Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	MUSKOKA	HAMILTON
TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 721-7863	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 721-7864	FAX: (905) 542-2769

September 18, 2025 Reference No. 2507-S026
(Revision of Report dated April 13, 2020)

De Zen Realty Company Limited
4890 Tomken Road, Units 1-4
Mississauga, Ontario
L4W 1J8

Attention: Mr. Mark Palmieri

Re: Supplementary Slope Stability Study Letter Report
Proposed Employment Lands
De Zen Industrial - Phase 2
Southwest of Highway 407 and Hurontario Street
City of Mississauga

Dear Sir:

In 2008, a soil investigation consisting of 4 boreholes to depths ranging from 4.9 to 7.9 m was carried out onsite for a slope stability study. Subsequent to the 2008 slope stability report, Reference No. 0803-S002, an addendum was issued in 2012 to provide additional analyses and clarifications to address the Credit Valley Conservation (CVC) comments dated February 28, 2012. The topographic map for the site has since been updated. The previously analyzed cross-sections are therefore revised accordingly.

The slope stability report was revised again in 2016 and 2020 to address comments issued in 2015 by the CVC, and to incorporate the toe erosion allowance (TEA) and meander belt width (MBW) prepared and presented by GEO Morphix Ltd. in their 'Tributary of Fletcher's Creek Erosion Hazard Assessment', draft dated April 15, 2019. The MBW has since been refined in 2025, and in response, we herein present our supplementary slope stability study findings and recommendations, incorporating the updated setbacks.

FINDINGS

Based on the 2008 borehole information, beneath a layer of topsoil, 15 to 30± cm thick, the site is underlain by a layer of generally hard silty clay till and very dense sandy silt till.

All boreholes remained dry upon completion of field work. However, a groundwater level of El. 195.0± m was included in the modeling at the request of CVC and was assumed to taper towards Fletcher's Creek. In the absence of monitoring well data, the use of the transition zone where the colour of the soil changes from brown to grey best represents the potential groundwater regime.

SLOPE STABILITY STUDY

The slope stability study focuses on the eastern bank of Fletcher's Creek, meandering along the western and southern limits of the subject site. The drainage feature downstream to the pond in the centre of the site has been identified as a watercourse by CVC and therefore has been added to the slope study. At the time of the 2008 inspection, the drainage ditch was dry.

Cross-Sections A-A to E-E, were selected to represent the most critical portions of the slope. The locations of the cross-sections are shown on Drawing No. 1. These sections have an overall slope height of 3.0± to 8.0± m, measured from the tableland to the toe of slope, with an overall gradient of 1V:1.9 ± to 3.4± H and a local gradient of 1V:0.9 H. The surface profiles of the cross-sections are interpreted from the contours on the topographic plan prepared by David B. Searles Surveying Ltd.; the subsurface profiles are interpreted from the borehole logs. Cross-Sections A-A to E-E are shown on Drawing Nos. 2 to 8, inclusive.

As noted in the previous report and letter, visual inspection revealed that the slope is generally well-vegetated with dense grass- and weed-covers and sparse trees in the northern region where the slope is gentle. In the southern region where the slope is the steepest, tree growth was more prominent. No signs of seepage or major deep-seated failure were observed; however, minor channelization and surface creeping were noted in the proximity of Cross-Section B-B. In addition, active toe erosion was observed in the absence of a flood plain along the creek bank at Cross-Sections A-A and B-B (Boreholes 1 and 2). No active erosion was noted along the drainage/gulley features.

The slope stability was analyzed using limit-equilibrium criteria of the Bishop Method with the effective soil strength parameters shown in the table below.

Strength Parameters for Slope Stability Analysis

	γ (kN/m^3)	c' (kPa)	ϕ' (degrees)
Silty Clay Till	22.0	5	30
Sandy Silt Till	22.0	0	31

The result from the analysis indicates that the slope at Cross-Sections B-B to E-E has a factor of safety (FOS) ranging from 1.79 and 2.40, which satisfies the OMNR guideline requirements for infrastructure and public land uses (minimum FOS of 1.5). These existing slopes are therefore considered geotechnically stable. The results are presented on Drawing Nos. 4, 6, 7 and 8.

For Cross-Section A-A, the result (Drawing No. 2) shows that the existing slope has a FOS of 1.45, which fails to meet the OMNR requirements. A stable gradient of 1V:2.2H is recommended for use in the sound native clay till. The remodelled slope, yielding a FOS of 1.54 which meets the OMNR requirements, is presented on Drawing No. 3.

In the absence of an adequate flood plain (less than 15 m in width), a TEA of 5 m has been recommended by GEO Morphix Ltd. in their study. This is mainly applicable for Cross-Sections A-A, B-B and E-E and surrounding areas. For Cross-Sections B-B and E-E, a geotechnically stable gradient of 1V:1.9H to 1V:2H is used behind the TEA. The remodelled slopes, with FOS of 1.57 and 2.12, meets the OMNR requirements and is presented on Drawing Nos. 5 and 9.

The Long-Term Stable Slope Line (LTSSL), incorporating the geotechnically stable gradients and TEA, where applicable, is established on the Borehole and Cross-Section Location Plan, Drawing No. 1. For the most part, the LTSSL coincides with the Top of Bank (staked with CVC on November 9, 2001) or the Farm Pond Drainage Area (staked July 6, 2012). The LTSSL is not defined for the unconfined feature east/opposite of Cross-Section E-E (also known as Reach FCT-2); instead, the MBW will govern in this area.

Lastly, a development setback buffer for man-made and environmental degradation of the bank will be required, subject to the discretion and approval of CVC.

