**COMMITTEE OF ADJUSTMENT**
City Hall, 5th floor, 71 Main Street West, Hamilton, ON L8P 4Y5
Telephone (905) 546-2424, ext. 4221
E-mail: cofa@hamilton.ca

# NOTICE OF PUBLIC HEARING
## Consent/Land Severance

**You are receiving this notice because you are either:**

- Assessed owner of a property located within 60 metres of the subject property
- Applicant/agent on file, or
- Person likely to be interested in this application

| | | | |
|---|---|---|---|
| **APPLICATION NO.:** | **B.24.34** | **SUBJECT PROPERTY:** | 96 Creighton Road, Dundas |

**APPLICANTS:** Owner: Contructology Inc.
Agent: Arcadis Professional Services (Canada) Inc. c/o Mike Crough

**PURPOSE & EFFECT:** To permit the conveyance of a parcel of land to create a new residential building lot. The existing dwelling will be demolished to facilitate this application. To permit the creation of an easement over a portion of land for access and maintenance purposes.

| | **Frontage** | **Depth** | **Area** |
|---|---|---|---|
| **SEVERED LANDS:** | 1.88 m± | 65.37 m± | 1081.63 $m^2$ ± |
| **RETAINED LANDS:** | 10.84 m± | 59.21 m± | 1427.24 $m^2$ ± |
| **EASEMENT LANDS** | 4.62 m± | Varies m± | 105 $m^2$ ± |

Associated Planning Act File(s): A-24:118

**This Notice must be posted by the owner of any land which contains seven or more residential units so that it is visible to all residents.**

This application will be heard by the Committee as shown below:

| | |
|---|---|
| **DATE:** | **Tuesday, June 25, 2024** |
| **TIME:** | **2:15 p.m.** |
| **PLACE:** | **City Hall Council Chambers (71 Main St. W., Hamilton)** |
| | **To be streamed (viewing only) at www.hamilton.ca/committeeofadjustment** |

For more information on this matter, including access to drawings illustrating this request and other information submitted:

- Visit www.hamilton.ca/committeeofadjustment
- Email Committee of Adjustment staff at cofa@hamilton.ca
- Call 905-546-CITY (2489) or 905-546-2424 extension 4221

## PUBLIC INPUT

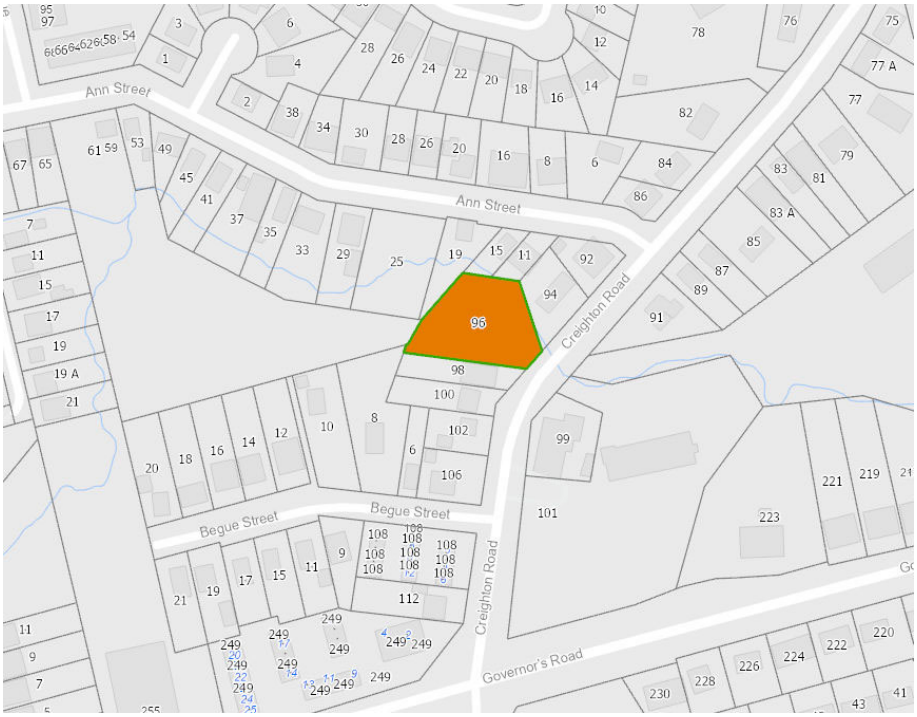
**Written:** If you would like to submit written comments to the Committee of Adjustment you may do so via email or hardcopy. Please see attached page for complete instructions, written comments must be received no later than noon **June 21, 2024**

**Orally:** If you would like to speak to this item at the hearing you may do so via video link, calling in, or attending in person. Please see attached page for complete instructions, registration to participate virtually must be received no later than noon **June 24, 2024**

## FURTHER NOTIFICATION

If you wish to be notified of future Public Hearings, if applicable, regarding B.24.34, you must submit a written request to cofa@hamilton.ca or by mailing the Committee of Adjustment, City of Hamilton, 71 Main Street West, 5th Floor, Hamilton, Ontario, L8P 4Y5**.**

If you wish to be provided the Notice of Decision of the proposed consent, you must make a written request to the Secretary-Treasurer of The City of Hamilton Committee of Adjustment by email at cofa@hamilton.ca or by mail through City Hall, 5th floor, 71 Main Street West, Hamilton, ON L8P 4Y5.




**Subject Lands**

DATED: June 6, 2024

_____

Jamila Sheffield,
Secretary-Treasurer
Committee of Adjustment

Information respecting this application is being collected under the authority of the Planning Act, R.S.O., 1990, c. P. 13. All comments and opinions submitted to the City of Hamilton on this matter, including the name, address, and contact information of persons submitting comments and/or opinions, will become part of the public record and will be made available to the Applicant and the general public.

If a person or public body that files an appeal of a decision of The City of Hamilton Committee of Adjustment in respect of the proposed consent does not make written submissions to The City of Hamilton Committee of Adjustment before it gives or refuses to give a provisional consent, the Ontario Land Tribunal may dismiss the appeal.

**COMMITTEE OF ADJUSTMENT**

City Hall, 5th floor, 71 Main Street West, Hamilton, ON L8P 4Y5

Telephone (905) 546-2424, ext. 4221

E-mail: cofa@hamilton.ca

# PARTICIPATION PROCEDURES

## Written Submissions

Members of the public who would like to participate in a Committee of Adjustment meeting are able to provide comments in writing advance of the meeting. Comments can be submitted by emailing cofa@hamilton.ca or by mailing the Committee of Adjustment, City of Hamilton, 71 Main Street West, 5th Floor, Hamilton, Ontario, L8P 4Y5. **Comments must be received by noon on the date listed on the Notice of Public Hearing.**

Comments are available the Friday prior to the Hearing and are available on our website: **www.hamilton.ca/committeeofadjustment**

## Oral Submissions

Members of the public are also able to provide oral comments regarding Committee of Adjustment Hearing items by participating Virtually through Webex via computer or phone or by attending the Hearing In-person. Participation Virtually requires pre-registration in advance. Please contact staff for instructions if you wish to make a presentation containing visual materials.

### 1. Virtual Oral Submissions

Interested members of the public, agents, and owners **must register by noon on the day listed on the Notice of Public Hearing to** participate Virtually.

To register to participate Virtually by Webex either via computer or phone, please contact Committee of Adjustment staff by email cofa@hamilton.ca. The following information is required to register: Committee of Adjustment file number, hearing date, name and mailing address of each person wishing to speak, if participation will be by phone or video, and if applicable the phone number they will be using to call in.

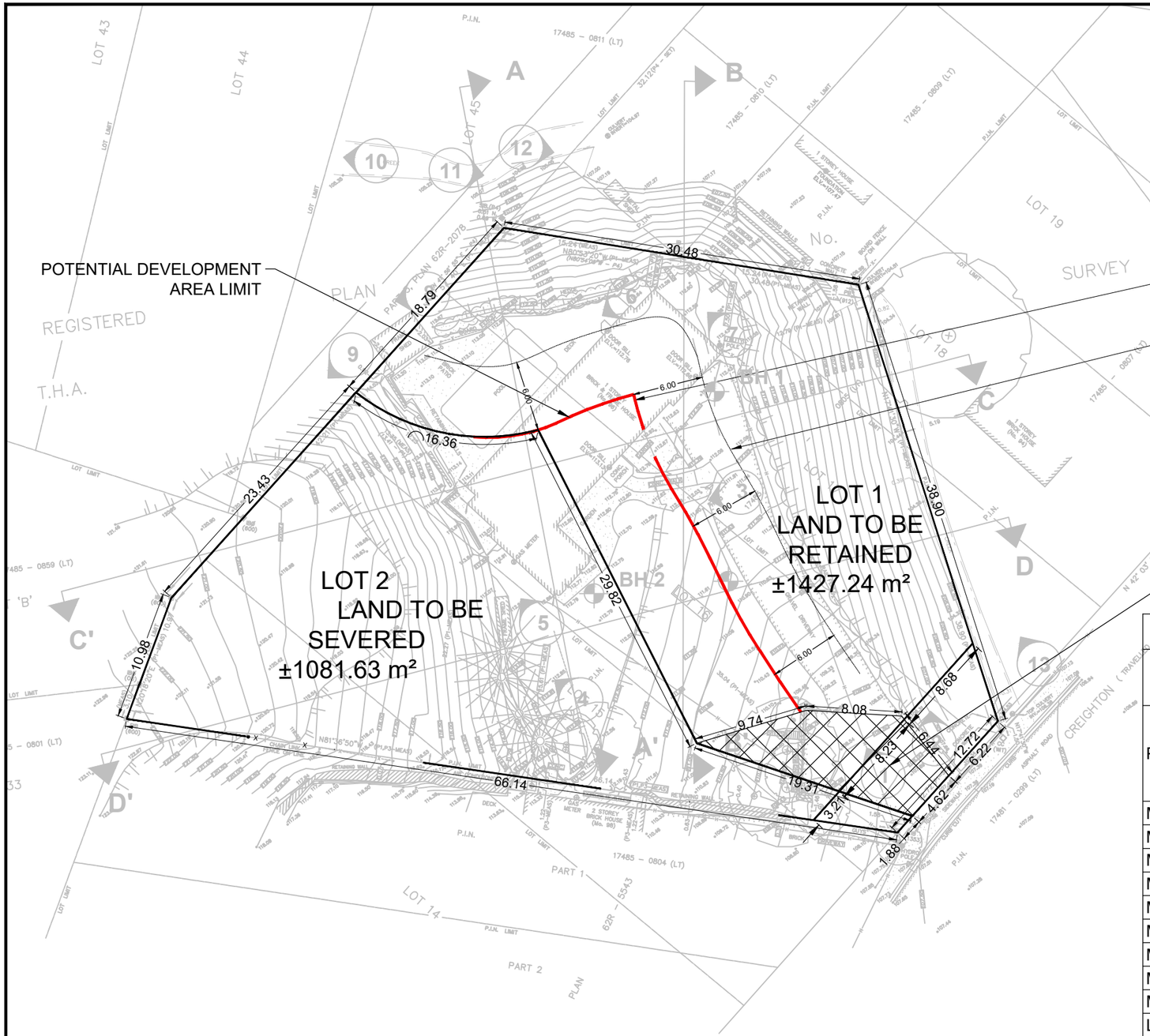
A separate registration for each person wishing to speak is required. Upon registering for a meeting, members of the public will be emailed a link for the Webex meeting one business day before the Hearing. Only those registered will be called upon to speak.

### 2. In person Oral Submissions

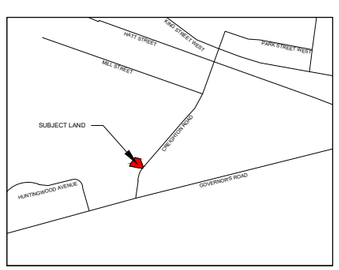
Interested members of the public, agents, and owners who wish to participate in person may attend Council Chambers on the date and time listed on the Notice of Public Hearing. Please note, you will be required to provide your name and address for the record. It is advised that you arrive **no less than 10 minutes** before the time of the Public Hearing as noted on the Notice of Public Hearing.

We hope this is of assistance and if you need clarification or have any questions, please email cofa@hamilton.ca or by phone at 905-977-1654.

Please note: Webex (video) participation requires either a compatible computer or smartphone and an application (app/program) must be downloaded by the interested party in order to participate. It is the interested party's responsibility to ensure that their device is compatible and operating correctly prior to the Hearing.




| ZONING BY-LAW- No.3581-86 | | | | |
|---|---|---|---|---|
| PROVISIONS | SINGLE DETACHED RESIDENTIAL R2-FP | LOT 2 | LOT 1 | VARIANCE |
| PERMITTED USES | SINGLE DETACHED DWELLING | SINGLE DETACHED DWELLING | SINGLE DETACHED DWELLING | |
| MIN. LOT AREA | 450 m² | 1081.63 m² | 1427.24 m² | |
| MIN. LOT FRONTAGE | 15 m | 3.21 m | 16.91 m | X |
| MAXIMUM HEIGHT | 10.5 m | | | |
| MAX. LOT COVERAGE | | | | |
| MIN. FRONT YARD | 6.0 m | | | |
| MIN. REAR YARD | 7.5 m | | | |
| MIN. INTERIOR SIDE YARD | 1.2 m | | | |
| MIN. EXTRIOR SIDE YARD | | | | |
| MAX. FLOOR SPACE | | | | |
| LANDSCAPE OPEN SPACE | | | | |




ARCADIS
360 James Street North - Suite 200
Hamilton ON L8L 1H5 Canada
tel 905 546 1010
www.arcadis.com

CLIENT
Constructology Inc.

96 CREIGHTON ROAD
DUNDAS, ON L9H 3B9

PROJECT NAME
96 CREIGHTON

96 CREIGHTON ROAD,
DUNDAS



| SCALE: | DATE: |
|---|---|
| 1 : 400 | 2024 02 16 |
| PROJECT ENG: M. CROUGH | DRAWN BY: D.LEE |
| CHECKED BY: M. CROUGH | APPROVED BY: M. CROUGH |
| PROJECT NO: 143959 | |

FIGURE NAME
96 CREIGHTON
CONSENT SKETCH

FIGURE NO. C1

REVISION 0

SCALE CHECK 1 in 10mm

File Location: J:\143959_96_Creighton\7.0_Production\7.02_Conceptual_Design\17_Planning\143959 Consent Sketch.dwg Last Saved: February 16, 2024, by daniel.lee Plotted: Friday, February 16, 2024 11:40:30 AM by Daniel Lee

Chair and Members of Committee of Adjustment c/o Ms. Jamila Sheffield
Secretary - Treasurer, Committee of Adjustment
City of Hamilton
71 Main Street West - 5th Floor
Hamilton ON, L8P 4Y5

Arcadis Professional Services (Canada) Inc.
360 James Street North
Suite 200
Hamilton, Ontario L8L 1H5
Canada
Phone: 905 546 1010
www.arcadis.com

Date: May 2, 2024
Our Ref: 143959

**Subject: APPLICATIONS FOR CONCURRENT CONSENT TO SEVER AND MINOR VARIANCE AT 96 CREIGHTON ROAD, HAMILTON**

Dear Ms. Sheffield,

## 1.0 Introduction

Arcadis Professional Services (Canada) Inc. ("Arcadis") has been retained by the Owners to provide an independent planning opinion on the concurrent applications for Consent to Sever ("consent") and Minor Variance ("variance") to the City of Hamilton Committee of Adjustment pertaining to 96 Creighton Road in the City of Hamilton (herein referred to as the "subject lands"). The subject lands have an approximate lot area of 0.25 hectares and currently contain a one-storey single detached dwelling with associated driveway, deck, pool and accessory buildings and structures.

The purpose of the consent is to divide the existing parcel into two separate lots, consisting of severed and retained lands. The existing dwelling, pool and deck will be demolished. The size and shape of the severed and retained lands are described on the submitted consent sketch and in later sections of this letter. The purpose of the concurrent variance application is to permit a reduced lot width for the severed lands. This letter provides the required analysis, including a review of provincial and local policy, and the final recommendation that the applications should be approved by the Committee.

## 2.0 Planning Applications

The consent to sever application is being made to the City of Hamilton Committee of Adjustment under subsection 53(12) of the Planning Act, which provides the powers to the Committee to make decisions with respect to severing lots. Concurrently with the consent application, a minor variance application is being made to the City of Hamilton Committee of Adjustment under subsection 45(1) of the Planning Act, which provides the powers to the Committee to make decisions with respect to minor variances to the Zoning By-law.

## 3.0 Site Location and Context

The subject lands are municipally known as 96 Creighton Road and are legally described as PT LTS 14, 15, 16, 17 & 18, PL 1463, AS IN VM62721; DUNDAS CITY OF HAMILTON. Please refer to **Figure 1** for an aerial image of the subject lands. The subject lands are in a developed residential neighbourhood bound by Ann Street to the north, Creighton Road to the east, Begue Street to the south, and Sullivans Lane to the west. The subject lands are irregular in shape with a lot frontage of approximately 12.72 metres onto Creighton Road, and a lot area of approximately 0.25 ha. A bungalow, driveway, and pool currently exist on the subject lands. **Figure 2** displays a parcel map of the subject lands and adjacent properties.


*Figure 1: Aerial image of subject lands, retrieved from GeoWarehouse*

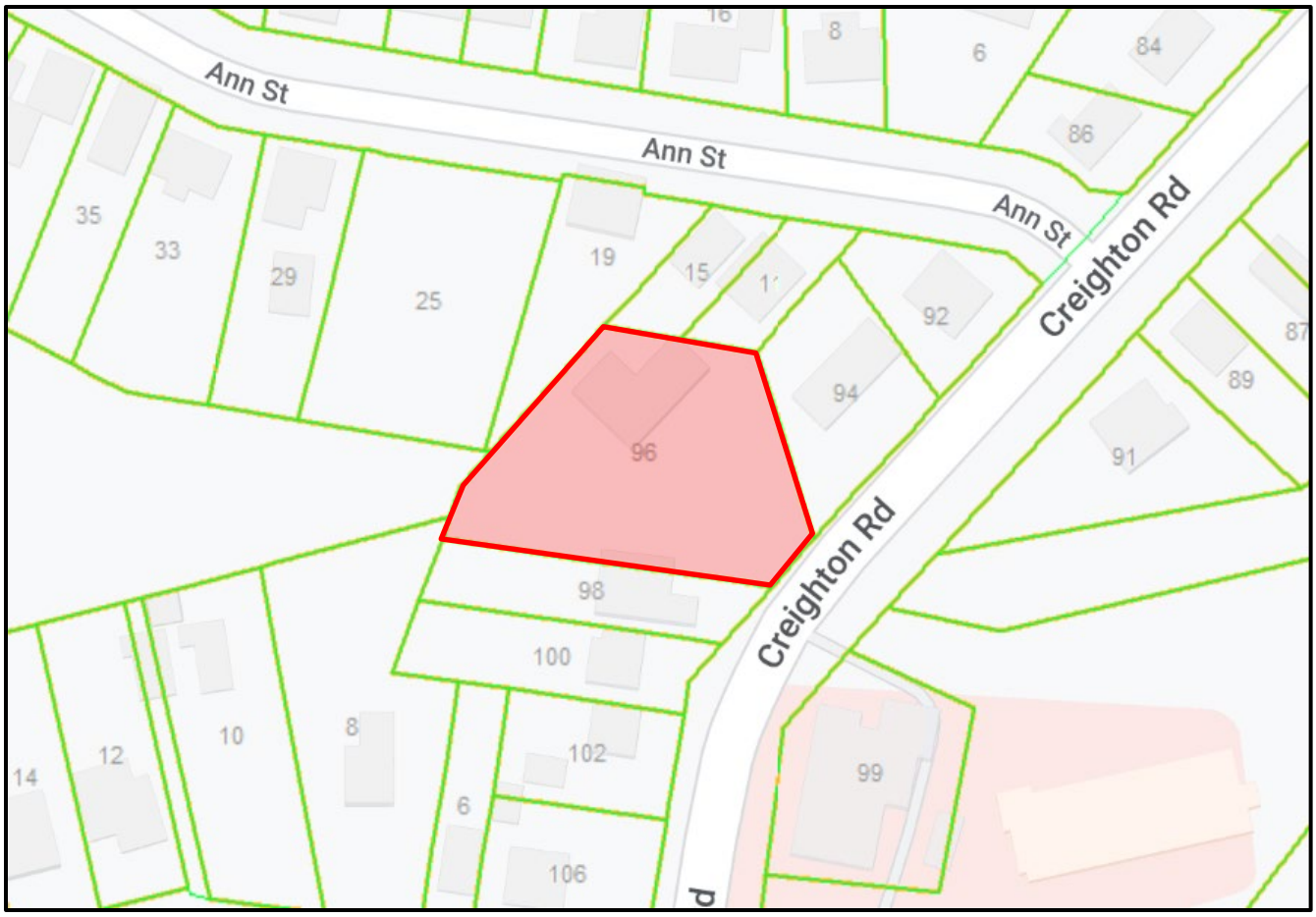



*Figure 2: Parcel Map of Subject Lands, Retrieved from GeoWarehouse*

## 4.0 Proposed Development

The current proposal is to separate the existing lot into two separate lots. The lands to be severed will have an approximate lot area of 1081.63 $m^2$, lot width of 3.21 m (as measured at 6 m back from the lot line; with 1.88 m of actual frontage on Creighton Road), and a lot depth of approximately 66.14 m. The lands to be retained will have an approximate lot area of 1427.24 $m^2$, lot width of 16.91 m (as measured at 6 m back from the lot line; with 10.84 m of actual frontage on Creighton Road), and a lot depth of approximately 70 m. Please refer to **Figure 3** for a graphic of the proposed severance.

