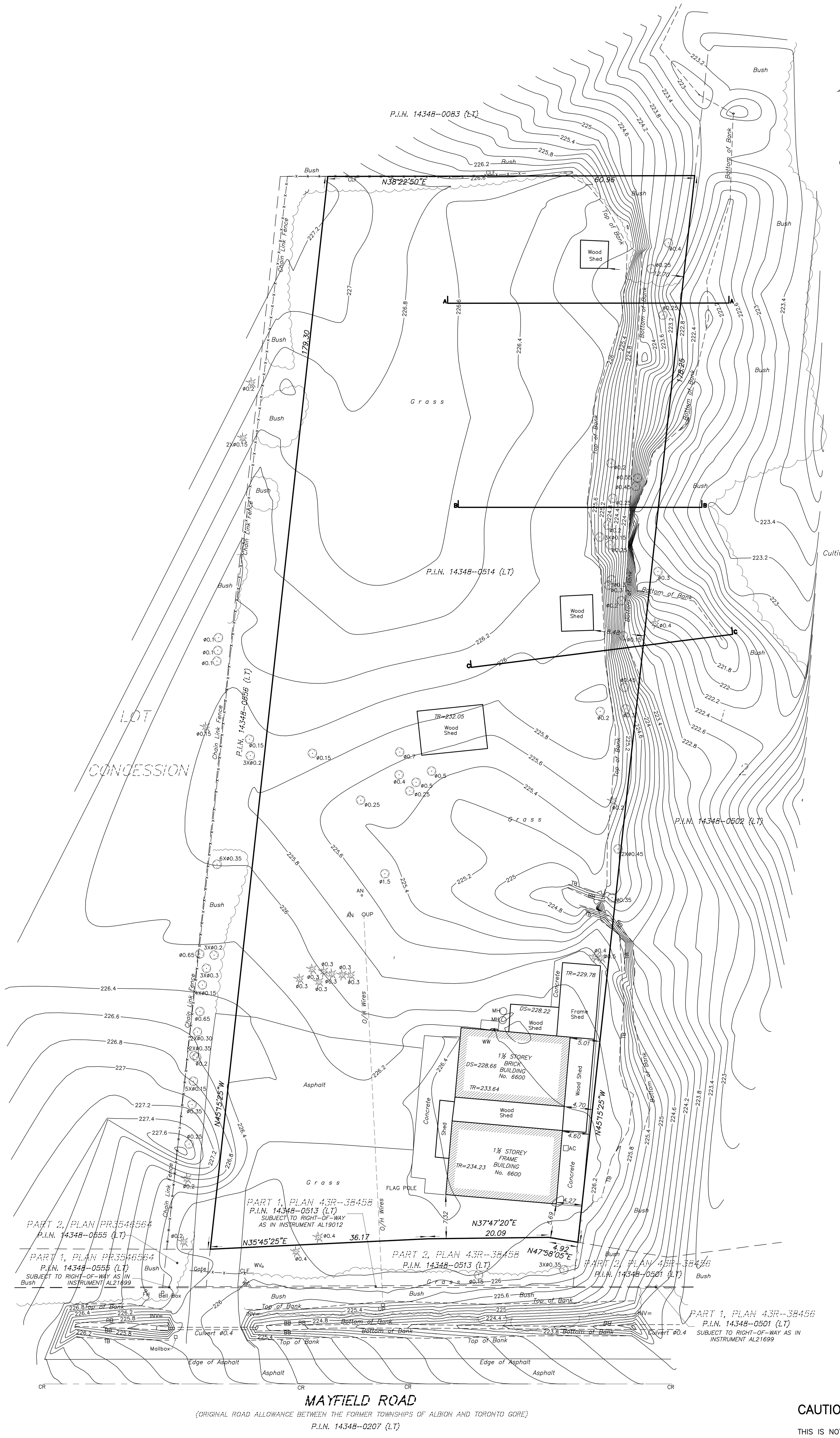
APPENDIX F

CROSS-SECTIONS AND TOPOGRAPHIC MAP – PROVIDED BY THE CLIENT









TOPOGRAPHIC SURVEY OF PART OF LOT 1 CONCESSION 2 TOWN OF CALEDON

(REGIONAL MUNICIPALITY OF PEEL)

SCALE 1 : 400

10 0 10 20 30 40 metres

ALEX MARTON LTD.
ONTARIO LAND SURVEYORS

METRIC

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE DERIVED FROM GPS OBSERVATIONS USING REAL TIME NETWORK OBSERVATIONS.

LEGEND

MH	DENOTES	MANHOLE
TR	"	TOP PF ROOF
WV	"	WATER VALVE
AN	"	ANCHOR
AC	"	AIR CONDITIONER
UP	"	UTILITY POLE
DS	"	DOOR SILL
CR	"	CENTERLINE
FH	"	FIRE HYDRANT
TB	"	TOP OF BANK
BB	"	BOTTOM OF BANK
CLF	"	CHAIN LINK FENCE
WF	"	WIRE FENCE
WW	"	WINDOW WELL
O/H	"	OVERHEAD
PIN	"	PROPERTY IDENTIFIER NUMBER
ø	"	DIAMETER
(deciduous tree symbol)	"	DECIDUOUS TREE
(coniferous tree symbol)	"	CONIFEROUS TREE

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
THE FIELD OBSERVATIONS REPRESENTED ON THIS PLAN WERE COMPLETED ON THE 9TH DAY OF JANUARY, 2024.

FEBRUARY 8, 2024
DATE

ALEX MARTON
ONTARIO LAND SURVEYOR

CAUTION

THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED FOR MORTGAGE OR TRANSACTION PURPOSES.

AMENDMENTS

No.	DESCRIPTION	DATE
1	TOPOGRAPHIC INFORMATION ADDED	3.07.2024
2	TOPOGRAPHIC INFORMATION AND CROSS SECTION INFORMATION ADDED	5.11.2024

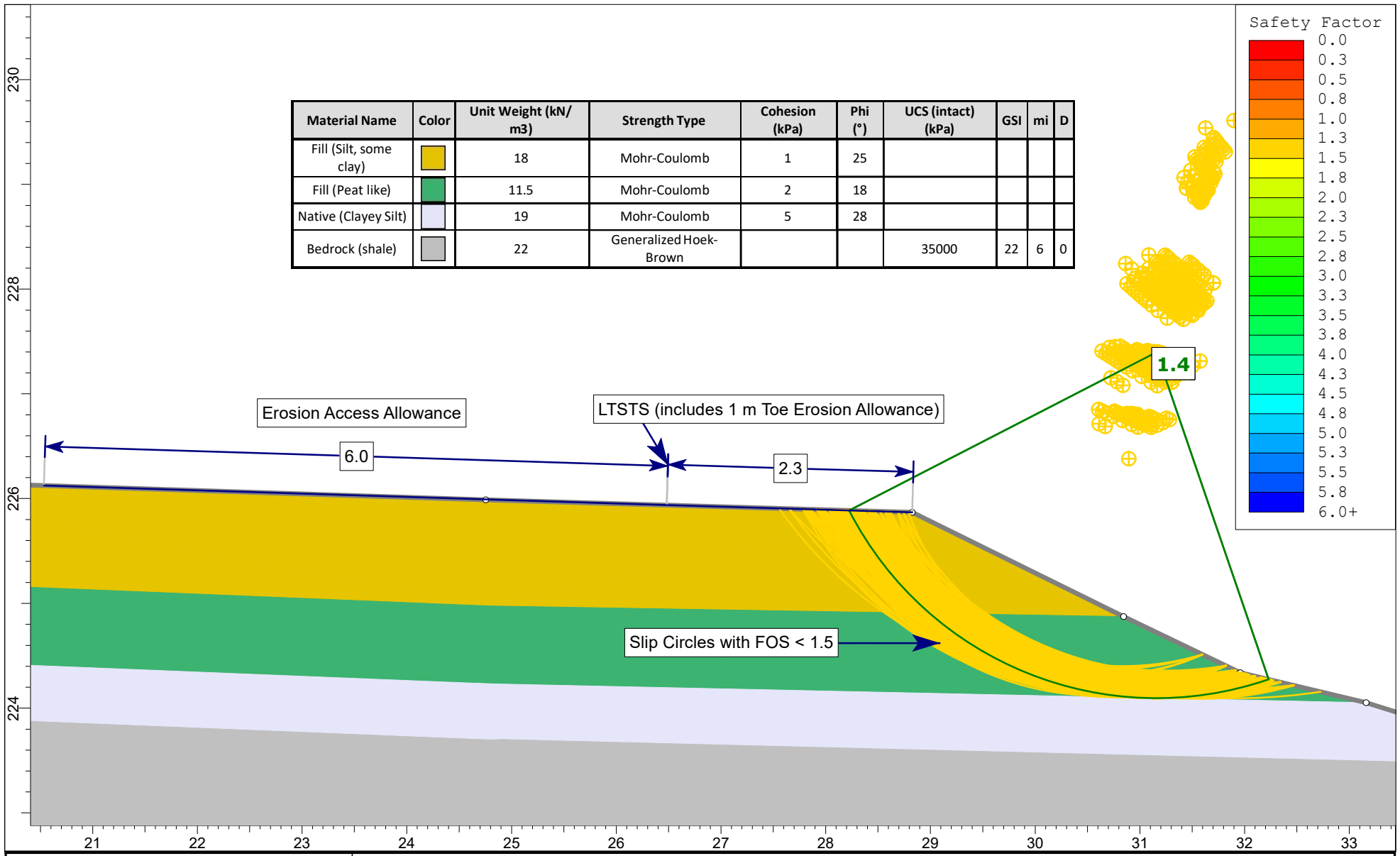
ALEX MARTON LTD.
ONTARIO LAND SURVEYORS
160 APPLEWOOD CRESCENT, UNIT 8,
CONCORD, ONTARIO, L4K 4H2
PHONE: 905–879–9889 FAX: 905–879–0770
E–MAIL: info@amsurveying.ca
WEBSITE: www.amsurveying.ca

PARTY CHIEF: C.P.	FILE NAME: 2024–003_CONTOUR.DWG
DRAWN : X.Z	PLOT SCALE: 1:400
CHECKED : A.M.	PROJECT No. 2022–003

APPENDIX G

SLOPE STABILITY MODELS

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	UCS (intact) (kPa)	GSI	mi	D
Fill (Silt, some clay)		18	Mohr-Coulomb	1	25				
Fill (Peat like)		11.5	Mohr-Coulomb	2	18				
Native (Clayey Silt)		19	Mohr-Coulomb	5	28				
Bedrock (shale)		22	Generalized Hoek-Brown			35000	22	6	0