In future development, should any alteration be carried out in the slope areas, it should either be restored to its original condition or better than its original condition.

In order to prevent the occurrence of localized surface slides in the future and to enhance the stability of the slope, the following geotechnical constraints should be stipulated:

1. The prevailing vegetative cover must be maintained, since its extraction would deprive the rooting system that is reinforcement against soil erosion by weathering. If for any reason the vegetation cover is stripped, it must be reinstated to its original, or better than its original, protective condition. Restoration with selective native plantings including deep rooting systems which would penetrate the original buried topsoil

shall be carried out to ensure bank stability.

2. Grading of the land adjacent to the slope must be such that concentrated runoff is not allowed to drain onto the slope face. Landscaping features which may cause runoff to pond at the top of the slope must not be permitted.
3. The leafy topsoil cover on the bank face should not be disturbed, since this provides insulation and a screen against frost wedging and rainwash erosion.
4. Where development is carried out near the top of the slope, there are other factors to be considered related to possible human environmental abuse. Soil saturation from maintenance of landscaping features, stripping of topsoil or vegetation, and dumping of loose fill over the bank must not be allowed.

The above recommendations are subject to the approval of the CVC.

We trust this letter satisfies your present requirements; however, should any queries arise, please feel free to contact this office.

Yours truly,
SOIL ENGINEERS LTD.

Hui Wing Yang, P.Eng.
HWY/BL

Bernard Lee, P.Eng.

ENCLOSURES

Borehole and Cross-Section Location Plan	Drawing No. 1
Cross-Section A-A (Existing Condition)	Drawing No. 2
Cross-Section A-A (Stable Condition)	Drawing No. 3
Cross-Section B-B (Existing Condition)	Drawing No. 4
Cross-Section B-B (Stable Condition)	Drawing No. 5
Cross-Section C-C (Existing Condition)	Drawing No. 6
Cross-Section D-D (Existing Condition)	Drawing No. 7
Cross-Section E-E (Existing Condition)	Drawing No. 8
Cross-Section E-E (Existing Condition with Toe Erosion Allowance)	Drawing No. 9

c. Soil Engineers Ltd. (Mississauga) Attn: Mr. Benjamin Lee

This letter/report/certification was prepared by Soil Engineers Ltd. for the account of the captioned clients and may be relied upon by regulatory agencies. The material in it reflects the writer's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this letter/report/certification, or any reliance on or decisions to be made based upon it, are the responsibility of such third parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this letter/report/certification.

SKETCH ILLUSTRATING
TOPOGRAPHIC DETAIL
DEZEN INDUSTRIAL LANDS PHASE 2
CITY OF MISSISSAUGA
REGIONAL MUNICIPALITY OF PEEL

SCALE 1: 500

0 5 10 15 20 25 30 40 50 metres

David B. Searles Surveying Ltd.
ONTARIO LAND SURVEYORS

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

BENCHMARK NOTE

ELEVATIONS ARE REFERRED TO THE CITY OF MISSISSAUGA BENCHMARK No. 1079 BEING A 90 MM DIAMETER BRASS DISC SET IN THE NOSE OF A CONCRETE MONUMENT AT THE INTERSECTION OF THE WEST LIMIT OF HURONTARIO STREET AND TRAFFIC ISLAND, 400M SW ELEVATION OF 202.010m.

VERTICAL DATUM CANADIAN GEODETIC DATUM, 1928
(NOT 1978 SOUTHERN ONTARIO READJUSTMENT)