In the context of establishing the proposed consent, we have identified the following required minor variance:

1. To permit a minimum lot width of 3.2 m for the severed lot, whereas the Zoning By-law requires 15 m.

The Planning Act requires that minor variance applications meet the applicable tests within Section 45, to ensure good planning to support requested variances. In our opinion that this proposal does maintain the general intent and purpose of the Official Plan and Zoning By-law, is desirable for the appropriate development use of the lands and is minor in nature. A more in-depth explanation, based on applicable legislation, policy, and contextual information, is provided below to support our opinion.

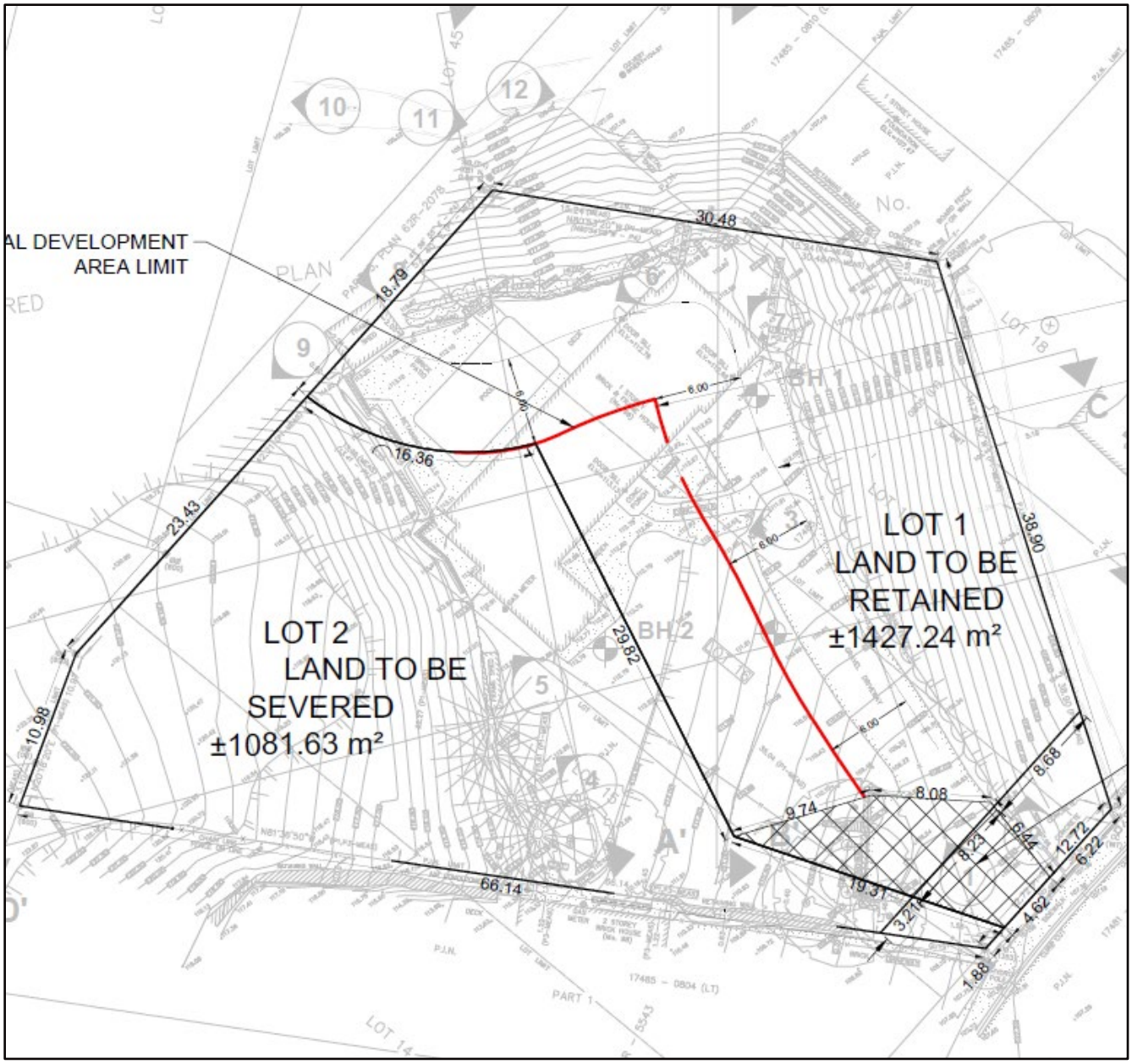



*Figure 3: Proposed land division*

## 5.0 Applicable Planning Policy and Legislation

Development on the subject lands is affected by several provincial and local policy and legislative documents with respect to land use planning.

### 5.1 Planning Act

The Powers of the Committee of Adjustment with respect to consent to sever applications are provided by subsection 53(12) of the Planning Act, which states the following:

> *(12) Powers – A council or the Minister in determining whether a provisional consent is to be given shall have regard to the matters under subsection 51 (24) and has the same powers as the approval authority has under subsection 51 (25) with respect to the approval of a plan of subdivision and subsections 51 (26) and (27) and section 51.1 apply with necessary modifications to the granting of a provisional consent.*

The Powers of the Committee of Adjustment with respect to minor variances are provided by subsection 45 (1) of the Planning Act, which states the following:

> *(1) Powers of committee – The committee of adjustment, upon the application of the owner of any land, building or structure affected by any by-law that is passed under section 34 or 38, or a predecessor of such sections, or any person authorized in writing by the owner, may, despite any other Act, authorize such minor variance from the provisions of the by-law, in respect of the land, building or structure or the use thereof, as in its opinion is desirable for the appropriate development or use of the land, building or structure, if in the opinion of the committee the general intent and purpose of the by-law and of the official plan, if any, are maintained.*

**Arcadis Comment:** Subsection 51 (24) (a) of the Planning Act refers to matters of provincial interest which are listed in subsection 2. These include:

- *the protection of ecological systems, including natural areas, features and functions;*
- *the orderly development of safe and healthy communities;*
- *the adequate provision of a full range of housing, including affordable housing;*
- *the protection of public health and safety;*
- *the appropriate location of growth and development*

The proposed land division has had regard for each of these matters. The proposed land division will not negatively impact existing natural heritage features and functions, as future demolition and construction activities can be managed through standard erosion, sediment control, and management measures (i.e. silt fencing, etc.). Further, due to the existing residential use, portions of the site are already developed and/or cleared (i.e. building footprint, driveway, mowed lawn, etc.). The lands are within the Settlement Area and Built-up Area boundaries for the City; have direct access to a municipal road; can be fully connected to existing municipal water and wastewater systems; and are already zoned and designated for residential use. It is our opinion that the required variance for lot width for the severed lands meets the Planning Act tests for same, as the resulting lot will have adequate width for potential future development, while the proposed mutual access easement will allow access to the Creighton Road ROW while also maintaining actual physical frontage for both parcels.

### 5.2 Provincial Policy Statement

The Provincial Policy Statement 2020 (“PPS”) was issued under Section 3 of the Planning Act and came into effect May 1, 2020. It replaces the PPS issued April 30, 2014 and applies to all decisions in respect of the exercise of any authority that affects a planning matter made on or after this date. Planning decisions are to be consistent with the PPS. Therefore, the proposed application is subject to the PPS, including the following:

**Subsection 1.1 Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns**

***Policy 1.1.1*** *Healthy, liveable and safe communities are sustained by:*

*a) promoting efficient development and land use patterns which sustain the financial well-being of the Province and municipalities over the long term;*

b) *accommodating an appropriate affordable and market-based range and mix of residential types (including single-detached, additional residential units, multi-unit housing, affordable housing and housing for older persons), employment (including industrial and commercial), institutional (including places of worship, cemeteries and long-term care homes), recreation, park and open space, and other uses to meet long-term needs;*

c) *avoiding development and land use patterns which may cause environmental or public health and safety concerns;*

***Sub-Section 1.1.3 – Settlement Areas***

***Policy 1.1.3.1*** *Settlement areas shall be the focus of growth and development.*

***Policy 1.1.3.2*** *Land use patterns within settlement areas shall be based on densities and a mix of land uses which:*

*a) efficiently use land and resources;*

*b) are appropriate for, and efficiently use, the infrastructure and public service facilities which are planned or available, and avoid the need for their unjustified and/or uneconomical expansion;*

**Arcadis Comment:** The subject lands are within the Settlement Area and Built-Up Area boundaries and are within an area of existing residential development. The lands have full access to a municipal roadway and are fully serviced with water and sanitary sewers. The proposed land division will allow the subject lands to be utilized efficiently, such that future dwellings could be located within the developable area of each lot. This will assist in creating additional ownership options for residential land and uses.

**Section 2.1 Natural Heritage**

***Policy 2.1.1*** *Natural features and areas shall be protected for the long term.*

***Section 3.1 Natural Hazards***

***Policy 3.1.1*** *Development shall generally be directed, in accordance with guidance developed by the Province (as amended from time to time), to areas outside of:*

*a) hazardous lands adjacent to the shorelines of the Great Lakes - St. Lawrence River System and large inland lakes which are impacted by flooding hazards, erosion hazards and/or dynamic beach hazards;*

*b) hazardous lands adjacent to river, stream and small inland lake systems which are impacted by flooding hazards and/or erosion hazards; and*

*c) hazardous sites.*

**Arcadis Comment:** As shown on the submitted consent sketch, the hazard area associated with the valley land which contains the small creek has been technically delineated. This delineation is based on the site-specific Geotechnical and Slope Stability assessment completed by TerraProbe (August 13, 2023; Revision date October 13, 2023). This assessment determined the long-term stable top of bank, then applied a standard 6 m erosion access allowance, providing a resulting potential developable area. The proposed land division will create two lots with roughly equal amounts of potential developable area outside of this hazard delineation. Importantly, the existing dwelling, deck, pool etc., which are all within the delineated hazard area, will be removed, and thus the proposed land division and developable area delineation will create an improvement over existing conditions. At the rear of the site, the proposed internal lot line follows the curvature and delineation of the developable area limit, so that there is no fragmentation of lands within a hazard area.

### 5.3 Growth Plan for the Greater Golden Horseshoe

A Place to Grow, the Growth Plan for the Greater Golden Horseshoe ("Growth Plan") provides the framework for implementing the Government of Ontario's vision for building stronger, prosperous communities by better managing growth in the region to 2051. Section 5(b) of the Planning Act requires decisions that affect planning matters shall conform to provincial plans, including the Growth Plan, or shall not conflict with them. The proposed application is subject to the Growth Plan, including the following:

***Section 2.2 Policies for Where and How to Grow***

***Sub-Section 2.2.1 Managing Growth***

***Policy 2.*** *Forecasted growth to the horizon of this Plan will be allocated based on the following:*

*a) the vast majority of growth will be directed to settlement areas that:*

*i. have a delineated built boundary;*

*ii. have existing or planned municipal water and wastewater systems; and*

*iii. can support the achievement of complete communities;*

*c) within settlement areas, growth will be focused in:*

*i. delineated built-up areas;*

***Sub-Section 2.2.6 Housing***

***Policy 1****. Upper-and single-tier municipalities, in consultation with lower-tier municipalities, the Province, and other appropriate stakeholders, will:*

*a) support housing choice through the achievement of the minimum intensification and density targets in this Plan, as well as the other policies of this Plan by:*

*i. identifying a diverse range and mix of housing options and densities, including additional residential units and affordable housing to meet projected needs of current and future residents; and*

*ii. establishing targets for affordable ownership housing and rental housing;*

**Arcadis Comment:** The subject lands are within a Settlement Area and the Built-up Area. The lands are already designated and zoned to permit residential uses, including a range of housing typologies (i.e. single, semi-detached, triplex, etc.). The lands are serviced by existing municipal infrastructure and have frontage on and direct access to the public right-of-way for Creighton Road. The proposed land division will create additional options for housing ownership, which will contribute, in a minor way, to achieving housing and intensification targets and providing housing choice in tenure and location.

### 5.4 Urban Hamilton Official Plan

The subject lands are designated "Neighbourhoods" within Schedule E - Urban Structure and Schedule E-1 - Urban Land Use Designations of the Urban Hamilton Official Plan ("UHOP"). Chapter E Section 3.0 states the intent of the designation "is to describe neighbourhood functions, identify appropriate scales of development and design requirements for various land uses, and allow for the continued evolution of neighbourhoods". **Figures 4 & 5** provide excerpts from the UHOP, confirming the Neighbourhoods designation and that the lands are adjacent to/traversed

by a hydrologic feature (i.e. creek). The site is subject to the Neighbourhoods policies as well as the lot creation policies of the UHOP.

**3.4 Low Density Residential**

**Function**

***Policy E 3.4.1*** *The preferred location for low density residential uses is within the interior of neighbourhoods.*

***Policy E 3.4.2*** *Low density residential areas are characterized by lower profile, grade-oriented built forms that generally have direct access to each unit at grade.*

***Policy E 3.4.3*** *Uses permitted in low density residential areas: a) shall include single-detached, semi-detached, duplex, triplex, fourplex, and street townhouse dwellings; and, (OPA 167)*

*b) may include multiple dwellings containing a maximum of 6 units for lots in proximity to collector roads or arterial roads (OPA 167)*

***Scale***

***Policy E 3.4.4*** *For low density residential areas the maximum net residential density for the purpose of estimating unit yield and/or population growth, as part of the preparation of Secondary Plans, Special Policy Areas, Infrastructure Master Plans and Community Plans shall be 60 units per hectare. (OPA 167)*

***Policy E 3.4.5*** *For low density residential areas, the maximum height shall be three storeys.*


*Figure 4 - Excerpt of Schedule E-1 Urban Land Use Designations from the UHOP*

***1.14.3 Lot Creation – Urban Area***

***Neighbourhoods Designation***

***Policy F - 1.14.3.1*** *Consents for new lot creation, for both the severed and retained lands, for residential uses in the Neighbourhoods designation shown on Map E-1 – Urban Land Use Designation, shall be permitted provided the following conditions are met:*

*a) The lots comply with the policies of this Plan, including secondary plans, where one exists;*

*b) Deleted by OPA 167, MMAH Mod. 39, subsequent policies renumbered.*

*b) The lots are in conformity with the Zoning By-law or a minor variance is approved;*

*c) The lots reflect the general scale and character of the established development pattern in the surrounding area by taking into consideration lot frontages and areas, building height, coverage, mass, setbacks, privacy and overview;*

*d) The lots are fully serviced by municipal water and wastewater systems; and,*

*e) The lots have frontage on a public road.*

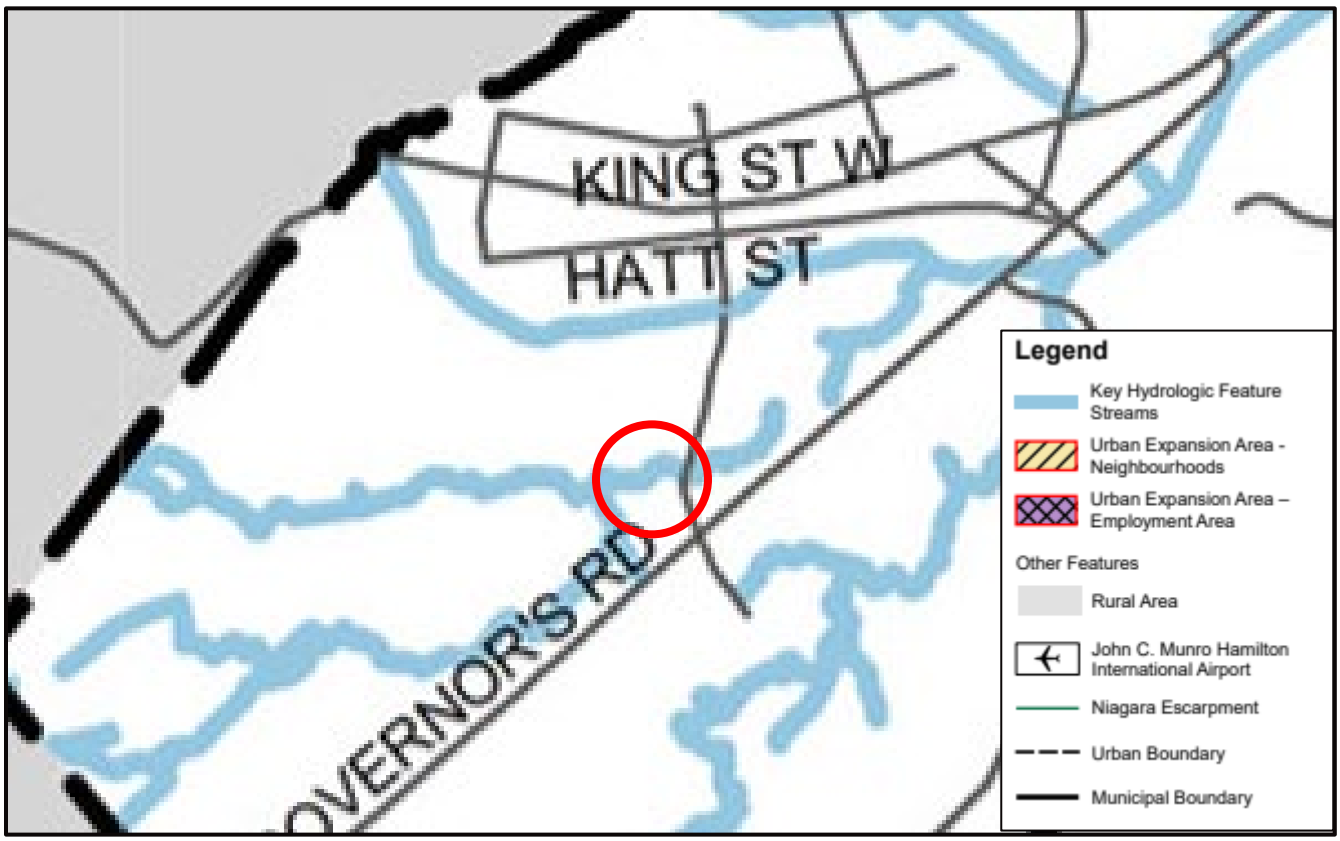



*Figure 5 - Excerpt of Schedule B-8 Detailed Natural Heritage Features Streams from the UHOP*

As seen in **Figure 6**, the subject lands are within the Dundas Two Zone Floodplain Special Policy Area (UD-1). Volume 3, Chapter B – Dundas Area Specific Policies Section 1.0 outlines the following:

*Council recognizes the inherent dangers to development in areas subject to flooding and the constraints required to minimize the loss of life and property. Accordingly, the following policies shall apply within the floodplain area shown on Map D-1 as Area Specific UD-1:*

a) *It is the intent of Council to limit development within the floodplain areas defined by the Hamilton Conservation Authority, of Spencer, Ann and Sydenham Creeks. In this regard, policies a) through i) shall apply to floodplain areas identified from time to time as floodway or flood fringe by the Conservation Authority in consultation with the City.*

b) *Where a proposal is made for development or redevelopment within or in proximity to UD-1, the City shall request the proponent to contact the Hamilton Conservation Authority to determine if and what flood protection measures are necessary, or other limitations to development.*

c) *It is intended the floodway be kept unobstructed, and free of all structures or the placement of fill.*

d) *Notwithstanding Policy 1.0 c), existing and similar uses otherwise complying with the intent of this Plan shall be appropriately zoned in the implementing Zoning By-law. However, extensions and enlargements of these uses shall not be permitted within the floodway.*

e) *It is the intent of Council that limited development may be permitted within the flood fringe subject to protection from flooding. In this regard such protection shall include the placement and stabilization of fill to or above the limit of the flooding, identified by the Hamilton Conservation Authority, floodproofing, or a combination of both.*

f) *Residential development may be permitted, in accordance with Volume 1 of this Plan, within the flood fringe subject to the placement and stabilization of fill to, or above the limit of flooding identified by the Hamilton Conservation Authority.*

g) *Non-residential development within the flood fringe area may be permitted on the basis of limited or no fill and subject to adequate flood proofing.*

h) *Paved day-use parking lots may be permitted within the flood fringe without the necessity of flood protection measures.*

*The boundaries of this Area Specific Policy Area are approximate and shall be confirmed by the Hamilton Conservation Authority during the review of applications for development regulations of the Conservation Authority (emphasis added).*


*Figure 6 - Excerpt of Map D-1 Dundas Area Specific Policies from the UHOP*

**Arcadis Comment:** The creek feature that traverses the site is identified on Schedule B – Natural Heritage System as a Key Hydrologic Feature – Stream. The severance application will not negatively affect this feature nor its function, as there is no physical development proposed or change in land use being requested. The feature is in a valley where development is not permitted. The submitted consent sketch shows the extent of potential developable area, which is well outside the boundaries of the valley. This developable area has been established based on the site-specific Geotechnical and Slope Stability Assessment completed by TerraProbe. The findings of this report have been reviewed and generally accepted by Hamilton Conservation Authority ("HCA") staff on an informal pre-consultation review basis. Future demolition and removal of the existing dwelling, structures etc. and any future construction should follow current practices with respect to sediment and erosion control, construction management etc., and may require a permit from the HCA.

