



**THURBER** ENGINEERING LTD.

**FOUNDATION INVESTIGATION REPORT  
HIDDEN GLEN ROAD ACCELERATION LANE  
HIGHWAY 400 SOUTHBOUND LANES, DISTRICT OF MUSKOKA, ONTARIO  
ASSIGNMENT NO. 5019-E-0016  
G.W.P. 5191-18-00**

**LATITUDE: 44.900886°, LONGITUDE: -79.769238°**

**GEOCRES No.: 31D13-001**

**Report**

to

**LEA Consulting Ltd.**

Date: April 3, 2024  
File: 28317



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**FOUNDATION INVESTIGATION REPORT  
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**GEOGRES No. 31D13-001**

**PART 1: FACTUAL INFORMATION**

**1. INTRODUCTION**

This section of the report presents the factual findings obtained from a field investigation completed to support the design of the embankment widening related to the proposed 650 m long acceleration lane on Highway 400 Southbound (SB) from Hidden Glen Road to 650 m southerly in the Township of Georgian Bay within the District of Muskoka, Ontario.

The purpose of the investigation was to explore the surface and shallow sub-surface conditions at the site, and based on the data obtained, to provide detailed inspection notes and a written description of the surface and subsurface conditions.

Thurber carried out the investigation as a sub-consultant to LEA Consulting Ltd. (LEA), under Ministry of Transportation Ontario (MTO) Agreement Number 5019-E-0016.

It is a condition of this report that Thurber's performance of its professional services is subject to the attached Statement of Limitations and Conditions.

**2. SITE DESCRIPTION**

The Highway 400 SB and Hidden Glen Rd. intersection is located 2.3 km south of the Crooked Bay Rd. interchange in Georgian Bay Township, Ontario. Hidden Glen Rd. extends westward from Highway 400 SB toward Georgian Bay. The existing intersection provides access to and from Highway 400 SB. Access from Hidden Glen Rd. to Highway 400 SB is controlled with a stop sign. A deceleration lane is located north of Hidden Glen Rd.



Highway 400 is a divided highway within the project limits. The existing SB highway is two lanes with an approximately 3 m wide paved shoulder on the west side and 1.5 m paved shoulder on the east side.

The base plan provided by LEA indicates the presence of a low-lying area west of the highway from Hidden Glen Rd. to approximately 50 m southerly and a swampy area located between Stations 22+450 and 22+300. Two box culverts cross under the SB lanes of the highway from the median ditch at approximate Stations 22+790 and 22+475. Most of the remaining areas along the proposed widening area consist of rock outcrops that are visible at the ground surface. Photographs of the Highway 400 SB and Hidden Glen Rd. intersection and the surrounding area are presented in Appendix B.

Based on the Ontario Geological Survey's Open File Map 194 titled "Quaternary Geology of the Penetanguishene and Christian Island Areas", dated 1992, the project area is located at the boundary of areas mapped as exposed Precambrian bedrock to very thin drift cover over Precambrian bedrock and swamp and organic deposits. Bedrock mapping indicates the local bedrock consists of igneous rock classified as monzogranite.

### **3. SITE INSPECTION AND FIELD TESTING**

#### **3.1 Current Investigation**

The site inspection and field testing for this project was carried out between May 16<sup>th</sup> and 18<sup>th</sup>, 2023. The site inspection and field testing included the following components:

- Visual inspection of the entire widening area including taking site photographs and preparing site sketches.
- Manual probing of accessible areas within the widening footprint using a metal rod.
- Completion of Dynamic Cone Penetration Tests (DCPT) using a miniature, portable DCPT unit in areas where manual probing did not reach refusal.

Field sketches including the approximate locations of the DCPTs, a table of the manual probing findings and DCPT logs are attached in Appendix A. Site photographs are attached in Appendix B. A probe hole and DCPT location plan is attached in Appendix D.



### **3.2 Pavement Investigation**

The pavement investigation carried out as part of this overall assignment included boreholes for the Hidden Glen Road Acceleration Lane. The pavement boreholes were advanced through the embankment and west of the embankment in ditch. Relevant borehole logs are reproduced in Appendix C of this report. A full description of the pavement investigations and full results can be found in the pavement design report referenced below:

- “Pavement Design Report, Rehabilitation of Highway 400 and 10 Bridge Structures, G.W.P. 5191-18-00, Northeastern Region, Port Severn, Ontario, Agreement Number 5019-E-0016”, dated May 19, 2023.

## **4. DESCRIPTION OF FIELD INVESTIGATION RESULTS**

The project area has been split into six areas based on the results of the investigation. The following subsections summarize the results of the investigations in each of these six areas.

### **4.1 Area #1 (Station 22+200 to Station 22+370)**

Area #1 extends from the south end of the widening area north to the swamp.

Manual probing with a steel rod was carried out at approximately 10 m intervals along the ditch and 5 m west of the ditch. Results of the probing are included in Table A1 in Appendix A. The depth to refusal varied from 0 mm to approximately 750 mm. Between Stations 22+265 to 22+300 bedrock was often exposed at the ground surface.

### **4.2 Area #2 (Station 22+370 to 22+420)**

The area between Station 22+370 and 22+420 west of the embankment was noted as a swamp with standing water. The area could not be accessed at the time of the current investigation due to standing water and safety concerns with working in the water.

Three boreholes were attempted/advanced as part of the pavement investigation at the west toe of the embankment/ditch line within the station limits. Two of the three boreholes noted 600 mm of surface water and the third borehole noted 600 mm of peat. This third borehole met refusal below the peat at a depth of 600 mm.



#### **4.3 Area #3 – (Station 22+420 to 22+480)**

Area #3 extends from the north edge of the inaccessible area of the swamp near Station 22+420 north to approximately Station 22+480 where bedrock was noted at the ground surface or below a thin layer of topsoil. It includes the west end of a 1.25 m square concrete box culvert. The south end of this area was noted to be wet, and the vegetation was consistent with swampy terrain.

This area was investigated by advancing five DCPTs (DCPT-01 to DCPT-05). The results of the DCPTs are included in Appendix A. Refusal in the DCTPs was encountered at depths ranging from 0.7 m to 1.1 m below ground surface on assumed bedrock. N-values ranged from 0 to 3 (excluding the refusal values at the bottom of each DCPT) indicating a very loose/very soft relative density/consistency.

As part of the pavement investigation three boreholes were advanced in the ditch west of the embankment. The boreholes encountered 100 mm to 800 mm of peat/topsoil at the ground surface. Refusal on presumed bedrock/cobbles and boulders was noted in all boreholes below the peat/topsoil.

#### **4.4 Area #4 (Station 22+480 to 22+770)**

During the current investigation it was noted that bedrock was exposed at the ground surface or was below a thin layer of topsoil/soil within this area. Additional investigation was not carried out during the current investigation.

As part of the pavement investigation, 15 boreholes were advanced in the ditch along the west side of the embankment. The boreholes encountered up to 300 mm of topsoil at the ground surface. Below the topsoil all the boreholes encountered refusal.

#### **4.5 Area #5 (Station 22+770 to 22+795)**

This area extends north from the north end of bedrock outcrop / shallow bedrock which characterized Area #4 to another area of exposed / shallow bedrock. The west end of a second 1.25 m square concrete box culvert is located within this area.

During the current investigation, this area was investigated by carrying out five DCPTs (DCPT-06 to DCPT-10). The DCPTs were located 3 m to approximately 12 m west of the toe of the embankment slope as shown on the sketch in Appendix A. Refusal was encountered at depths ranging from 0.6 m to 3.4 m below the ground surface. The depth to refusal was greatest near the end of the box culvert and decreased to the north, south and west. N-values ranged from 0 to



83 (typically 8 to 30) in the upper 1.2 m and from 1 to 15 (typically 2 to 4) below 1.2 m (excluding the refusal values at the bottom of each DCPT) indicating a compact/stiff to very stiff relative density/consistency in the upper 1.2 m and a very loose/soft relative density/consistency below 1.2m, respectively.

#### **4.6 Area #6 (Station 22+795 to 22+850)**

This area extends from the low area near the end of the culvert to Hidden Glen Road at Station 22+850. Based on observations made during the current investigation, within this area the bedrock was exposed at ground surface or below a thin layer of topsoil.

As part of the pavement investigation, two boreholes were advanced in the ditch west of the current embankment. The boreholes encountered 225 mm to 250 mm of topsoil at the ground surface. Both boreholes encountered refusal below the topsoil.

#### **4.7 Pavement Structure and Embankment**

The scope of the current investigation did not include any investigation of the existing pavement structure or embankment materials.

As part of the pavement investigation a total of 11 boreholes were advanced through the southbound lanes and an additional 10 boreholes were advanced through either the inside or outside shoulder of the southbound lanes.

The boreholes drilled through the travelled lanes encountered 175 mm to 235 mm of asphalt overlying approximately 0.5 m to 1.2 m of granular fill. In all 11 boreholes refusal was encountered at the bottom of the granular fill layer on assumed rockfill.

The boreholes drilled through the shoulders encountered 80 mm to 110 mm of asphalt overlying approximately 0.5 m to 1.1 m of granular fill. In all ten boreholes drilled through the west shoulders refusal was encountered at the bottom of the granular fill layer on assumed rockfill.



## 5. MISCELLANEOUS

The report was prepared by Mr. Scott Gittens, E.I.T. and Mr. Rod de Castro, P.Eng., and reviewed by Mr. Matthew Boucher, P.Eng. and Mr. Jason Lee, P.Eng., a Designated Contact for MTO Foundations Projects.

Thurber Engineering Ltd.