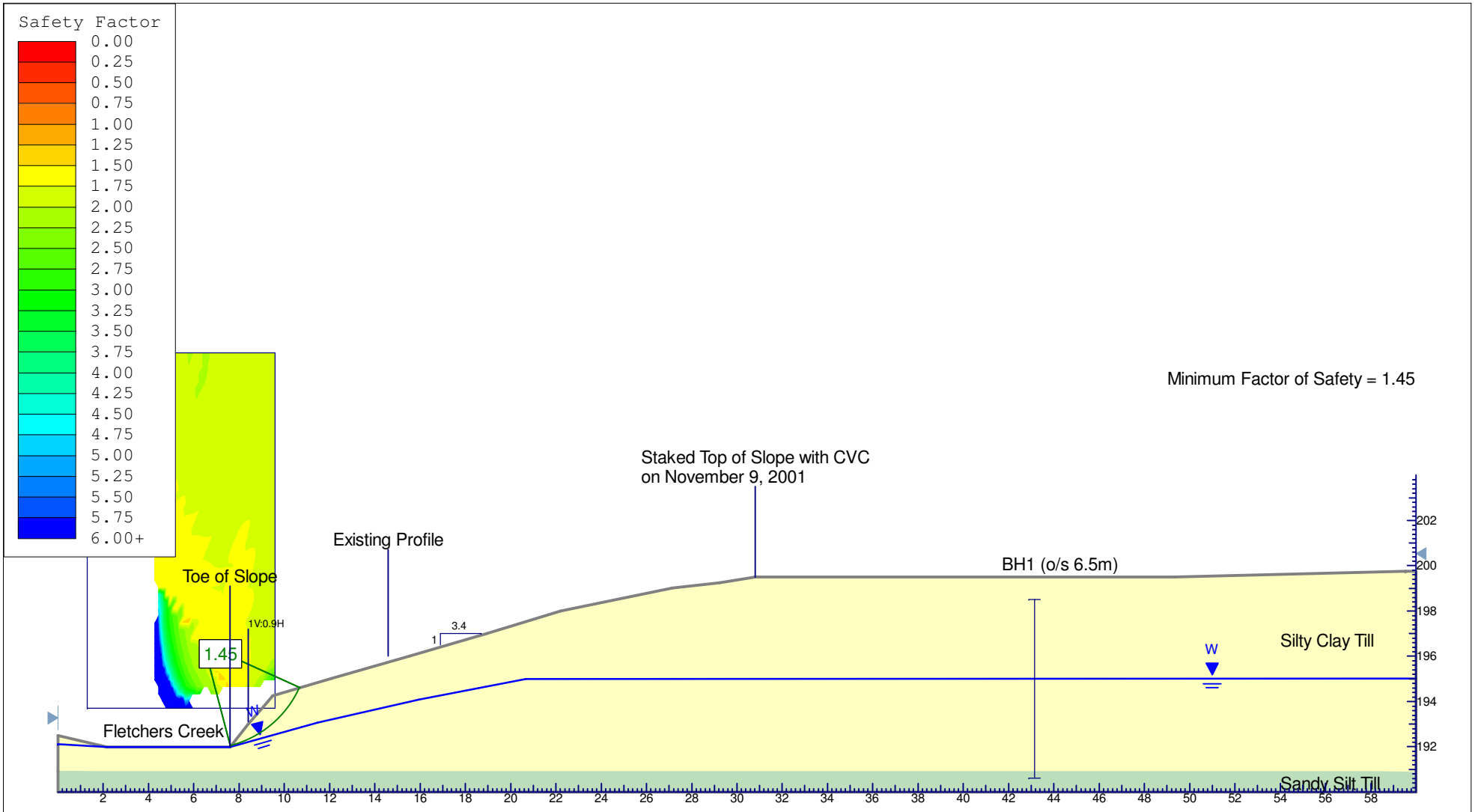
LEGEND

FH	DENOTES FIRE HYDRANT
BC	DENOTES BACK OF CURB
BF	DENOTES BOARD FENCE
CF	DENOTES CHAIN FENCE
COUT	DENOTES CURB CUT
CLF	DENOTES CHAIN LINK FENCE
CMP	DENOTES CORR. METAL PIPE
CSP	DENOTES CULVERT (STEEL PIPE)
CW	DENOTES CONCRETE SIDE WALK
DW	DENOTES DRIVEWAY (CONCRETE)
EW	DENOTES EDGE OF WATER
LS	DENOTES LIGHT STANDARD
MH	DENOTES MAINTENANCE HOLE COVER
MH(CMH)	DENOTES MAINTENANCE HOLE COVER (CONTAMP)
MH(STM)	DENOTES MAINTENANCE HOLE COVER (STORM)
PWF	DENOTES POST AND WIRE FENCE
RF	DENOTES RAIL FENCE
VP	DENOTES VENT PIPE
WV	DENOTES WATER VALVE
x	DENOTES BOTTOM OF SLOPE
	DENOTES DITCH LINE
	DENOTES TOP OF SLOPE
	DENOTES CONIFEROUS TREE
	DENOTES DECIDUOUS TREE
	DENOTES TREE LINE