With respect to land use and built form, the Neigbourhoods designation permits a range of dwelling types, for example in the Low Density Residential categorization which includes single detached, semi-detached, duplex and triplex dwellings to a maximum density of 60 Units Per Net Hectare. In this case, as no physical development is yet proposed, but noting that there is contemplation for one single detached dwelling per lot, the proposed density of this outcome would equate to approximately 8 units per hectare. Future development on the lands will be subject to applicable zoning and/or may be permitted through other planning approvals (i.e. minor variance).

### 5.5 Town of Dundas Zoning By-law 3581-86

The Town of Dundas Zoning By-law 3581-86 (the "Zoning By-law) zones the subject lands as Single Detached Residential (R2-FP).

The permitted uses of the R2 Zone, outlined in Section 9.1 of the Zoning By-law, are as follows:

- *A Single-Detached Dwelling*
- *A Retirement Home*
- *A Bed and Breakfast Establishment*
- *Accessory Buildings, Structures and Uses*
- *Urban Farm*
- *Community Garden*
- *A Semi-Detached Dwelling*
- *A Duplex Dwelling*
- *A Street Townhouse Dwelling*

The regulations for single-detached dwellings and duplex dwellings, outlined in Section 9.2 of the Zoning By-law are as follows:

*9.2.1 <u>Area Requirements</u>*

*9.2.1.1 Lot Area: Minimum 450.0 square metres*

*9.2.1.2 Lot Frontage: Minimum 15.0 metres*

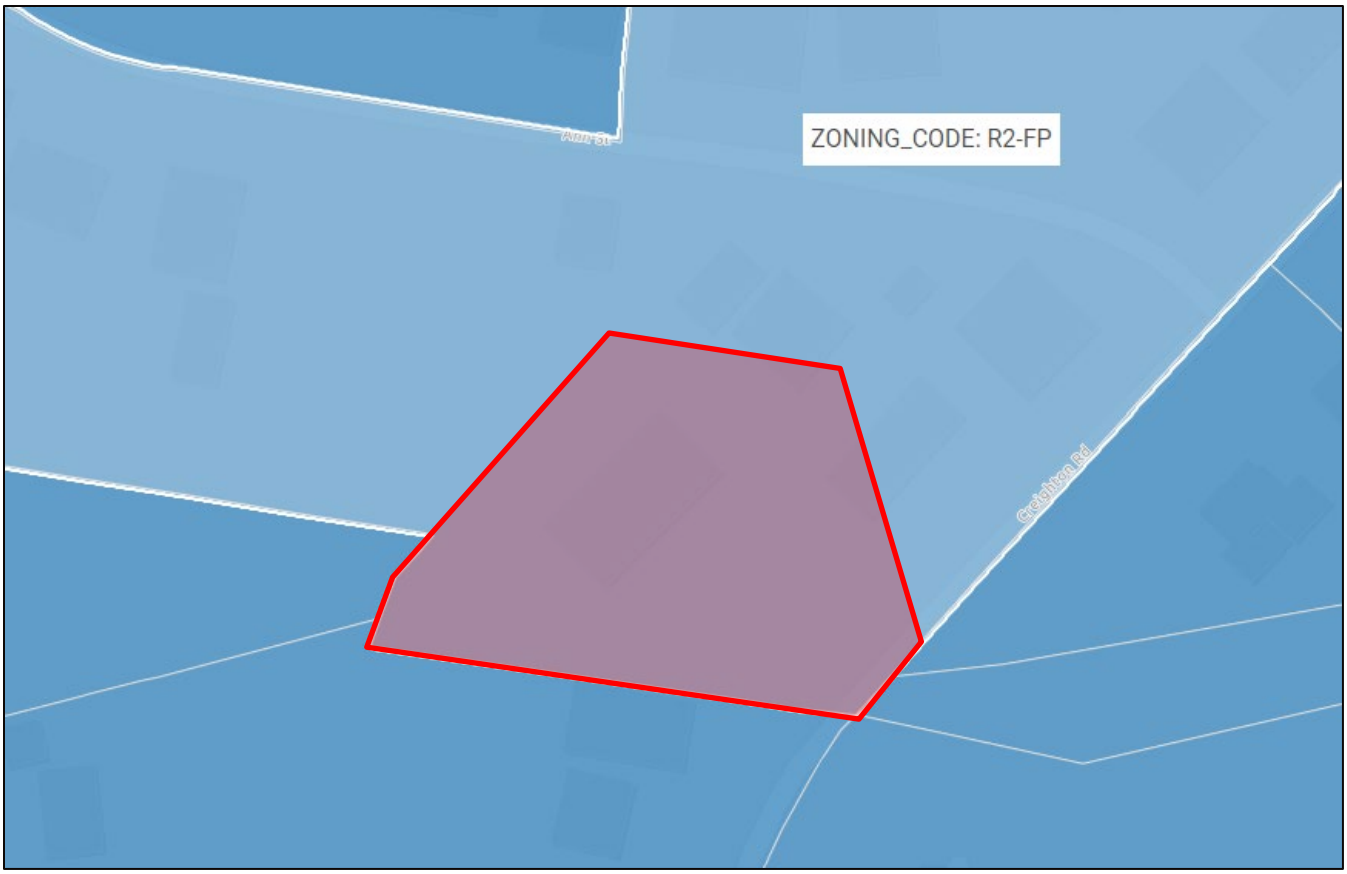



*Figure 7: Zoning of the subject lands, retrieved from the City of Hamilton Interactive Zoning Mapping*

**Arcadis Comment:** The proposed lots both exceed the minimum requirement for lot area. Further, the retained lands exceed the lot width. As required by the By-law, due to the non-parallel side lot lines, lot width has been measured at 6 m back from and parallel to Creighton Road. The proposed severed lands require a variance to lot width due to the constraints imposed by the existing driveway access and the adjacent creek. This issue is addressed by the proposed mutual access easement, such that the lot will have physical frontage on Creighton Road as well as legal access.

## 6.0 Hamilton Conservation Authority

Parts of the subject lands are covered by the approximate regulated area of the HCA, as illustrated in **Figure 8** below.

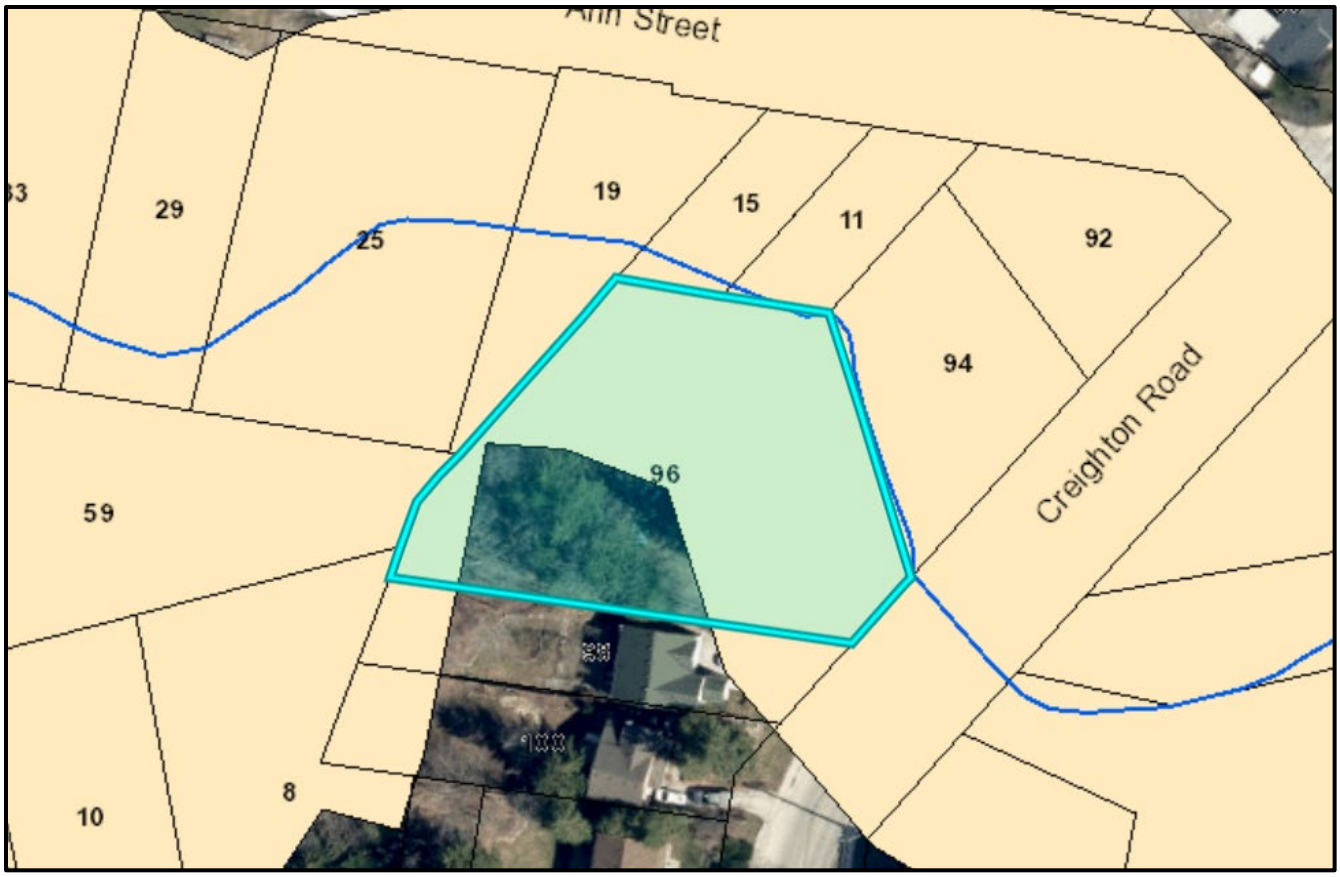



*Figure 8 - Excerpt from Hamilton Conservation Authority Approximate Regulated Area Online Map*

The potential natural hazard of issue is not the flood plain but rather the erosion hazard associated with the confined creek. No new development is permitted within either the erosion hazard or the required 6 m access allowance. This erosion hazard has been assessed and delineated through the site-specific Geotechnical and Slope Stability Assessment completed by TerraProbe. The delineated hazard area and 6 m erosion access offset are drawn on the consent sketch. The proposed new lot line dividing the subject lands follows the 6 m offset line, where required, so that there is no fragmentation land ownership within the hazard area. This also allows a roughly equal amount of potentially developable area for both parcels, within the constraints of the site. We note that the TerraProbe report was provided to HCA staff on an informal pre-consultation basis, and HCA advised of general acceptance of the findings, subject to minor comments within. It was also acknowledged by HCA staff that removing the existing dwelling etc. would be an improvement over existing conditions with respect to possible hazard impacts. It is expected that future physical development would require either an HCA permit or a letter of permission, to address issues of grading, drainage, foundation location, etc. This process would be required at the time of development proposal, prior to a building permit being issued.

## 7.0 Conclusion and Recommendations

The proposed development conforms to, is consistent with, and/or maintains the intent and purpose of the applicable planning policy and legislative documents and is compatible with the existing neighbourhood. The Committee of Adjustment has power under subsection 53(12) to make decisions with respect to land division. Also, under subsection 45(1) the Committee of Adjustment has the powers to make decisions with respect to minor variances to the Zoning By-law. In doing so, the Committee must find the proposed development represents good

planning principles and does not introduce any adverse impacts, through the application of the four tests. It is our opinion that the proposed development conforms to all these requirements and the applications should be approved.

Sincerely,
Arcadis Professional Services (Canada) Inc.

Mike Crough MCIP RPP
Principal - Planning

Terraprobe
*Consulting Geotechnical & Environmental Engineering*
*Construction Materials Inspection & Testing*

# GEOTECHNICAL INVESTIGATION AND ENGINEERING REVIEW OF SLOPE STABILITY 96 CREIGHTON ROAD DUNDAS, ONTARIO

**Prepared For:** Constructology Inc.
96 Creighton Road
Dundas, ON

Attention: Ms. Stephanie Freeman

File No. 02210465.000
Revision 1: October 13, 2023
Dated: August 23, 2023


**Distribution**:

1 copy (pdf): Constructology Inc.
1 copy: Terraprobe Inc., Stoney Creek

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# 1.0 INTRODUCTION

Terraprobe Inc. was retained by Constructology Inc. to carry out a geotechnical investigation and engineering review of slope stability at 96 Creighton Road, Dundas (Hamilton), Ontario. A proposal and cost estimate to carry out the assessment were provided in our letter of June 22, 2023. Authorization to proceed with the work was provided by Stephanie Freeman of Constructology Inc. on July 5, 32023. It is understood that the geotechnical assessment will be required as part of the permitting process for the proposed redevelopment of the property.

The purpose of the work was to investigate and report on the subsurface soil and ground water conditions in a series of boreholes drilled at the site. Based on this information, a slope stability assessment was completed to evaluate the erosion hazard limit. The geotechnical assessment was completed to satisfy the intents of the guidelines outlined in the document entitled '*Technical Guide – River and Stream Systems: Erosion Hazard Limits*' (Ministry of Natural Reysources, 2001) and the document entitled '*Hamilton Conservation Authority Planning & Regulation Policies and Guidelines*' (Hamilton Conservation Authority, October 6 2011).

Advice has also been provided with respect to the geotechnical design aspects of the proposed development, including recommendations for foundation design and floor slabs-on-grade. The anticipated construction conditions pertaining to excavation, backfill and temporary ground water control are discussed also, but only with regard to how these might influence the design.

# 2.0 SITE DESCRIPTION

## 2.1 Existing Site Conditions

The site was examined by a senior geotechnical engineer from our staff on August 3, 2023 in order to obtain general information regarding the existing slope features such as slope profile, slope drainage, water course features, vegetation cover and structures in the vicinity of the slope. Photographs illustrating the various features of the study area are provided in Appendix A. The general arrangement of the site is shown on Figure 2.

The property is located on tableland adjacent to the southwest valley slope of an existing ravine, associated within the Middle Spencer Creek Watershed Area. Development on the property consisted of a single-family dwelling (Photographs 1 to 3). The land surrounding the dwelling consisted mostly of manicured lawn, shrubs and a few large mature trees. Auxiliary structures include storage sheds, a stone retaining wall, and an inground swimming pool (Photographs 4 to 6).

Based on the topographic survey prepared by AK&M Surveying Inc., OLS; the valley slope is about 7 to 8 m high and has an approximate inclination of about 1.4 to 2.0 horizontal: 1 vertical. No obvious indications of deep seated slope distress were observed. The overall slope appeared to be in a stable condition (Photographs 7 and 8). There is a upper slope area along the west property boundary, which has an approximate inclination of 1.6 to 9.2 horizontal: 1 vertical (Photograph 9). At the toe of the slope there was a shallow watercourse about 2 to 4 m wide, and formed in clayey silt till. The flow of the creek was observed to be relatively shallow at the time of our site inspection (Photograph 10 and 11). Active erosion along the creek bank was not evident. It is also noted that a portion of the water course is channelized in an existing culvert (Figures 1 and 2; Photograph 12). Figures 2 and 3, present representative cross-sections of the valley slope, Section A-A', B-B', C-C' and D-D'.

## 2.2 Site Geology

Based on published geological information for the general area of the site, the near surface overburden soil at and in the vicinity of the subject property consists of Pleistocene Age Late Wisconsinan Halton Till: clay or silt till.[1] Beneath the overburden deposits is bedrock of the Queenston Formation of Silurian Age.[2] The Queenston Formation consists of reddish-brown shale, interbedded with limestone and calcareous sandstone. The geological mapping and regional well records indicated that the bedrock beneath the site is about 50 to 80 metres below existing grade.[3]

## 2.3 Slope Stability Rating - Valley Slope

The above information was used to complete the Slope Stability Rating Chart as shown in Table 4.2 of the Technical Guide of the River and Stream Systems: Erosion and Hazard Limit, by the Ontario Ministry of Natural Resources (MNR Guide). The results of the rating are shown in the attached Table 1. A slope stability rating of 26 has been indicated for the site. The MNR guidelines indicate a "moderate potential" for unstable slopes for sites with a rating in the range of about 40 and 43. The guideline indicates that a site inspection, boreholes, surveying and a detailed report would be required to assess the stability of the slope for sites with this rating. The present assessment is consistent with the level of effort recommended in the MNR Guidelines.

## 2.4 Proposed Development

Specific details regarding the proposed development and the like are not known at this time, however it is understood that the development presently under consideration would include a new single detached residential dwelling.

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1 *Quaternary Geology of the Hamilton Area, Southern Ontario*; Ontario Division of Mines; Map No. 2605; 1983.

2 *Paleozoic Geology, Hamilton Area, Southern Ontario*; Ontario Division of Mines; Map No. 2336; 1976.

3 *Bedrock Topography of the Hamilton Area, Southern Ontario*; Ontario Department of Mines; Map No. 2034; 1964.

## 3.0 PROCEDURE

The field work for this investigation was carried out on August 3, 2023, during which time three (3) boreholes were drilled to depths of about 5.0 to 9.6 metres below the existing ground surface (m BGS). The locations of the boreholes are shown on the Site Plan, Figure 2. The results of the boreholes are shown on the Log of Borehole sheets presented in Appendix B.

The field work was observed throughout by members of our engineering staff who located the boreholes, arranged for the underground utility locates at the borehole locations, observed the drilling, and cared for the samples obtained. The boreholes were located in the field with respect to the site features shown on a site survey of the property. The ground surface elevations at the boreholes were inferred from spot elevations shown on a topographic plan prepared by AK&M Surveying Inc., OLS, which was understood to have been referred to the Canadian Geodetic Datum (CGD). The ground water conditions were observed in the boreholes as drilling proceeded. No provision was made for long term ground water monitoring at the site.

The boreholes were carried out using a track mounted drill rig “mini mole” supplied and operated by a specialist drill contractor. The soil samples were recovered at regular intervals of depth by split barrel sampling in accordance with ASTM Standard D1586. Upon completion of drilling, the boreholes were decommissioned and sealed with bentonite pellets in accordance with Ontario Regulation 903.

Ground water observations were made in the open borehole during and upon the completion of drilling. No provision was made for long-term ground water monitoring at the site.

All of the samples recovered in the course of the investigation were brought to our Stoney Creek laboratory for further examination and water content determinations. The results of water content determinations are shown on the Log of Borehole sheets in Appendix B.

## 4.0 SUBSURFACE CONDITIONS

The subsurface soil and ground water conditions encountered in the boreholes, and the results of the field and laboratory testing, are shown on the Log of Borehole sheets in Appendix B. A list of abbreviations and symbols are provided to assist in the interpretation of the borehole logs. It should be noted that the boundaries between the strata have been inferred from drilling observations and non-continuous samples. They generally represent a transition from one soil type to another and should not be inferred to represent exact planes of geological change. Further, conditions will vary beyond the locations investigated.

## 4.1 Soil Conditions

The following discussion has been simplified in terms of the major soil strata. In general, the boreholes drilled at the site penetrated shallow fill overlying clayey silt till.

### 4.1.1 Fill

The fill generally consisted of sandy silt or clayey silt, with traces of rootlets. The N values determined within the fill ranged from 4 to 8 blows per 0.3 m, inferring a loose state of packing. The in-situ water content of the fill samples ranged from about 19 to 21 percent.

### 4.1.2 Clayey Silt Till

The boreholes penetrated clayey silt till beneath the fill to depths of about 5.0 to 9.6 m BGS. As is typical of till deposits, the clayey silt contained embedded sand and gravel. The N values in the till ranged from 4 to 22 blows per 0.3m, inferring a firm to very stiff consistency. The natural water content of the clayey silt till ranged from about 19 to 21 percent. It should be noted that larger particle sizes (i.e., cobbles and boulders) are commonly encountered in glacial till deposits and are also likely to be present in the clayey silt till deposit at this site, although not specifically indicated in the borehole logs.

## 4.2 Ground Water Conditions

Ground water level observations were made in each of the boreholes as they were drilled and after completion of drilling, as noted on the enclosed borehole logs. All of the boreholes were dry during and upon completion of drilling. It should be noted that the conditions reported above may not necessarily represent stabilized conditions or the ground water conditions which will be encountered during construction. The ground water levels will vary due to seasonal effects and precipitation conditions.

# 5.0 EROSION HAZARD LIMIT

An erosion hazard means the potential loss of land, due to human or natural process, that pose a threat to life and property. The erosion hazard limit for river and stream systems is determined based on the potential for creek bank erosion to impact on the stability of the slope (toe erosion allowance), the stability of the slopes (stable slope allowance), and a need for access during emergencies (erosion access allowance). The following presents an assessment of each component to determine the erosion hazard limit:

## 5.1 Toe Erosion Allowance

A toe erosion allowance is recommended in areas where the water course position is within 15 m to the slope toe. A guideline table recommended for estimating the erosion allowance is presented as follows:

**MINIMUM TOE EROSION ALLOWANCE - River within 15 m of Slope Toe ***

| Type of Material | Evidence of active erosion** or bankfull flow velocity > competent flow velocity** | No evidence of active erosion** or flow velocity << competent flow velocity*** | | |
|---|---|---|---|---|
| | | Bankfull Width | | |
| | | < 5 m | 5 - 30 m | > 30 m |
| 1. Hard Rock (granite) | 0 - 2 m | 0 m | 0 m | 1 m |
| 2. Soft Rock (shale, limestone) Cobbles, Boulders | 2 - 5 m | 0 m | 1 m | 2 m |
| 3. Stiff/Hard Cohesive Soil (clays, clayey silt) | 5 - 8 m | 1 m | 2 m | 4 m |
| 4. Soft/Firm Cohesive Soil Fine Granular (sand, silt) Fills | 8 - 15 m | 1 - 2 m | 5 m | 7 m |

Notes:

** Active Erosion is defined as: bank material is bare and exposed directly to stream flow under normal or flood flow conditions and, where undercutting, over steepening, slumping of a bank or high down stream sediment loading is occurring. An area may be exposed to river flow but may not display “active erosion” (i.e. is not bare or undercut) either as a result of well rooted vegetation or as a result of shifting of the channel or because flows are relatively low velocity. The toe erosion allowances presented in the right half of Table 2 are suggested for sites with this condition.