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## **STATEMENT OF LIMITATIONS AND CONDITIONS**

### **1. STANDARD OF CARE**

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

### **2. COMPLETE REPORT**

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

### **3. BASIS OF REPORT**

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

### **4. USE OF THE REPORT**

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

### **5. INTERPRETATION OF THE REPORT**

- a) **Nature and Exactness of Soil and Contaminant Description:** Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.
- b) **Reliance on Provided Information:** The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
- c) **Design Services:** The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.
- d) **Construction Services:** During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

### **6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES**

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

### **7. INDEPENDENT JUDGEMENTS OF CLIENT**

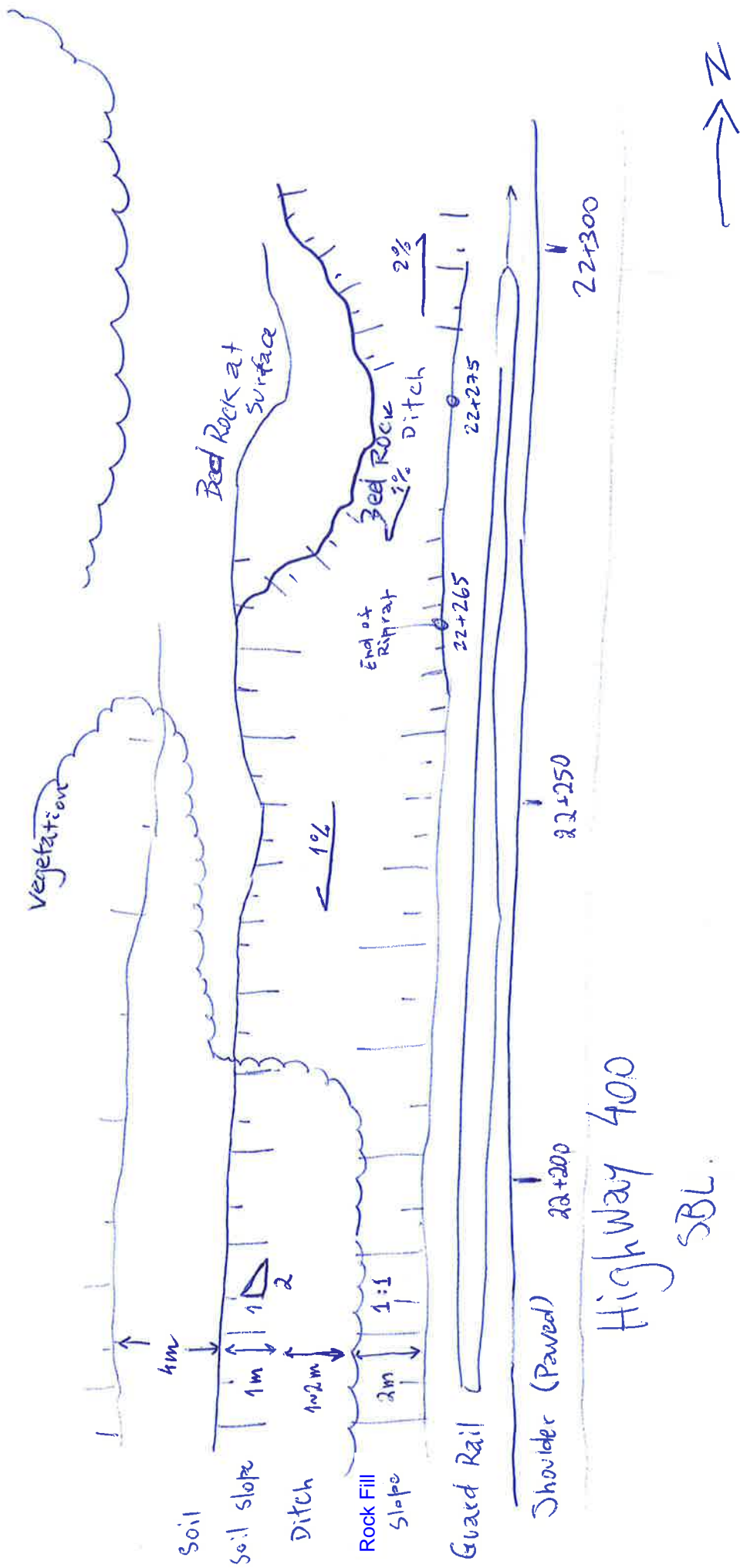
The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.



## **Appendix A**

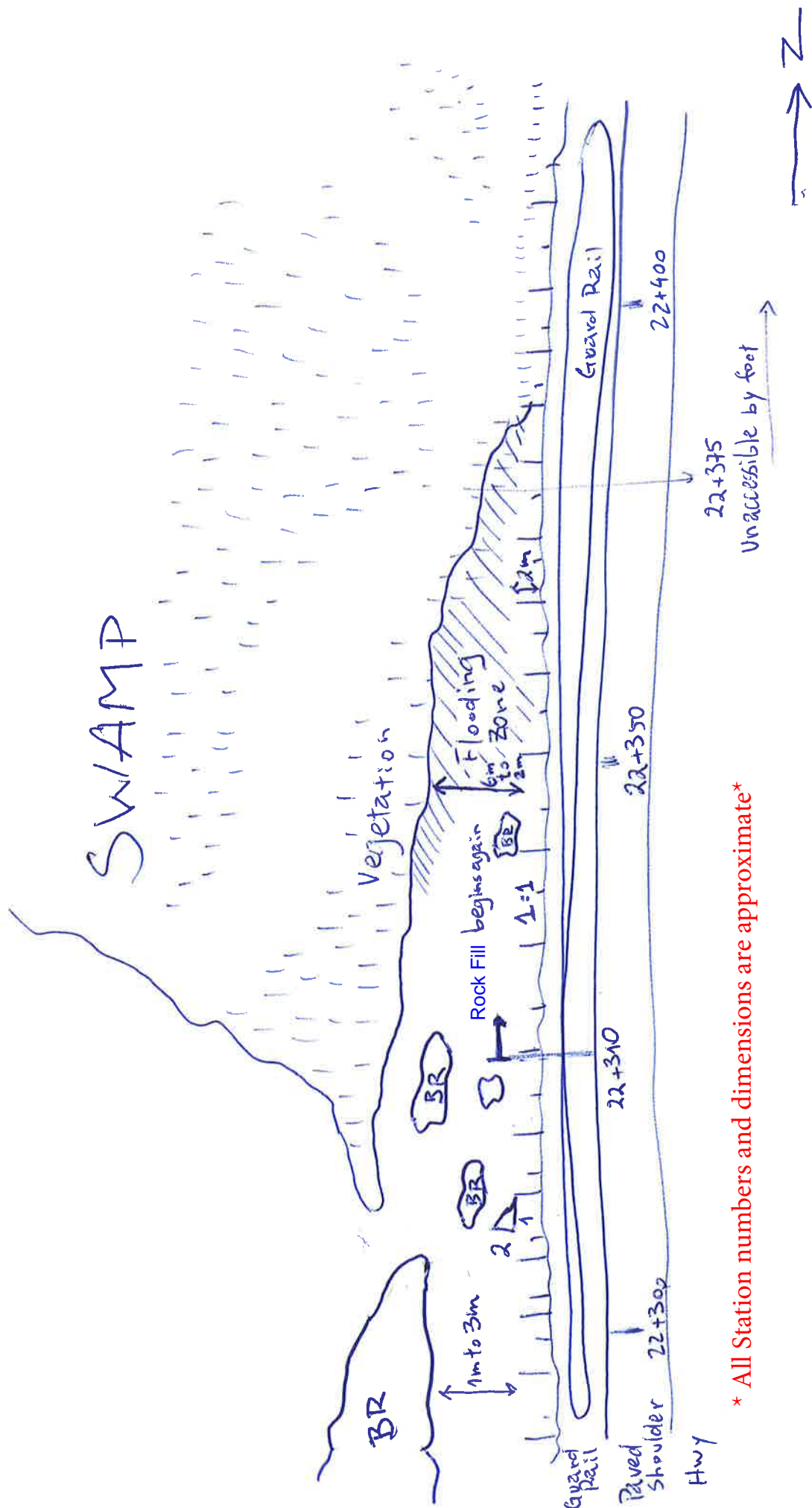
### **Field Sketches, Dynamic Cone Penetration and Manual Probing Results**

Hidden Glen Acceleration Lane  
 Highway 400, District of Muskoka  
 Field Sketch, Station 22+200 to 22+300



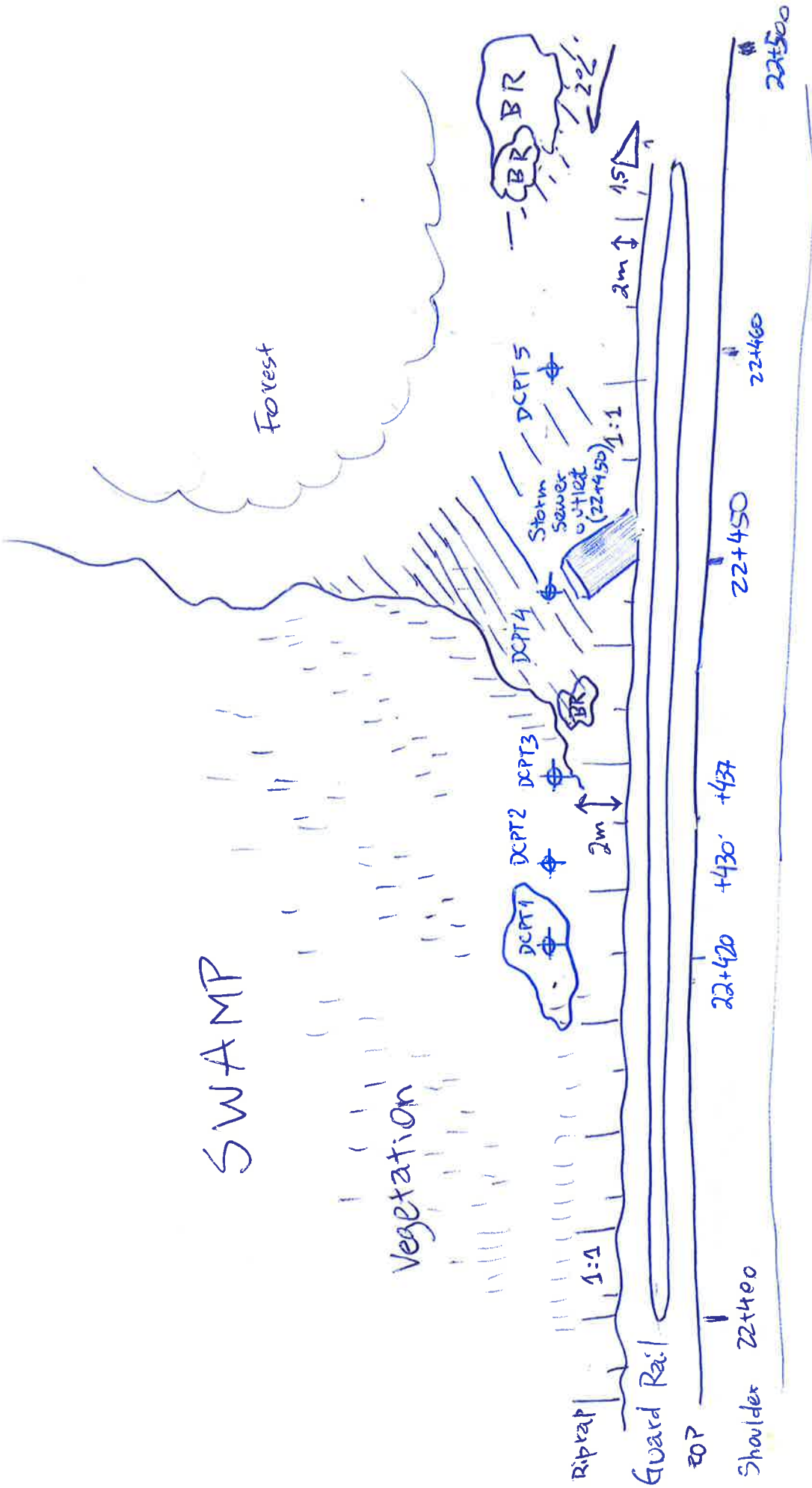
\* All Station numbers and dimensions are approximate\*