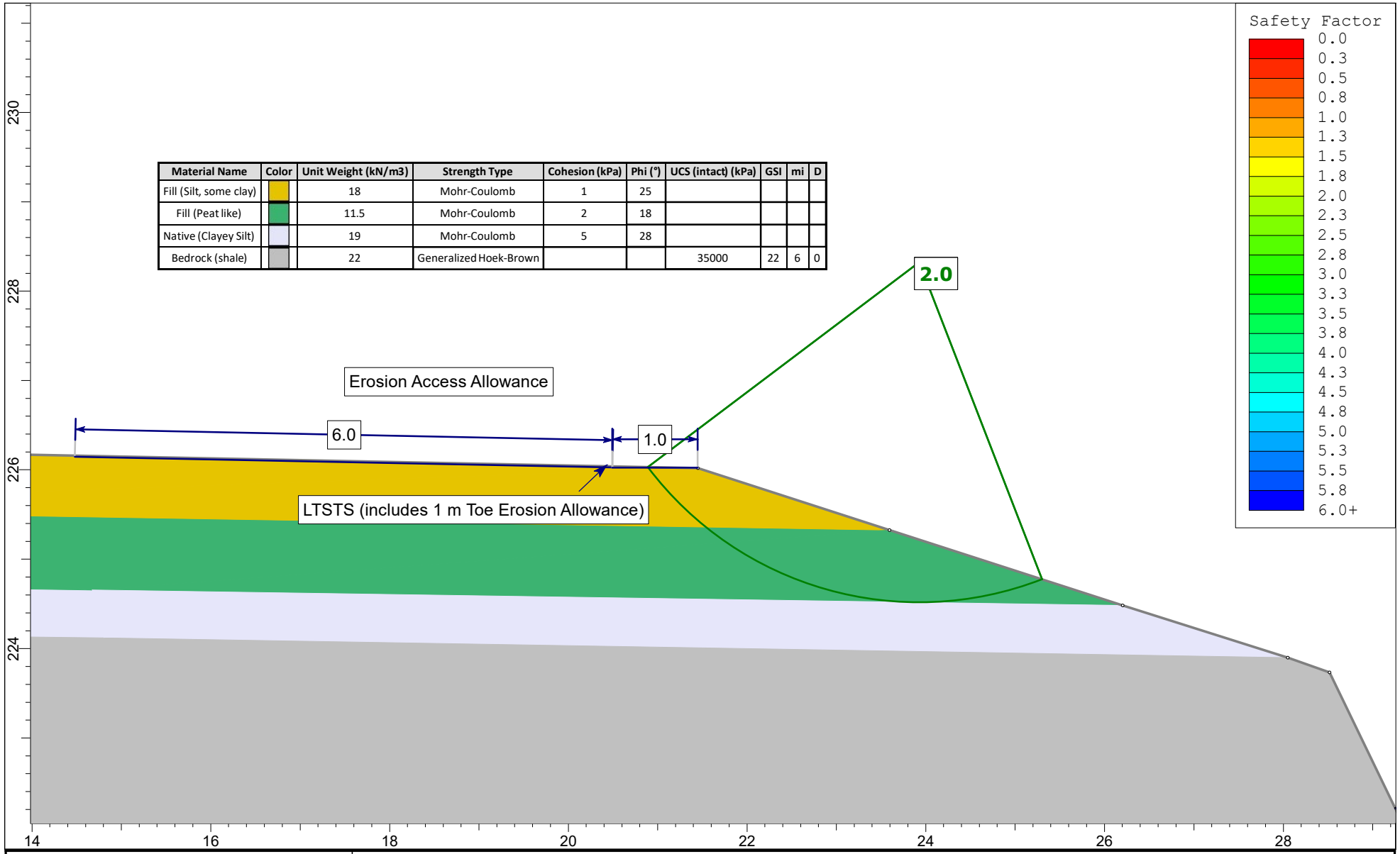


PNJ ENGINEERING INC.
Pavement · Materials · Geo-Environmental · Engineering

SLIDEINTERPRET 9.028

Project	600 Mayfield Rd, Brampton, ON - Slope Stability Analysis		
Project Engineer	AS	*Client*	Khalsa Gurmat Academy Toronto
Date	2025-02-20	*Project No.*	24-1202-01
Title:	Cross-section A-A` - Master Scenario		

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	UCS (intact) (kPa)	GSI	mi	D
Fill (Silt, some clay)		18	Mohr-Coulomb	1	25				
Fill (Peat like)		11.5	Mohr-Coulomb	2	18				
Native (Clayey Silt)		19	Mohr-Coulomb	5	28				
Bedrock (shale)		22	Generalized Hoek-Brown			35000	22	6	0

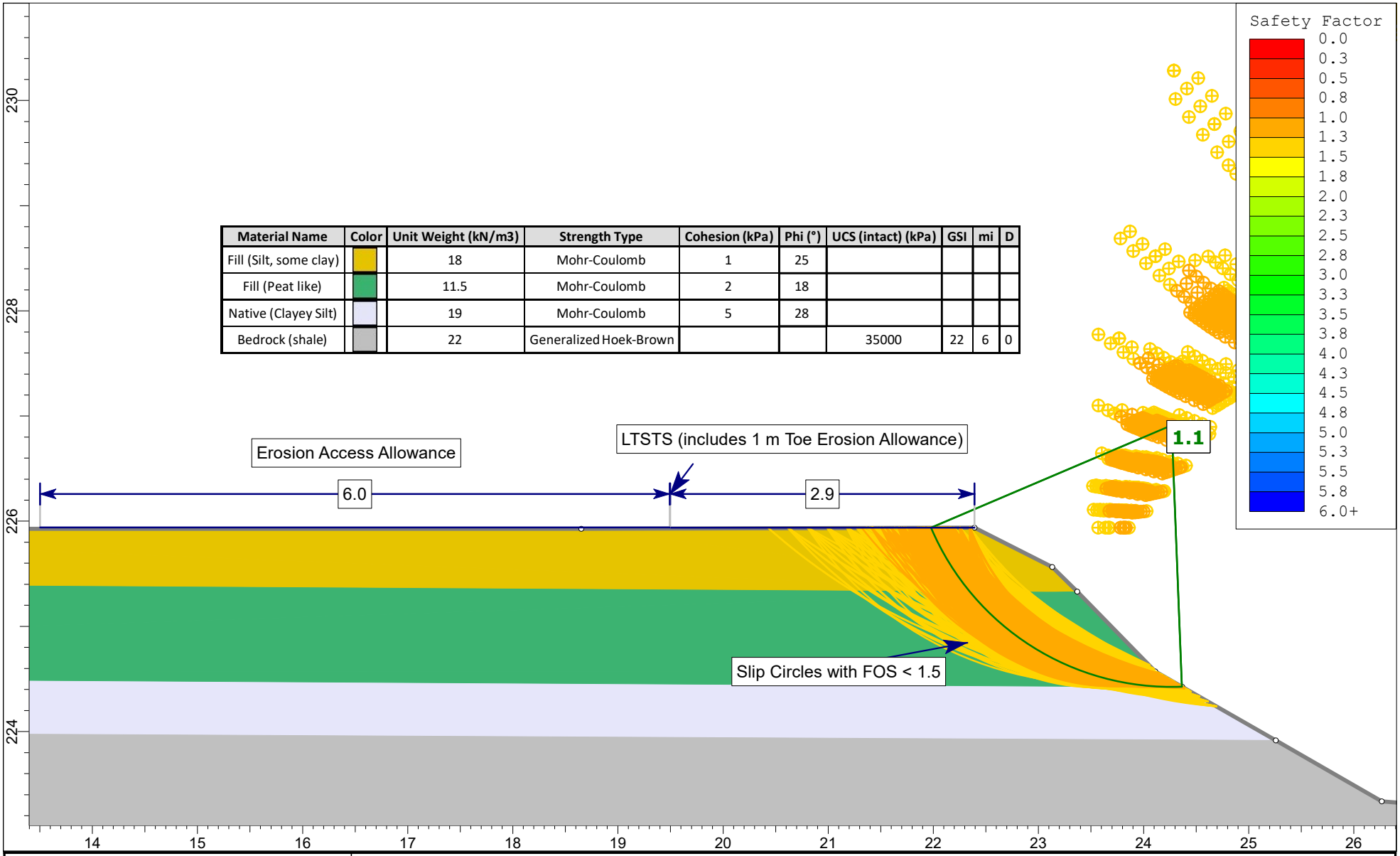


PNJ ENGINEERING INC.
Pavement · Materials · Geo-Environmental · Engineering

SLIDEINTERPRET 9.028

Project	600 Mayfield Rd, Brampton, ON - Slope Stability Analysis		
Project Engineer	AS	*Client*	Khalsa Gurmat Academy Toronto
Date	2025-02-20	*Project No.* 24-1202-01	*Title:* Cross-section B-B` - Master Scenario

Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (°)	UCS (intact) (kPa)	GSI	mi	D
Fill (Silt, some clay)		18	Mohr-Coulomb	1	25				
Fill (Peat like)		11.5	Mohr-Coulomb	2	18				
Native (Clayey Silt)		19	Mohr-Coulomb	5	28				
Bedrock (shale)		22	Generalized Hoek-Brown			35000	22	6	0



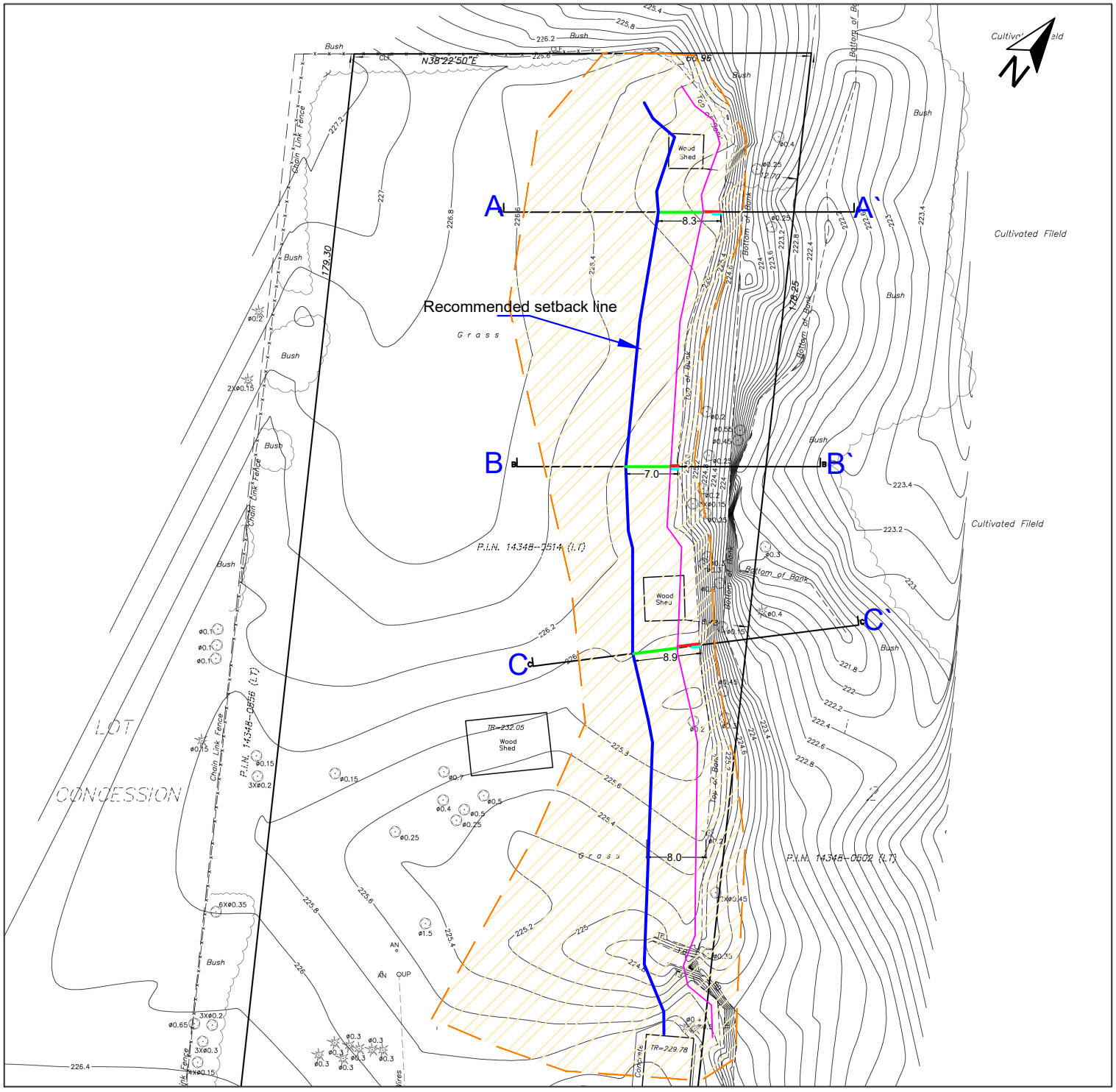
PNJ ENGINEERING INC.
Pavement · Materials · Geo-Environmental · Engineering

SLIDEINTERPRET 9.028

Project	600 Mayfield Rd, Brampton, ON - Slope Stability Analysis		
Project Engineer	AS	*Client*	Khalsa Gurmat Academy Toronto
Date	2025-02-20	*Project No.* 24-1202-01	*Title:* Cross-section C-C` - Master Scenario