*** Competent Flow velocity; the flow velocity that the bed material in the stream can support without resulting in erosion or scour.

Consideration must also be given to potential future meandering of the watercourse channel.

Source: “*Geotechnical Principles for Stable Slopes*” (Terraprobe, June 1998), prepared for: Ontario Ministry of Natural Resources, Lands and Natural Heritage Branch

In consideration of the prevailing site conditions, as described in Section 2.0, a minimum erosion allowance of 1 m is recommended.

## 5.2 Stable Slope Allowance

A detailed engineering analysis of slope stability was carried out for a selected slope cross-section utilizing a commercially available slope stability program Rocscience - Slide 6.0. The slope stability assessment was based on an effective stress limiting equilibrium analysis for long term slope stability using Spencer, Simplified Bishop and Morgenstern-Price methods. The methods of analysis allow for the calculation of Factors of Safety for hypothetical or assumed failure surfaces through the slope. The analysis method is used to assess potential for movements of large masses of soil over a specific failure surface which is often curved or circular.

For a specific failure surface, the Factor of Safety is defined as the ratio of available strength resisting movement, divided by the gravitational forces tending to cause movement. The Factor of Safety of 1.0 represents a 'limiting equilibrium' condition where the slope is at the point of pending failure since the soil resistance is equal to the forces tending to cause movement. The analysis involves dividing the sliding mass into many thin slices and calculating the forces on each slice. The normal and shear forces acting on the slides and base of each slice are calculated. It is an iterative process that converges on a solution.

The typical Factor of Safety used for engineering design of slopes for stability in building applications, ranges from about 1.3 to 1.5. The Ministry of Natural Resources (MNR) Policy Guidelines allow a minimum Factor of Safety for slope stability as follows:

| TYPE | LAND-USES | DESIGN MINIMUM FACTOR OF SAFETY |
|---|---|---|
| A | PASSIVE: no buildings near slope; farm field, bush, forest, timberland, woods, wasteland, badlands, tundra | 1.1 |
| B | LIGHT: no habitable structures near slope; recreational parks, golf courses, buried small utilities, tile beds, barns, garages, swimming pools, sheds, decks, satellite dishes, dog houses | 1.20 to 1.30 |
| C | ACTIVE: habitable or occupied structures near slopes; residential, commercial, and industrial buildings, retaining walls, storage/warehousing of non-hazardous substances | 1.30 to 1.50 |
| D | INFRASTRUCTURE and PUBLIC USE: public use structures and buildings (i.e. hospitals, schools, stadiums), cemeteries, bridges, high voltage power transmission lines, towers, storage/warehousing of hazardous materials, waste management areas | 1.40 to 1.50 |

HCA policies are based on a minimum Factor of Safety of 1.5 for development applications.

The following average soil properties were assumed for the soil strata in the slope stability analysis.

| Stratigraphic Unit | Unit Weight (kN/cu.m) | Effective Shear Resistance, c' (kPa) | Effective Angle of Internal Friction φ' (degrees) |
|---|---|---|---|
| FILL, clayey to sandy silt, loose | 18 | 0 | 28 |
| CLAYEY SILT TILL, firm to very stiff | 19 | 2 | 34 |

The above soil strength parameters were based on effective stress analysis for long-term slope stability. In addition, piezometric surface was incorporated in the analyses to simulate elevated groundwater conditions. The slope at Section A-A' was selected for the analysis since it was considered the most critical section in the study area. Graphical depictions of the slope stability analysis results are presented in Appendix C and are summarized in the following table:

| Slope Conditions Analysed | Minimum Factor of Safety by Method | | |
|---|---|---|---|
| | Bishop Simplified | Spencer | Morgenstern-Price |
| Stable Slope Analyses - Section A-A' Assumed Stable Slope Profile of 1.8H:1V under elevated groundwater conditions | 1.484 | 1.483 | 1.480 |
| Existing Slope Section A-A' Figure 2; 1.4H:1V | 1.233 | 1.235 | 1.230 |
| Existing Slope Section B-B' Figure 2; 2H:1V; Channelized Culvert | 1.470 | 1.467 | 1.460 |
| Existing Slope Section C-C' Figure 3; 1.6H:1V | 1.388 | 1.384 | 1.383 |
| Existing Slope Section D-D' Figure 3; 1.7H:1V | 1.410 | 1.412 | 1.412 |

Based on the results of the analyses, it is our opinion that a stable slope profile of 1.8 horizontal to 1 vertical for long-term conditions would be appropriate for the slope. The location of the long-term stable top of slope, determined on this basis is shown on Figures 1, 2 and 3. The results also indicate that the existing slopes have a minimum factor of safety ranging from about 1.23 to 1.47.

## 5.3 Regulatory Setback

HCA requires an additional setback from the long term stable top of slope. The intent is to control top of bank land use that could potentially impact slope stability and to ensure that future development is not impacted by slope deformations. This setback also provides a means of access to the slope. Policies for this component of the setback have been established by HCA in the document '*Hamilton Conservation Authority Planning & Regulation Policies and Guidelines*' (Hamilton Conservation Authority, October 6 2011). The policies that pertain specifically to new development or redevelopment on the property are outlined under Policy #2.1.2.1.1, where it is stated:

*'The authority requires a minimum 6.0 m erosion access allowance, where possible, from the Authority approved top of slope for any development and/or site alteration. This includes swimming pools, sub-surface sewage disposal systems and the placement of fill. Wherever possible, existing vegetation should be maintained in the setback areas.'*

It should be noted that there is an existing driveway situated within the erosion hazard, as defined by a minimum factor of safety of 1.5, as reported above. It is understood that the owner has a preference to maintain the driveway at its present location due to on-site constraints. It is also considered that land usage within the development setback that consists of flexible pavements would still achieve the intents of the setback, provided that the construction does not result in significant filling (i.e., the serviceability of the pavement would not be reduced by minor ground deformation and access of the slope would not be impeded). Based on the results of the analyses, it is our opinion that the driveway at its present location will not adversely affect the long-term stability of the slope. The existing slopes at Section C-C' and D-D' have a minimum factor of safety in the range of 1.38 to 1.41.

# 6.0 GEOTECHNICAL DESIGN

The following discussion is based on our interpretation of the factual data obtained during this investigation and is intended for the use of the design engineer only. Comments made regarding the construction aspects are provided only in as much as they may impact on preliminary design considerations. Contractors bidding on or undertaking any work at the site should examine the factual results of the investigation, satisfy themselves as to the adequacy of the information for construction and make their own interpretation of the factual data as it affects their proposed construction techniques, schedule, equipment capabilities, costs, sequencing and the like.

This report is provided on the basis of these terms of reference and on the assumption that the design features relevant to the geotechnical analyses will be in accordance with applicable codes, standards and guidelines of practice. The pertinent sections of the Ontario Building Code (2012) may require additional considerations beyond the recommendations provided in this report and should be referred. If there are any changes to the site development features, or if there is any additional information relevant to the interpretations made of the subsurface information with respect to the geotechnical analyses or other recommendations, then Terraprobe should be retained to review the implications of these changes with respect to the contents of this report.

## 6.1 Foundations

Boreholes 1 and 2 were located within the approximate area where new building development might be considered. The boreholes penetrated shallow fills to depths of up to 0.9 m BGS, overlying a stratum of clayey silt till. Based on the results of the boreholes it is considered feasible to support the building foundations on conventionally designed spread or strip footings bearing in the undisturbed clayey silt till. The existing fill is unsuitable for the support of building foundations.

All foundations designed to bear on the undisturbed silty sand can be designed using a factored bearing resistance at Ultimate Limit States (ULS) of 225 kPa and a bearing reaction of 150 kPa at Serviceability

Limit States (SLS). Higher design bearing resistances are feasible; however any change to the design bearing resistance given above should be discussed with our office.

It is recommended that the minimum footing width for strip footings be 500 mm, and a minimum footing width of 900 mm be used for the design of spread footings. All spread footing foundations exposed to freezing temperatures must be provided with a minimum of 1.2 metres of earth cover for frost protection or alternative equivalent insulation. If construction proceeds during freezing weather conditions, adequate temporary frost protection for the footing bases and concrete must be provided.

Some variability in the consistency and depth of the native undisturbed strata is expected. Deeper excavations may be required locally and for this reason, it is important that all of the foundation excavations be inspected by a geotechnical engineer to confirm that the surficial strata has been fully penetrated and to identify any preparatory work required prior to placing the footing concrete. Where deeper excavations are required, the footings should be lowered in a series of steps with maximum vertical increments of 600 mm and with a rise to run ratio of 1:2.

## 6.2 Seismic Design Parameters

Under Ontario Regulation 88/19, the ministry amended Ontario's Building Code (O. Reg 332/12) to further harmonize Ontario's Building Code with the 2015 National Codes. These changes are intended to help reduce red tape for businesses and remove barriers to interprovincial trade throughout the country. The amendments are based on code change proposals the ministry consulted in 2016 and 2017. The majority of the amendments came into effect on January 1, 2020, which includes structural sufficiency of buildings to withstand external forces and improve resilience.

Seismic hazard is defined in the 2012 Ontario Building Code (OBC 2012) by uniform hazard spectra (UHS) at spectral coordinates of 0.2 s, 0.5 s, 1.0 s and 2.0 s and a probability of exceedance of 2% in 50 years. The OBC method uses a site classification system defined by the average soil/bedrock properties (e.g., shear wave velocity (vs), Standard Penetration Test (SPT) resistance, and undrained shear strength (su)) in the top 30 meters of the site stratigraphy below the foundation level, as set out in Table 4.1.8.4A of the Ontario Building Code (2012). There are 6 site classes from A to F, decreasing in ground stiffness from A, hard rock, to E, soft soil; with site class F used to denote problematic soils (e.g. sites underlain by thick peat deposits and/or liquefiable soils). The site class is then used to obtain peak ground acceleration (PGA), peak ground velocity (PGV) site coefficients Fa and Fv, respectively, used to modify the UHS to account for the effects of site-specific soil conditions.

Based on the above noted information, it is recommended that the site designation for seismic analysis be 'Site Class C', as per Table 4.1.8.4.A of the Ontario Building Code (2012).

The values of the site coefficient for design spectral acceleration at period T, F(T), and of similar coefficients F(PGA) and F(PGV) shall conform to Tables 4.1.8.4.B. to 4.1.8.4.I of the OBC 2012, as amended January 1, 2020, using linear interpolation for intermediate values of PGA.

## 6.3 Floor Slabs on Grade

The subgrade at the lowest floor level is expected to be a clayey silt till stratum, which is capable of supporting a conventional lightly loaded slab on grade. The moduli of subgrade reaction appropriate for slab on grade design on the aforementioned soils are as follows:

- clayey silt till: 30,000 kPa/m

The exposed subgrade should be inspected by the geotechnical engineer, to identify any loose or weak zones requiring remedial work (i.e., recompaction of the existing subgrade prior to placing the underfloor fill materials and local sub excavation of weak soils). The sub-excavated areas may be restored using select excavated soil from the site or imported OPSS Type 1 Granular B.

All slabs on grade should be structurally separate from foundation walls and columns. Saw cut control joints should be incorporated into the slabs along column lines and at regular intervals. Interior load bearing walls should not be founded on the slab but on spread footings as outlined above.

## 6.4 Lateral Earth Pressures

Walls subject to unbalanced earth pressures must be designed to resist a pressure that can be calculated based on the following equation:

$$P = K[\gamma (h-h_w) + \gamma' h_w + q] + \gamma_w h_w$$

where,
**P** = the horizontal pressure at depth, **h** (m)
**K** = the earth pressure coefficient,
$h_w$ = the depth below the ground water level (m)
$\gamma$ = the bulk unit weight of soil, ( kN/m$^3$ )
$\gamma'$ = the submerged unit weight of the exterior soil, ( $\gamma$ - 9.8 kN/m$^3$ )
**q** = the complete surcharge loading (kPa)

Where the wall backfill can be drained effectively to eliminate hydrostatic pressures on the wall, acting in conjunction with the earth pressure, this equation can be simplified to:

$$P = K[\gamma h + q]$$

The above equation assumes that free draining granular backfill such as OPSS 1010 Granular B Type I, is used and positive drainage is provided to ensure that there will be no hydrostatic pressure acting on the walls in conjunction with the earth pressure.

### 6.4.1 Foundation Walls

The appropriate values for use in the design of structures subject to unbalanced earth pressures at this site are tabulated as follows:

| Stratum/Parameter | φ | γ | Ka | Ko | Kp |
|---|---|---|---|---|---|
| Compact Granular Fill<br>Granular 'B' (OPSS 1010) | 32 | 21.2 | 0.31 | 0.47 | 3.25 |
| Clayey Silt Till or Similar Fill | 29 | 19.0 | 0.33 | 0.50 | 3.00 |

### 6.4.2 Retaining Walls

It is understood that consideration is being given to replacing an existing stone retaining wall along the base of a slope on the west side of the property. The parameters that can be considered for determining the lateral earth pressures for retaining walls are shown in the following table. The values in the table are "ultimate" values and require certain movements for the respective conditions to be mobilized.

| Wall Condition | Earth Pressure Coefficient (K) | | | |
|---|---|---|---|---|
| | OPSS Granular A or Granular B Type II<br>γ = 22.8 kN/m, φ = 35° | | OPSS Granular B Type I<br>γ = 21.2 kN/m, φ = 32° | |
| | Horizontal Surface behind wall | Sloping surface behind wall (3H:1V) | Horizontal Surface behind wall | Sloping surface behind Wall (3H:1V) |
| Ka - Active (Unrestrained Wall) | 0.27 | 0.4 | 0.31 | 0.48 |

The factored geotechnical resistance to sliding of earth retaining structures is developed by friction between the base of the footing and the soil. This friction **(R)** depends on the normal load on the soil contact (**N**) and the frictional resistance of the soil **(tan φ)** expressed as: **R = N tan φ**. This is an unfactored resistance. The factored resistance at ULS is $\mathbf{R_f = 0.8\ N \tan \varphi}$. The K value to be used for the design will depend on the rigidity of the wall.

Passive earth pressure resistance is generally not considered as a resisting force against sliding for conventional retaining structure design because a structure must deflect significantly to develop the full passive resistance.

#### *6.4.2.1 Backfill*

Select free draining granular fill should be used as backfill behind the wall. Granular backfill should be placed in thin lifts (200 mm thick or less) and compacted to a minimum of 95 percent of standard Proctor maximum dry density. Heavy compaction equipment should not be used behind the wall within a lateral distance equal to the current height of fill above the wall footing, in order to minimize deflection or possible damage of the wall.

#### *6.4.2.2 Drainage*

A drainage system should be provided behind the wall to prevent the build-up of hydrostatic forces. A perforated subdrain pipe (minimum 100 mm diameter) should be installed within the backfill immediately behind the wall. The drainage system should incorporate a properly designed filter to protect against clogging of drainage pipes. The subdrain should outlet through the wall at intervals of at least 3.5 m. The outlet of the drainage system should be protected against freezing to ensure proper functioning of the system during the winter season.

## 6.5 Excavations

Excavations must be carried out in accordance with the Occupational Health and Safety Act, Ontario Regulation 213/91 (as amended), Construction Projects, Part III – Excavations, Sections 222 through 242. These regulations designate four (4) broad classifications of soils to stipulate appropriate measures for excavation safety. For practical purposes at this site, the existing fill and stratum of silty fine sand strata are considered Type 3 Soils.

Where workers must enter a trench or excavation the soil must be suitably sloped and/or braced in accordance with the Occupational Health and Safety Act and Regulations for Construction Projects. The regulation stipulates safe slopes of excavation by soil type as follows:

| Soil Type | Base of Slope | Steepest Slope Inclination |
|---|---|---|
| 1 | within 1.2 metres of bottom of trench | 1 horizontal to 1 vertical |
| 2 | within 1.2 metres of bottom of trench | 1 horizontal to 1 vertical |
| 3 | from bottom of trench | 1 horizontal to 1 vertical |
| 4 | from bottom of trench | 3 horizontal to 1 vertical |

Minimum support system requirements for steeper excavations are stipulated in Sections 235 through 238 and 241 of the Act and Regulations and include provisions for timbering, shoring and moveable trench boxes.

Depending on the conditions encountered at the time of construction, some ground water seepage into open excavations may occur. It is anticipated that the volume of ground water encountered can be adequately managed by pumping from properly filtered sumps as required.

It should be noted that surplus excavated soil resulting from the construction that is to be disposed of off-site, will require chemical analyses to assess the disposal site requirements. No soil quality analyses have been completed in conjunction with this investigation.

# 7.0 LIMITATIONS AND RISKS

## 7.1 Investigation Procedures

This investigation has been carried out using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by Terraprobe and other engineering practitioners, working under similar conditions and subject to the time, financial and physical constraints applicable to this project. The discussions and recommendations that have been presented are based on the factual data obtained from this investigation.

The drilling work was carried out by a specialist drilling contractor. The boreholes were made by a continuous flight power auger machine. A Terraprobe technician logged the boreholes and examined all of the recovered samples. The samples obtained were sealed in clean, air-tight containers and transferred to Terraprobe's Stoney Creek laboratory, where they were reviewed for consistency of description by a geotechnical engineer. Ground water observations were made in the borehole as drilling proceeded.

The samples of the strata penetrated were obtained using the Split-Barrel Method technique (ASTM D1586). The samples were taken at regular intervals of depth. The sampling procedure used for this investigation does not recover continuous samples of soil. Consequently, there is some interpolation of the borehole layering between samples and indications of changes in stratigraphy as shown on the borehole logs are approximate.

It must be recognized that there are special risks whenever engineering or related disciplines are applied to identify subsurface conditions. A comprehensive sampling and testing programme implemented in accordance with the most stringent level of care may fail to detect certain conditions. Terraprobe has assumed for the purposes of providing design parameters and advice, that the conditions that exist between sampling points are similar to those found at the sample locations.

It may not be possible to drill a sufficient number of boreholes and/or sample and report them in a way that would provide all the subsurface information and geotechnical advice to completely identify all aspects of the site and works that could affect construction costs, techniques, equipment and scheduling. Contractors bidding on or undertaking work on the project must be directed to draw their own conclusions as to how the subsurface conditions may affect them, based on their own investigations and their own interpretations of the factual investigation results, and their approach to the construction works, cognizant of the risks implicit in the subsurface investigation activities.

## 7.2 Slope Stability Assessment

In assessing the location of the long-term stable top of slope on the subject property, Terraprobe Inc. has relied in good faith on information provided by others, as noted in this report, and has assumed that the information provided by those individuals is factual and accurate. Terraprobe Inc. accepts no responsibility for any deficiency, misstatement or inaccuracy in this report resulting from the information provided by those individuals.

## 7.3 Changes in Site and Scope

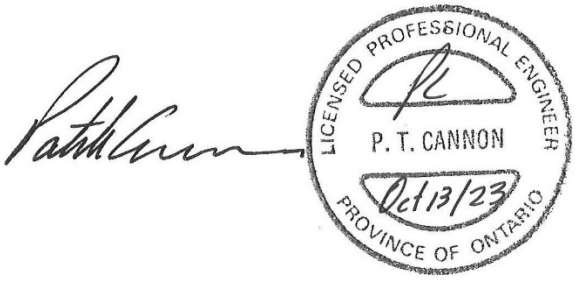
The design parameters provided and the engineering advice offered in this report are based on the factual data obtained from this investigation made at the site by Terraprobe and are intended for use by the owner and its retained design consultants in the design phase of the project. If there are changes to the project scope and development features, the interpretations made of the subsurface information, the geotechnical design parameters, advice and comments relating to constructability issues and quality control may not be relevant or complete for the project. Terraprobe should be retained to review the implications of such changes with respect to the contents of this report.

## 7.4 Use of Report

This report was prepared for the express use of Constructology Inc. and their retained design consultants. It is not for use by others. This report is copyright of Terraprobe Inc., and no part of this report may be reproduced by any means, in any form, without the prior written permission of Terraprobe Inc. Constructology Inc. and their retained design consultants are authorized users. It is recognized that the City of Hamilton and HCA will make use of and rely upon this report, cognizant of the limitations thereof, both expressed and implied.

We trust the foregoing information is sufficient for your present requirements. If you have any questions, or if we can be of further assistance, please do not hesitate to contact us.