Hidden Glen Acceleration Lane  
 Highway 400, District of Muskoka  
 Field Sketch, Station 22+300 to 22+400



\* All Station numbers and dimensions are approximate\*

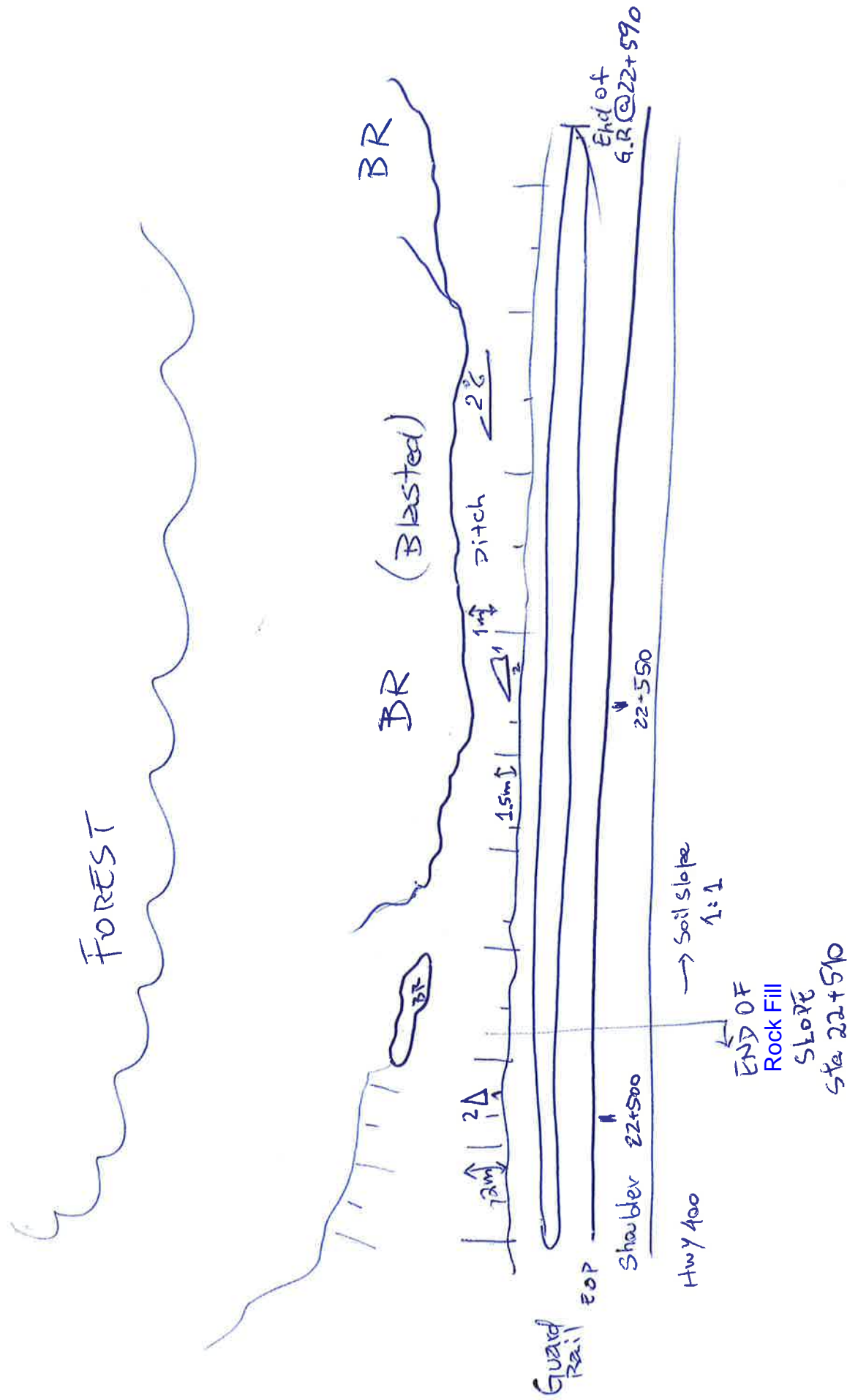
Hidden Glen Acceleration Lane  
Highway 400, District of Muskoka  
Field Sketch, Station 22+400 to 22+500



\* All Station numbers and dimensions are approximate\*

4

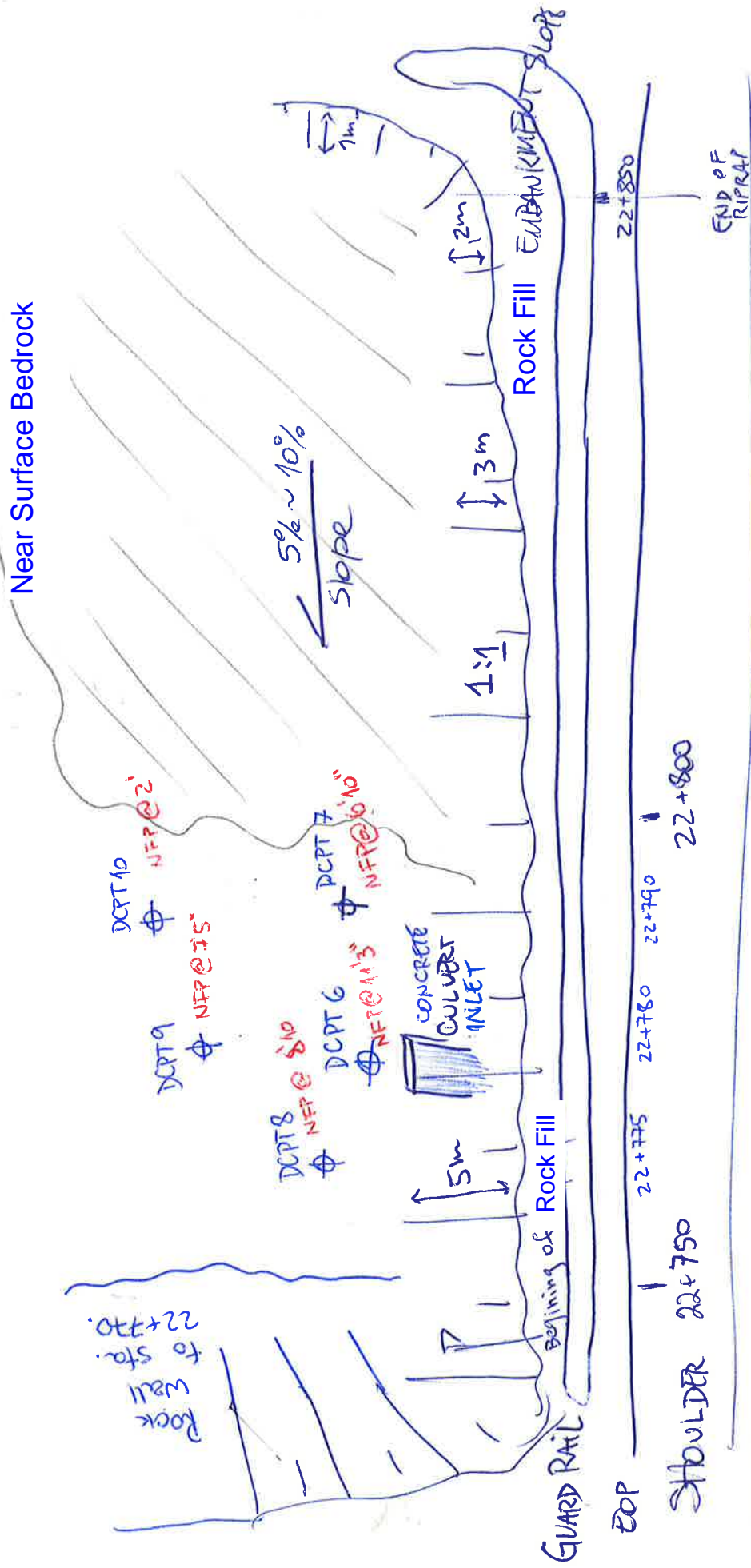
Hidden Glen Acceleration Lane  
Highway 400, District of Muskoka  
Field Sketch, Station 22+500 to 22+590





Hidden Glen Acceleration Lane  
 Highway 400, District of Muskoka  
 Field Sketch, Station 22+750 to 22+850

\* Please refer to table on page 2  
 of the field notes document for  
 further details.