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

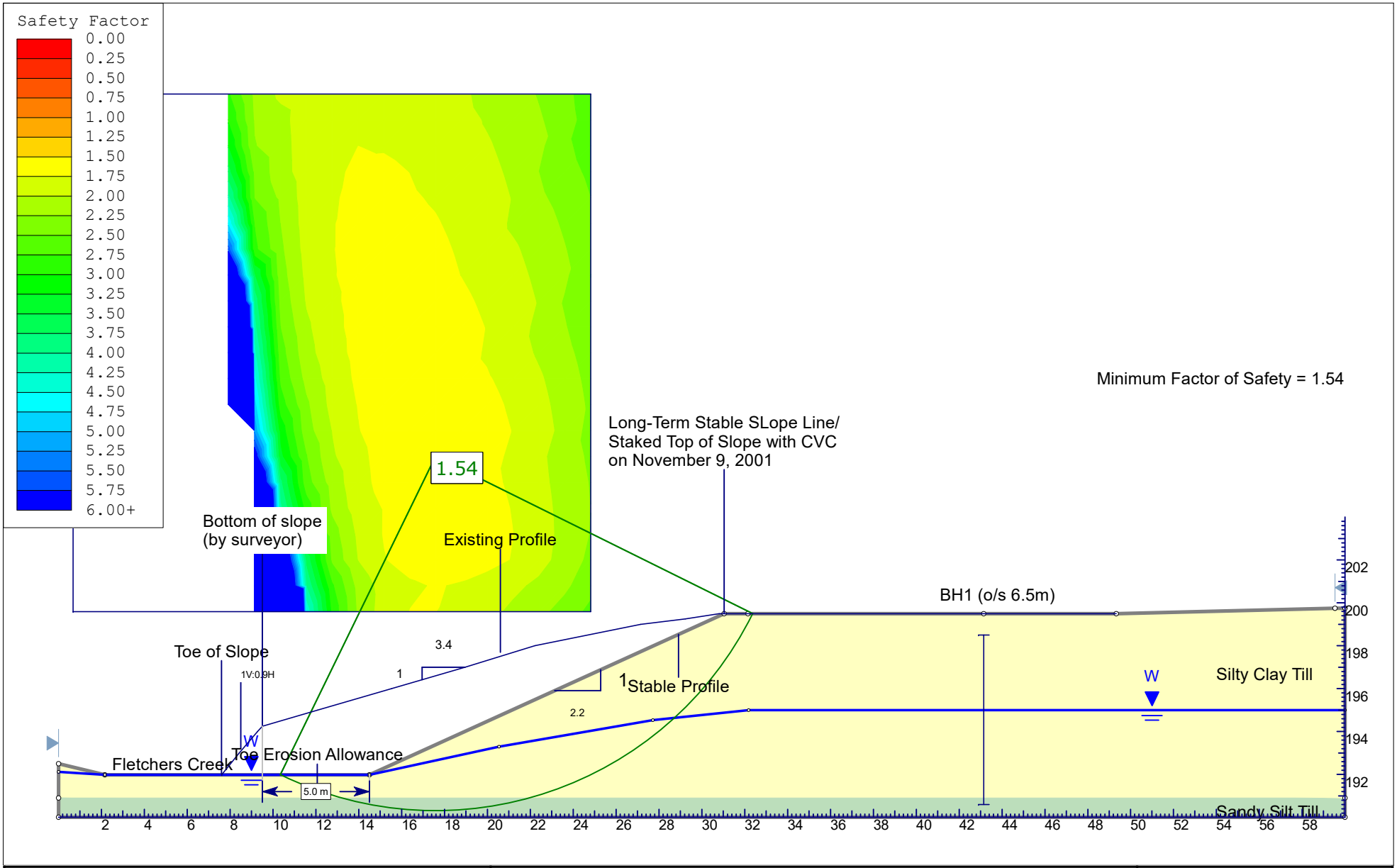
BOREHOLE & CROSS-SECTION LOCATION PLAN
DE ZEN INDUSTRIAL PHASE 2

SITE: SOUTHWEST OF HIGHWAY 407 AND HURONTARIO STREET, CITY OF MISSISSAUGA			
DESIGNED BY:	**CHECKED BY:**	**DWG NO.:** 1	
SCALE: 1:2000	**REF. NO.:** 2507-S026	**DATE:** SEPTEMBER 2025	**REV** D



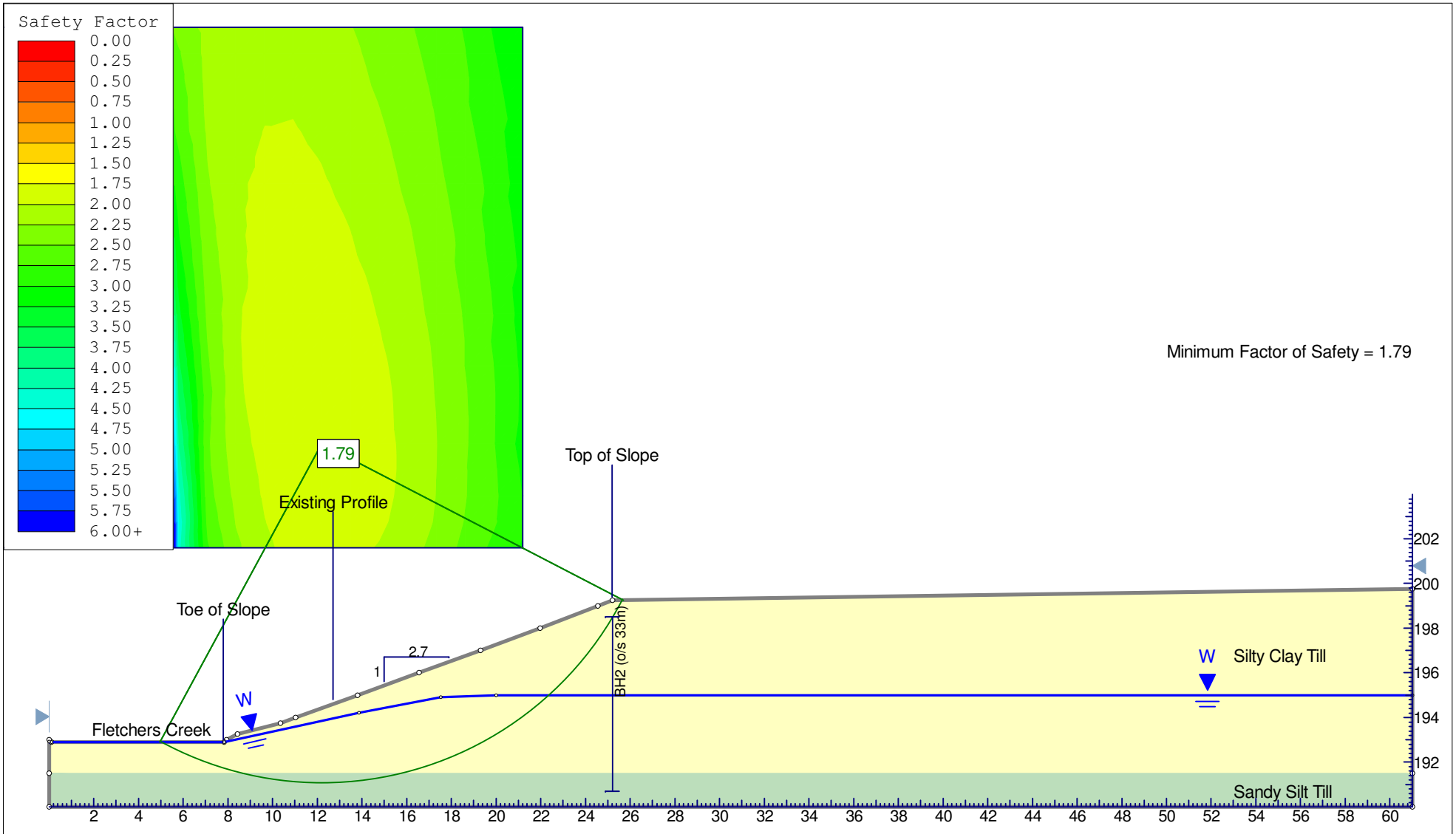
Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
100 NUGGET AVENUE, TORONTO, ONTARIO M1S 3A7 · TEL: (416) 754-8515 · FAX: (416) 754-8516