APPENDIX H

LONG TERM STABLE TOP OF THE SLOPE



LEGEND

- Total Recommended Setback
- Toe Erosion Allowance (1m)
- Distance From Existing Top of Slope to LTSTS:
  - A-A` 2.3 m
  - B-B` 1 m
  - C-C` 2.9 m
- Long Term Stable Top of Slope (LTSTS) Line
- Erosion Access Allowance (6m)
- Approximate Area of Recently Placed Fill - Refer to Drawing CV-102 By CivilGo

NOTES

-

REFERENCES

- Topographic Survey of Part of Lot 1 Concession 2, by Alex Marton LTD., Dated 5.11.2024, Project No 2022-003
- PROPOSED REMEDIAL GRADING TO ADDRESS UNAUTHORIZED FILL PLACEMENT, Drawing No CV-102, by CivilGO

TITLE

Long-Term-Stable-Top-Of-Slope Line

PROJECT

6600 Mayfield - Geotechnical & Slope Analysis

ADDRESS

6600 Mayfield Rd., Brampton, ON

CLIENT

Khalsa Gurmat Academy Toronto

DRAWING NO.	LTSTOS
DATE	FEB 19, 2025
PREPARED BY	MA
REVIEWED BY	AS

PNJ ENGINEERING INC.
Pavement · Materials · Geo-Environmental · Engineering
70 Galaxy Blvd Suite 100, Toronto, ON M9W 4Y6
Tel: 905.597.8383 Fax:905.597.0825
www.pnjeng.com

PROJECT NO. 24-1202-01 REV.1

APPENDIX I

DOCUMENTS PROVIDED BY THE CLIENT

- TRCA COMMENTS

September 13, 2024 CDA-2024-00079

SENT BY E-MAIL: (khalsagurmatacademy5@gmail.com)

Amarjit Singh Sandhu
16 Bridgend Cres.
Brampton, ON
L6P 1K8

Dear Amarij Sandhu:

Re: TRCA Concept Development Application
6600 Mayfield Road
Lot 1, Concession 2
Town of Caledon, Region of Peel
Owner: Khalsa Gurmat Academy Toronto, Amarjit Singh Sandhu

Thank you for the opportunity to review this application. TRCA staff have reviewed the application in accordance with the Conservation Authorities Act (CA Act) and its associated regulations, which require TRCA to provide programs and services related to the risk of natural hazards within its jurisdiction. Whether acting on behalf of the Ministry of Natural Resources and Forestry (MNRF) or as a public body under the Planning Act, Conservation Authorities (CAs) must help ensure that decisions under the Planning Act are consistent with the natural hazards policies of the Provincial Policy Statement (PPS) and conform to any natural hazard policies in a provincial plan.

In addition, TRCA staff have also reviewed this application in accordance with TRCA's permitting responsibilities under Section 28.1 of the CA Act. Where development activities are proposed within a TRCA Regulated Area (i.e., river or valley, wetlands, hazardous lands, etc.), a permit is required from TRCA.

Please be advised this correspondence is absent of input from the Town of Caledon's Planning and/or Building departments. Further, this letter is based on current policy, which is subject to change. Any future development proposal would be required to meet the policies in effect at the time a formal application is filed. This letter does not provide official comment or clearance with respect to the TRCA's position on any municipal application(s) related to the subject property.

Purpose of the Application

The purpose of the above noted application was to complete a site visit to review development activity that has taken place on the property and to provide TRCA requirements and guidance to determine appropriate mitigation and restoration on the subject property.

Ontario Regulation 41/24 and CA Act

A significant portion of the subject property is located within TRCA's Regulated Area of the Humber River Watershed and is subject to O. Reg. 41/24 and the CA Act. The property is regulated by TRCA as the northeast side of the property is traversed by a valley corridor, contains an erosion hazard, watercourse feature, regulatory floodplain hazard and an unevaluated wetland feature. As such, a TRCA permit in accordance with Section 28.1 of the Conservation Authorities Act will be required for development activity within TRCA's regulated area.

Provincial Policy Statement (PPS):
The Provincial *Planning Act* dictates that agencies involved in planning, including the TRCA, "**shall** be consistent with" the Provincial Policy Statement (PPS) when reviewing development applications. Though not to be read in isolation, a number of policy threads run throughout the PPS which have implications for the TRCA, including Section 3.1 relating to natural hazards. In accordance with Sections 3.1.1(b) of the PPS, development shall generally be directed to areas outside of hazardous lands adjacent to river or stream systems which are impacted by flooding hazards and/or erosion hazards.

Background:
On July 24, 2024, TRCA planning staff completed a site visit with the applicant to review the subject property and confirm the works and/or grading that had taken place on site. TRCA staff identified a steep slope associated with a defined valley feature traversing the subject property. It was noted on site that it was evident that a large amount of material/fill was brought on site and placed within the valley. Further, it was also noted that the two gazebos on site were constructed adjacent to the slope and appeared to be within the erosion hazard. As such, TRCA staff advised that once the top of slope was confirmed and re-established on site the gazebos would likely need to be relocated and appropriately setback from the hazard.

Application Specific Comments:
TRCA technical staff have conducted their desktop review of the subject property and offer detailed comments in **Appendix A,** but generally speak to the following key issues:

- The need to determine the amount of fill placed with the valley.
- The need to develop a detailed plan to remove all the fill from the valley including the setback area and restore the slope.
- The need to determine TRCA's limits of development and ensure all development including grading/fill is appropriately setback.
- The need to provide a Restoration plan to restore the valley.
- The need to provide an appropriate Erosion and Sediment Control (ESC) plan.

Permitting
A TRCA permit pursuant to Section 28.1 of the Conservation Authority (CA) Act will be required for any development activity or site alteration within TRCA's regulated area. Further details with respect to permit submission requirements are available at our website (Apply For A Permit - Toronto and Region Conservation Authority (TRCA)).

Municipal Approvals
It is recommended that you also contact the Town of Caledon to confirm municipal approval requirements. Further, it is noted that TRCA's position is absent of comments pertaining to matters (e.g., natural heritage) outside of our core planning mandate and regulatory authority. As such, it is the responsibility of the municipality to ensure applicable natural heritage policies associated with the Town of Caledon Official Plan are met.

Conclusion
Based on the comments provided above, the TRCA will require additional information to confirm the stable slope and site conditions. This will aid in the review of options presented to determine the most suitable approach for addressing the removal of the fill. It is essential to ensure that the approach TRCA staff adopt is not only effective but also sustainable in the long term. Once a geotechnical engineer has been retained, the slope assessment completed and options for remediations provided, TRCA staff propose a collaborative review of their findings and recommendations through a virtual meeting. This will allow us to assess the feasibility of their suggested solutions, consider any

associated risks, and ensure the implementation plan aligns with TRCA's regulatory requirements before detailed drawings are prepared.

We trust these comments are of assistance. Should you have any questions, please contact me at 437-880-1937 or at andrea.terella@trca.ca.

Sincerely,

Andrea Terella
Planner
Development Planning and Permits | Development and Engineering Services

AT/

cc. Grant Uyeyama, KLM Planning Partners Inc. – guyeyama@klmplanning.com

Appendix A: TRCA's Application Specific Comments

1. As noted above the subject property is traversed by a valley corridor and contains a slope hazard. In accordance with TRCA policy, development must be a minimum of 10 metres from the Stable Top of Slope and a minimum of 6 metres from the Stable Top Slope for non-habitable accessory structures. Based on desktop review and a site visit it was identified the slope is steep and a portion of the slope further to the rear half of the property has a watercourse in close proximity to the toe of the slope. Given the steepness of the slope and watercourse at the toe, a geotechnical investigation (i.e., slope assessment) will be required to accurately delineate the Long-Term Stable Top of Slope. This will ensure the fill, grading works and the gazebos are appropriately setback. Please submit a stamped geotechnical report. The scope of work for the geotechnical study is as follows:

    a. A topographical survey is required to illustrate the slope features including existing top of slope, contours of the slope, toe of the slope, watercourse, etc.;

    b. Boreholes should be drilled to determine the native soil stratigraphy;

    c. In-situ and lab tests should be carried out, to identify the soil stratigraphy encountered throughout the entire slope, and to determine the soil strength parameters required for slope stability analysis;

    d. Piezometers should be installed in select boreholes to measure groundwater levels;

    e. The location of the long-term stable top of slope should be determined as follows:

        - A sufficient number of cross-sections based on the topography (e.g. slope height and inclination) and slope features that represent the critical slope conditions should be analyzed;

        - Long-term stable slope allowances (setbacks) should be determined and correctly incorporated into each cross-section to delineate the long-term stable top of slope for each cross-section. The minimum acceptable safety factor is 1.50;

        - The Bishop, Spencer or Morgenstern-Price methods can be used for the slope stability analysis. The slope stability analysis should be performed by using either SLIDE or SLOPE/W;

        - Any stabilization effects of existing retaining structures on slopes should be ignored when delineating the long-term stable top of slope;

    The cross-sections, methodology, parameters and test results should be presented in the report. The long-term stable top of slope should be shown on the site plan.

2. Further to the above comment, as noted a large amount of fill and debris was placed on the slope. Placement of fill on a slope could adversely affect the stability of the slope and contribute to active soil erosion. TRCA policy does not permit the placement of fill on slopes. As such, the fill and debris will need to be removed, and the entire slope restored. A qualified geotechnical engineer should be retained to provide the applicant with slope restoration recommendations. A slope restoration plan prepared by a qualified geotechnical engineer should be provided. The slope restoration plan can be included in the geotechnical study requested above (Comment 1). The plans should identify the location of the fill, the amount of

fill that was placed and plans for the removal of this material. This should also be accompanied by a detailed site grading plan.

Please note that the fill, debris and gazebo removal should be carried out in such a way that it does not adversely affect the slope. Stockpiles, heavy machinery etc., should be placed as far away from the slope as possible. All measures should be taken to ensure the slope is protected during removal works.

3. A restoration plan is necessary to restore the valley corridor, which includes the slope and buffer to the slope. The restoration plan must be completed by a qualified professional (environmental consultant, arborist, landscape architect etc.) and should include native trees and shrubs, as well as a native seed mix to stabilize loose soil. The plan should be prepared in accordance with TRCA's post-construction restoration guidelines: https://trca.ca/app/uploads/2016/02/Post-Construction_Restoration_Guidelines_July_2004.pdf

4. To prevent sediment from potentially leaving the site and entering into the adjacent features specifically the watercourse, please provide a stand-alone multi-barrier Erosion and Sediment Control (ESC) Plan that details measures for both erosion protection and sediment control in accordance with TRCA's *Erosion and Sediment Control Guideline for Urban Construction, 2019* https://s3-ca-central-1.amazonaws.com/trcaca/app/uploads/2020/01/30145157/ESC-Guide-for-Urban-Construction_FINAL.pdf. The proposed ESCs must cover the full extent of the work area. In addition, please note that the following should be included:
    a. Multi-barrier method to isolate the development area and demonstrate requirements for winter site protection as necessary.
    b. If utilizing sediment fence, it is required to be non-woven geotextile. Please provide typical details.
    c. Multi-barrier method is required to protect the natural features from the proposed development. For example, the combination of silt fence and silt soxx could be utilized.
    d. Location of stockpiling areas and related ESCs. If no stockpiling is being proposed on the site, please provide a note stating it.
    e. Typical details for all proposed ESC measures.
    f. TRCA Standard Notes # 1, 2, 4, 7, 8, 9, 11 and 14 in the drawings. They can be found at: https://trcaca.s3.ca-central-1.amazonaws.com/app/uploads/2020/10/14163702/StandardNotesInterimSeptember2020.pdf

5. Please note that a geotechnical engineer should be present on site periodically to supervise the slope restoration works. A letter confirming that a geotechnical engineer will be retained should be provided prior to construction. A geotechnical engineer will also need to submit a review letter to confirm that the removal of fill and restoration work conducted at the site is satisfactory. The review letter can be submitted after completion of the restoration work.

6. A portion of the subject property is also located within a Regulatory Floodplain and contains a flood hazard. In accordance with TRCA policy, development must be a minimum of 10 metres from the flood hazard. To obtain TRCA's current floodplain elevation for the property, the proponent can contact the undersigned. Once the flood elevation for the property has been obtained, please ensure its location is clearly delineated on a current topographic survey and site plan drawing. In addition, please ensure the location of all proposed development including any proposed grading works and location of the gazebos and any future structures are located outside of the floodplain and buffer.