\* All Station numbers and dimensions are approximate\*

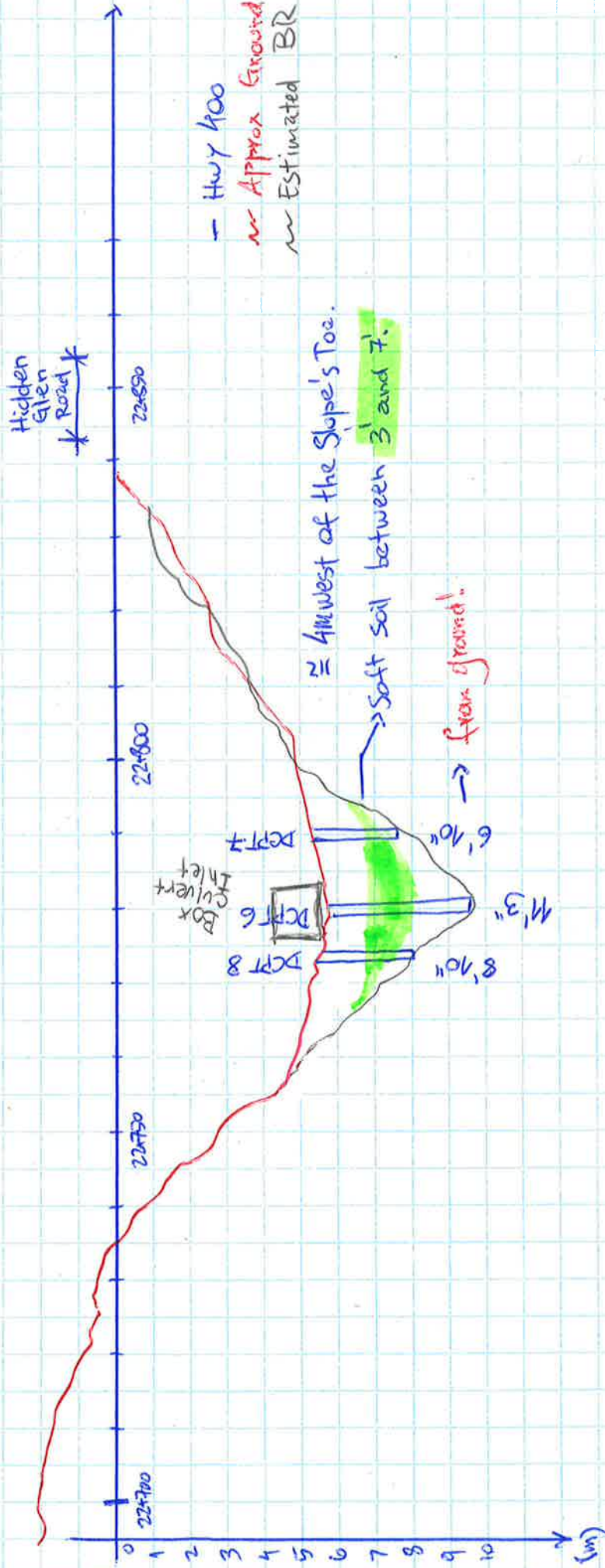
HWY 400 ACC. LANE EXPANSION

JOB # 28 317

CROSS SECTION

Rock Fill

Rock Fill



Hidden Glen Acceleration Lane  
Highway 400, District of Muskoka  
Profile, Station 22+700 to 22+840

\* All Station numbers and dimensions are approximate\*

F.K. ②



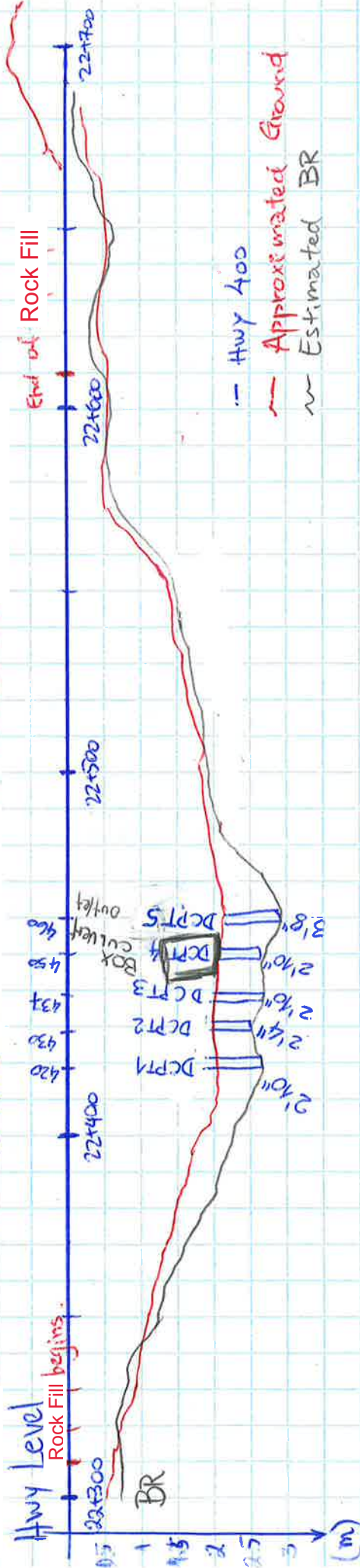
# CROSS SECTION

Hwy 400 SBL ACCELERATION LANE EXPANSION

Job #28317

F.K.

near surface BR ← 22+345 — SWAMP — 22+465 → Bed Rock is near surface



- \* Swamp inaccessible from 22+375 to 22+410.
- \* DCPT's 2 and 3 in the swamp (under water - 1' to 2').
- \* Riprap 1:1, varies from 0.5m to 2m height.

Hidden Glen Acceleration Lane  
Highway 400, District of Muskoka  
Profile, Station 22+300 to 22+700

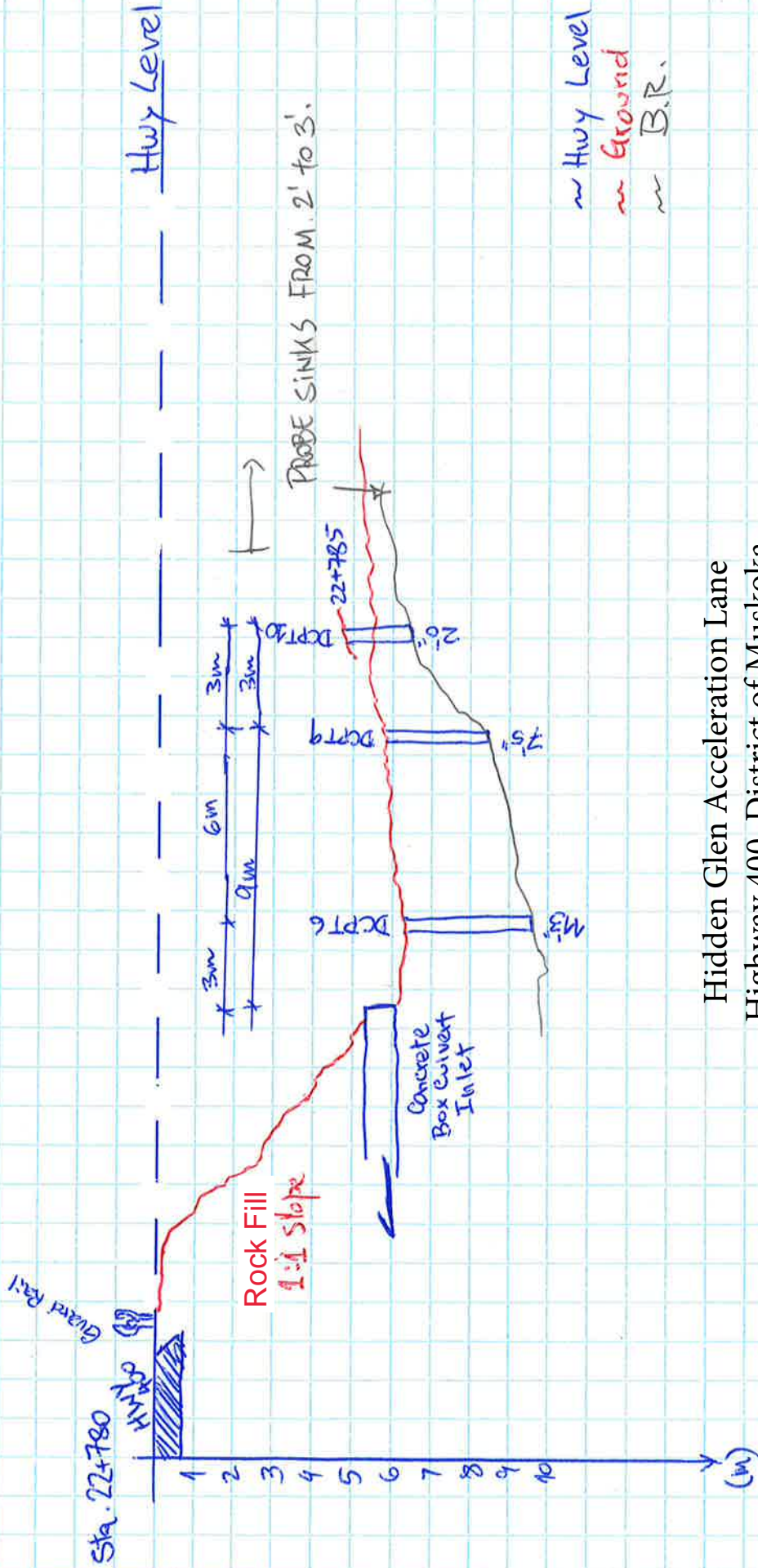
\* All Station numbers and dimensions are approximate\*

F.K.

(1)

Transversal Section at Sta. 22+780.