Project Title: Cross-Section A-A			Load Case: Existing Condition
Location: Southwest Quadrant of Highway 407 and Hurontario Street, Mississauga			
Drawn By: BL	Checked By:	Scale: 1:250	Revision: -
Date: January 2016		Reference No.: 0803-S002	Drawing No.: 2



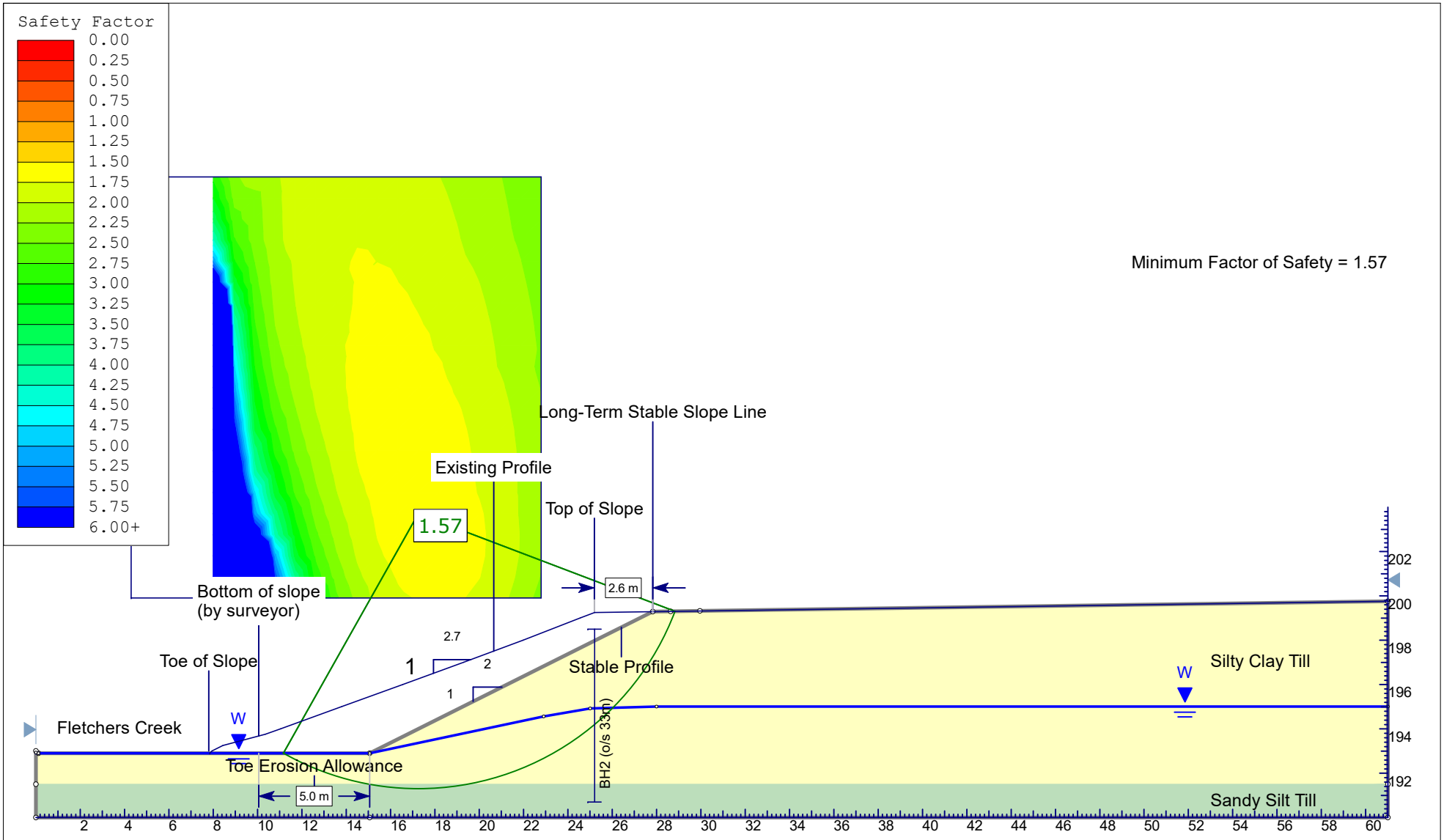
Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

Project Title: Cross-Section A-A			Load Case: Stable Condition
Location: Southwest Quadrant of Highway 407 and Hurontario Street, Mississauga			
Drawn By: HWY	Checked By: BL	Scale: 1:250	Revision: 1
Date: April 2020		Reference No.: 0803-S002	Drawing No.: 3