**Terraprobe Inc.**




Patrick Cannon, P. Eng.
Principal

## TABLE I - SLOPE STABILITY RATING CHART - VALLEY SLOPE

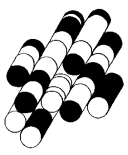
| | | |
|---|---|---|
| Site Location: | 96 Creighton Road, Hamilton (Dundas) | File No. 02210465.000 |
| Property Owner: | Constructology Inc. | |
| Inspection Date: | August 3, 2023 | |
| Inspected By: | Patrick Cannon, P. Eng. | |

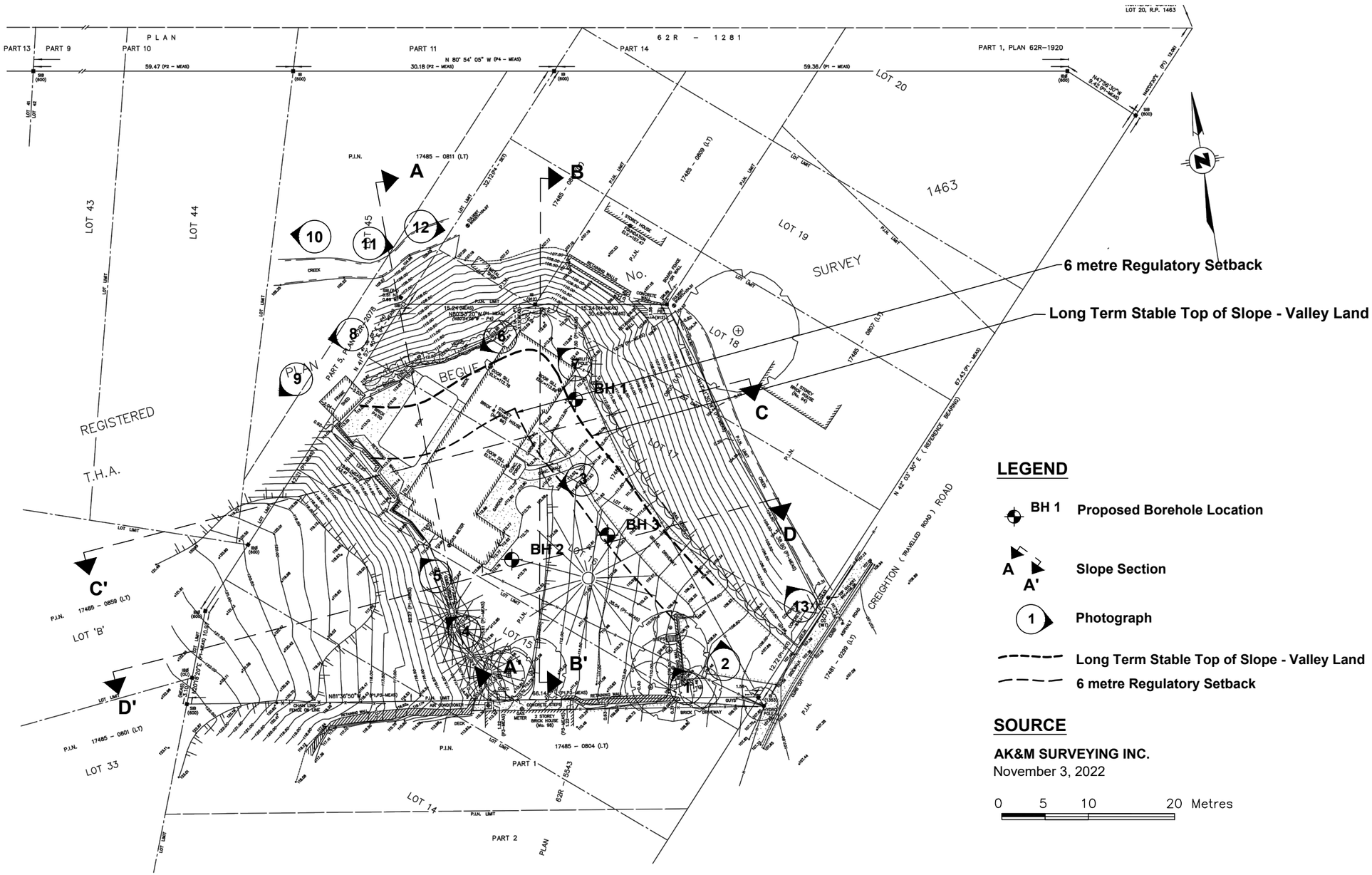
| | | | Selected Slope Section(s) | | | |
|---|---|---|---|---|---|---|
| 1. SLOPE INCLINATION | Degrees | Horizontal / Vertical | **A-A'** | **B-B'** | C-C' | D-D' |
| a) | 18 or less | 3:1 or flatter | 0 | 0 | 0 | 0 |
| b) | 18 - 26 | 2:1 to more than 3:1 | 6 | 6* | 6 | 6 |
| c) | > 26 | Steeper than 2:1 | 16* | 16 | 16* | 16* |
| 2. SOIL STRATIGRAPHY | | | | | | |
| a) | Shale Limestone, Granite (Bedrock) | | 0 | 0 | 0 | 0 |
| b) | Sand, Gravel | | 6 | 6 | 6 | 6 |
| c) | Glacial Till | | 9* | 9 | 9* | 9* |
| d) | Clay, Silt | | 12 | 12 | 12 | 12 |
| e) | Fill | | 16 | 16* | 16 | 16 |
| f) | Leda clay | | 24 | 24 | 24 | 24 |
| 3. SEEPAGE FROM SLOPE FACE | | | | | | |
| a) | None or Near bottom only | | 0* | 0* | 0* | 0* |
| b) | Near mid-slope only | | 6 | 6 | 6 | 6 |
| c) | Near crest only or, From several levels | | 12 | 12 | 12 | 12 |
| 4. SLOPE HEIGHT | | | | | | |
| a) | 2 m or less | | 0 | 0 | 0 | 0 |
| b) | 2.1 to 5 m | | 2 | 2 | 2 | 2 |
| c) | 5.1 to 10m | | 8* | 8* | 8* | 8* |
| 5. VEGETATION COVER ON SLOPE FACE | | | | | | |
| a) | Well vegetated; heavy shrubs or forested with mature trees | | 0 | 0 | 0 | 0 |
| b) | Light vegetation; mostly grass, weeds, occasional trees | | 4* | 4* | 4* | 4* |
| c) | No vegetation, bare | | 8 | 8 | 8 | 8 |
| 6. TABLE LAND DRAINAGE | | | | | | |
| a) | Table land flat, no apparent drainage over slope | | 0* | 0* | 0* | 0* |
| b) | Minor drainage over slope, no active erosion | | 2 | 2 | 2 | 2 |
| c) | Drainage over slope, active erosion, gullies | | 4 | 4 | 4 | 4 |
| 7. PROXIMITY OF WATERCOURSE AT SLOPE TOE | | | | | | |
| a) | 15 metres or more from slope toe | | 0 | 0 | 0 | 0 |
| b) | Less than 15 metres from slope toe | | 6* | 6* | 6* | 6* |
| 8. PREVIOUS LANDSLIDE ACTIVITY | | | | | | |
| a) | No | | 0* | 0* | 0* | 0* |
| b) | Yes | | 6 | 6 | 6 | 6 |
| **SLOPE STABILITY RATING VALUE INVESTIGATION RATING SUMMARY** | | **TOTAL** | **43** | **40** | **43** | **43** |

| 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 | Site inspection, boreholes, surveying, detailed report. |

# FIGURES

Terraprobe Inc.






## LEGEND

- BH 1 — Proposed Borehole Location
- A / A' — Slope Section
- 1 — Photograph
- Long Term Stable Top of Slope - Valley Land
- 6 metre Regulatory Setback

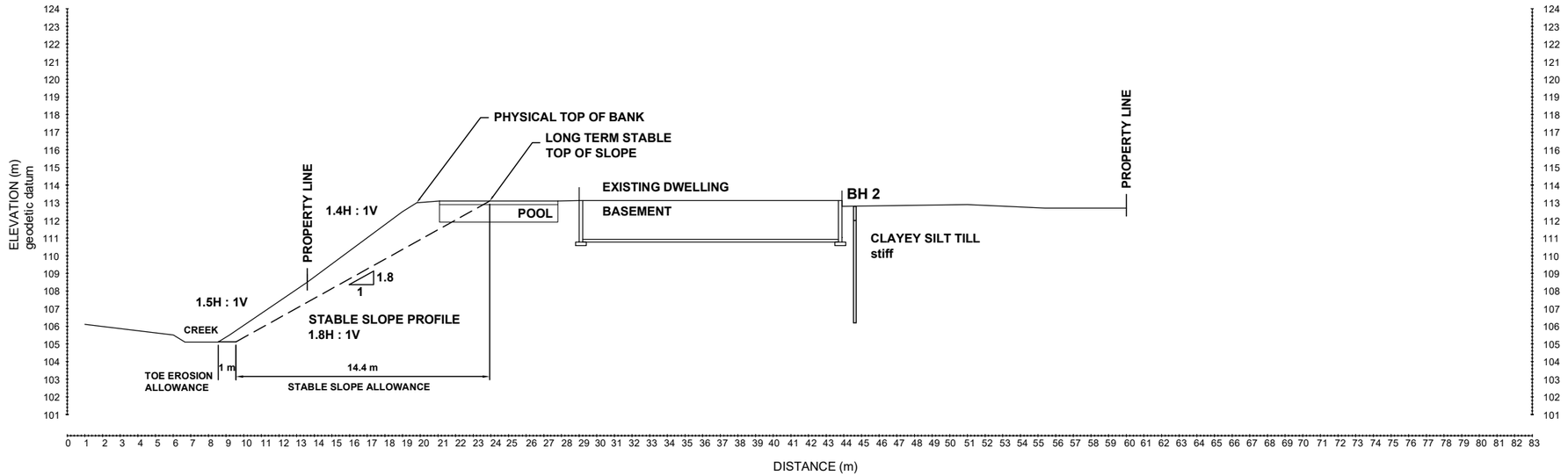
## SOURCE

**AK&M SURVEYING INC.**
November 3, 2022

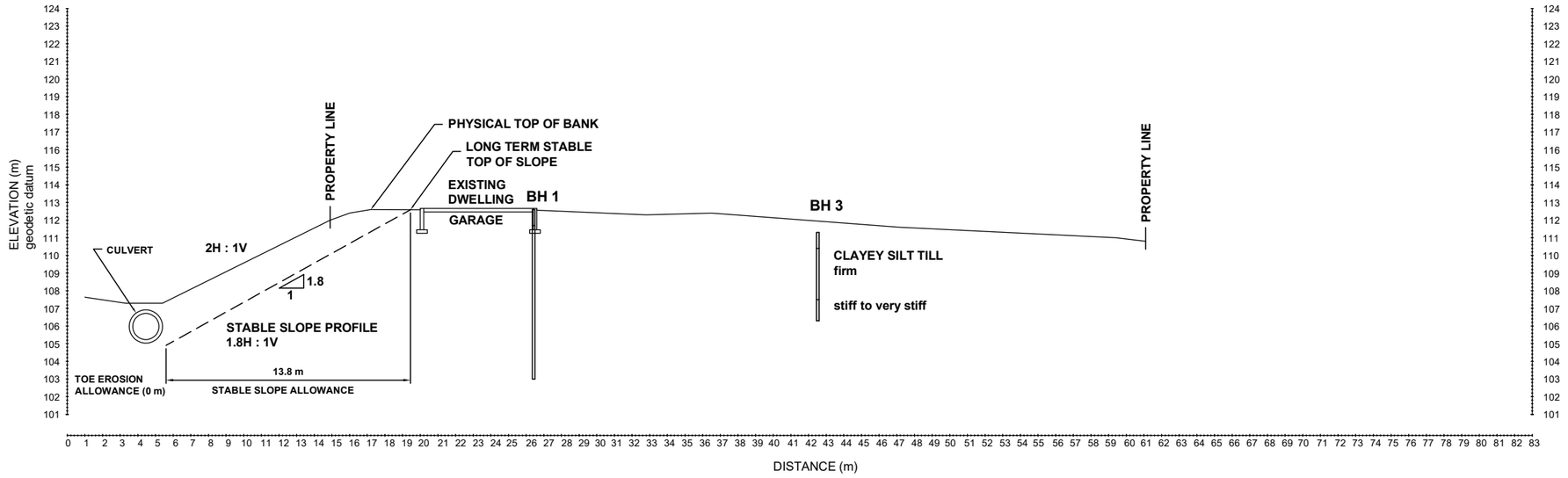
0 5 10 20 Metres


**Terraprobe**
903 Barton Street - Unit 22, Stoney Creek, Ontario, L8E 5R7
Tel: (905) 643-7560, Fax: (905) 643-7559


| Title: | FIGURE : |
|---|---|
| SITE PLAN | 1 |
| File No. 02210465.000 | |




**SECTION A-A'**




**SECTION B-B'**

Terraprobe
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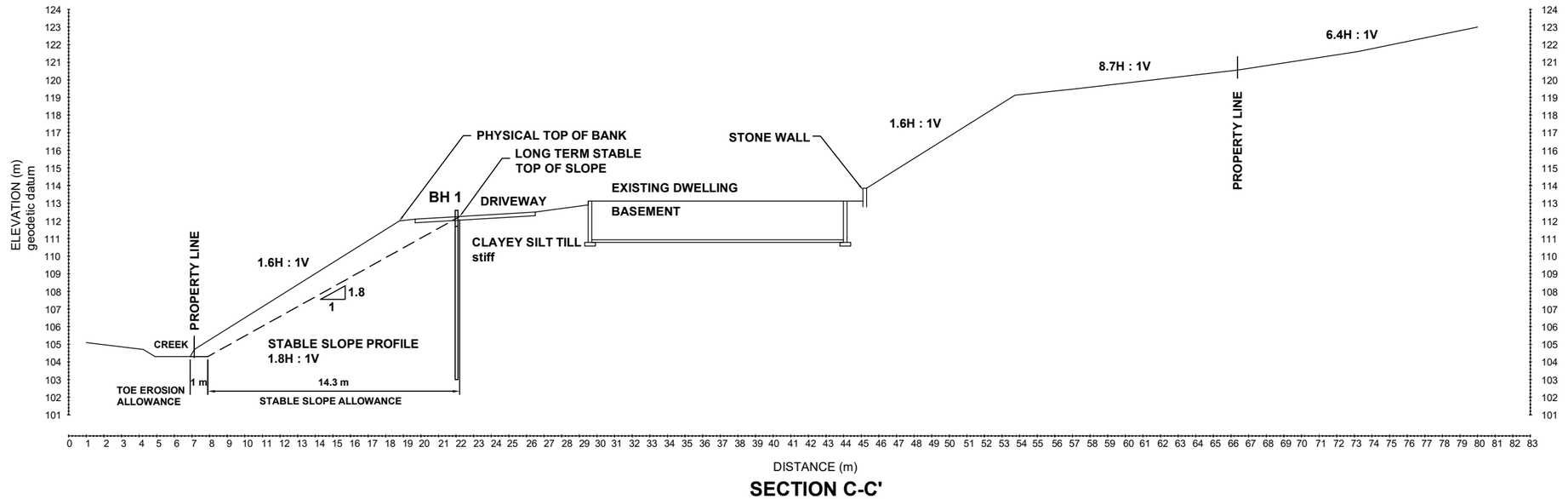
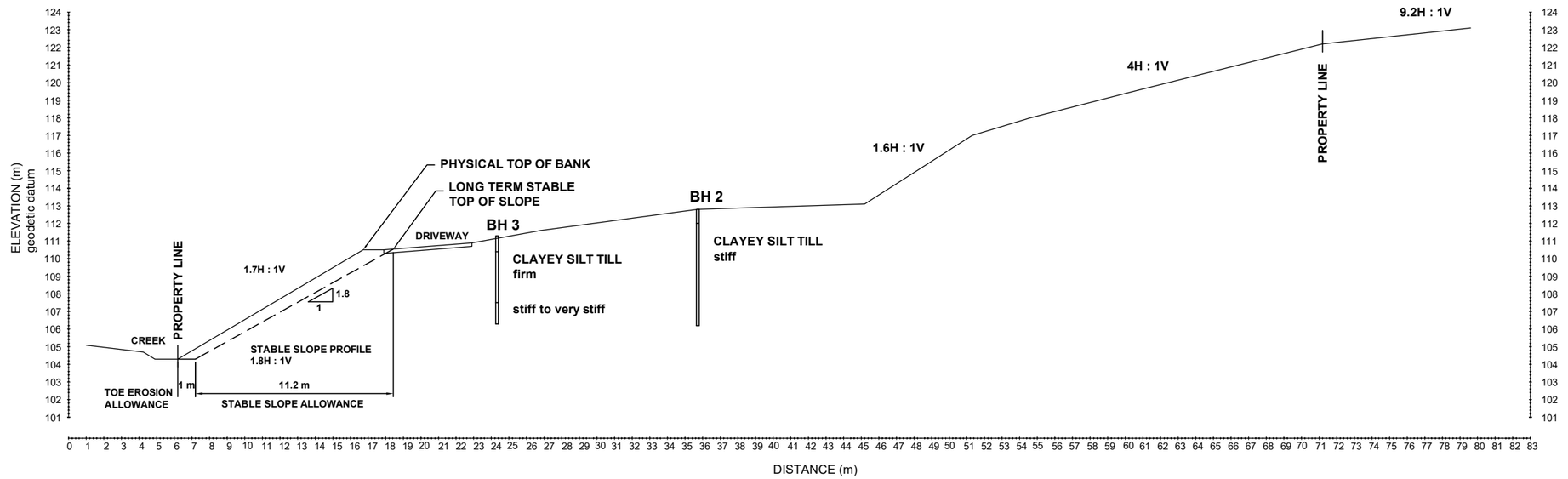
| | |
|---|---|
| Title: | CROSS SECTIONS |
| File No. | 02210465.000 |
| FIGURE : | 2 |




**SECTION C-C'**




**SECTION D-D'**

Terraprobe
903 Barton Street - Unit 22, Stoney Creek, Ontario, L8E 5R7
Tel: (905) 643-7560, Fax: (905) 643-7559

Title: CROSS SECTIONS

File No. 02210465.000

FIGURE : 3

**PHOTOGRAPHS**

# APPENDIX A

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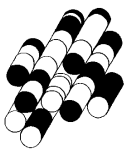
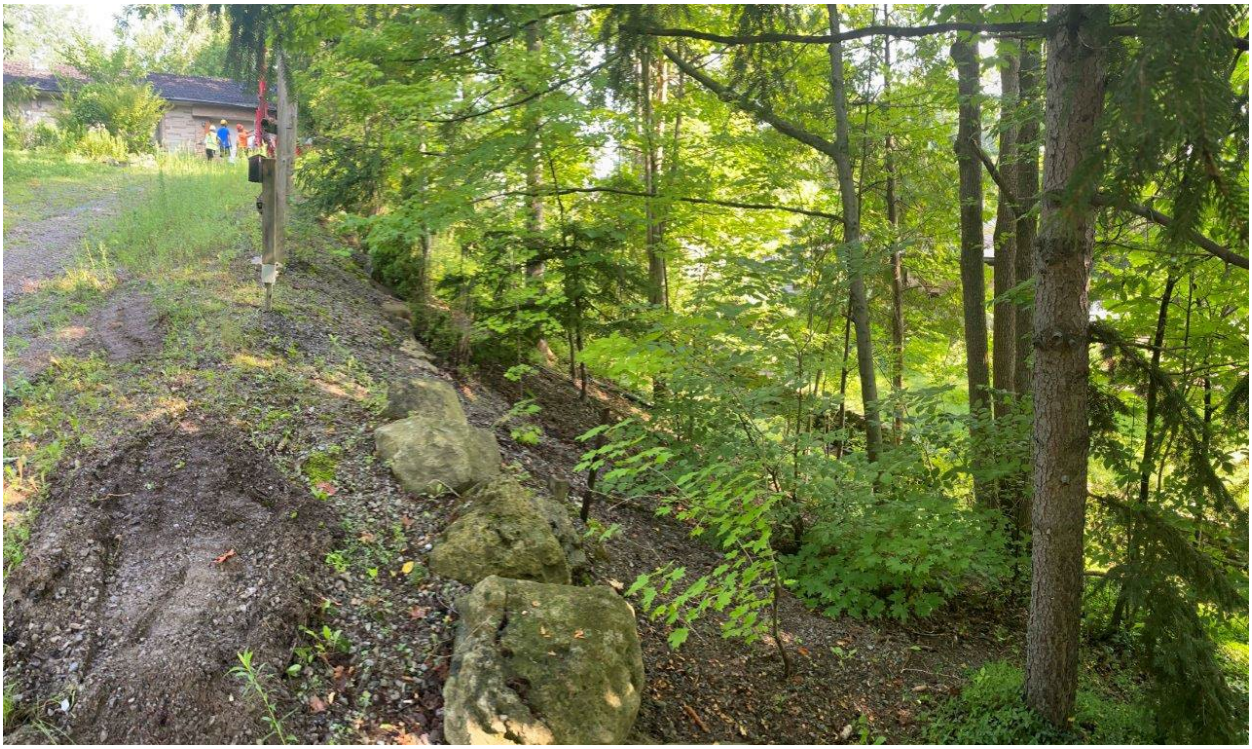