APPENDIX J

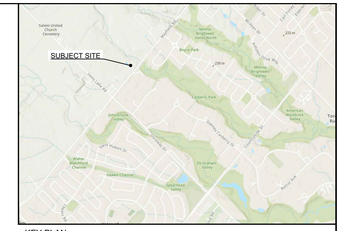
REMEDIAL GRADING AND RESTORATION PLAN

TRUE NORTH

CONSTRUCTION NORTH

LEGEND

80.86+	DENOTES EXISTING SPOT ELEVATION
x(80.81)T/C	DENOTES PROPOSED TOP OF CURB ELEVATION
x(80.81)B/C	DENOTES PROPOSED BOTTOM OF CURB ELEVATION
x(80.82)	DENOTES PROPOSED ELEVATION
0.39%	DENOTES GRADE
	DENOTES CONTOUR LINE
	DENOTES FIRE HYDRANT
	DENOTES PROPOSED FIRE HYDRANT
	DENOTES EXISTING WATER VALVE
	DENOTES PROPOSED WATER VALVE
	DENOTES EXISTING CATCHBASIN
	DENOTES PROPOSED CATCHBASIN
	DENOTES EXISTING STORM MH
	DENOTES PROPOSED STORM MH
	DENOTES EXISTING SANITARY MH
	DENOTES PROPOSED SANITARY MH
	DENOTES MAJOR OVERLAND FLOW ROUTE
	DENOTES EXTERNAL PROPERTY LINE
	DENOTES SUBJECT SITE PROPERTY LINE
	DENOTES LIMIT OF CONSTRUCTION
	DENOTES SLOPE
	DENOTES TREE PROTECTION ZONE
	DENOTES RAINWATER LEADER
	DENOTES EXISTING TREE TO BE REMOVED



KEY PLAN

NOTES:
THE HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES, WATERMAINS, SEWERS AND EXISTING INFRASTRUCTURE MAY NOT BE SHOWN COMPLETELY ACCURATELY ON CONTRACT DRAWINGS AND SHOULD BE VERIFIED BY THE CONTRACTOR. WHERE SUCH INFRASTRUCTURE IS SHOWN THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCY TO THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORKS.

CONTRACTOR TO USE DIGITAL FILES PROVIDED BY THE ENGINEER FOR LAYOUT, RATHER THAN SCALING FROM THIS DRAWING.

THIS PLAN MUST NOT BE USED TO SITE THE PROPOSED BUILDINGS.

APPROVAL OF THIS PLAN MAY NOT BE CONSTRUED AS APPROVAL FOR CONSTRUCTION. THE OWNER AND/OR CONTRACTOR ARE RESPONSIBLE FOR OBTAINING PERMITS FOR ROAD CUT, ROAD OCCUPATION, SEWER & SERVICING INSTALLATION, SERVICE RELOCATION, ENCROACHMENT AGREEMENT, ETC.

REFERENCE SURVEY:
EXISTING BOUNDARY AND TOPOGRAPHIC INFORMATION SUPPLIED BY ALEX MARTON LTD. IN THEIR BOUNDARY AND TOPOGRAPHIC SURVEY OF JANUARY 9, 2024.

BENCH MARK:
ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE DERIVED FROM GPS OBSERVATIONS USING REAL TIME NETWORK.

TOPOGRAPHIC INFORMATION PRIOR-TO UNAUTHORIZED FILL PLACEMENT IS 'NRCAN 2014 LIDAR DATA SET'.

UNITS:
UNITS SHOWN HEREIN ARE IN METERS UNLESS OTHERWISE NOTED AND MAY BE CONVERTED INTO FEET BY DIVIDING BY 0.3048.

SCALE BAR

0 10 20 Meters

CLIENT

A.S SANDHU

REV.	DATE	REVISIONS	INITIAL
2	FEB 20/25	ISSUED FOR TRCA SUBMISSION	D.B.
1	FEB 10/25	ISSUED FOR CLIENT REVIEW	J.T

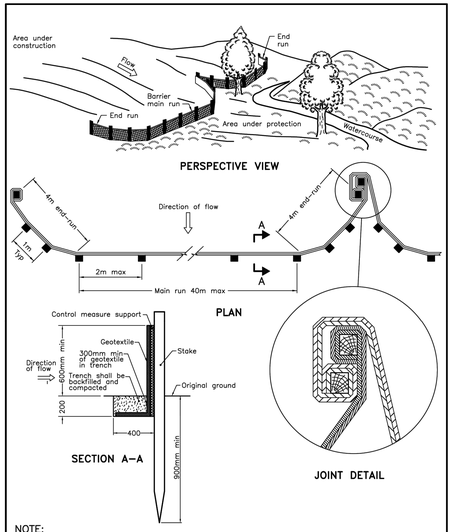
civilGo ENGINEERING INC.
civilGo Engineering Inc.
60 Atlantic Avenue
Suite 200
Toronto, ON
M6K 1X9
www.civilGo.ca
T: 437-222-2062
E: info@civilGo.ca

LICENSED PROFESSIONAL ENGINEER
FEB 20/25
D. I. BARROFF
100200672
PROVINCE OF ONTARIO

PROPOSED REMEDIAL GRADING TO ADDRESS UNAUTHORIZED FILL PLACEMENT, 6600 MAYFIELD ROAD, BRAMPTON, ON

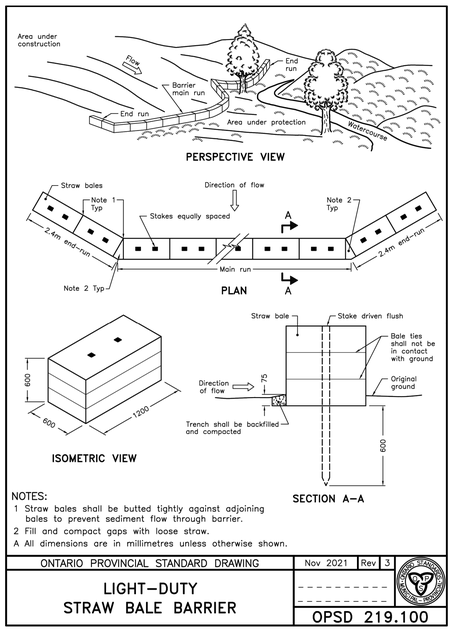
PART OF LOT 1,CONCESSION 2

DESIGN	D.B.	DRAWN	J.T	CHECKED	D.B.	PROJECT No.	24-009
SCALE:	1:400			DRAWING TITLE	EXISTING CONDITIONS PLAN (PLACEMENT OF UNAUTHORIZED FILL)		SHEET CV-101
DATE:	JANUARY 2025						



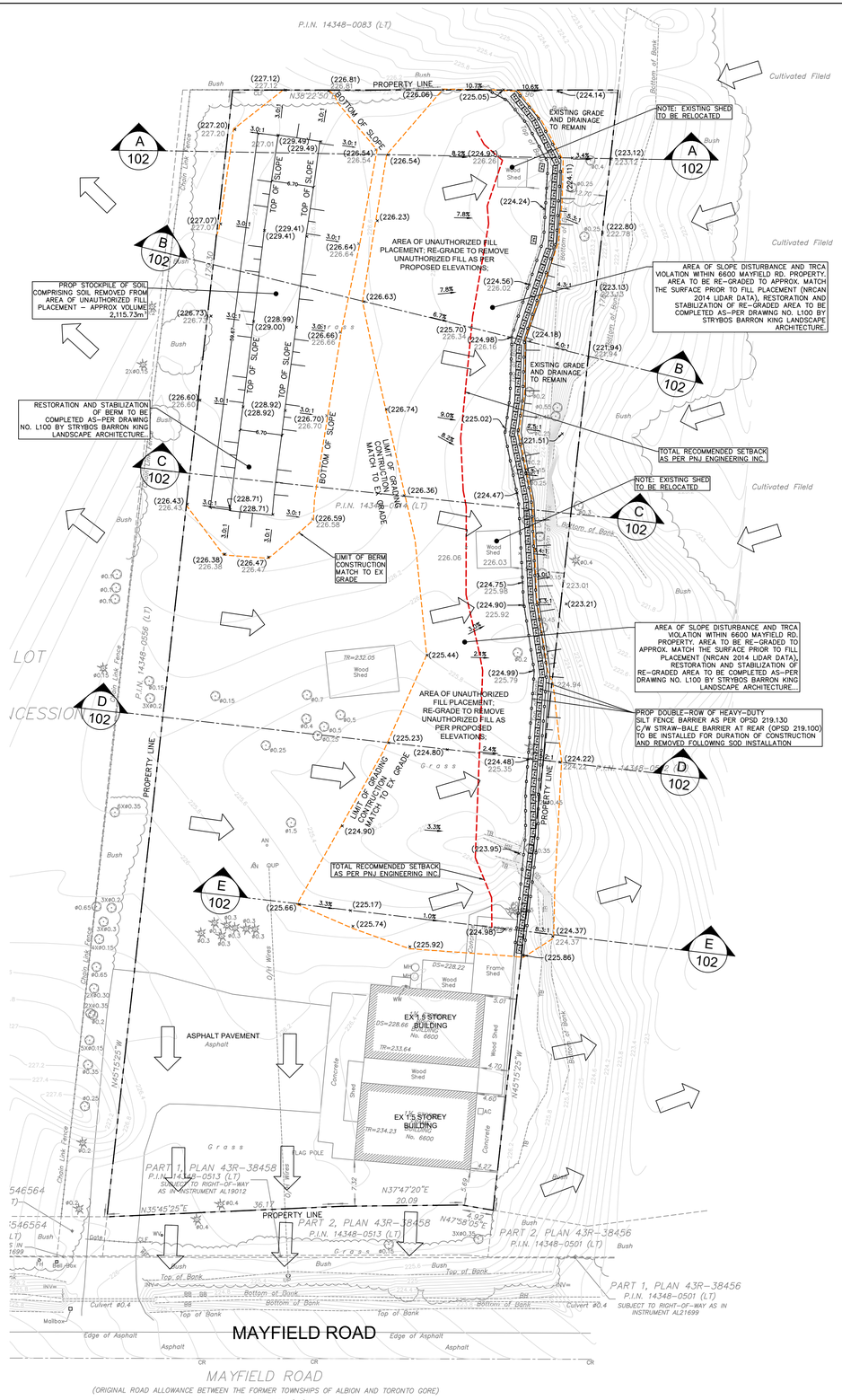
NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev	3
HEAVY-DUTY SILT FENCE BARRIER			
	OPSD 219.130		



NOTES:
1 Straw bales shall be butted tightly against adjoining bales to prevent sediment flow through barrier.
2 Fill and compact gaps with loose straw.
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2021	Rev	3
LIGHT-DUTY STRAW BALE BARRIER			
	OPSD 219.100		



TRUE NORTH

CONSTRUCTION NORTH

LEGEND

- 80.86 DENOTES EXISTING SPOT ELEVATION
- (80.81)T/C DENOTES PROPOSED TOP OF CURB ELEVATION
- (80.81)B/C DENOTES PROPOSED BOTTOM OF CURB ELEVATION
- (80.82) DENOTES PROPOSED ELEVATION
- 0.3% DENOTES GRADE
- DENOTES CONTOUR LINE
- DENOTES FIRE HYDRANT
- DENOTES PROPOSED FIRE HYDRANT
- DENOTES EXISTING WATER VALVE
- DENOTES PROPOSED WATER VALVE
- DENOTES EXISTING CATCHBASIN
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- DENOTES PROPOSED SANITARY MH
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- DENOTES EXTERNAL PROPERTY LINE
- DENOTES SUBJECT SITE PROPERTY LINE
- DENOTES LIMIT OF CONSTRUCTION
- DENOTES SLOPE
- DENOTES TREE PROTECTION ZONE
- DENOTES RAINWATER LEADER
- DENOTES EXISTING TREE TO BE REMOVED

TRCA-STANDARD ESC NOTES

1.EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED AND/OR REPLACED WITHIN 48 HOURS OF THE INSPECTION.