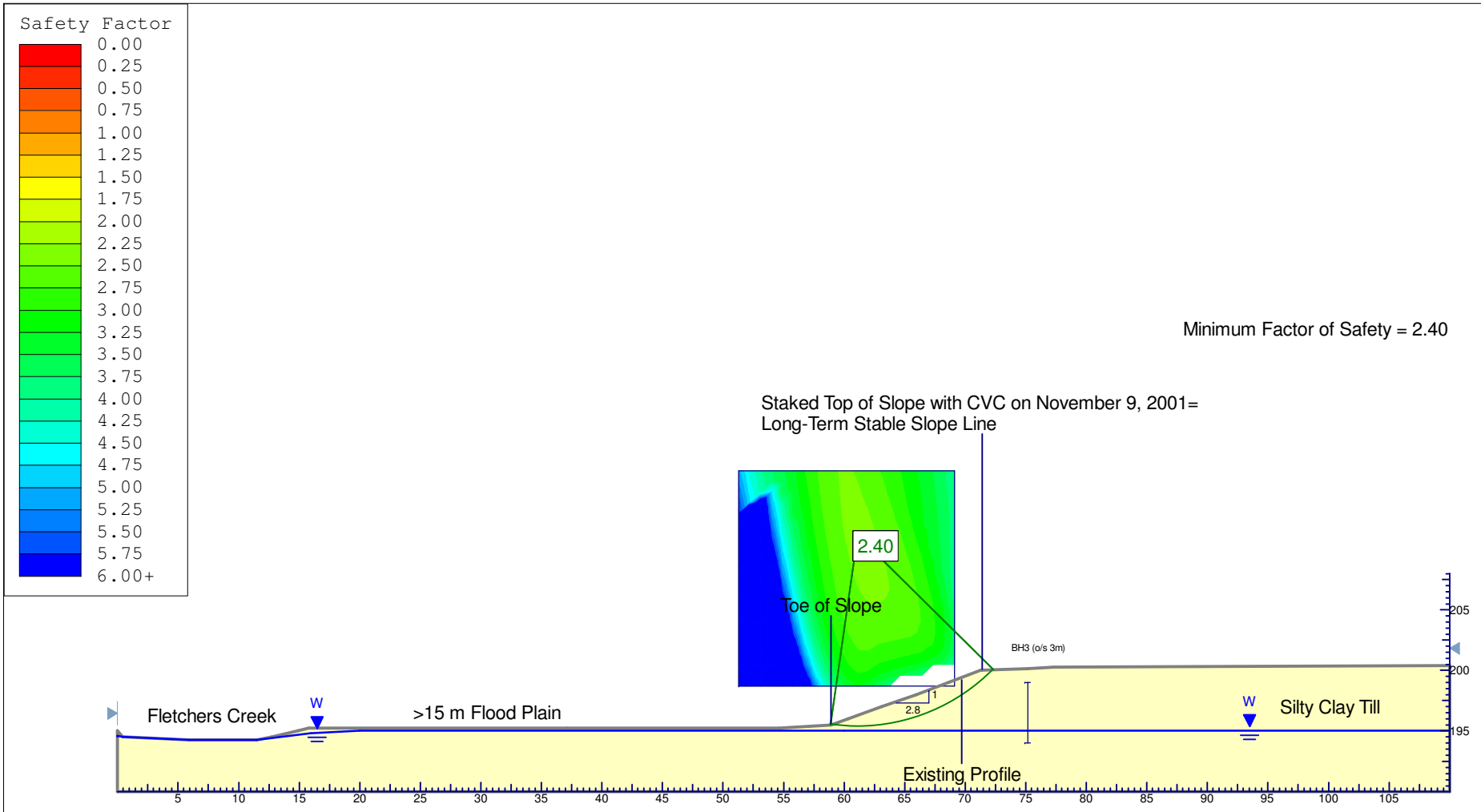
Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
100 NUGGET AVENUE, TORONTO, ONTARIO M1S 3A7 · TEL: (416) 754-8515 · FAX: (416) 754-8516

Project Title: Cross-Section B-B			Load Case: Existing Condition
Location: Southwest Quadrant of Highway 407 and Hurontario Street, Mississauga			
Drawn By: BL	Checked By:	Scale: 1:250	Revision: -
Date: January 2016		Reference No.: 0803-S002	Drawing No.: 4