Photograph 1

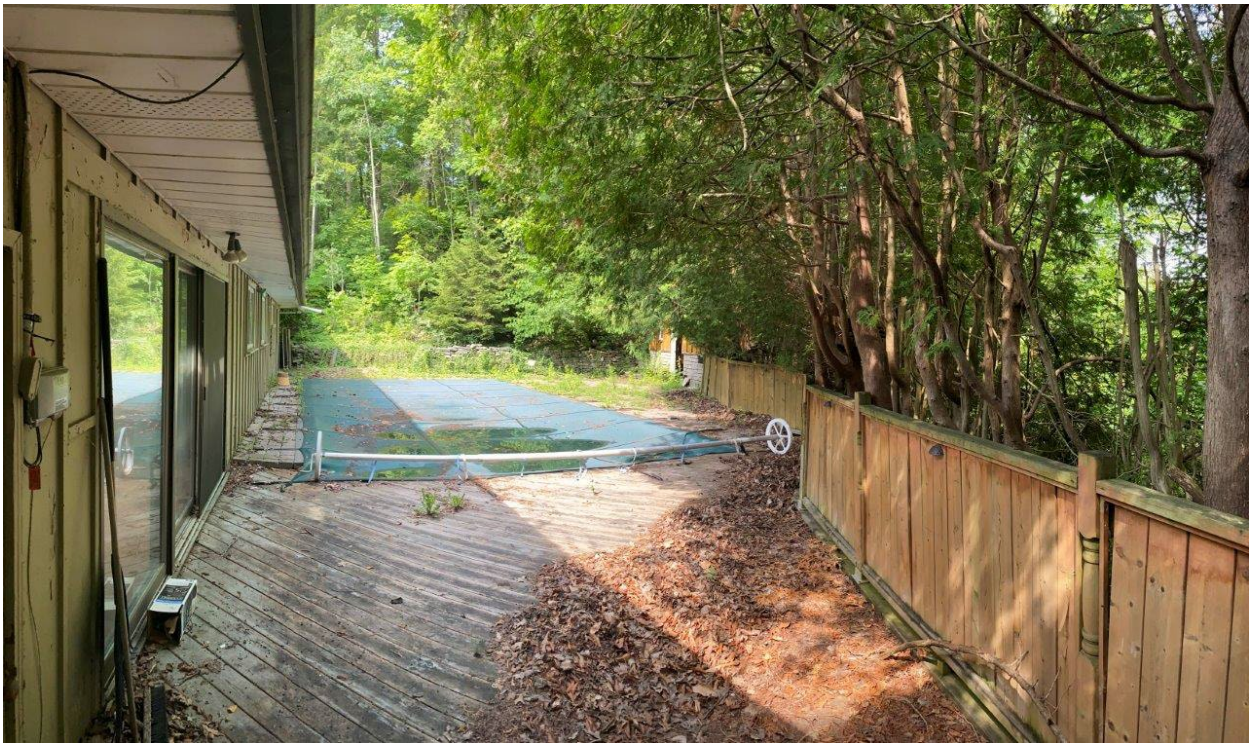


Photograph 2

Photograph 3

Photograph 4

Photograph 5



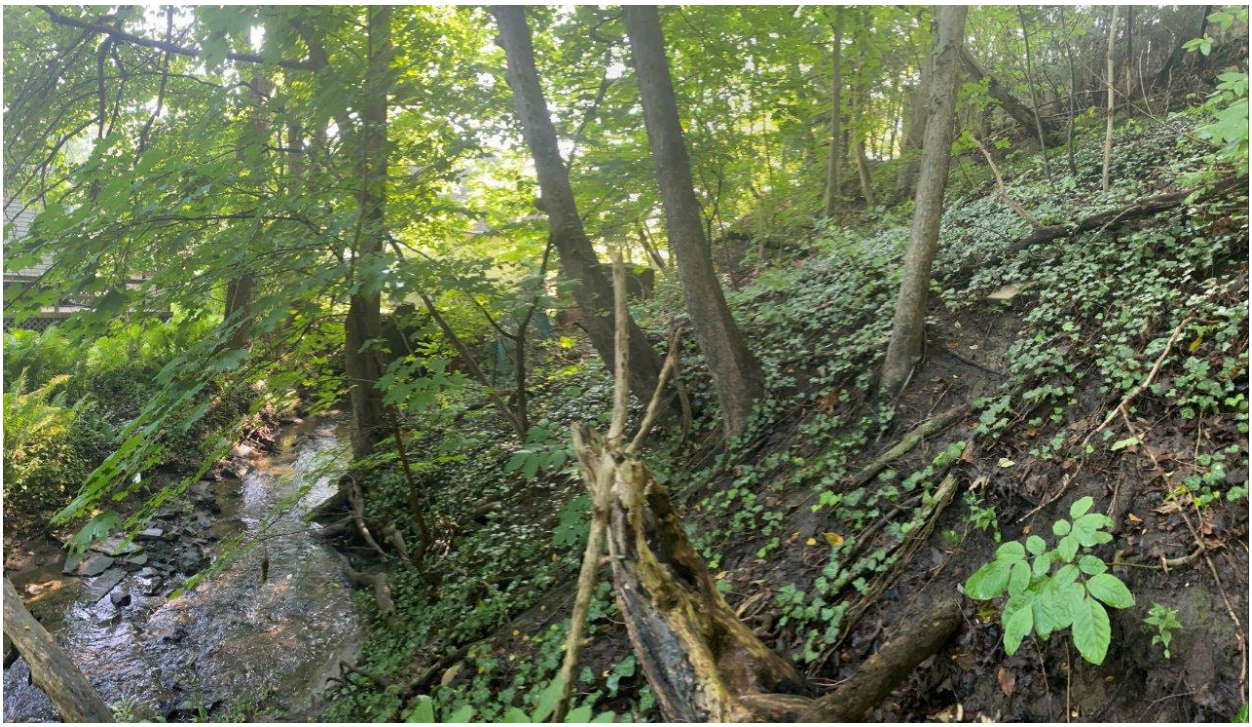
Photograph 6


Photograph 7

Photograph 8

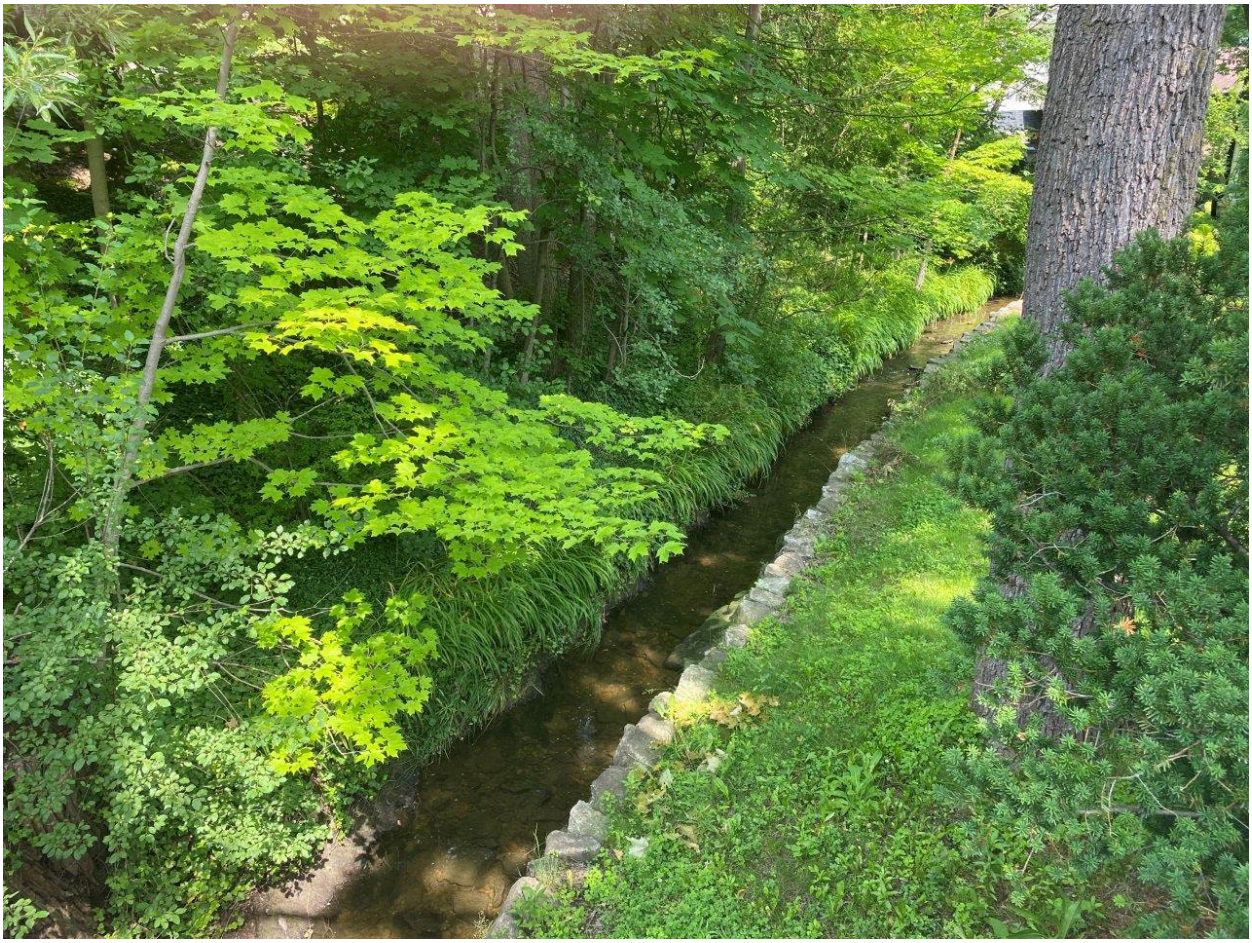
Photograph 9

Photograph 10



Photograph 11

Photograph 12

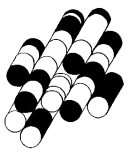


Photograph 13

## LOGS OF BOREHOLES

# APPENDIX B

Terraprobe Inc.



Terraprobe

# ABBREVIATIONS AND TERMINOLOGY

## SAMPLING METHODS

| | |
|---|---|
| AS | auger sample |
| CORE | cored sample |
| DP | direct push |
| FV | field vane |
| GS | grab sample |
| SS | split spoon |
| ST | shelby tube |
| WS | wash sample |

## PENETRATION RESISTANCE

**Standard Penetration Test (SPT)** resistance ('N' values) is defined as the number of blows by a hammer weighing 63.6 kg (140 lb.) falling freely for a distance of 0.76 m (30 in.) required to advance a standard 50 mm (2 in.) diameter split spoon sampler for a distance of 0.3 m (12 in.).

**Dynamic Cone Test (DCT)** resistance is defined as the number of blows by a hammer weighing 63.6 kg (140 lb.) falling freely for a distance of 0.76 m (30 in.) required to advance a conical steel point of 50 mm (2 in.) diameter and with 60° sides on 'A' size drill rods for a distance of 0.3 m (12 in.)."

## COHESIONLESS SOILS

| Compactness | 'N' value |
|---|---|
| very loose | < 4 |
| loose | 4 – 10 |
| compact | 10 – 30 |
| dense | 30 – 50 |
| very dense | > 50 |

## COHESIVE SOILS

| Consistency | 'N' value | Undrained Shear Strength (kPa) |
|---|---|---|
| very soft | < 2 | < 12 |
| soft | 2 – 4 | 12 – 25 |
| firm | 4 – 8 | 25 – 50 |
| stiff | 8 – 15 | 50 – 100 |
| very stiff | 15 – 30 | 100 – 200 |
| hard | > 30 | > 200 |

## COMPOSITION

| Term (e.g) | % by weight |
|---|---|
| *trace* silt | < 10 |
| *some* silt | 10 – 20 |
| silty | 20 – 35 |
| sand *and* silt | > 35 |

## TESTS AND SYMBOLS

| | |
|---|---|
| MH | mechanical sieve and hydrometer analysis |
| w, $w_c$ | water content |
| $w_L$, LL | liquid limit |
| $w_P$, PL | plastic limit |
| $I_P$, PI | plasticity index |
| k | coefficient of permeability |
| γ | soil unit weight, bulk |
| φ' | internal friction angle |
| c' | effective cohesion |
| $c_u$ | undrained shear strength |

| | |
|---|---|
| ▽ | Unstabilized water level |
| ▼ | 1st water level measurement |
| ▼ | 2nd water level measurement |
| ▼ | Most recent water level measurement |
| 3.0 + | Undrained shear strength from field vane (with sensitivity) |
| $C_c$ | compression index |
| $c_v$ | coefficient of consolidation |
| $m_v$ | coefficient of compressibility |
| e | void ratio |

## FIELD MOISTURE DESCRIPTIONS

| | |
|---|---|
| **Damp** | refers to a soil sample that does not exhibit any observable pore water from field/hand inspection. |
| **Moist** | refers to a soil sample that exhibits evidence of existing pore water (e.g. sample feels cool, cohesive soil is at plastic limit) but does not have visible pore water |
| **Wet** | refers to a soil sample that has visible pore water |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**Sudbury**, Ontario P3E 5P4
(705) 670-0460 Fax: 670-0558

www.terraprobe.ca

# LOG OF BOREHOLE 1

Terraprobe

| | | |
|---|---|---|
| Project No. : 02210465.000 | Client : Constructology Inc. | Originated by : EC |
| Date started : August 3, 2023 | Project : 96 Creighton Road | Compiled by : PC |
| Sheet No. : 1 of 1 | Location : Dundas, Ontario | Checked by : PC |

Position : E: 583735, N: 4790443 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

| Depth Scale (m) | Elev Depth (m) | Description | Graphic Log | Number | Type | SPT 'N' Value | Elevation Scale (m) | Penetration Test Values (Blows / 0.3m) / Undrained Shear Strength (kPa) | Moisture / Plasticity | Headspace Vapour (ppm) | Instrument Details | Unstabilized Water Level | Lab Data and Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 112.6 | **GROUND SURFACE** | | | | | | | | | | | |
| 0 | | **FILL**, sandy silt, trace gravel, trace rootlets, loose, brown | | 1 | SS | 5 | 112 | | | | | | |
| | 111.7 | | | | | | | | | | | | |
| 1 | 0.9 | **CLAYEY SILT**, embedded sand and gravel, occasional silt seams and layers, stiff, brown (GLACIAL TILL) | | 2 | SS | 8 | 111 | | | | | | |
| | | | | 3 | SS | 14 | | | | | | | |
| 2 | | | | 4 | SS | 18 | 110 | | | | | | 2 12 55 31 |
| 3 | | ...sand seam at 3.4m depth | | 5 | SS | 13 | 109 | | | | | | |
| 4 | | | | 6 | SS | 13 | | | | | | | |
| | | ...becoming grey at 4.6m depth | | 7 | SS | 12 | 108 | | | | | | |
| 5 | | | | | | | | | | | | | |
| 6 | | | | 8 | SS | 16 | 107 | | | | | | |
| | | | | | | | 106 | | | | | | |
| 7 | | | | | | | | | | | | | |
| | | | | 9 | SS | 15 | 105 | | | | | | |
| 8 | | | | | | | | | | | | | |
| | | | | | | | 104 | | | | | | |
| 9 | | | | 10 | SS | 16 | | | | | | | |
| | 103.0 | | | | | | 103 | | | | | | |
| | 9.6 | **END OF BOREHOLE** | | | | | | | | | | | |

Penetration Test Values (Blows / 0.3m): Dynamic Cone; 10 20 30 40

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane; 40 80 120 160

Moisture / Plasticity: Plastic Limit, Natural Water Content, Liquid Limit; PL MC LL; 10 20 30

Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT); GR SA SI CL

Borehole was dry and open upon completion of drilling.

file: 02210465.000 96 creighton road.gpj

# LOG OF BOREHOLE 2

Terraprobe

| | | |
|---|---|---|
| Project No. : 02210465.000 | Client : Constructology Inc. | Originated by : EC |
| Date started : August 3, 2023 | Project : 96 Creighton Road | Compiled by : PC |
| Sheet No. : 1 of 1 | Location : Dundas, Ontario | Checked by : PC |

Position : E: 583724, N: 4790426 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

| Depth Scale (m) | Elev / Depth (m) | Description | Graphic Log | Number | Type | SPT 'N' Value | Elevation Scale (m) | Penetration Test Values (Blows / 0.3m) / Undrained Shear Strength (kPa) | Moisture / Plasticity (Plastic Limit, Natural Water Content, Liquid Limit) | Headspace Vapour (ppm) | Instrument Details | Lab Data and Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 112.8 | **GROUND SURFACE** | | | | | | | | | | |
| | | **FILL**, clayey silt, trace rootlets, loose, brown | | 1 | SS | 8 | | | | | | |
| | 112.0 / 0.8 | | | | | | | | | | | |
| 1 | | **CLAYEY SILT**, embedded sand and gravel, occasional silt seams and layers, stiff, brown (GLACIAL TILL) | | 2 | SS | 10 | 112 | | | | | |
| | | | | 3 | SS | 22 | 111 | | | | | |
| 2 | | | | 4 | SS | 19 | | | | | | |
| | | | | | | | 110 | | | | | |
| 3 | | | | 5 | SS | 23 | | | | | | |
| | | | | | | | 109 | | | | | |
| 4 | | | | 6 | SS | 11 | | | | | | |
| | | ...becoming grey at 4.6m depth | | 7 | SS | 12 | 108 | | | | | |
| 5 | | | | | | | | | | | | |
| | | | | | | | 107 | | | | | |
| 6 | | | | 8 | SS | 12 | | | | | | |
| | 106.2 / 6.6 | | | | | | | | | | | |

**END OF BOREHOLE**

Borehole was dry and open upon completion of drilling.

Penetration Test Values (Blows / 0.3m): Dynamic Cone (10, 20, 30, 40)

Undrained Shear Strength (kPa): Unconfined, Pocket Penetrometer, Field Vane, Lab Vane (40, 80, 120, 160)

Moisture / Plasticity: PL, MC, LL (10, 20, 30)

Unstabilized Water Level

Lab Data and Comments: GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

file: 02210465.000 96 creighton road.gpj

# LOG OF BOREHOLE 3

Terraprobe

| | | |
|---|---|---|
| Project No. : 02210465.000 | Client : Constructology Inc. | Originated by : EC |
| Date started : August 3, 2023 | Project : 96 Creighton Road | Compiled by : PC |
| Sheet No. : 1 of 1 | Location : Dundas, Ontario | Checked by : PC |

Position : E: 583735, N: 4790431 (UTM 17T) Elevation Datum : Geodetic

Rig type : Mini Mole, track-mounted Drilling Method : Solid stem augers

| Depth Scale (m) | Elev Depth (m) | Description | Graphic Log | Number | Type | SPT 'N' Value | Elevation Scale (m) | Penetration Test Values (Blows / 0.3m) / Undrained Shear Strength (kPa) | Moisture / Plasticity | Headspace Vapour (ppm) | Instrument Details | Unstabilized Water Level | Lab Data and Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 111.3 | **GROUND SURFACE** | | | | | 111 | Dynamic Cone 10 20 30 40; Unconfined / Pocket Penetrometer / Field Vane / Lab Vane 40 80 120 160 | Plastic Limit / Natural Water Content / Liquid Limit PL MC LL 10 20 30 | | | | |
| | | **FILL**, clayey silt, trace rootlets, loose, brown | | 1 | SS | 4 | | | | | | | |
| | 110.4 | | | | | | | | | | | | |
| 1 | 0.9 | **CLAYEY SILT**, embedded sand and gravel, occasional silt seams and layers, firm, brown (GLACIAL TILL) | | 2 | SS | 5 | 110 | | | | | | |
| | | | | 3 | SS | 6 | | | | | | | 1 10 48 41 |
| 2 | | ...becoming grey at 2.3m depth | | 4 | SS | 4 | 109 | | | | | | |
| 3 | | | | 5 | SS | 4 | 108 | | | | | | |
| 4 | | ...becoming stiff to very stiff at 3.8m depth | | 6 | SS | 13 | 107 | | | | | | |
| | | | | 7 | SS | 18 | | | | | | | |
| 5 | 106.3 | | | | | | | | | | | | |
| | 5.0 | **END OF BOREHOLE** | | | | | | | | | | | |

Borehole was dry and open upon completion of drilling.