2.DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES

3. ALL IN-WATER AND NEAR-WATER WORKS WILL BE CONDUCTED IN THE DRY WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS.

4.THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREAS. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. TRCA ENFORCEMENT OFFICER SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED, AS NECESSARY.

5.AN ENVIRONMENTAL MONITOR WILL ATTEND THE SITE TO INSPECT ALL NEW CONTROLS IMMEDIATELY AFTER INSTALLATION. INSPECTION OF ESC MEASURES TO BE WILL OCCUR, AT MINIMUM:
- ON A WEEKLY BASIS;
- PRIOR TO SIGNIFICANT RAINFALL EVENTS (MINIMUM PREDICTED 25MM OVER 24 HOURS);
- AFTER EVERY RAINFALL/SNOWMELT EVENT; AND
- DAILY DURING EXTENDED RAINFALL PERIODS.

INSPECTIONS WILL FOCUS ON MEASURES RELATED TO EROSION AND SEDIMENT CONTROLS, DEWATERING OR UNWATERING, RESTORATION AND IN/OR NEAR WATER WORKS. SHOULD CONCERNS ARISE ON SITE THE ENVIRONMENTAL MONITOR WILL CONTACT THE TRCA ENFORCEMENT OFFICER AS WELL AS THE PROPONENT.

6.ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE WILL BE CONDUCTED A MINIMUM OF 30 METRES FROM THE WATER.

7.ALL GRADES WITHIN THE REGULATORY FLOOD PLAIN WILL BE MAINTAINED OR MATCHED.

8.THE PROPONENT/CONTRACTOR SHALL MONITOR THE WEATHER SEVERAL DAYS IN ADVANCE OF THE ONSET OF THE PROJECT TO ENSURE THAT THE WORKS WILL BE CONDUCTED DURING FAVOURABLE WEATHER CONDITIONS. SHOULD AN UNEXPECTED STORM ARISE, THE CONTRACTOR WILL REMOVE ALL UNFIXED ITEMS FROM THE REGIONAL STORM FLOOD PLAIN THAT WOULD HAVE THE POTENTIAL TO CAUSE A SPILL OR AN OBSTRUCTION TO FLOW, E.G., FUEL TANKS, PORTABLE POTTIES, MACHINERY, EQUIPMENT, CONSTRUCTION MATERIALS, ETC.

9.ALL DEWATERING/UNWATERING SHALL BE TREATED AND RELEASED TO THE ENVIRONMENT AT LEAST 30 METRES FROM A WATERCOURSE OR WETLAND AND ALLOWED TO DRAIN THROUGH A WELL-VEGETATED AREA. NO DEWATERING EFFLUENT SHALL BE SENT DIRECTLY TO ANY WATERCOURSE, WETLAND OR FOREST, OR ALLOWED TO DRAIN ONTO DISTURBED SOILS WITHIN THE WORK AREA. THESE CONTROL MEASURES SHALL BE MONITORED FOR EFFECTIVENESS AND MAINTAINED OR REVISED TO MEET THE OBJECTIVE OF PREVENTING THE RELEASE OF SEDIMENT LADEN WATER.

10.ALL ACCESS TO THE WORK SITE SHALL BE FROM EITHER SIDE OF THE WATERCOURSE. NO EQUIPMENT OR VEHICLES ARE PERMITTED TO CROSS THROUGH THE WATERCOURSE UNLESS APPROVED BY TRCA.

11.PRIOR TO SITE DISTURBANCE THE CONTRACTOR/PROPONENT SHOULD ENSURE THAT THE WORKS ARE IN CONFORMANCE WITH THE MIGRATORY BIRDS CONVENTION ACT. PLEASE NOTE THAT THE GENERAL BREEDING BIRD TIMING WINDOW FOR THIS AREA IS APRIL 1ST TO AUGUST 31ST, HOWEVER, BREEDING ACTIVITIES MIGHT INITIATE PRIOR TO AND CONTINUE PAST THIS PERIOD.

12.WHERE IMPACTS TO LOCAL FISH POPULATIONS MAY OCCUR DURING THEIR SPAWNING, NURSERY AND MIGRATORY PERIODS, CONSTRUCTION TIMING WINDOWS SHOULD APPLY TO IN-WATER OR NEAR-WATER ACTIVITIES. THE PROPONENT/CONTRACTOR SHOULD CONFIRM APPLICABILITY AND DATES WITH APPROPRIATE PROVINCIAL AND FEDERAL AGENCIES.

13.FISH AND WILDLIFE STRANDED WITHIN THE WORK AREA SHALL BE CAPTURED AND RELEASED LIVE IN SUITABLE HABITAT UPSTREAM OF THE WORK AREA UNDER THE SUPERVISION OF QUALIFIED AQUATIC TECHNICAL STAFF. THE PROPONENT/CONTRACTOR SHOULD CONFIRM REQUIREMENTS DIRECTLY WITH MINISTRY OF NATURAL RESOURCES AND FORESTRY.

14.PLEASE NOTIFY TRCA ENFORCEMENT OFFICER (JULIA PINDER, AT 1 (437) 880-2294, JULIA.PINDER@TRCA.CA), AND TRCA PROJECT MANAGER (ALI SHIRAZI AT (416) 388-3987, ALI.SHIRAZI@TRCA.CA) 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.

15.AN ENVIRONMENTAL MONITOR WILL BE ON SITE, AND PROVIDE ADVICE, TO ENSURE THAT ACTIVITIES THAT COULD HAVE A NEGATIVE IMPACT TO THE NATURAL ENVIRONMENT ARE EFFECTIVELY MITIGATED AS CONSTRUCTION PROCEEDS. THE ENVIRONMENTAL MONITOR SHALL NOTIFY THE TRCA ENFORCEMENT OFFICER AND PROJECT MANAGER IF ISSUES ARISE.

TRCA RESTORATION NOTES

I. SECURING SEED MIX WITH SEED SUPPLIER WELL IN ADVANCE IS RECOMMENDED, SINCE THERE IS LIMITED LOCAL SEED SUPPLY. CONSIDER PLANNING AND BUDGETING FOR LONG-TERM AS RE-SEEDING MAY BE REQUIRED OVER TIME.

II. AREAS WITH DISPROPORTIONATELY HIGH INVASIVE SPECIES PRESENCE, SUCH AS MOST OF THE GREATER TORONTO AREA, SHOULD BE SEEDED AT A HIGHER RATE (646 SEEDS PER M2) AS OPPOSED TO THE STANDARD RATE OF (431 SEEDS PER M2), DUE TO THE CONSIDERABLE INVASIVE SPECIES PRESSURE ON NEWLY SEEDED SOILS.

III. PRIOR TO SEEDING, TAGS SHOULD BE CHECKED TO CONFIRM THAT THE CORRECT (APPROVED) SEED MIX IS BEING APPLIED.

IV. ENSURING A THOROUGH COVERAGE IS KEY FOR A SUCCESSFUL APPLICATION.

V. REGARDLESS OF SEEDING METHOD USED, MORE INTENSIVE EROSION CONTROLS MAY ALSO BE NECESSARY IN HIGH EROSION RISK AREAS (E.G. SLOPES STEEPER THAN 2H:1V).

VI. ENSURE VEHICLES AND EQUIPMENT ARE NOT DRIVING OVER AREAS THAT HAVE BEEN SEEDED. TO PREVENT DAMAGE, SEEDED AREAS SHOULD BE FENCED OFF DURING VEGETATION ESTABLISHMENT, PARTICULARLY IF IT IS A HEAVILY USED AREA.

VII. ESTABLISH A PLAN TO ENSURE SEEDED AREAS ARE IRRIGATED AS NEEDED.

VIII. PLEASE INCORPORATE INSPECTION ON SEEDED AREAS AS PART OF THE EROSION AND SEDIMENT CONTROL INSPECTION REQUIREMENTS APPROVED FOR THE SITE. PLEASE ADD A SPECIFIC SECTION FOR THE SEEDED AREAS IN THE STABILIZATION MONITORING REPORTS AND PROVIDE A PERCENTAGE OF SUCCESSFUL COVERAGE. BEYOND THIS ROUTINE INSPECTION, ADDITIONAL INSPECTIONS OF SEEDED AREAS MAY BE NEEDED WHEN THE SEED IS NEWLY PLANTED AS WELL AS DURING PERIODS OF DROUGHT. TRCA ENCOURAGES THE SUBMISSION OF MONITORING REPORTS TO HELP INFORM FUTURE UPDATES TO THE GUIDELINE, BASED ON IN-FIELD EXPERIENCE.

IX. DURING INSPECTION, DETERMINE WHETHER SEED IS WELL ESTABLISHED WITH GOOD COVERAGE (>80%).

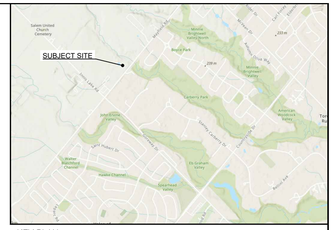
X. DURING RESTORATION MONITORING AND RESTORATION WARRANTY INSPECTION, PLEASE RECORD WHICH SPECIES FROM THE APPLIED SEED MIX HAVE GERMINATED AND PERCENTAGE OF SUCCESSFUL COVERAGE FOR EACH ONE.

XI. LOOK FOR ANY EVIDENCE OF EROSION ON SEEDED AREAS (E.G., RILLING). WHERE EROSION IS OCCURRING, DETERMINE WHETHER A HIGHER SEED APPLICATION RATE IS NEEDED, IF THE WEL AREA SHOULD BE REINFORCED WITH ADDITIONAL EROSION CONTROL MEASURES (E.G. BLANKETS, MATS), OR IF FLOWS SHOULD BE RE-ROUTED AROUND THE SEEDED AREA.

XII. REGRADE AND RE-APPLY TOPSOIL AND SEED IN AREAS THAT DID NOT TAKE OR THAT HAVE BEEN REMOVED BY EROSION.

XIII. CONSIDERATION SHOULD BE GIVEN TO INCREASING THE RATE OF THE SEED MIXES AND USING MYCORRHIZAL FUNGI ON SPECIFIC AREAS OF THE SITE CONSIDERED TO BE MORE CHALLENGING FOR GERMINATION, OR IN AREAS WHERE THE FIRST APPLICATION HAS FAILED, AND IT IS UNDERSTOOD THAT REGULAR DENSITIES ARE NOT WORKING.

XIV.A 2-YEAR WARRANTY ON PLANTING MATERIAL WILL BE REQUIRED. TRCA CONSIDERS THE SEEDING TO BE A PART OF THE OVERALL WARRANTY.



KEY PLAN

NOTES:
THE HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES, WATERMAINS, SEWERS AND EXISTING INFRASTRUCTURE MAY NOT BE SHOWN COMPLETELY ACCURATELY ON CONTRACT DRAWINGS AND SHOULD BE VERIFIED BY THE CONTRACTOR. WHERE SUCH INFRASTRUCTURE IS SHOWN THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCY TO THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORKS.

CONTRACTOR TO USE DIGITAL FILES PROVIDED BY THE ENGINEER FOR LAYOUT, RATHER THAN SCALING FROM THIS DRAWING.

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REFERENCE SURVEY:
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BENCH MARK:
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UNITS:
UNITS SHOWN HEREIN ARE IN METERS UNLESS OTHERWISE NOTED AND MAY BE CONVERTED INTO FEET BY DIVIDING BY 0.3048.