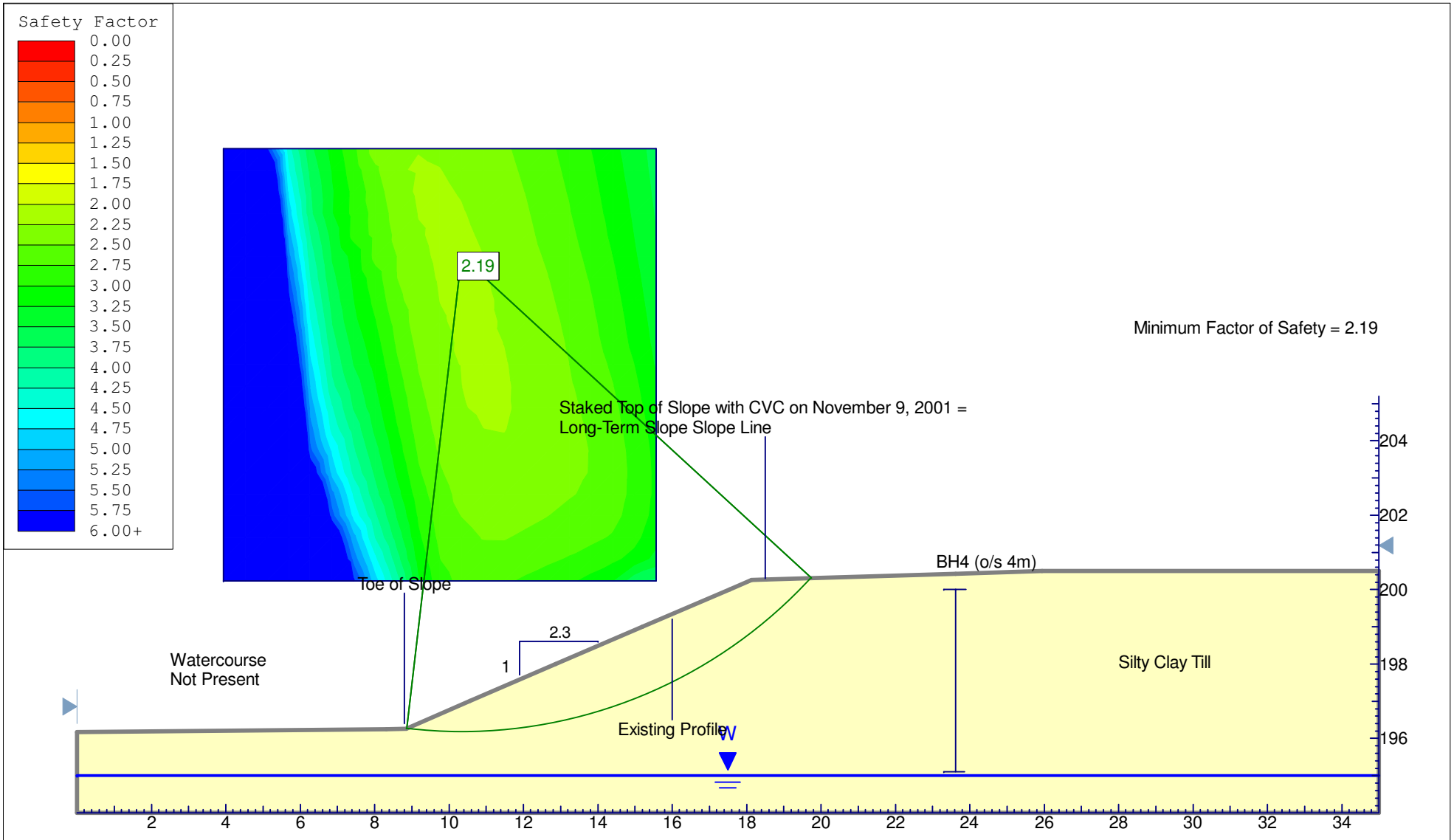


Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

Project Title: Cross-Section B-B			Load Case: Stable Condition
Location: Southwest Quadrant of Highway 407 and Hurontario Street, Mississauga			
Drawn By	Checked By: BL	Scale: 1:250	Revision: 1
Date: April 2020		Reference No.: 0803-S002	Drawing No.: 5

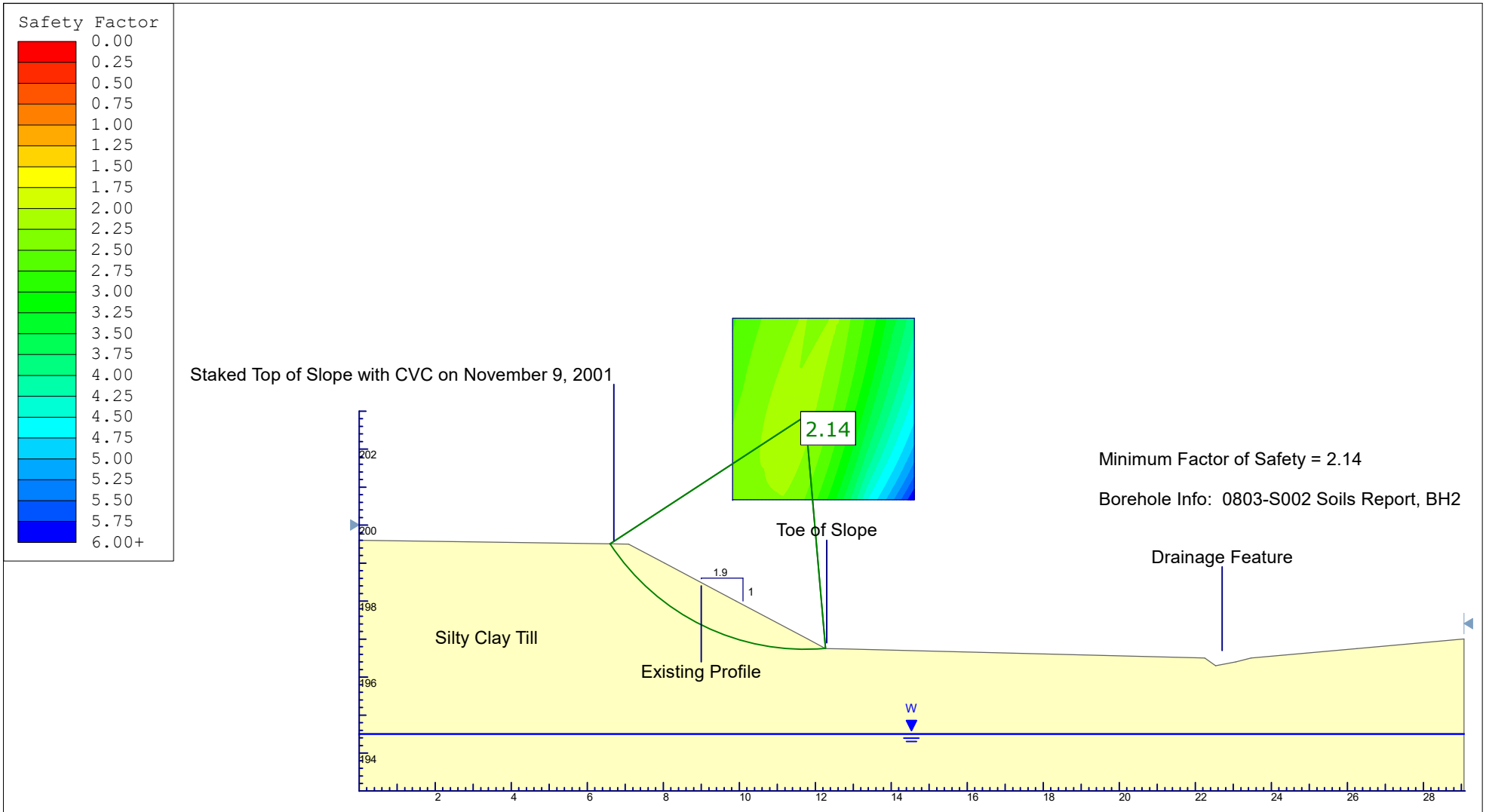


Soil Engineers Ltd. CONSULTING ENGINEERS GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE 100 NUGGET AVENUE, TORONTO, ONTARIO M1S 3A7 · TEL: (416) 754-8515 · FAX: (416) 754-8516	Project Title: Cross-Section C-C			Load Case: Existing Condition
	Location: Southwest Quadrant of Highway 407 and Hurontario Street, Mississauga			
	Drawn By: BL	Checked By:	Scale: 1:500	Revision: -
	Date: January 2016		Reference No.: 0803-S002	Drawing No.: 6