Job # 28317



Hidden Glen Acceleration Lane  
Highway 400, District of Muskoka  
Section at Station 22+780

\* All Station numbers and dimensions are approximate\*

F.V. (3)

RECORD OF BOREHOLE No DCPT-01 (Sta.22+420)1 OF 1

METRIC

W.P. 5191-18-00 LOCATION (Sta.22+420 o/s 4m W of toe) ORIGINATED BY FK  
HWY 400 BOREHOLE TYPE Miniature Dynamic Cone Penetration Testing COMPILED BY RdC  
DATUM Geodetic DATE 2023.05.17 - 2023.05.17 CHECKED BY RdC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100 PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT Wp W WL WATER CONTENT (%) 20 40 60 UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES				
0.0	Dynamic Cone Penetration Testing (DCPT)		DCPT	0					
			DCPT	2					
			DCPT	12/					
0.9	End of DCPT at 0.9 m upon practical refusal and no further penetration (NFP)				0.250				

RECORD OF BOREHOLE No DCPT-02 (Sta.22+430) of 1

METRIC

W.P. 5191-18-00 LOCATION (Sta.22+430 o/s 3m W of toe) ORIGINATED BY FK  
HWY 400 BOREHOLE TYPE Miniature Dynamic Cone Penetration Testing COMPILED BY RdC  
DATUM Geodetic DATE 2023.05.17 - 2023.05.17 CHECKED BY RdC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT $\gamma$ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
0.0	Dynamic Cone Penetration Testing (DCPT)			DCPT	0												
				DCPT	0												
				DCPT	10/												
0.7	End of DCPT at 0.7 m upon practical refusal and no further penetration (NFP)				0.100												

RECORD OF BOREHOLE No DCPT-03 (Sta.22+437) of 1

METRIC

W.P. 5191-18-00 LOCATION (Sta.22+437 o/s 5m W of toe) ORIGINATED BY FK  
HWY 400 BOREHOLE TYPE Miniature Dynamic Cone Penetration Testing COMPILED BY RdC  
DATUM Geodetic DATE 2023.05.17 - 2023.05.17 CHECKED BY RdC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa	WATER CONTENT (%)					
0.0	Dynamic Cone Penetration Testing (DCPT)		DCPT	0										
			DCPT	1										
			DCPT	5/										
0.9	End of DCPT at 0.9 m upon practical refusal and no further penetration (NFP)				0.250									

RECORD OF BOREHOLE No DCPT-04 (Sta.22+450)1 OF 1

METRIC

W.P. 5191-18-00 LOCATION (Sta.22+450 o/s 2m W of toe) ORIGINATED BY FK  
HWY 400 BOREHOLE TYPE Miniature Dynamic Cone Penetration Testing COMPILED BY RdC  
DATUM Geodetic DATE 2023.05.17 - 2023.05.17 CHECKED BY RdC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100 PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT W P W W L WATER CONTENT (%) 20 40 60 UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES				
0.0	Dynamic Cone Penetration Testing (DCPT)		DCPT	0					
			DCPT	3					
			DCPT	7/					
0.9	End of DCPT at 0.9 m upon practical refusal and no further penetration (NFP)				0.250				



# RECORD OF BOREHOLE No DCPT-05 (Sta.22+460)1 OF 1

**METRIC**

W.P. 5191-18-00 LOCATION (Sta.22+460 o/s 2m W of toe) ORIGINATED BY FK  
 HWY 400 BOREHOLE TYPE Miniature Dynamic Cone Penetration Testing COMPILED BY RdC  
 DATUM Geodetic DATE 2023.05.17 - 2023.05.17 CHECKED BY RdC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa	WATER CONTENT (%)					
0.0	Dynamic Cone Penetration Testing (DCPT)			DCPT	0									
				DCPT	0									
				DCPT	2									
				DCPT	19/									
1.1	End of DCPT at 1.1 m upon practical refusal and no further penetration (NFP)				0.200									

## METRIC

W.P.	5191-18-00	LOCATION	(Sta.22+780 o/s 3m W of toe)	ORIGINATED BY	FK
HWY	400	BOREHOLE TYPE	Miniature Dynamic Cone Penetration Testing	COMPILED BY	RdC
DATUM	Geodetic	DATE	2023.05.18 - 2023.05.18	CHECKED BY	RdC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT  γ  kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%)  GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)		
								○ UNCONFINED    + FIELD VANE ● QUICK TRIAXIAL    × LAB VANE										
0.0	Dynamic Cone Penetration Testing (DCPT)			DCPT	0													
				DCPT	15													
				DCPT	20													
				DCPT	11													
				DCPT	1													
				DCPT	1													
				DCPT	2													
				DCPT	3													
				DCPT	4													
				DCPT	4													
				DCPT	16													
				DCPT	18/													
3.4	End of DCPT at 3.4 m upon practical refusal and no further penetration (NFP)				0.08													



RECORD OF BOREHOLE No DCPT-07 (Sta.22+790)<sup>1</sup> OF 1

METRIC

W.P. 5191-18-00 LOCATION (Sta.22+790 o/s 5m W of toe) ORIGINATED BY FK  
HWY 400 BOREHOLE TYPE Miniature Dynamic Cone Penetration Testing COMPILED BY RdC  
DATUM Geodetic DATE 2023.05.18 - 2023.05.18 CHECKED BY RdC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa	WATER CONTENT (%)					
0.0	GROUND SURFACE													
	Dynamic Cone Penetration Testing (DCPT)			DCPT	1									
				DCPT	10									
				DCPT	29									
				DCPT	7									
				DCPT	7									
				DCPT	8									
				DCPT	43/									
2.1	End of DCPT at 2.1 m upon practical refusal and no further penetration (NFP)				0.250									

RECORD OF BOREHOLE No DCPT-08 (Sta.22+775)<sub>1</sub> OF 1

METRIC

W.P. 5191-18-00 LOCATION (Sta.22+775 o/s 3m W of toe) ORIGINATED BY FK  
HWY 400 BOREHOLE TYPE Miniature Dynamic Cone Penetration Testing COMPILED BY RdC  
DATUM Geodetic DATE 2023.05.18 - 2023.05.18 CHECKED BY RdC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES								
0.0	Dynamic Cone Penetration Testing (DCPT)			DCPT	1								
				DCPT	8								
				DCPT	30								
				DCPT	83								
				DCPT	15								
				DCPT	3								
				DCPT	3								
				DCPT	4								
				DCPT	14/								
2.7	End of DCPT at 2.7 m upon practical refusal and no further penetration (NFP)				0.250								

RECORD OF BOREHOLE No DCPT-09 (Sta.22+780)<sub>1</sub> OF 1

METRIC


W.P. 5191-18-00 LOCATION (Sta.22+780 o/s 9m W of toe) ORIGINATED BY FK  
HWY 400 BOREHOLE TYPE Miniature Dynamic Cone Penetration Testing COMPILED BY RdC  
DATUM Geodetic DATE 2023.05.18 - 2023.05.18 CHECKED BY RdC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES								
0.0	Dynamic Cone Penetration Testing (DCPT)			DCPT	1								
				DCPT	17								
				DCPT	58								
				DCPT	15								
				DCPT	10								
				DCPT	5								
				DCPT	5								
				DCPT	16/								
2.3	End of DCPT at 2.3 m upon practical refusal and no further penetration (NFP)				0.125								

RECORD OF BOREHOLE No DCPT-10 (Sta.22+785)<sup>1</sup> OF 1

METRIC

W.P. 5191-18-00 LOCATION (Sta.22+785 o/s 12m W of toe) ORIGINATED BY  
HWY 400 BOREHOLE TYPE Miniature Dynamic Cone Penetration Testing COMPILED BY  
DATUM Geodetic DATE 2023.05.18 - 2023.05.18 CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT  20 40 60 80 100 SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100 PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT Wp W WL WATER CONTENT (%) 20 40 60 UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL										
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES														
0.0	Dynamic Cone Penetration Testing (DCPT)			DCPT	0														
				DCPT	26/														
0.6	End of DCPT at 0.6 m upon practical refusal and no further penetration (NFP)				0.100														

**TABLE A1 - Summary of Manual Probing Results Between Station 22+200 and Station 22+370**

<b>Probe Hole No.</b>	<b>Approximate Station</b>	<b>Approximate Offset</b>	<b>Approximate Depth To No Further Penetration (mm)</b>	<b>Comments</b>
AR02-01A	22+200	Ditch	250	Topsoil at ground surface
AR02-01B	22+200	5 m west of Ditch	500	Sand, some silt, trace gravel, frequent rootlets and organics. Cobbles at 450 mm.
AR02-02A	22+210	Ditch	450	75 mm of topsoil over sand, some silt, trace gravel with frequent organics. Water at ground surface.
AR02-02B	22+210	5 m west of Ditch	450 to 750	Sand, some silt, trace gravel, frequent rootlets and organics. Cobbles at 450 mm.
AR02-03A	22+220	Ditch	0 to 150	Bedrock at surface to topsoil over bedrock.
AR02-03B	22+220	5 m west of Ditch	0 to 300	Bedrock at surface to sand, some silt, trace gravel, frequent rootlets and organics.
AR02-04A	22+230	Ditch	0 - 50	Bedrock at surface to thin topsoil over bedrock.
AR02-04B	22+230	5 m west of Ditch	0 - 250	Bedrock at surface to sand, some silt, trace gravel, frequent rootlets and organics.
AR02-05A	22+240	Ditch	0 - 175	Bedrock at surface to topsoil over bedrock.
AR02-05B	22+240	5 m west of Ditch	200	Sand, some silt, trace gravel, frequent rootlets and organics.
AR02-06A	22+250	Ditch	0	Bedrock at surface.
AR02-06B	22+250	5 m west of Ditch	100 - 250	Sand, some silt, trace gravel, frequent rootlets and organics.
AR02-07A	22+260	Ditch	0	Bedrock at surface.
AR02-07B	22+260	5 m west of Ditch	0 - 150	Bedrock at surface to sand, some silt, trace gravel, frequent rootlets and organics. Frequent cobbles at 150 mm.
AR02-08A	22+270	Ditch	0 - 150	Bedrock to topsoil over bedrock.
AR02-08B	22+270	5 m west of Ditch	200 - 250	Bedrock to topsoil over bedrock.
AR02-09A	22+280	Ditch	300	Sand, silty some gravel, frequent cobbles and rootlets.
AR02-09B	22+280	5 m west of Ditch	0 - 50	Bedrock to topsoil over bedrock.
AR02-10A	22+290	Ditch	150	Topsoil over bedrock.
AR02-10B	22+290	5 m west of Ditch	0	Bedrock at surface.
AR02-11A	22+300	Ditch	150	Topsoil over bedrock.
AR02-11B	22+300	5 m west of Ditch	0 - 300	Bedrock to topsoil over bedrock.
AR02-12A	22+310	Ditch	0 - 150	Bedrock to topsoil over bedrock.
AR02-12B	22+310	5 m west of Ditch	250 - 300	Topsoil over bedrock.
AR02-13A	22+320	Toe of embankment	0 - 150	Bedrock to topsoil over bedrock.
AR02-13B	22+320	5 m west of embankment toe	0 - 200	Bedrock to topsoil over bedrock.
AR02-14A	22+330	Toe of embankment	0	Bedrock at surface.
AR02-14B	22+330	5 m west of embankment toe	150 - 300	Topsoil over bedrock.
AR02-15A	22+340	Toe of embankment	0 - 100	Bedrock to topsoil over bedrock.
AR02-15B	22+340	5 m west of embankment toe	150 - 250	Topsoil over bedrock.
AR02-16A	22+360	Toe of embankment	300 - 600	Organics over bedrock.
AR02-17B	22+370	2 m west of embankment toe	-	Swamp starts.