SCALE BAR
0 10 20 Meters

CLIENT
A.S SANDHU

REV.	DATE	REVISIONS	INITIAL
2	FEB 20/25	ISSUED FOR TRCA SUBMISSION	D.B.
1	FEB 10/25	ISSUED FOR CLIENT REVIEW	J.T

civilGo ENGINEERING INC.
civilGo Engineering Inc.
60 Atlantic Avenue
Suite 200
Toronto, ON
M6K 1X9
www.civilGo.ca
T: 437-222-2062
E: info@civilGo.ca

LICENSED PROFESSIONAL ENGINEER
FEB 20/25
D. I. BARCROFT
100200672
PROVINCE OF ONTARIO

PROPOSED REMEDIAL GRADING TO ADDRESS UNAUTHORIZED FILL PLACEMENT, 6600 MAYFIELD ROAD, BRAMPTON, ON

PART OF LOT 1,CONCESSION 2

DESIGN	D.B.	DRAWN	J.T	CHECKED	D.B.	PROJECT No.	24-009
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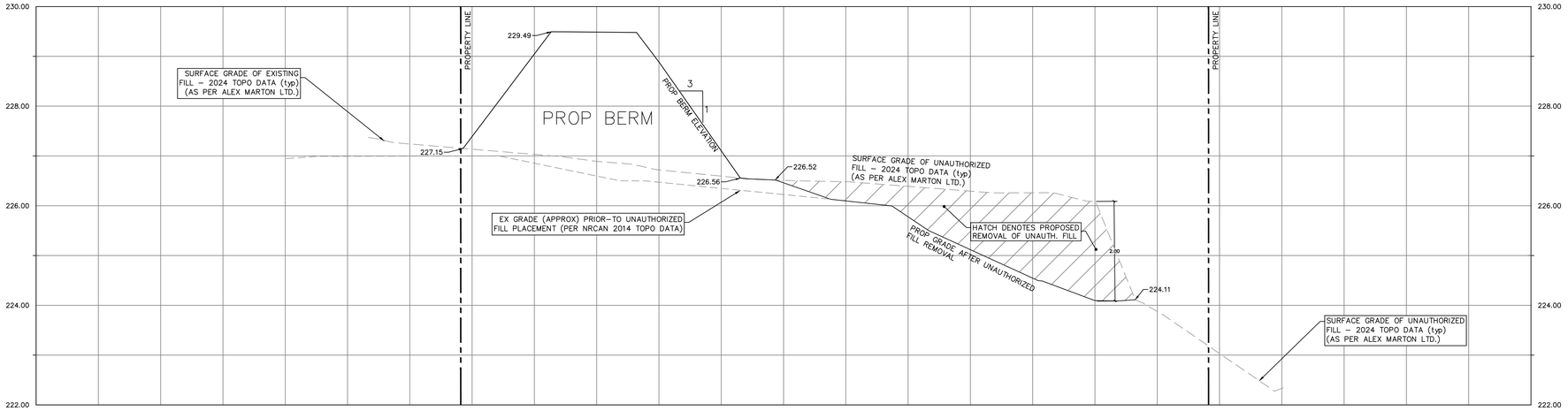
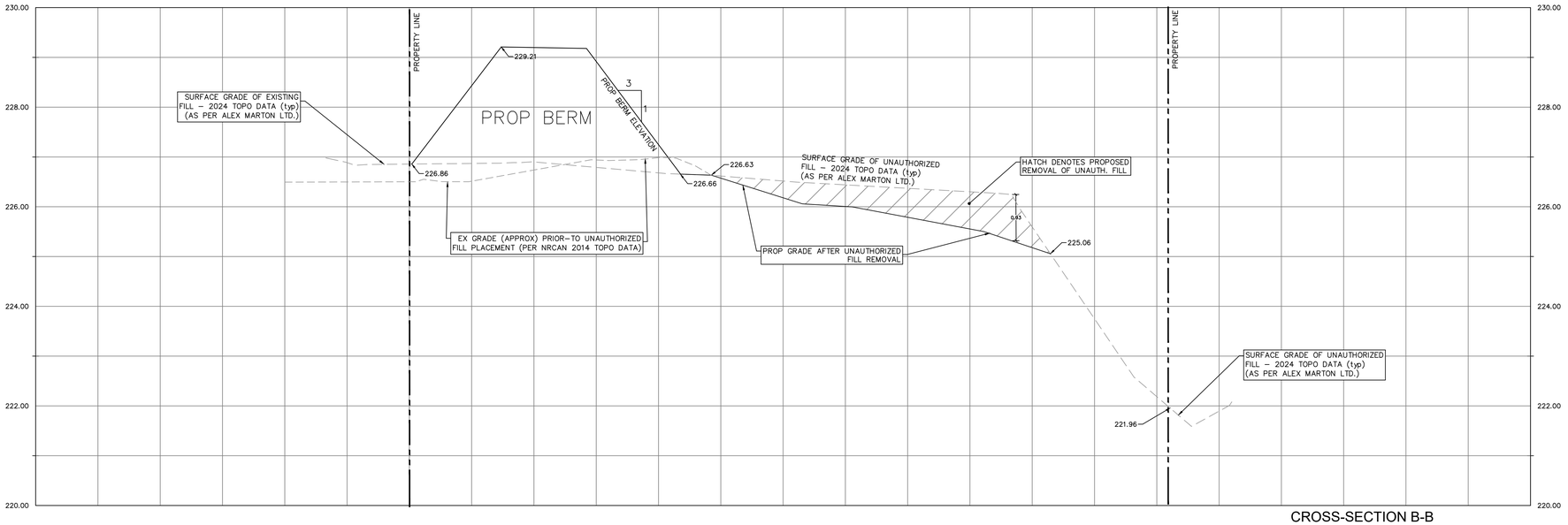
DATE:	JANUARY 2025						



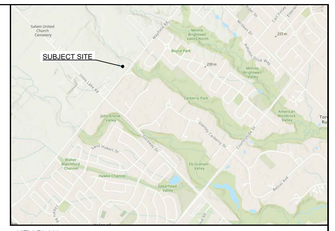
CROSS-SECTION A-A
PROPOSED REMOVAL OF UNAUTHORIZED FILL

SCALE H 1:200 V 1:50
(4X VERT. EXAGGERATION)



CROSS-SECTION B-B
PROPOSED REMOVAL OF UNAUTHORIZED FILL

SCALE H 1:200 V 1:50
(4X VERT. EXAGGERATION)



KEY PLAN

NOTES:
THE HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES, WATERMAINS, SEWERS AND EXISTING INFRASTRUCTURE MAY NOT BE SHOWN COMPLETELY ACCURATELY ON CONTRACT DRAWINGS AND SHOULD BE VERIFIED BY THE CONTRACTOR. WHERE SUCH INFRASTRUCTURE IS SHOWN THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCY TO THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORKS.

CONTRACTOR TO USE DIGITAL FILES PROVIDED BY THE ENGINEER FOR LAYOUT, RATHER THAN SCALING FROM THIS DRAWING.

THIS PLAN MUST NOT BE USED TO SITE THE PROPOSED BUILDINGS.

APPROVAL OF THIS PLAN MAY NOT BE CONSTRUED AS APPROVAL FOR CONSTRUCTION. THE OWNER AND/OR CONTRACTOR ARE RESPONSIBLE FOR OBTAINING PERMITS FOR ROAD CUT, ROAD OCCUPATION, SEWER & SERVICING INSTALLATION, SERVICE RELOCATION, ENCROACHMENT AGREEMENT, ETC.

REFERENCE SURVEY:
EXISTING BOUNDARY AND TOPOGRAPHIC INFORMATION SUPPLIED BY ALEX MARTON LTD. IN THEIR BOUNDARY AND TOPOGRAPHIC SURVEY OF JANUARY 9, 2024.

BENCH MARK:
ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE DERIVED FROM GPS OBSERVATIONS USING REAL TIME NETWORK.

TOPOGRAPHIC INFORMATION PRIOR–TO UNAUTHORIZED FILL PLACEMENT IS 'NRCAN 2014 LIDAR DATA SET'.

UNITS:
UNITS SHOWN HEREIN ARE IN METERS UNLESS OTHERWISE NOTED AND MAY BE CONVERTED INTO FEET BY DIVIDING BY 0.3048.

SCALE BAR

CLIENT
A.S SANDHU

REV.	DATE	REVISIONS	INITIAL
2	FEB 20/25	ISSUED FOR TRCA SUBMISSION	D.B.
1	FEB 10/25	ISSUED FOR CLIENT REVIEW	J.T

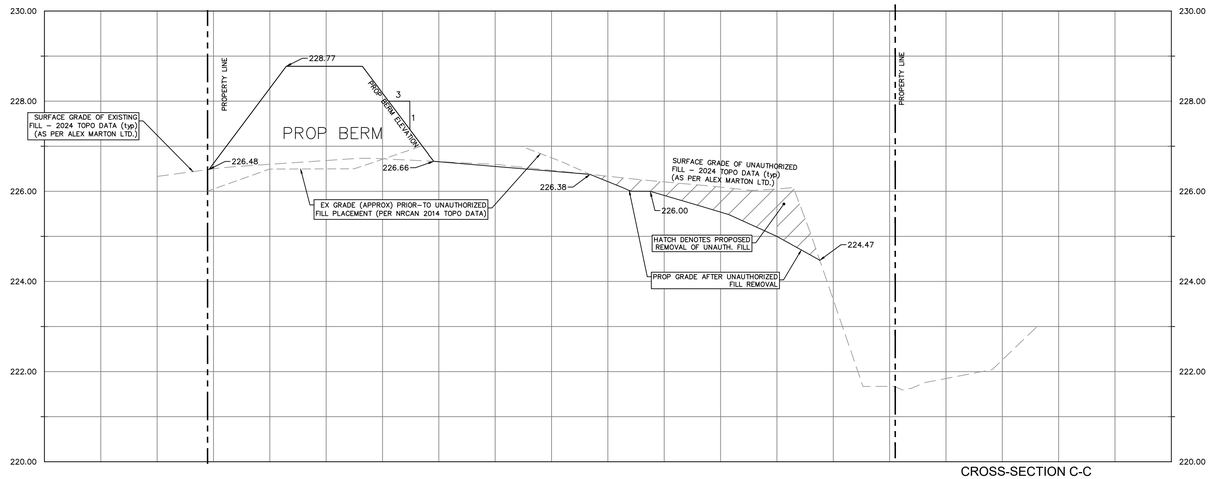
civilGo ENGINEERING INC.
civilGo Engineering Inc.
60 Atlantic Avenue
Suite 200
Toronto, ON
M6K 1X9
www.civilGo.ca
T: 437-222-2062
E: info@civilGo.ca

LICENSED PROFESSIONAL ENGINEER
FEB 20/25
D. T. BAWCROFT
100200672
PROVINCE OF ONTARIO

PROPOSED REMEDIAL GRADING TO ADDRESS UNAUTHORIZED FILL PLACEMENT, 6600 MAYFIELD ROAD, BRAMPTON, ON

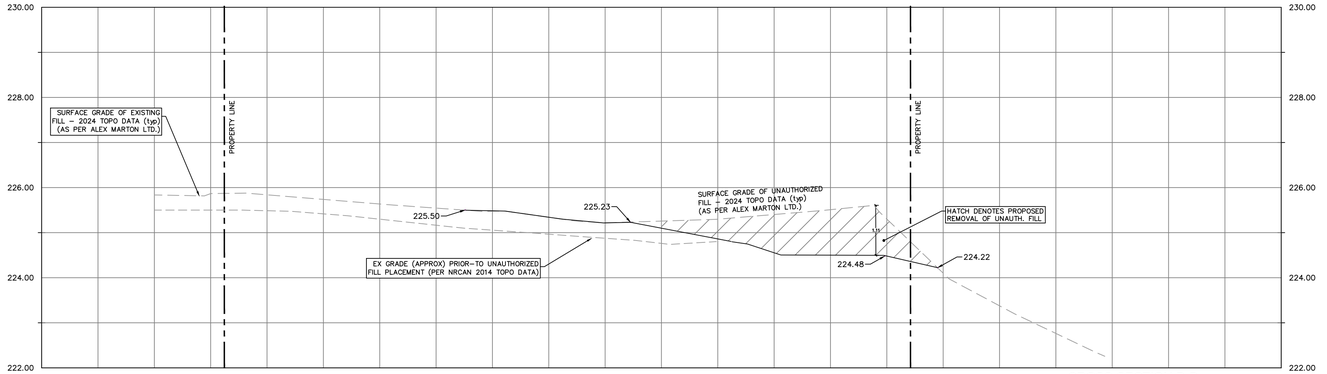
PART OF LOT 1,CONCESSION 2

DESIGN	D.B.	DRAWN	J.T	CHECKED	D.B.	PROJECT No.	24-009
SCALE:		DRAWING TITLE	PROPOSED REMEDIAL GRADING PLAN CROSS-SECTIONS			SHEET	CV-103
DATE:	JANUARY 2025						