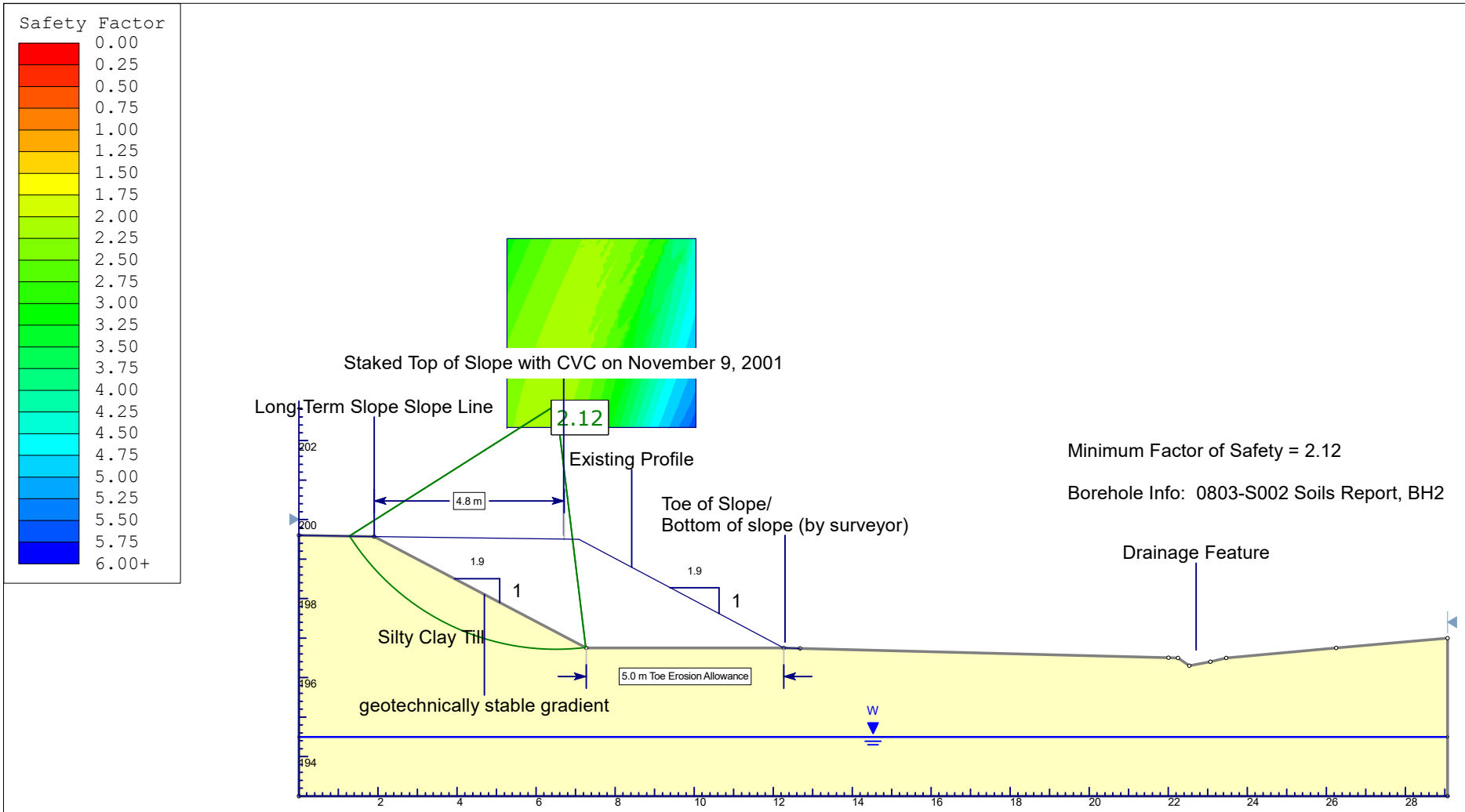
Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
100 NUGGET AVENUE, TORONTO, ONTARIO M1S 3A7 · TEL: (416) 754-8515 · FAX: (416) 754-8516

Project Title: Cross-Section D-D			Load Case: Existing Condition
Location: Southwest Quadrant of Highway 407 and Hurontario Street, Mississauga			
Drawn By: BL	Checked By:	Scale: 1:150	Revision: -
Date: January 2016		Reference No.: 0803-S002	Drawing No.: 7



Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

Project Title: Cross-Section E-E			Load Case: Existing Condition
Location: Southwest Quadrant of Highway 407 and Hurontario Street, Mississauga			
Drawn By: HWY	Checked By: BL	Scale: 1:150	Revision: 1
Date: April 2020		Reference No.: 0803-S002	Drawing No.: 8



Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | HYDROGEOLOGICAL | BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

Project Title: Cross-Section E-E			Load Case: Existing Condition (with Toe Erosion Allowance)
Location: Southwest Quadrant of Highway 407 and Hurontario Street, Mississauga			
Drawn By: HWY	Checked By: BL	Scale: 1:150	Revision: -
Date: April 2020		Reference No.: 0803-S002	Drawing No.: 9