## **Appendix B**

### **Site Photographs**



**Photograph #1: Looking south from the top of the embankment slope at Sta. 22+460.**





**Photograph #2: Looking north from the top of the embankment slope at Sta. 22+400.**





**Photograph #3: Looking south at base of embankment slope of Highway 400 southbound Sta. 22+820.**





**Photograph #3: Looking north from the top of the embankment slope at Sta. 22+750.**



## **Appendix C**

### **Boreholes from Pavement Investigation**



# Rehabilitation of Highway 400 (GWP 5191-18-00)

## Port Severn, ON

### Borehole Logs

<b>Station 22+150</b>	<b>NB 2.4m LT CL</b>	<b>Lane 1</b>
0- 395	Asph	
395- 590	Br Cr Gr(y) Sa Some Si	Moist
590- 1.1	Br Sa Some Si Some Gr Tr Cl	Moist
1.1-	NFP (RF)	
<b>Station 22+150</b>	<b>NB 4.8m RT CL</b>	<b>OSH</b>
0- 185	Asph	
185- 420	Br Sa and Cr Gr Tr Si	Moist
420- 1.2	Br Sa Some Gr Some Si	Moist
1.2-	NFP (RF)	
<b>Station 22+150</b>	<b>NB 18m LT CL</b>	<b>Ditch D-3</b>
0- 100	Tps	
100-	NFP (Cob)	
<b>Station 22+200</b>	<b>NB 2.4m LT CL</b>	<b>Lane 1</b>
0- 385	Asph	
385- 510	Br Sa and Cr Gr Tr Si	Moist
510- 750	Br Sa Some Gr Some Si	Moist
750-	NFP (RF)	
<b>Station 22+200</b>	<b>NB 4.8m RT CL</b>	<b>OSH</b>
0- 165	Asph	
165- 570	Br Sa and Cr Gr Tr Si	Moist
570- 900	Br Sa Some Gr Some Si	Moist
900-	NFP (RF)	
<b>Station 22+200</b>	<b>NB 15m LT CL</b>	<b>Ditch D 0</b>
0- 150	Tps	
150-	NFP (Cob)	
<b>Station 22+250</b>	<b>NB 2.6m LT CL</b>	<b>Lane 1</b>
0- 350	Asph	
350- 630	Br Sa and Cr Gr Tr Si	Moist
630- 750	Br Sa Some Gr Some Si	Moist
750-	NFP (RF)	
<b>Station 22+250</b>	<b>NB 2.6m RT CL</b>	<b>Lane 2</b>
0- 210	Asph	
		RWP Core=205 mm
210- 480	Br Sa and Cr Gr Tr Si	Moist
480- 900	Br Sa Some Gr Some Si	Moist
900-	NFP (RF)	Moist
<b>Station 22+250</b>	<b>NB 5.5m RT CL</b>	<b>OSH</b>
0- 200	Asph	
200- 640	Br Sa and Cr Gr Tr Si	Moist
640- 1.1	Br Sa Some Gr Some Si	Moist
1.1-	NFP (RF)	
<b>Station 22+250</b>	<b>NB -.6m LT CL</b>	<b>Ditch</b>
0- 200	Tps	
200-	NFP (Cob)	

<b>Station 22+300</b>	<b>NB 2.7m LT CL</b>	<b>Lane 1</b>
0- 405	Asph	
405- 590	Br Sa and Cr Gr Tr Si	Moist
590- 900	Br Sa Some Gr Some Si	Moist
900-	NFP (RF)	
<b>Station 22+300</b>	<b>NB 6.1m RT CL</b>	<b>OSH</b>
0- 180	Asph	
180- 390	Br Sa and Cr Gr Tr Si	Moist
		w @ 0.3m = 3%
		Percent Passing 4.75 mm = 55%
		75 µm = 5%
		Slightly Finer Than Granular A
390- 1.2	Br Sa Some Gr Some Si	Moist
		w @ 0.8m = 7%
		Percent Passing 4.75 mm = 85%
		75 µm = 11%
		Slightly Finer Than Granular B, Type I
1.2-	NFP (RF)	Moist
<b>Station 22+300</b>	<b>NB 15m LT CL</b>	<b>Ditch D-0.9</b>
0-	RF	

#### Hidden Glen Road Acceleration

<b>Station 22+380</b>	<b>SB 14m LT CL</b>	<b>Ditch D-3.7</b>
0- 600	Surf Wat	Wet
<b>Station 22+400</b>	<b>SB 2.5m LT CL</b>	<b>Lane 2</b>
0- 175	Asph	
175- 340	Br Sa(y) Cr Gr Tr Si	Moist
340- 750	Br Sa and Gr Some Si	Moist
750-	NFP (RF)	
<b>Station 22+400</b>	<b>SB 5.3m LT CL</b>	<b>OSH</b>
0- 85	Asph	
85- 180	Br Sa(y) Cr Gr Tr Si	Moist
180- 400	Br Sa and Gr Some Si	Moist
400- 750	Br Sa W Gr Some Si	Moist
750-	NFP (BR)	
<b>Station 22+400</b>	<b>SB 14m LT CL</b>	<b>Ditch D-3.5</b>
0- 600	Surf Wat	
		Swamp bed beyond 300 mm
600-	NFP (Cob or Blds)	
		Swamp
<b>Station 22+420</b>	<b>SB 14m LT CL</b>	<b>Ditch D-3.5</b>
0- 600	Peat	Wet
600-	NFP (Cob or Blds)	Wet
		Swamp
<b>Station 22+440</b>	<b>SB 14m LT CL</b>	<b>Ditch D-3.5</b>
0- 350	Peat	Wet
350-	NFP (Cob or Blds)	

Note: Boreholes offsets referenced from directional centreline.



# Rehabilitation of Highway 400 (GWP 5191-18-00)

## Port Severn, ON

### Borehole Logs

<b>Station 22+450</b>	<b>SB 2.5m LT CL</b>	<b>Lane 2</b>	<b>Station 22+500</b>	<b>SB 11.5m LT CL</b>	<b>Ditch D-2.4</b>
0- 180	Asph		0- 200	Tps	Moist
180- 355	Br Sa(y) Cr Gr Tr Si	Moist	200- 300	Br/Red Si(y) Sa Tr Org	Moist
355- 455	Br Sa and Gr Some Si	Moist	300-	NFP (Cob)	
455- 700	Br Sa W Gr Some Si	Moist	<b>Station 22+520</b>	<b>SB 12.3m LT CL</b>	<b>Ditch D-1.7</b>
700-	NFP (RF)		0- 250	Tps	
<b>Station 22+450</b>	<b>SB 5.4m LT CL</b>	<b>OSH</b>	250-	NFP (Cob)	
0- 90	Asph		<b>Station 22+540</b>	<b>SB 11m LT CL</b>	<b>Ditch D-1.5</b>
90- 260	Br Sa(y) Cr Gr Tr Si	Moist	0- 100	Tps	Moist
260- 400	Br Sa and Gr Some Si	Moist	100-	NFP (Cob)	
400- 700	Br Sa W Gr Some Si	Moist	<b>Station 22+550</b>	<b>SB 2.8m LT CL</b>	<b>Lane 2</b>
700-	NFP (RF)		0- 210	Asph	
<b>Station 22+460</b>	<b>SB 12m LT CL</b>	<b>Ditch D-3.5</b>	210- 395	Br Sa(y) Cr Gr Tr Si	Moist
0- 800	Tps	Moist	395- 625	Br Sa and Gr Some Si	Moist
800-	NFP (Cob)		625- 900	Br Sa W Gr Some Si	Moist
<b>Station 22+480</b>	<b>SB 11.5m LT CL</b>	<b>Ditch D-2.2</b>	900-	NFP (RF)	
0- 100	Tps		<b>Station 22+550</b>	<b>SB 5.3m LT CL</b>	<b>OSH</b>
100-	NFP (Cob)		0- 100	Asph	
<b>Station 22+500</b>	<b>SB 4.8m RT CL</b>	<b>ISH</b>	100- 250	Br Sa(y) Cr Gr Tr Si	Moist
0- 110	Asph		250- 530	Br Sa and Gr Some Si	Moist
<b>Station 22+500</b>	<b>SB 2.5m RT CL</b>	<b>Lane 1</b>	530- 1.1	Br Sa W Gr Some Si	Moist
0- 225	Asph		1.1-	NFP (RF)	
	RWP Core=150 mm recovery only		<b>Station 22+560</b>	<b>SB 11m LT CL</b>	<b>Ditch D-1.6</b>
225- 410	Br Sa(y) Cr Gr Tr Si	Moist	0- 150	Tps	
	Percent Passing 4.75 mm = 48%		150-	NFP (Cob)	
	75 µm = 10%		<b>Station 22+600</b>	<b>SB 2.9m LT CL</b>	<b>Lane 2</b>
	Slightly Finer Than Granular A		0- 215	Asph	
410- 830	Br Sa and Gr Some Si	Moist	215- 435	Br Sa(y) Cr Gr Tr Si	Moist
	Percent Passing 4.75 mm = 60%		435- 725	Br Sa and Gr Some Si	Moist
	75 µm = 15%		725- 1.1	Br Sa W Gr Some Si	Moist
	Finer Than Granular B, Type I		1.1-	NFP (RF)	
830- 1.4	Br Sa W Gr Some Si	Moist	<b>Station 22+600</b>	<b>SB 5.3m LT CL</b>	<b>OSH</b>
	Percent Passing 4.75 mm = 77%		0- 90	Asph	
	75 µm = 16%		90- 225	Br Sa(y) Cr Gr Tr Si	Moist
	Finer Than Granular B, Type I		225- 770	Br Sa and Gr Some Si	Moist
1.4-	NFP (RF)		770- 1	Br Sa W Gr Some Si	Moist
			1-	NFP (RF)	
<b>Station 22+500</b>	<b>SB 2.8m LT CL</b>	<b>Lane 2</b>	<b>Station 22+600</b>	<b>SB 12.3m LT CL</b>	<b>Ditch D-1.5</b>
0- 200	Asph		0- 100	Tps	
200- 460	Br Sa(y) Cr Gr Tr Si	Moist	100-	NFP (Cob)	Moist
460- 700	Br Sa W Gr Some Si	Moist	<b>Station 22+640</b>	<b>SB 11.5m LT CL</b>	<b>Ditch D-0.8</b>
700-	NFP (RF)		0- 200	Tps	
<b>Station 22+500</b>	<b>SB 5.5m LT CL</b>	<b>OSH</b>	200-	NFP (Cob)	
0- 80	Asph				
80- 250	Br Sa(y) Cr Gr Tr Si	Moist			
250- 490	Br Sa and Gr Some Si	Moist			
490- 800	Br Sa W Gr Some Si	Moist			
800-	NFP (RF)				