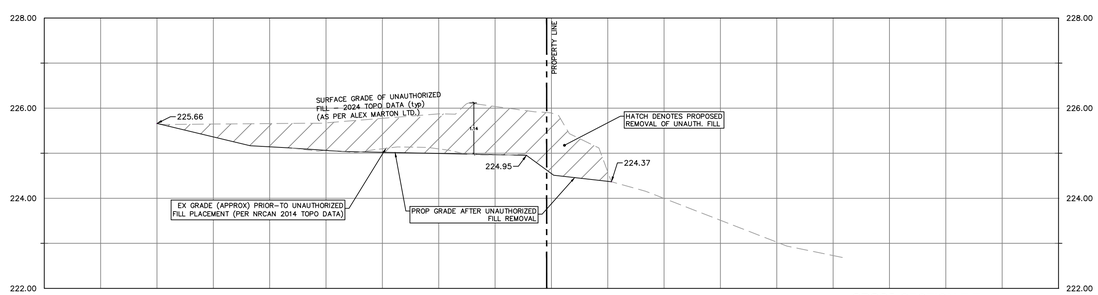
CROSS-SECTION C-C
PROPOSED REMOVAL OF UNAUTHORIZED FILL
& STOCKPILE OF REMOVED FILL

SCALE H 1:250 V 1:62.5
(4X VERT. EXAGGERATION)



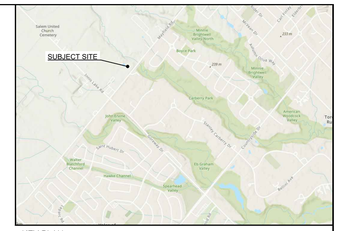
CROSS-SECTION D-D
PROPOSED REMOVAL OF UNAUTHORIZED FILL
& STOCKPILE OF REMOVED FILL

SCALE H 1:250 V 1:62.5
(4X VERT. EXAGGERATION)



CROSS-SECTION E-E
PROPOSED REMOVAL OF UNAUTHORIZED FILL

SCALE H 1:250 V 1:62.5
(4X VERT. EXAGGERATION)



KEY PLAN

NOTES:
THE HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES, WATERMAINS, SEWERS AND EXISTING INFRASTRUCTURE MAY NOT BE SHOWN COMPLETELY ACCURATELY ON CONTRACT DRAWINGS AND SHOULD BE VERIFIED BY THE CONTRACTOR. WHERE SUCH INFRASTRUCTURE IS SHOWN THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCY TO THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE WORKS.

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BENCH MARK:
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TOPOGRAPHIC INFORMATION PRIOR–TO UNAUTHORIZED FILL PLACEMENT IS 'NRCAN 2014 LIDAR DATA SET'.

UNITS:
UNITS SHOWN HEREIN ARE IN METERS UNLESS OTHERWISE NOTED AND MAY BE CONVERTED INTO FEET BY DIVIDING BY 0.3048.

SCALE BAR

CLIENT
A.S SANDHU

REV.	DATE	REVISIONS	INITIAL
2	FEB 20/25	ISSUED FOR TRCA SUBMISSION	D.B.
1	FEB 10/25	ISSUED FOR CLIENT REVIEW	J.T

civilGo ENGINEERING INC.
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T: 437-222-2062
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LICENSED PROFESSIONAL ENGINEER
FEB 20/25
D. I. BAIRCROFT
100200672
PROVINCE OF ONTARIO

PROPOSED REMEDIAL GRADING TO ADDRESS UNAUTHORIZED FILL PLACEMENT, 6600 MAYFIELD ROAD, BRAMPTON, ON

PART OF LOT 1,CONCESSION 2

DESIGN	D.B.	DRAWN	J.T	CHECKED	D.B.	PROJECT No.	24-009
SCALE:				DRAWING TITLE	PROPOSED REMEDIAL GRADING PLAN CROSS-SECTIONS	SHEET	CV-104
DATE:	JANUARY 2025						

APPENDIX K

VALLEY CORRIDOR RESTORATION PLAN

PLANT LIST

KEY	QNT	BOTANICAL NAME	COMMON NAME	CAL.	HEIGHT	SPREAD	SPACE	COND.	KEY
A1	1	Acer saccharum	Sugar Maple	50	4000	2000	–	SB	A1
AR1	2	Acer rubrum	Red Maple	50	4000	2000	–	SB	AR1
CO1	2	Celtis occidentalis	Hackberry	50	4000	2000	–	SB	CO1
TA1	2	Tilia americana	Basswood	50	4000	2000	–	SB	TA1
QR1	1	Quercus rubra	Red Oak	50	4000	2000	–	SB	QR1
A2	1	Acer saccharum	Sugar Maple	–	3000	1000	–	SB	A2
AR2	1	Acer rubrum	Red Maple	–	3000	1000	–	SB	AR2
CO2	1	Celtis occidentalis	Hackberry	–	3000	1000	–	SB	CO2
TA2	1	Tilia americana	Basswood	–	3000	1000	–	SB	TA1
QR2	2	Quercus rubra	Red Oak	–	3000	1000	–	SB	QR1
PG	6	Picea glauca	White Spruce	–	1500	1500	–	SB	PG
PS	5	Pinus strobus	White Pine	–	1500	1500	–	SB	PS
TO	11	Thuja accidentalis	White Cedar	–	1500	1200	–	SB	TO
AL	15	Amelanchier laevis	Allegheny Serviceberry	–	600	–	900	CG	AL
VL	23	Viburnum lentago	Nannyberry	–	600	–	900	CG	VL
cr	14	Cornus racemosa	Gray Dogwood	–	600	–	900	CG	cr
cs	27	Cornus sericea	Red Osier Dogwood	–	600	–	900	CG	cs
dl	20	Diervilla lonicera	Bush Honeysuckle	–	600	–	900	CG	dl
hv	20	Hamamelis virginiana	Common Witch Hazel	–	600	–	900	CG	hv
pv	13	Prunus virginiana	Common Choke Cherry	–	600	–	900	CG	pv
rb	7	Rosa blanda	Smooth Wild Rose	–	600	–	900	CG	rb
sr	18	Sambucus racemose	Red–Berried Elder	–	600	–	900	CG	sr

SEED MIX – UPLAND MEADOW SEED MIX

10% Big Bluestem (Andropogan gerardii)
10% Little Bluestem (Andropogan scoparius)
10% Fox Sedge (Carex vulipinoidea)
20% Canada Wild Rye (Elymus canadensis)
20% Switchgrass (Panicum virgatum)
10% Indiangrass (Sorghatun nutans)
20% Fowl Bluegrass (Poa palustris)
100%

SEED TO BE SUPPLIED BY:
ONTARIO SEED COMPANY
330 PHILIP STREET, WATERLOO,
ONT. N2J 3Z6
TEL (519) 886–0557 FAX. (519) 886–0605
OR APPROVED EQUAL

APPLY TERRASEED MIX FOR AREAS AS INDICATED AT A RATE OF 30 KG/HECTARE OVER 100mm OF CLEAN TOPSOIL.

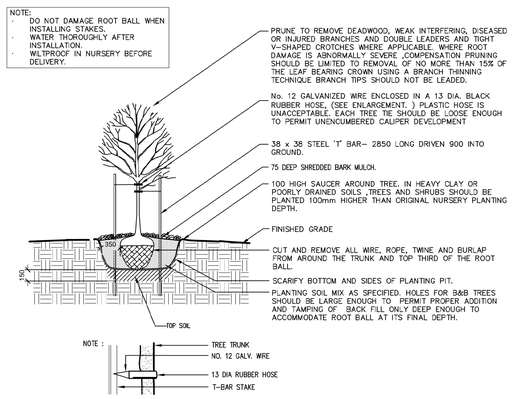
SEED MIXTURE AS MANUFACTURED BY ONTARIO SEED COMPANY OR APPROVED EQUAL.

NOTE:
SEED TO BE APPLIED ALONG WITH A NURSE GRASS OF ANNUAL RYE AT A RATE OF 50KG/HECTARE IN ADDITION TO SPECIFIED SEED MIX.

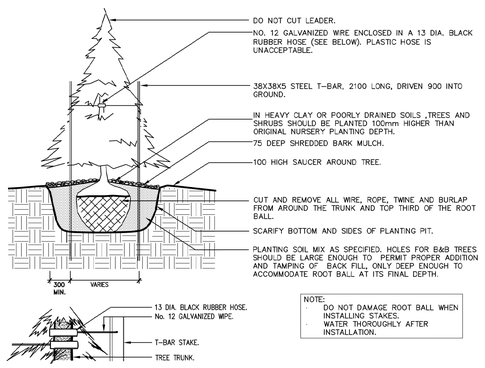
SEED APPLICATION METHOD: TERRASEEDING BY APPROVED CONTRACTOR

NOTE:
–CHECK ALL QUANTITIES
–REPORT ANY DISCREPANCIES TO THE LANDSCAPE ARCHITECT
–THE QUANTITIES INDICATED ON THE PLAN SUPERSEDE THE TOTAL ON THE PLANT LIST
–THE LAYOUT OF ALL PLANT MATERIAL IS TO BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO PLANTING

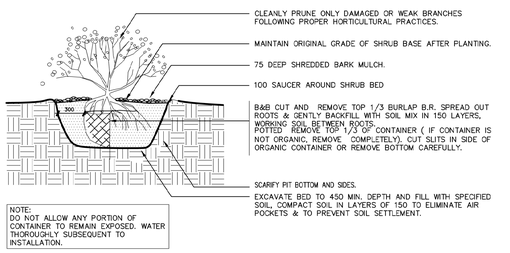
NOTE :
– DO NOT DAMAGE ROOT BALL WHEN INSTALLING STAKES.
– WATER THOROUGHLY AFTER INSTALLATION.
– WILTPROOF IN NURSERY BEFORE DELIVERY.