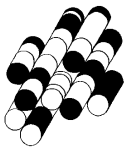
GRAIN SIZE DISTRIBUTION (%) (MIT) GR SA SI CL

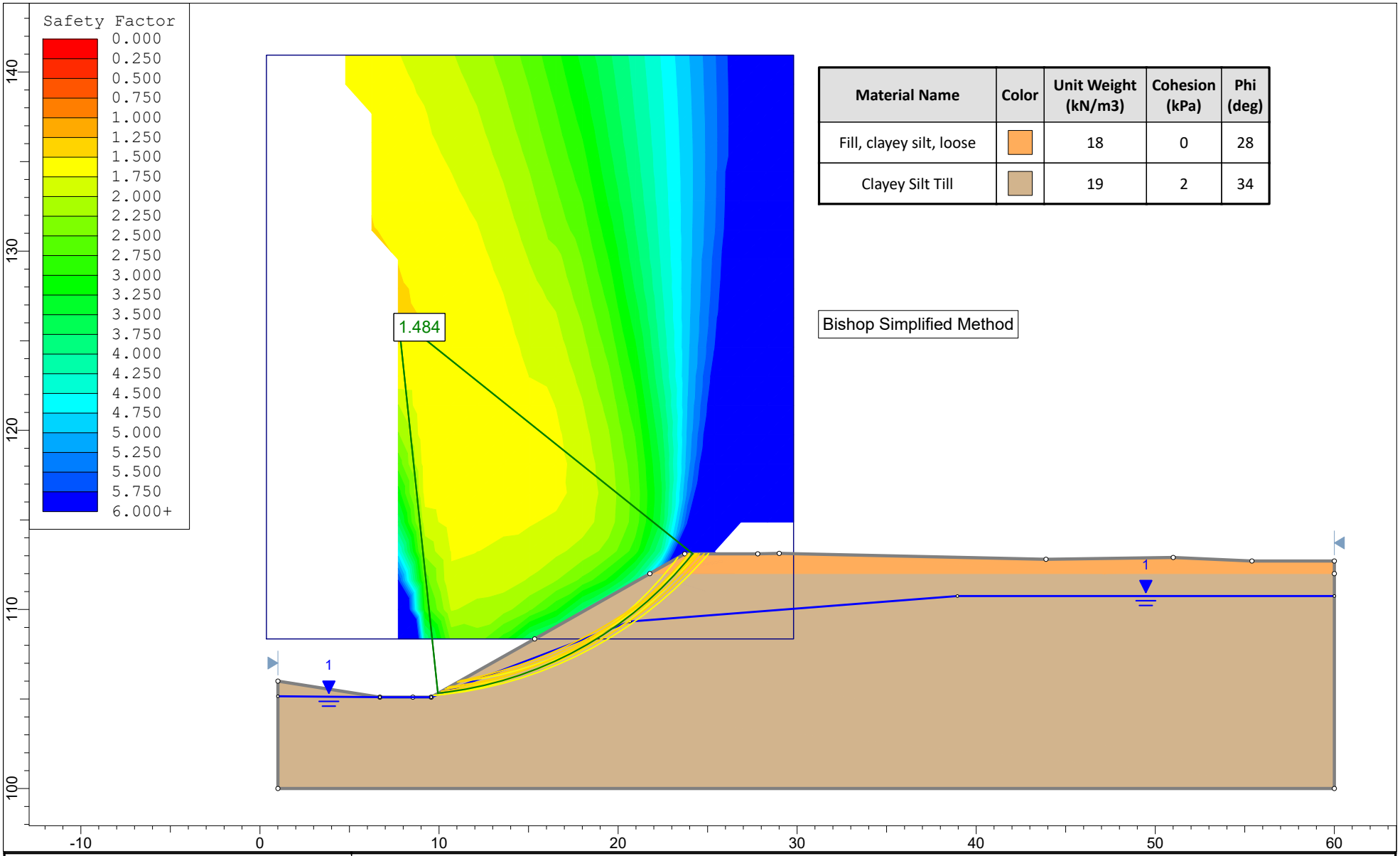
file: 02210465.000 96 creighton road.gpj

## SLOPE STABILITY ANALYSIS RESULTS

# APPENDIX C

Terraprobe Inc.

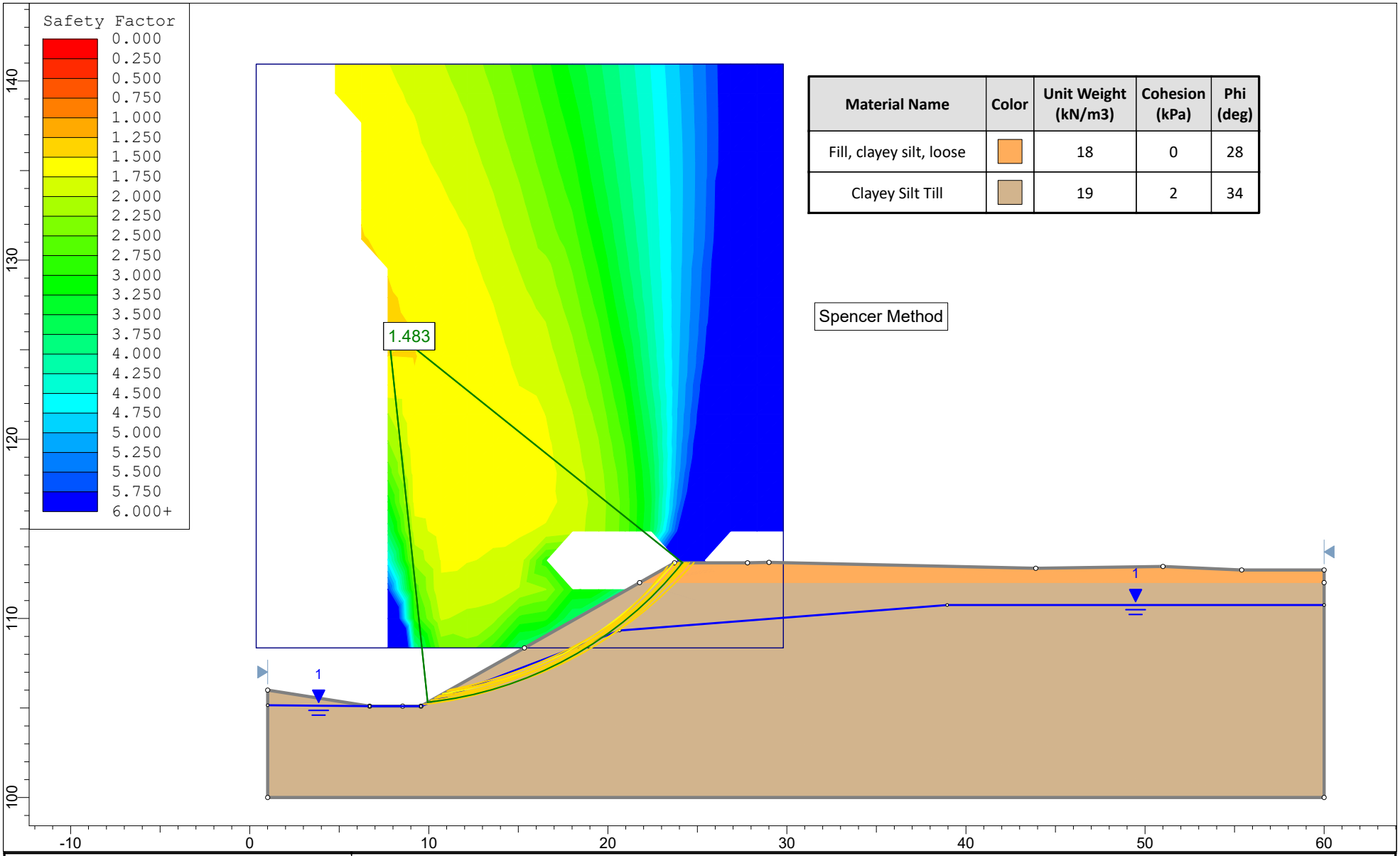





| Material Name | Color | Unit Weight (kN/m3) | Cohesion (kPa) | Phi (deg) |
|---|---|---|---|---|
| Fill, clayey silt, loose | | 18 | 0 | 28 |
| Clayey Silt Till | | 19 | 2 | 34 |

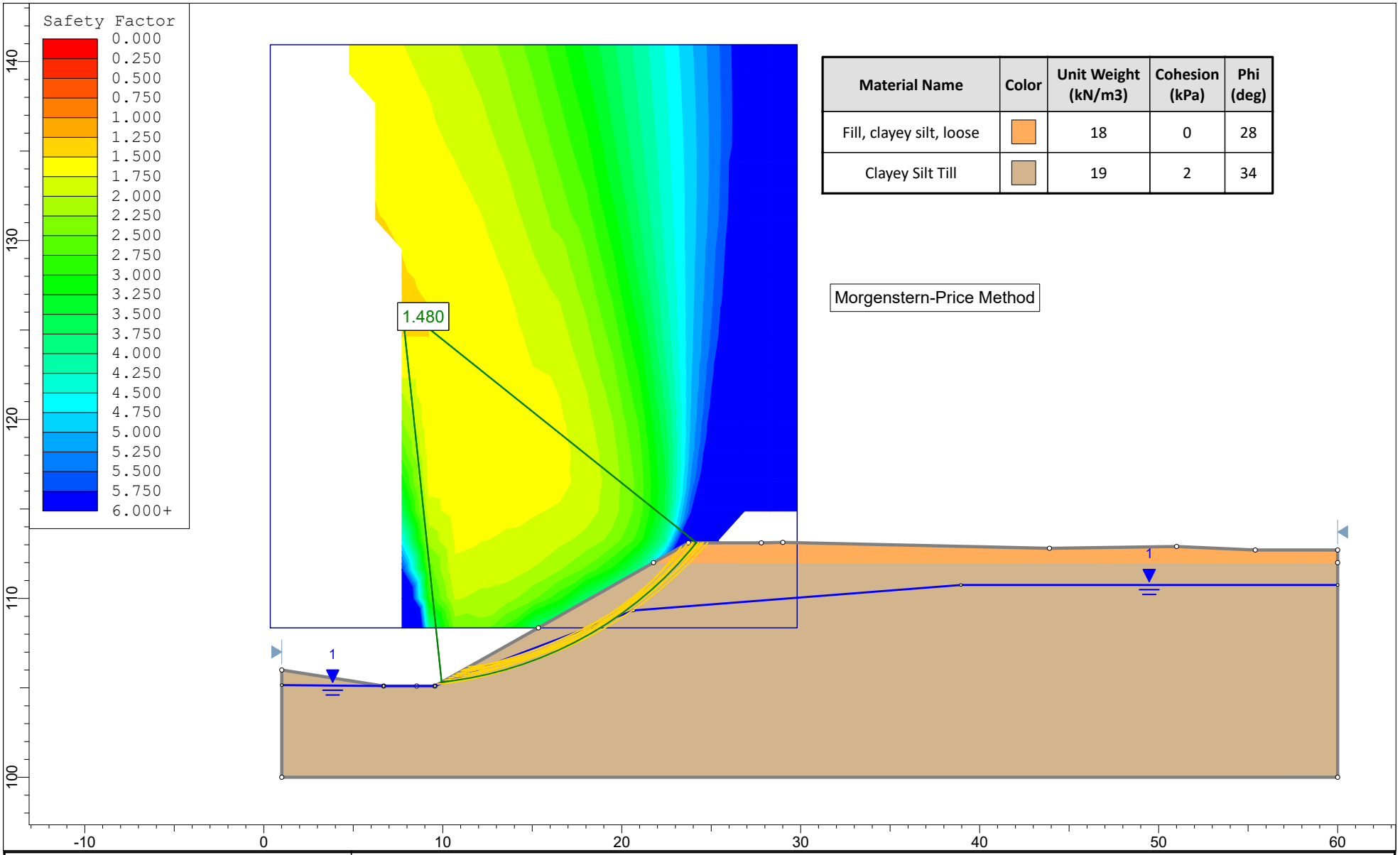
| | | | |
|---|---|---|---|
| Project | 96 Creighton Road, Hamilton (Dundas) | | |
| Analysis Description | Stable Slope Analyses - Section A-A' | | |
| Drawn By: Patrick Cannon | Scale: 1:300 | Company: Terraprobe Inc. | |
| Date: August 21, 2023 | | File Name: 02210465.000 Stable Slope Section AA.slim | |

SLIDEINTERPRET 6.035



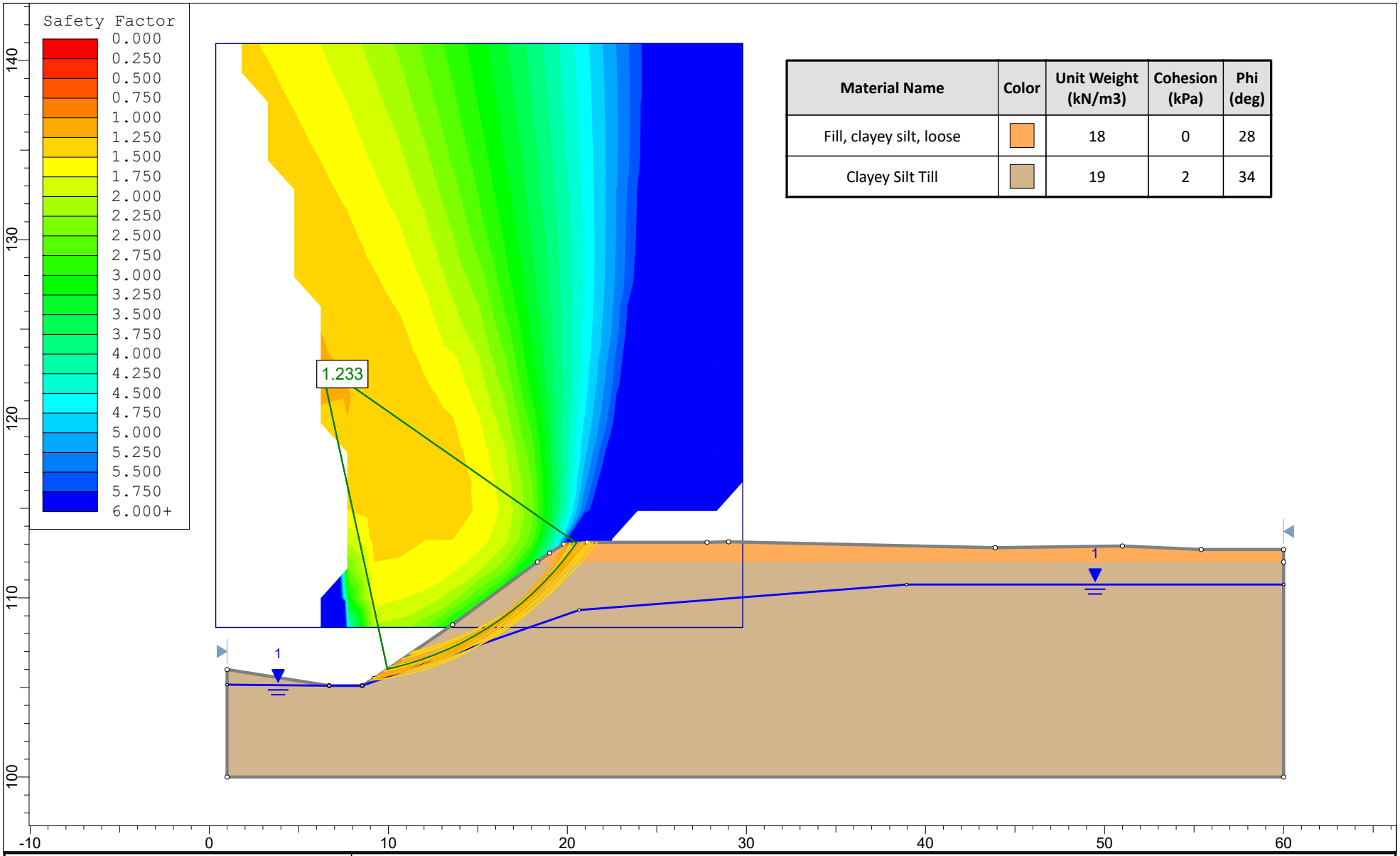

| Material Name | Color | Unit Weight (kN/m3) | Cohesion (kPa) | Phi (deg) |
|---|---|---|---|---|
| Fill, clayey silt, loose | | 18 | 0 | 28 |
| Clayey Silt Till | | 19 | 2 | 34 |

| | | | | |
|---|---|---|---|---|
| | *Project* | 96 Creighton Road, Hamilton (Dundas) | | |
| | *Analysis Description* | Stable Slope Analyses - Section A-A' | | |
| SLIDEINTERPRET 6.035 | *Drawn By* Patrick Cannon | *Scale* 1:300 | *Company* | Terraprobe Inc. |
| | *Date* August 21, 2023 | | *File Name* | 02210465.000 Stable Slope Section AA.slim |




| Material Name | Color | Unit Weight (kN/m3) | Cohesion (kPa) | Phi (deg) |
|---|---|---|---|---|
| Fill, clayey silt, loose | | 18 | 0 | 28 |
| Clayey Silt Till | | 19 | 2 | 34 |

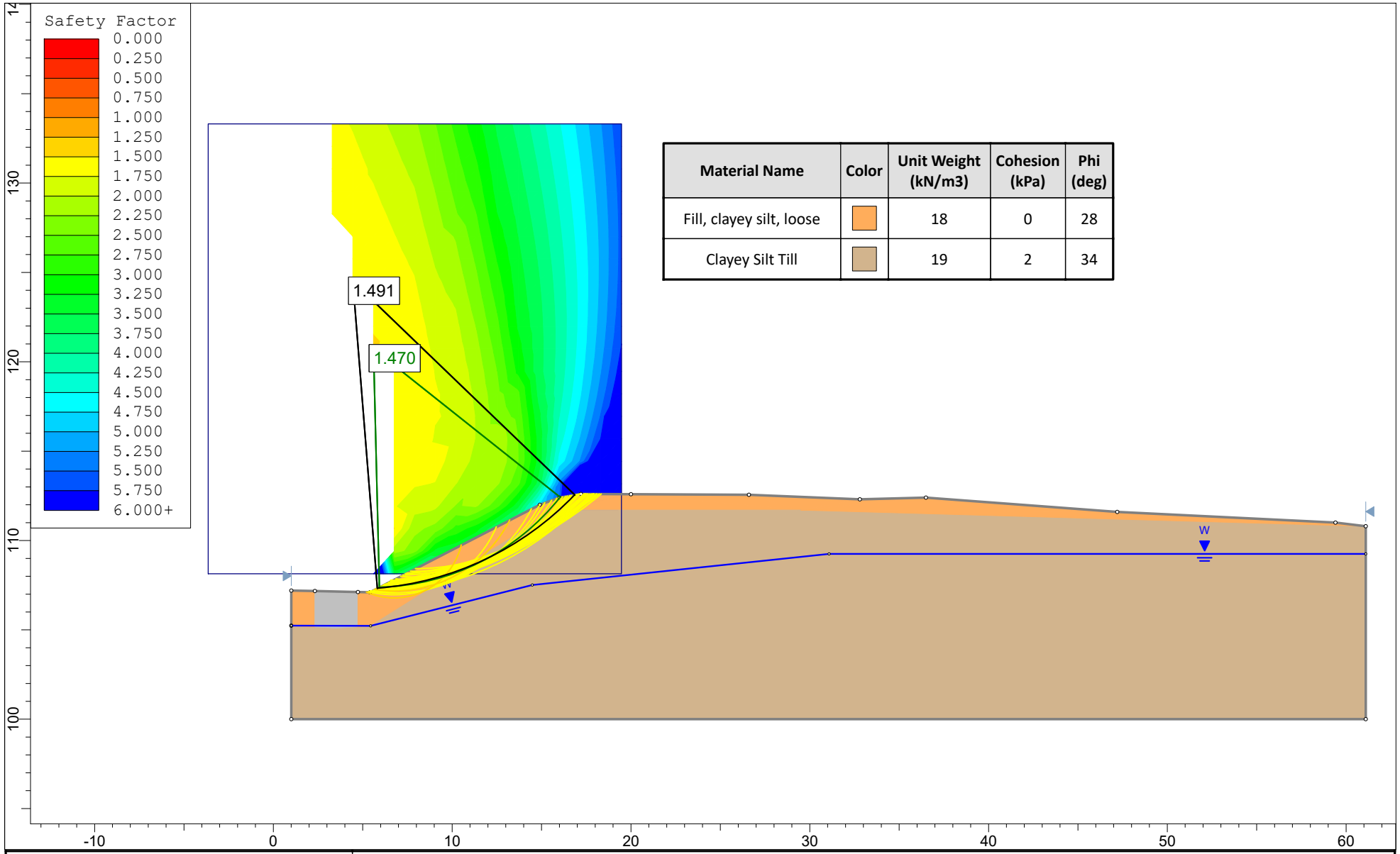
| | | | | |
|---|---|---|---|---|
| | *Project* | 96 Creighton Road, Hamilton (Dundas) | | |
| | *Analysis Description* | Stable Slope Analyses - Section A-A' | | |
| SLIDEINTERPRET 6.035 | *Drawn By* Patrick Cannon | *Scale* 1:300 | *Company* | Terraprobe Inc. |
| | *Date* August 21, 2023 | | *File Name* | 02210465.000 Stable Slope Section AA.slim |




| Material Name | Color | Unit Weight (kN/m3) | Cohesion (kPa) | Phi (deg) |
|---|---|---|---|---|
| Fill, clayey silt, loose | | 18 | 0 | 28 |
| Clayey Silt Till | | 19 | 2 | 34 |

| | | | | |
|---|---|---|---|---|
| rocscience | *Project* | 96 Creighton Road, Hamilton (Dundas) | | |
| | *Analysis Description* | Slope Stability Analyses - Existing Section A-A' | | |
| | *Drawn By* Patrick Cannon | *Scale* 1:300 | *Company* Terraprobe Inc. | |
| | *Date* August 21, 2023 | | *File Name* 02210465.000 Existing Section AA.slim | |