Note: Boreholes offsets referenced from directional centreline.



# Rehabilitation of Highway 400 (GWP 5191-18-00)

## Port Severn, ON

### Borehole Logs

**Station 22+650 SB 2.4m LT CL Lane 2**  
 0- 215 Asph  
 215- 405 Br Sa(y) Cr Gr Tr Si Moist  
 405- 875 Br Sa and Gr Some Si Moist  
 875- 1.2 Br Sa W Gr Some Si Moist  
 1.2- NFP (RF)

**Station 22+650 SB 5.6m LT CL OSH**  
 0- 100 Asph  
 100- 260 Br Sa(y) Cr Gr Tr Si Moist  
 260- 910 Br Sa and Gr Some Si Moist  
 910- 1.2 Br Sa W Gr Some Si Moist  
 1.2- NFP (RF)

**Station 22+650 SB 11.4m LT CL Ditch D-0.8**  
 0- 100 Tps  
 100- NFP (Cob)

**Station 22+660 SB 10.5m LT CL Ditch D-0.9**  
 0- 150 Tps  
 150- NFP (Cob)

**Station 22+680 SB 11m LT CL Ditch D-0.8**  
 0- 150 Tps  
 150- NFP (Cob)

**Station 22+680 SB 10m LT CL Ditch D-1.5**  
 0- 300 Tps  
 300- NFP (Cob)

**Station 22+700 SB 2.8m LT CL Lane 2**  
 0- 225 Asph  
 225- 405 Br Sa(y) Cr Gr Tr Si Moist  
 405- 600 Br Sa and Gr Some Si Moist  
 600- NFP (Cob)

**Station 22+700 SB 5.5m LT CL OSH**  
 0- 85 Asph  
 85- 300 Br Sa(y) Cr Gr Tr Si Moist  
 300- 600 Br Sa and Gr Some Si Moist  
 600- NFP (RF)

**Station 22+700 SB 6m LT CL Ditch**  
 0- 150 Tps Moist  
 150- NFP (Cob)

**Station 22+720 SB 12m LT CL Ditch D-1.1**  
 0- 200 Tps  
 200- NFP (Cob)

**Station 22+740 SB 11.5m LT CL Ditch D-1.5**  
 0- 100 Tps  
 100- NFP (Cob)

**Station 22+750 SB 2.5m LT CL Lane 2**  
 0- 210 Asph  
 210- 500 Br Sa(y) Cr Gr Tr Si Moist  
 500- 760 Br Sa and Gr Some Si Moist  
 760- NFP (RF)

**Station 22+750 SB 5.6m LT CL OSH**  
 0- 95 Asph  
 95- 340 Br Sa(y) Cr Gr Tr Si Moist  
 340- 700 Br Sa and Gr Some Si Moist  
 700- NFP (RF)

**Station 22+760 SB 10m LT CL Ditch D-1.5**  
 0- 250 Tps  
 250- NFP (Cob)

**Station 22+780 SB 20m LT CL Ditch D-9**  
 0- RF Moist

**Station 22+800 SB 2.5m LT CL Lane 2**  
 0- 235 Asph  
 235- 500 Br Sa(y) Cr Gr Tr Si Moist  
 500- 900 Br Sa and Gr Some Si Moist  
 900- NFP (RF)

**Station 22+800 SB 2.5m LT CL OSH**  
 0- 90 Asph  
 90- 250 Br Sa(y) Cr Gr Tr Si Moist  
 250- 800 Br Sa and Gr Some Si Moist  
 800- NFP (RF)

**Station 22+820 SB 16m LT CL Ditch D-6**  
 0- 250 Tps Moist  
 250- NFP (Cob)

**Station 22+825 SB 2.5m RT CL Lane 1**  
 0- 210 Asph  
 210- 430 Br Sa(y) Cr Gr Tr Si Moist  
 430- 800 Br Sa and Gr Some Si Moist  
 800- NFP (RF)

**Station 22+825 SB 14.7m LT CL Ditch D-5.5**  
 0- 225 Tps  
 225- NFP (Cob)

### Hidden Glen Road Deceleration

**Station 22+860 SB 16.5m LT CL Ditch D-0.6**  
 0- 300 Tps  
 300- NFP (Cob)

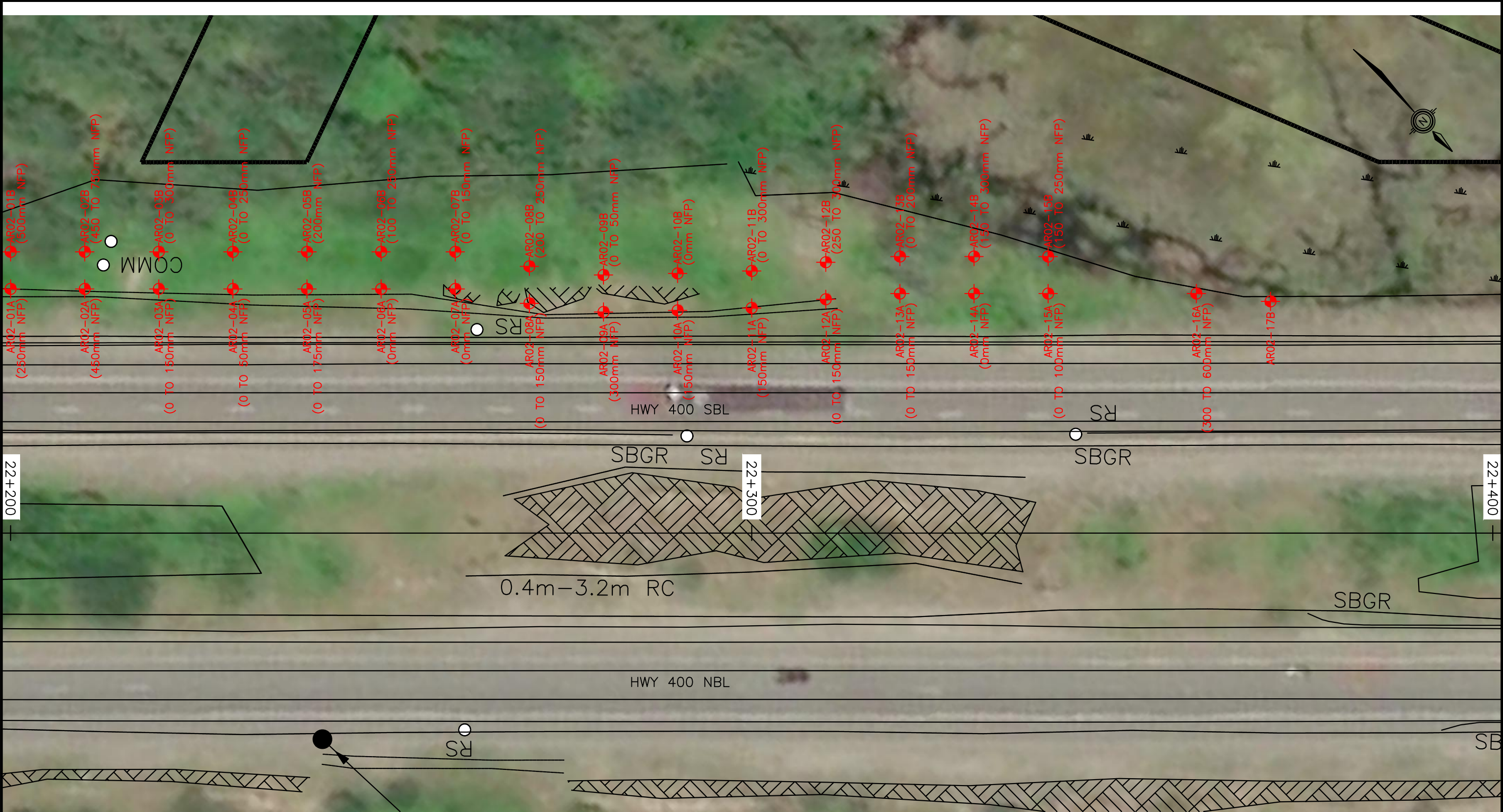
**Station 22+880 SB 15.3m LT CL Ditch D-0.9**  
 0- 250 Tps  
 250- NFP (Cob)



## **Appendix D**

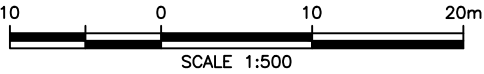
### **Probe Hole and DCPT Location Plan**





LEGEND:


- APPROX. PROBE HOLE LOCATION
- APPROX. DYNAMIC CONE PENETRATION TEST LOCATION
- NFP NO FURTHER PENETRATION



LEA CONSULTING LTD.