DECIDUOUS TREE PLANTING ON GRADE
FOR TREES LESS THAN 80 mm CALIPER

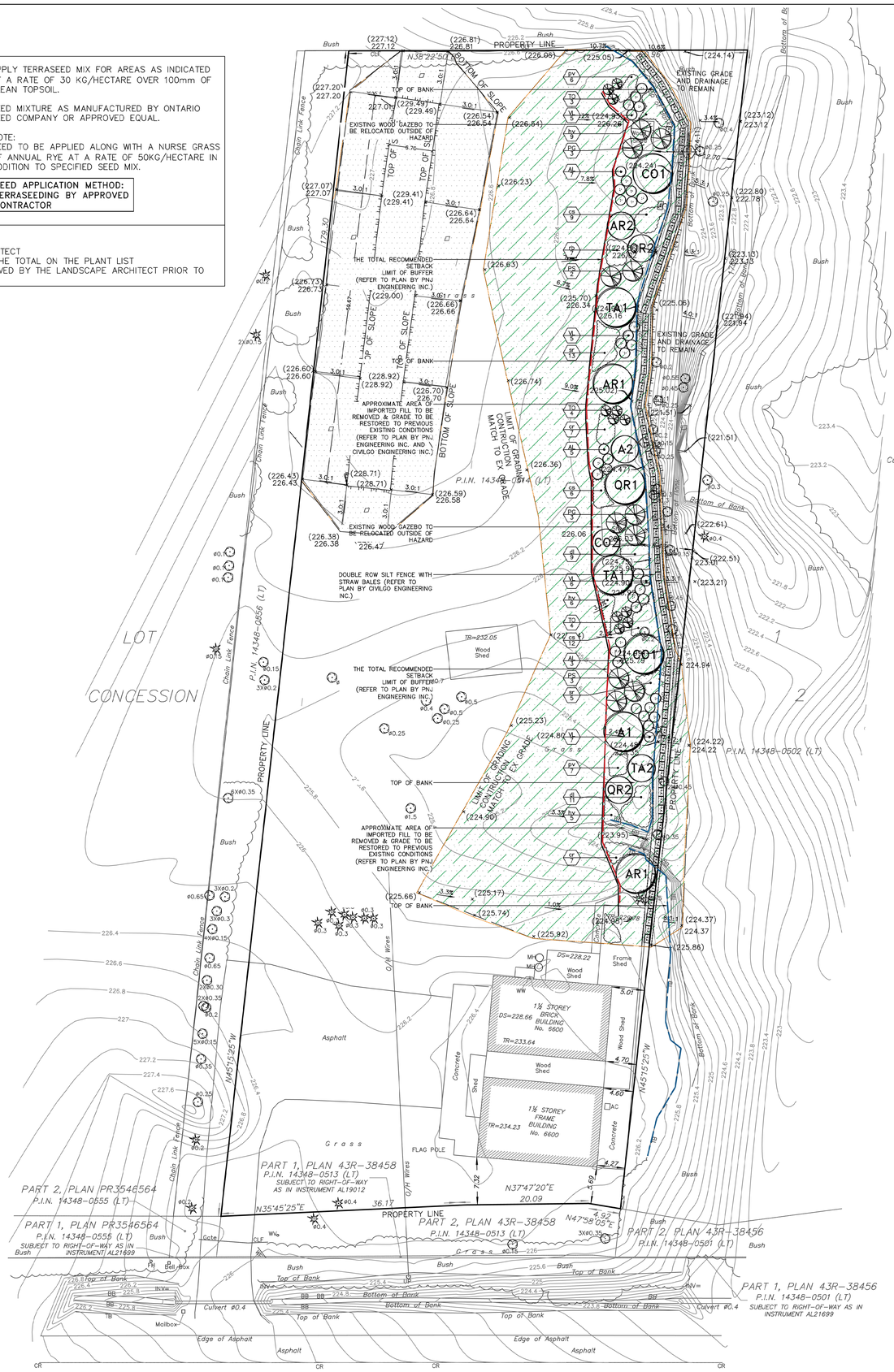


CONIFEROUS TREE PLANTING



SHRUB PLANTING

1 L300 PLANTING DETAILS
NOT TO SCALE



GENERAL NOTES

- VERIFY ALL DIMENSIONS.
- DO NOT SCALE DRAWINGS.
- REPORT ANY DISCREPANCIES, DISCOVERED ERRORS, OR OMISSIONS TO THE LANDSCAPE ARCHITECT BEFORE PROCEEDING.
- IT IS ADVISED THAT CONTRACTORS CONTACT THE LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION TO ENSURE THE USE OF THE LATEST REVISED DRAWINGS.
- DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE LANDSCAPE ARCHITECT.

KEYMAP

LEGEND

PROPOSED DECIDUOUS TREE
PROPOSED CONIFEROUS TREE
PROPOSED MULTI–STEM SHRUB
PROPOSED DECIDUOUS SHRUB
PROPOSED UPLAND SEED MIX
APPROXIMATE FILL AREA (REFER TO GEOTECHNICAL PLAN)
THE TOTAL RECOMMENDED SETBACK AS PER PNJ ENGINEERING INC.
TOP OF BANK
LIMIT OF CONSTRUCTION

Alistair Johnston
International Society of Arboriculture
Certified Arborist #ON-0586A
Date: JAN.23, 2025

No.	DATE.	REVISION.	BY.
1	02–11–2025	ISSUED FOR SUBMISSION	A.J.

It is the responsibility of the Contractor and/or Owner to ensure that the drawings with the latest revisions are used for construction.

SBK
STRYBOS BARRON KING
LANDSCAPE ARCHITECTURE
5770 HURONTARIO STREET, SUITE 320
MISSISSAUGA, ONTARIO, L5R 3G5
T: 416.695.4949 F: 905.712.3101
WWW.STRYBOS.COM

PROJECT.
6600 MAYFIELD ROAD
CALEDON, ONTARIO

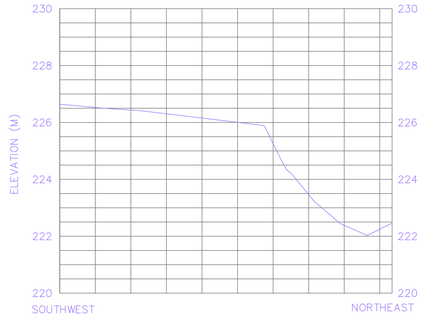
DRAWING TITLE.
VALLEY CORRIDOR RESTORATION PLAN

SCALE. 1:300	PROJECT No. 6089
DATE. JAN. 23, 2025	
DRAWN BY. J.H.	DRAWING No. L100
CHECKED BY. A.J.	

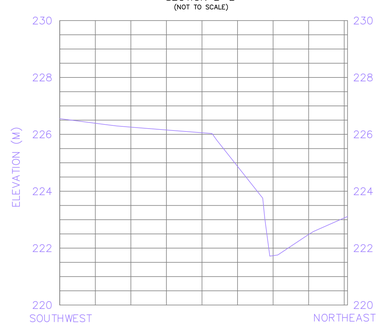
APPENDIX L

REGULATORY FLOODPLAIN

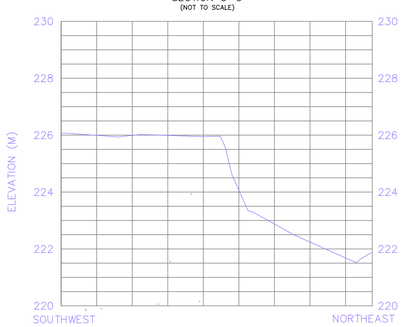
SECTION A–A
(NOT TO SCALE)

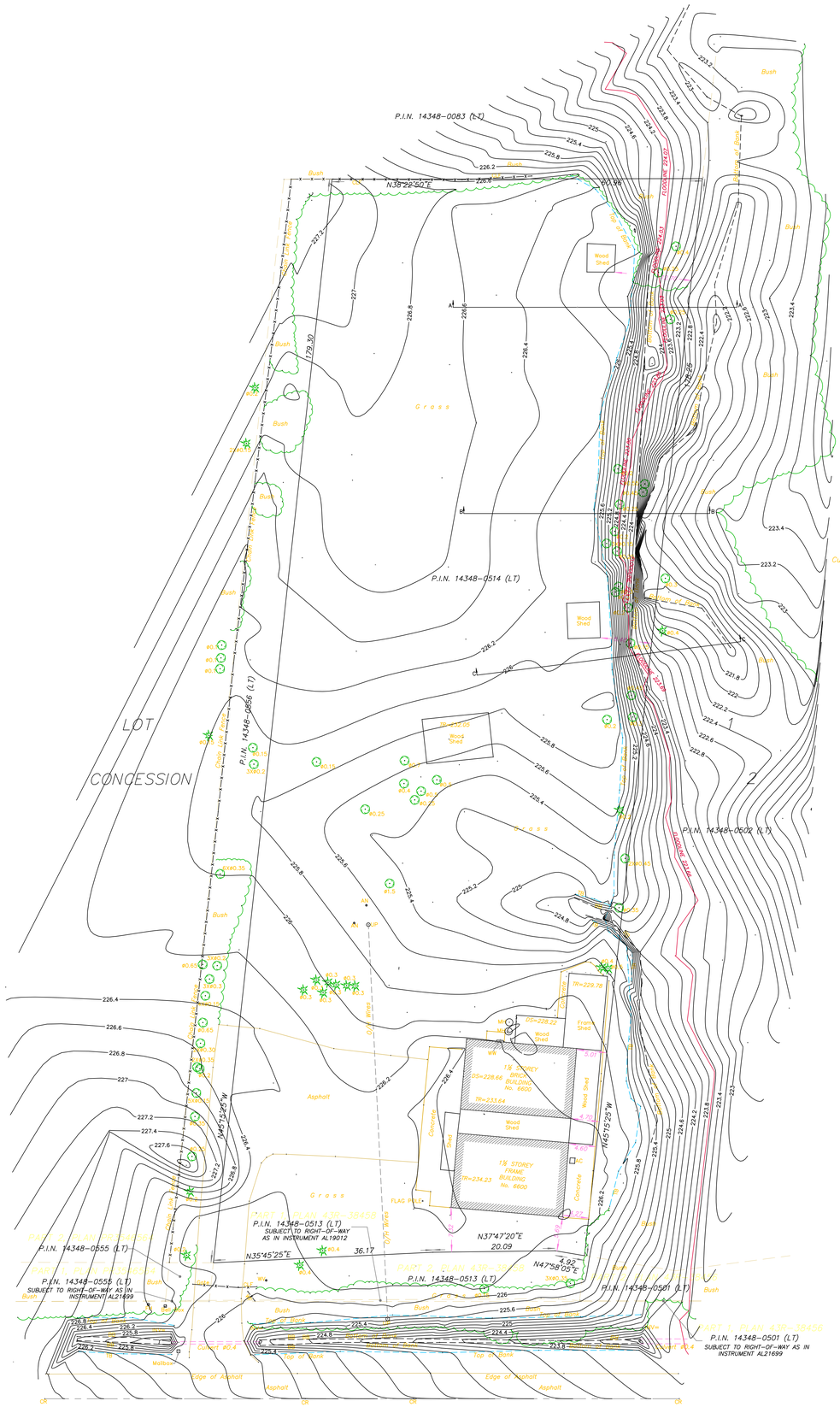


SECTION B–B
(NOT TO SCALE)



SECTION C–C
(NOT TO SCALE)





TOPOGRAPHIC SURVEY OF PART OF LOT 1 CONCESSION 2 TOWN OF CALEDON

(REGIONAL MUNICIPALITY OF PEEL)

SCALE 1 : 400

10 0 10 20 30 40 metres

ALEX MARTON LTD.
ONTARIO LAND SURVEYORS

METRIC

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

ELEVATION NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE DERIVED FROM GPS OBSERVATIONS USING REAL TIME NETWORK OBSERVATIONS.

NOTE

EXISTING FLOOD–LINE PLOTTED HEREON BY CIVILGO ENGINEERING INC., DATED FEBRUARY 24,2025, IN REFERENCE TO FLOODPLAIN ELEVATIONS PROVIDED BY TRCA (JODY SCOTT) ON FEBRUARY 24, 2025.

LEGEND

MH	DENOTES	MANHOLE
TR	"	TOP PF ROOF
WV	"	WATER VALVE
AN	"	ANCHOR
AC	"	AIR CONDITIONER
UP	"	UTILITY POLE
DS	"	DOOR SILL
CR	"	CENTERLINE
FH	"	FIRE HYDRANT
TB	"	TOP OF BANK
BB	"	BOTTOM OF BANK
CLF	"	CHAIN LINK FENCE
WF	"	WIRE FENCE
WW	"	WINDOW WELL
O/H	"	OVERHEAD
PIN	"	PROPERTY IDENTIFIER NUMBER
ø	"	DIAMETER
	"	DECIDUOUS TREE
	"	CONIFEROUS TREE

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:
THE FIELD OBSERVATIONS REPRESENTED ON THIS PLAN WERE COMPLETED ON THE 9TH DAY OF JANUARY, 2024.

FEBRUARY 8, 2024
DATE

ALEX MARTON
ONTARIO LAND SURVEYOR

CAUTION

THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED FOR MORTGAGE OR TRANSACTION PURPOSES.

AMENDMENTS		
No.	DESCRIPTION	DATE
1	TOPOGRAPHIC INFORMATION ADDED	3.07.2024
2	TOPOGRAPHIC INFORMATION AND CROSS SECTION INFORMATION ADDED	5.11.2024

ALEX MARTON LTD.
ONTARIO LAND SURVEYORS
160 APPLEWOOD CRESCENT, UNIT 8,
CONCORD, ONTARIO, L4K 4H2
PHONE: 905–879–9889 FAX: 905–879–0770
E–MAIL: info@amsurveying.ca
WEBSITE: www.amsurveying.ca

PARTY CHIEF: C.P.	FILE NAME: 2024–003_CONTOUR.DWG
DRAWN : X.Z	PLOT SCALE: 1:400
CHECKED : A.M.	PROJECT No. 2022–003

Abid Sahi
asahi@pnjeng.com

Muaad Alrawhani
malrawhani@pnjeng.com