SLIDEINTERPRET 6.035

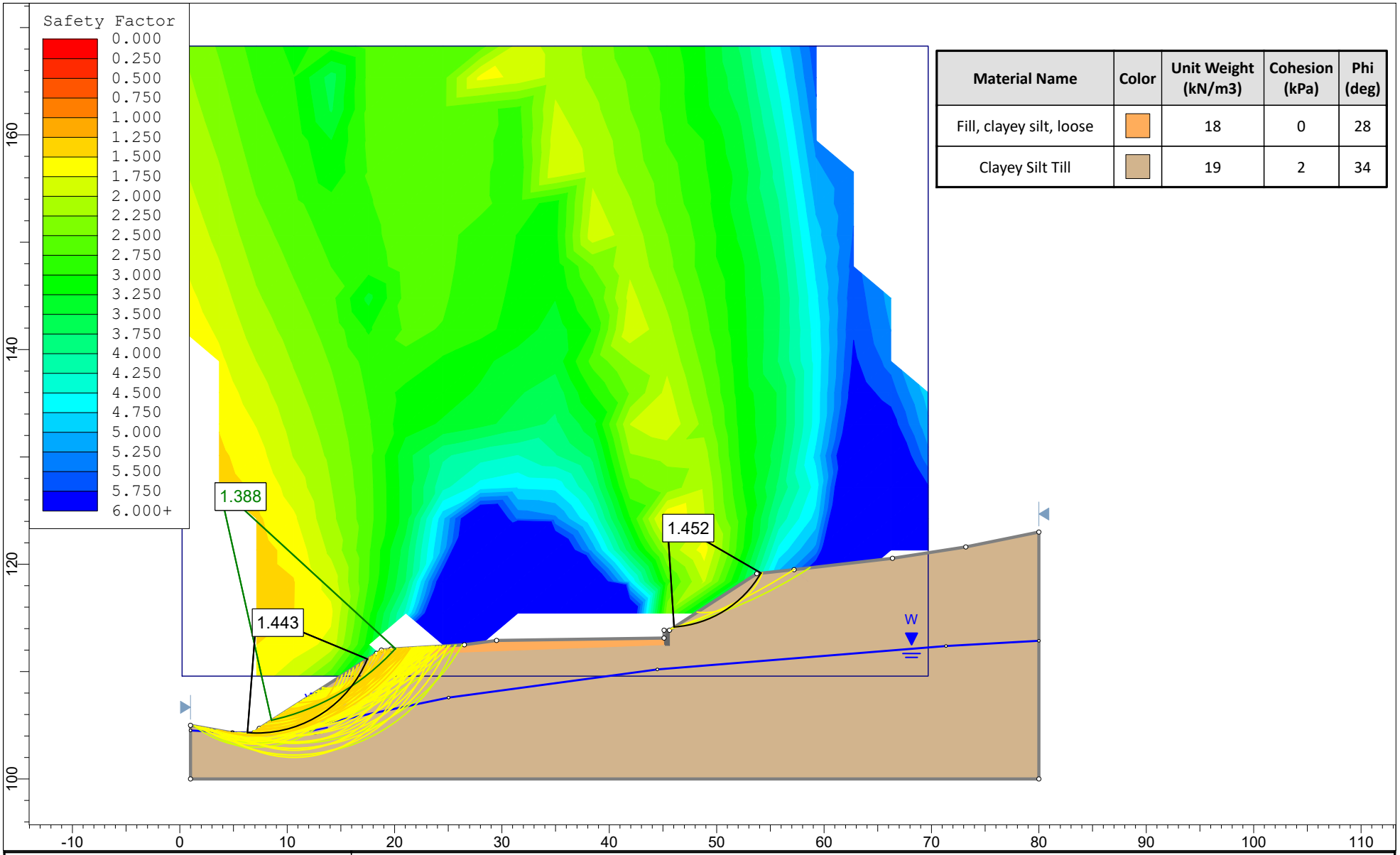



| Material Name | Color | Unit Weight (kN/m3) | Cohesion (kPa) | Phi (deg) |
|---|---|---|---|---|
| Fill, clayey silt, loose | | 18 | 0 | 28 |
| Clayey Silt Till | | 19 | 2 | 34 |

rocscience

SLIDEINTERPRET 6.035

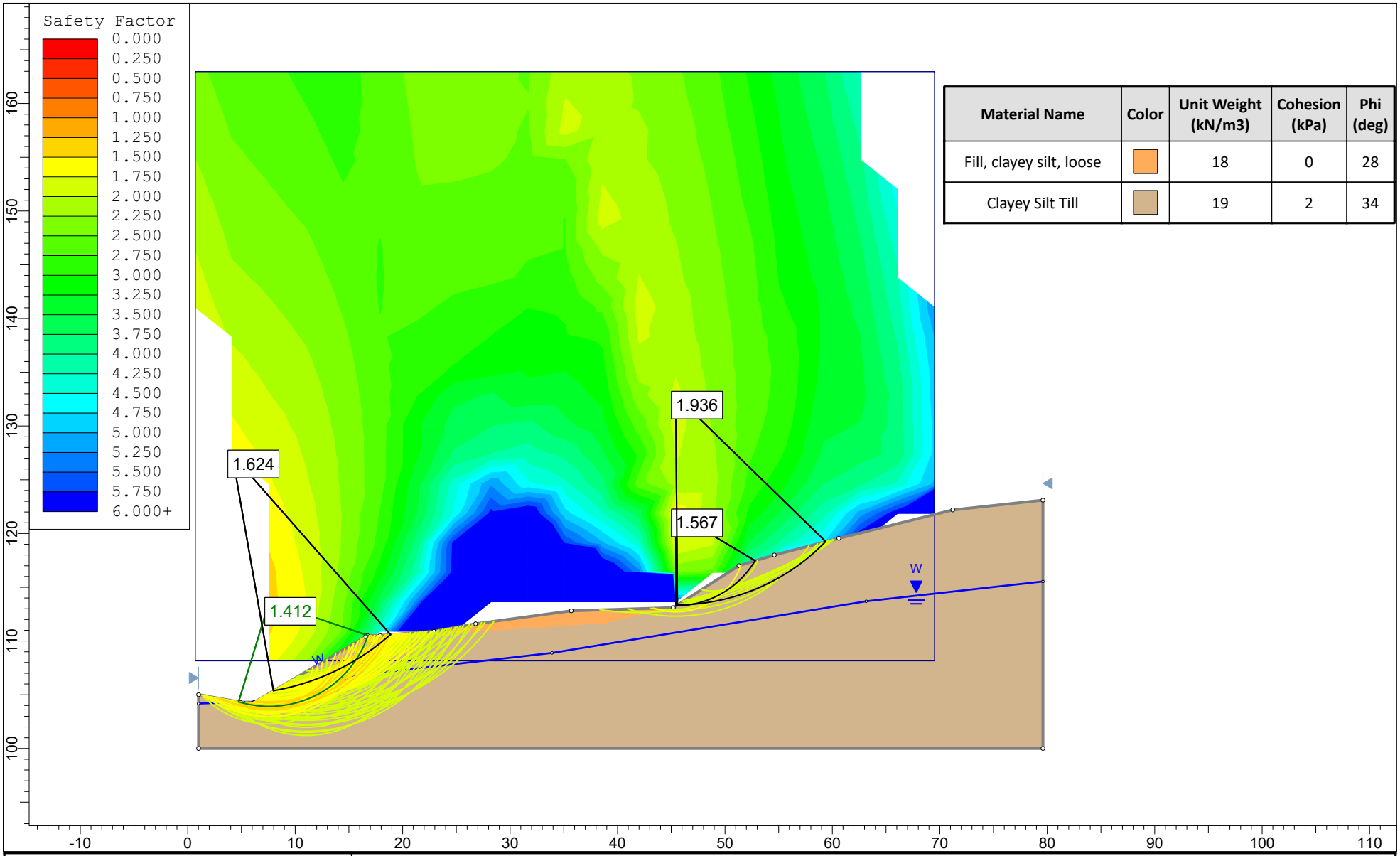
| | | | |
|---|---|---|---|
| *Project* | 96 Creighton Road, Hamilton (Dundas) | | |
| *Analysis Description* | Slope Stability Analyses - Existing Section B-B' | | |
| *Drawn By* | Patrick Cannon | *Scale* 1:300 | *Company* Terraprobe Inc. |
| *Date* | August 21, 2023 | | *File Name* 02210465.000 Slope Stablilty Anayses - Existing Section BB.slim |




| Material Name | Color | Unit Weight (kN/m3) | Cohesion (kPa) | Phi (deg) |
|---|---|---|---|---|
| Fill, clayey silt, loose | | 18 | 0 | 28 |
| Clayey Silt Till | | 19 | 2 | 34 |

SLIDEINTERPRET 6.035

| | | | |
|---|---|---|---|
| *Project* | 96 Creighton Road, Hamilton (Dundas) | | |
| *Analysis Description* | Slope Stability Analyses - Existing Section C-C' | | |
| *Drawn By* | Patrick Cannon | *Scale* 1:500 | *Company* Terraprobe Inc. |
| *Date* | August 21, 2023 | | *File Name* 02210465.000 Slope Stablilty Anayses - Existing Section CC.slim |




| Material Name | Color | Unit Weight (kN/m3) | Cohesion (kPa) | Phi (deg) |
|---|---|---|---|---|
| Fill, clayey silt, loose | | 18 | 0 | 28 |
| Clayey Silt Till | | 19 | 2 | 34 |

rocscience

SLIDEINTERPRET 6.035

| | | | |
|---|---|---|---|
| *Project* | 96 Creighton Road, Hamilton (Dundas) | | |
| *Analysis Description* | Slope Stability Analyses - Existing Section D-D' | | |
| *Drawn By* | Patrick Cannon | *Scale* 1:500 | *Company* Terraprobe Inc. |
| *Date* | August 21, 2023 | | *File Name* 02210465.000 Slope Stablilty Anayses - Existing Section DD.slim |

**Committee of Adjustment**
City Hall, 5th Floor,
71 Main St. W.,
Hamilton, ON L8P4Y5

Phone: (905) 546-2424 ext. 4221
Email: cofa@hamilton.ca

# APPLICATION FOR CONSENT TO SEVER LAND
## and VALIDATION OF TITLE
UNDER SECTION 53 & 57 OF THE *PLANNING ACT*

Please see additional information regarding how to submit an application, requirements for the required sketch and general information in the Submission Requirements and Information.

## 1. APPLICANT INFORMATION

| | NAME |
|---|---|
| **Purchaser*** | Unknown |
| **Registered Owners(s)** | Constructology Inc. |
| **Applicant(s)**** | Same as Agent |
| **Agent or Solicitor** | Arcadis Professional Services (Canada) Inc.<br>c/o Mike Crough |

[redacted]

*Purchaser must provide a copy of the portion of the agreement of purchase and sale that authorizes the purchaser to make the application in respect of the land that is the subject of the application.
** Owner's authorisation required if the applicant is not the owner or purchaser.

1.2 Primary contact ☐ Purchaser ☐ Owner ☐ Applicant ☑ Agent/Solicitor

1.3 Sign should be sent to ☐ Purchaser ☐ Owner ☐ Applicant ☑ Agent/Solicitor

1.4 Request for digital copy of sign ☑ Yes* ☐ No
If YES, provide email address where sign is to be sent [redacted]

1.5 All correspondence may be sent by email ☑ Yes* ☐ No
If Yes, a valid email must be included for the registered owner(s) AND the Applicant/Agent (if applicable). Only one email address submitted will result in the voiding of this service. This request does not guarantee all correspondence will sent by email.

1.6 Payment type ☐ In person ☐ Credit over phone*
☑ Cheque

*Must provide number above

## 2. LOCATION OF SUBJECT LAND

2.1 Complete the applicable sections:

| | | | |
|---|---|---|---|
| Municipal Address | 96 Creighton Rd | | |
| Assessment Roll Number | | | |
| Former Municipality | Regional Municipality of Hamilton - Wentworth | | |
| Lot | 14, 15, 16, 17, 18 | Concession | |
| Registered Plan Number | 1463 | Lot(s) | |
| Reference Plan Number (s) | | Part(s) | |

*T.H.A Begue Survey

2.2 Are there any easements or restrictive covenants affecting the subject land?
☐ Yes ☐ No
If YES, describe the easement or covenant and its effect:

## 3 PURPOSE OF THE APPLICATION

3.1 Type and purpose of proposed transaction: (check appropriate box)

☑ creation of a new lot(s)
☐ addition to a lot
☐ an easement
☐ validation of title (must also complete section 8)
☐ cancellation (must also complete section 9
☐ creation of a new non-farm parcel (must also complete section 10)
( i.e. a lot containing a surplus farm dwelling
resulting from a farm consolidation)

☐ concurrent new lot(s)
☐ a lease
☐ a correction of title
☐ a charge

3.2 Name of person(s), if known, to whom land or interest in land is to be transferred, leased or charged:

Unknown

3.3 If a lot addition, identify the lands to which the parcel will be added:

3.4 Certificate Request for Retained Lands: ☐ Yes*
* If yes, a statement from an Ontario solicitor in good standing that there is no land abutting the subject land that is owned by the owner of the subject land other than land that could be conveyed without contravening section 50 of the Act. (O. Reg. 786/21)

## 4 DESCRIPTION OF SUBJECT LAND AND SERVICING INFORMATION

4.1 Description of subject land:

All dimensions to be provided in metric (m, m² or ha), attach additional sheets as necessary.

| | Retained (remainder) | Parcel 1 | Parcel 2 | Parcel 3* | Parcel 4* |
|---|---|---|---|---|---|
| Identified on Sketch as: | LOT 1 | LOT 2 | | | |
| Type of Transfer | N/A | | | | |
| Frontage | 10.84 m | 1.88 m | | | |
| Depth | 59.21 m | 65.37 m | | | |
| Area | 1427.24 sqm | 1081.63 sqm | | | |
| Existing Use | Single dwelling | Single dwelling | | | |
| Proposed Use | Single dwelling | Sngle dwellling | | | |
| Existing Buildings/ Structures | Dwelling to be demolished | Dwelling to be demolished | | | |
| Proposed Buildings/ Structures | None proposed at this time | None proposed at this time | | | |
| Buildings/ Structures to be Removed | | | | | |

* Additional fees apply.

4.2 Subject Land Servicing

a) Type of access: (check appropriate box)

- ☐ provincial highway
- ☐ municipal road, seasonally maintained
- ☑ municipal road, maintained all year
- ☐ right of way
- ☐ other public road

_____

b) Type of water supply proposed: (check appropriate box)

- ☑ publicly owned and operated piped water system
- ☐ privately owned and operated individual well
- ☐ lake or other water body
- ☐ other means (specify)

_____

c) Type of sewage disposal proposed: (check appropriate box)

- ☑ publicly owned and operated sanitary sewage system
- ☐ privately owned and operated individual septic system
- ☐ other means (specify) _____

4.3 Other Services: (check if the service is available)

☑ electricity ☑ telephone ☑ school bussing ☑ garbage collection

## 5 CURRENT LAND USE

5.1 What is the existing official plan designation of the subject land?

Rural Hamilton Official Plan designation (if applicable): _____

Rural Settlement Area: _____

Urban Hamilton Official Plan designation (if applicable) Neighbourhoods

Please provide an explanation of how the application conforms with a City of Hamilton Official Plan.

Please refer to submitted cover letter.

5.2 Is the subject land currently the subject of a proposed official plan amendment that has been submitted for approval?

☐ Yes ☑ No ☐ Unknown

If YES, and known, provide the appropriate file number and status of the application.

_____

5.3 What is the existing zoning of the subject land? R2-FP

If the subject land is covered by a Minister's zoning order, what is the Ontario Regulation Number?

_____

5.4 Is the subject land the subject of any other application for a Minister's zoning order, zoning by-law amendment, minor variance, consent or approval of a plan of subdivision?

☑ Yes ☐ No ☐ Unknown

If YES, and known, provide the appropriate file number and status of the application.

Concurrent Minor Variance application.

5.5 Are any of the following uses or features on the subject land or within 500 metres of the subject land, unless otherwise specified. Please check the appropriate boxes, if any apply.

| Use or Feature | On the Subject Land | Within 500 Metres of Subject Land, unless otherwise specified (indicate approximate distance) |
|---|---|---|
| **An agricultural operation, including livestock facility or stockyard** * Submit Minimum Distance Separation Formulae (MDS) if applicable | ☐ | |
| **A land fill** | ☐ | |
| **A sewage treatment plant or waste stabilization plant** | ☐ | |
| **A provincially significant wetland** | ☐ | |
| **A provincially significant wetland within 120 metres** | ☐ | |
| **A flood plain** ***Mapped by HCA online mapping | ☑ | Adjacent |
| **An industrial or commercial use, and specify the use(s)** | ☐ | |
| **An active railway line** | ☐ | |
| **A municipal or federal airport** | ☐ | |

## 6 HISTORY OF THE SUBJECT LAND

6.1 Has the subject land ever been the subject of an application for approval of a plan of subdivision or a consent under sections 51 or 53 of the *Planning Act*?

☐ Yes ☐ No ☑ Unknown

If YES, and known, provide the appropriate application file number and the decision made on the application.

Lands are within registered plan of subdivision, so previous application approval assumed.

6.2 If this application is a re-submission of a previous consent application, describe how it has been changed from the original application.

6.3 Has any land been severed or subdivided from the parcel originally acquired by the owner of the subject land?

☐ Yes ☑ No

If YES, and if known, provide for each parcel severed, the date of transfer, the name of the transferee and the land use.

6.4 How long has the applicant owned the subject land?

Since January 17, 2023

6.5 Does the applicant own any other land in the City? ☐ Yes ☑ No

If YES, describe the lands below or attach a separate page.

## 7 PROVINCIAL POLICY

7.1 Is this application consistent with the Policy Statements issued under Section 3 of the *Planning Act*?

☑ Yes ☐ No (Provide explanation)

Please refer to submitted cover letter.

7.2 Is this application consistent with the Provincial Policy Statement (PPS)?

☑ Yes ☐ No (Provide explanation)

Please refer to submitted cover letter.

7.3 Does this application conform to the Growth Plan for the Greater Golden Horseshoe?

☑ Yes ☐ No (Provide explanation)

Please refer to submitted cover letter.

7.4 Are the subject lands subject to the Niagara Escarpment Plan?

☐ Yes ☑ No (Provide explanation)

7.5 Are the subject lands subject to the Parkway Belt West Plan?

☐ Yes ☑ No (Provide explanation)

7.6 Are the subject lands subject to the Greenbelt Plan?

☐ Yes ☑ No (Provide explanation)

7.7 Are the subject lands within an area of land designated under any other provincial plan or plans?

☐ Yes ☑ No (Provide explanation)

## 8 ADDITIONAL INFORMATION - VALIDATION

8.1 Did the previous owner retain any interest in the subject land?

☐ Yes ☐ No (Provide explanation)

8.2 Does the current owner have any interest in any abutting land?

☐ Yes ☐ No (Provide explanation and details on plan)

8.3 Why do you consider your title may require validation? (attach additional sheets as necessary)

## 9 ADDITIONAL INFORMATION - CANCELLATION

9.1 Did the previous owner retain any interest in the subject land?

☐ Yes ☐ No (Provide explanation)

9.2 Does the current owner have any interest in any abutting land?

☐ Yes ☐ No (Provide explanation and details on plan)

9.3 Why do you require cancellation of a previous consent? (attach additional sheets as necessary)

## 10 ADDITIONAL INFORMATION - FARM CONSOLIDATION

10.1 Purpose of the Application (Farm Consolidation)

If proposal is for the creation of a non-farm parcel resulting from a farm consolidation, indicate if the consolidation is for:

☐ Surplus Farm Dwelling Severance from an Abutting Farm Consolidation

☐ Surplus Farm Dwelling Severance from a Non-Abutting Farm Consolidation

10.2 Location of farm consolidation property:

| | | | |
|---|---|---|---|
| Municipal Address | | | |
| Assessment Roll Number | | | |
| Former Municipality | | | |
| Lot | | Concession | |
| Registered Plan Number | | Lot(s) | |
| Reference Plan Number (s) | | Part(s) | |

10.3 Rural Hamilton Official Plan Designation(s)
If proposal is for the creation of a non-farm parcel resulting from a farm consolidation, indicate the existing land use designation of the abutting or non-abutting farm consolidation property.

10.4 Description of farm consolidation property:

| | |
|---|---|
| Frontage (m): | Area (m² or ha): |

Existing Land Use(s): _____ Proposed Land Use(s): _____

10.5 Description of abutting consolidated farm (excluding lands intended to be severed for the surplus dwelling)

| | |
|---|---|
| Frontage (m): | Area (m² or ha): |

10.6 Existing Land Use: _____ Proposed Land Use: _____

10.7 Description of surplus dwelling lands proposed to be severed:

| | |
|---|---|
| Frontage (m): (from Section 4.1) | Area (m² or ha): (from Section 4.1) |

Front yard set back: _____

a) Date of construction:
☐ Prior to December 16, 2004 ☐ After December 16, 2004

b) Condition:
☐ Habitable ☐ Non-Habitable

## 11 COMPLETE APPLICATION REQUIREMENTS

### 11.1 All Applications

- [x] Application Fee
- [x] Site Sketch
- [x] Complete Application Form
- [x] Signatures Sheet

### 11.2 Validation of Title

- [ ] All information documents in Section 11.1
- [ ] Detailed history of why a Validation of Title is required
- [ ] All supporting materials indicating the contravention of the Planning Act, including PIN documents and other items deemed necessary.

### 11.3 Cancellation

- [ ] All information documents in Section 11.1
- [ ] Detailed history of when the previous consent took place.
- [ ] All supporting materials indicating the cancellation subject lands and any neighbouring lands owned in the same name, including PIN documents and other items deemed necessary.

### 11.4 Other Information Deemed Necessary

- [x] Cover Letter/Planning Justification Report
- [ ] Minimum Distance Separation Formulae (data sheet available upon request)
- [ ] Hydrogeological Assessment
- [ ] Septic Assessment
- [ ] Archeological Assessment
- [ ] Noise Study
- [ ] Parking Study

_____

_____