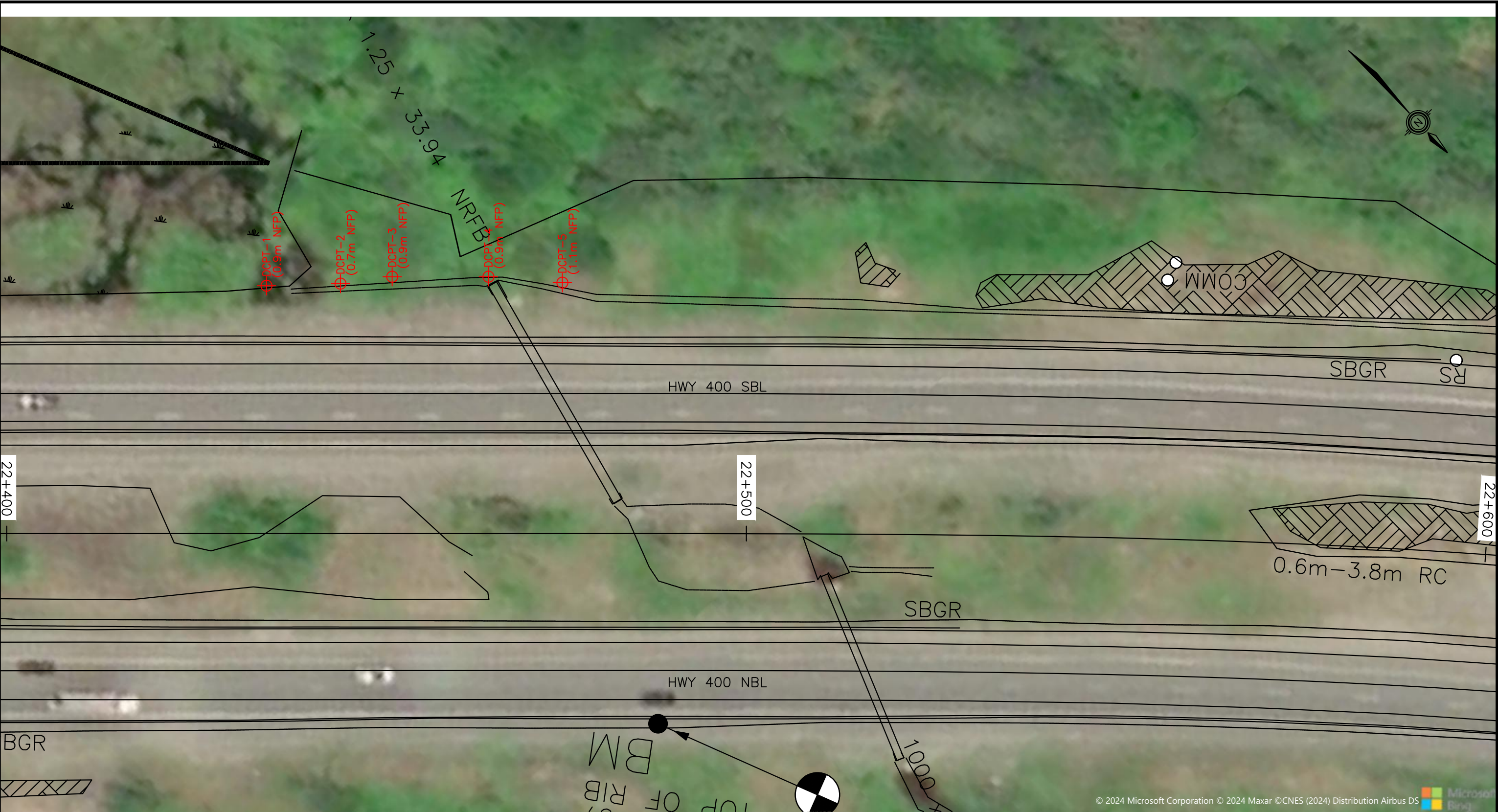
HIDDEN GLEN ROAD ACCELERATION LANE  
HIGHWAY 400, DISTRICT OF MUSKOKA  
STATION 22+200 TO 22+400  
PROBE HOLE AND DCPT LOCATION PLAN

JOB# 28317

  
THURBER ENGINEERING LTD.

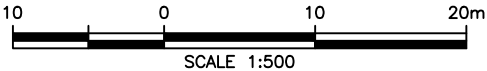
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DATE : MARCH 2024	SCALE : AS SHOWN	DRAWING No. FIGURE 1





LEGEND:

- APPROX. PROBE HOLE LOCATION
- APPROX. DYNAMIC CONE PENETRATION TEST LOCATION
- NFP NO FURTHER PENETRATION



LEA CONSULTING LTD.

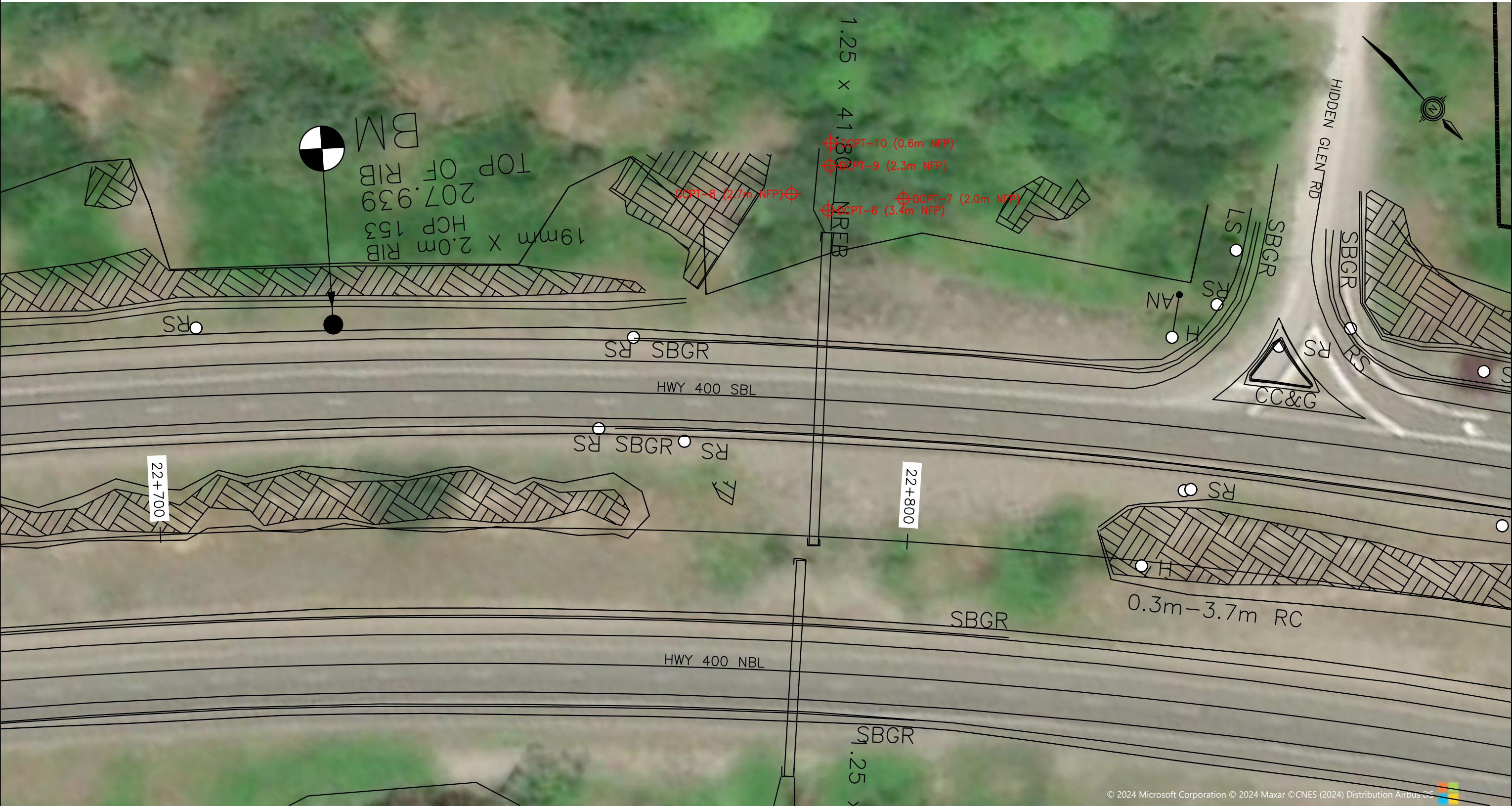
HIDDEN GLEN ROAD ACCELERATION LANE  
HIGHWAY 400, DISTRICT OF MUSKOKA  
STATION 22+400 TO 22+600  
PROBE HOLE AND DCPT LOCATION PLAN

JOB# 28317

THURBER ENGINEERING LTD.

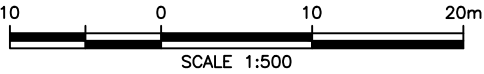
ENGINEER : RdC	DRAWN : AN	APPROVED : MTB
DATE : MARCH 2024	SCALE : AS SHOWN	DRAWING No. FIGURE 2





**LEGEND:**

- APPROX. PROBE HOLE LOCATION
- APPROX. DYNAMIC CONE PENETRATION TEST LOCATION
- NFP NO FURTHER PENETRATION



LEA CONSULTING LTD.

HIDDEN GLEN ROAD ACCELERATION LANE  
HIGHWAY 400, DISTRICT OF MUSKOKA  
STATION 22+700 TO 22+850  
PROBE HOLE AND DCPT LOCATION PLAN

JOB# 28317

**THURBER ENGINEERING LTD.**

ENGINEER : RdC	DRAWN : AN	APPROVED : MTB
DATE : MARCH 2024	SCALE : AS SHOWN	DRAWING No. FIGURE 3