

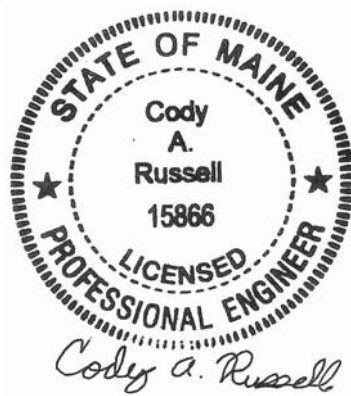
**MAINE DEPARTMENT OF TRANSPORTATION  
HIGHWAY PROGRAM  
GEOTECHNICAL SECTION  
AUGUSTA, MAINE**

**GEOTECHNICAL DESIGN REPORT**

*For a Slope Stabilization on:*

**ROUTE 140  
CANTON, MAINE**

*Prepared by:*  
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Geotechnical Engineer



*Reviewed by:*  
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Senior Geotechnical Engineer

Oxford County  
WIN 24083.00

Soils Report 2020-24  
Federal No. 2408300

August 14, 2020

**Table of Contents**

**1.0 INTRODUCTION ..... 2**

**2.0 GEOLOGIC SETTING ..... 2**

**3.0 SUBSURFACE INVESTIGATION..... 2**

**4.0 LABORATORY TESTING..... 3**

**5.0 SUBSURFACE CONDITIONS..... 3**

    5.1 PAVEMENT AND FILL SOILS ..... 3

    5.2 STREAM ALLUVIUM..... 4

    5.3 GROUNDWATER..... 4

**6.0 GEOTECHNICAL ANALYSES AND RECOMMENDATIONS ..... 4**

    6.1 SLOPE STABILITY ANALYSES ..... 4

    6.2 RIPRAP SLOPE FROM STATIONS 18+67 TO 32+33 ..... 5

    6.3 SETTLEMENT ..... 5

    6.4 ADDITIONAL CONSTRUCTION CONSIDERATIONS ..... 5

**7.0 CLOSURE..... 5**

**Sheets**

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- Sheet 1 – Location Map
- Sheet 2 – Boring Location Plan

**Appendices**

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- Appendix A – Boring Logs
- Appendix B – Laboratory Test Results
- Appendix C – Slope Stability Analyses

## **1.0 INTRODUCTION**

The purpose of this Geotechnical Design Report is to present subsurface information and make geotechnical design and construction recommendations for a slope stabilization project along an approximately 0.31-mile portion of Route 140 in Canton, shown on Sheet 1 – Location Map. The project is needed to address a portion of the slope on the south side of the road that was undercut and eroded by high river flows and sloughed into the Androscoggin River. The eroded slope is steeper than 1.5H:1V and in some areas is steeper than 1H:1V. The crest of the eroded slope is close to the back of the existing guardrail at the roadway edge in some locations. If left untreated, continued material loss along the toe of the slope could result in loss of the roadway section and closure of Route 140. The proposed scope includes shifting Route 140 away from the river to flatten the slopes and provide a maximum of 2H:1V down to the river armored with Heavy Riprap. The riprap will be keyed into the river bed at the toe of the proposed slope. Guardrail will be installed along Route 140 where necessary. The roadway will transition back to the existing road and slopes beyond the slopes impacted by erosion. Route 140 is a Highway Corridor Priority 3 road.

## **2.0 GEOLOGIC SETTING**

According to the Surficial Geology Map entitled Canton Quadrangle, Maine, Open File No. 08-82 (2008) published by the Maine Geological Survey (MGS), the surficial soils along the project consist of Stream Alluvium consisting of sand, silt and gravel.

According to the MGS map titled Bedrock Geologic Map of Maine (1985) the bedrock along the project consists of interbedded pelite and sandstone of the Sangerville Formation Anasagunticook Member.

## **3.0 SUBSURFACE INVESTIGATION**

Two (2) borings (HB-CAN-101 and HB-CAN-102) were drilled for this project on November 4, 2019 and November 5, 2019 by the MaineDOT drill crew using a trailer mounted drill rig. Exploration locations are shown on Sheet 2 – Boring Location Plan. Details and sampling methods used, field data obtained, and soil and groundwater conditions encountered are presented on the Boring Log in Appendix A.

The borings were drilled using solid stem auger and cased wash boring drilling techniques. Soil samples were obtained continuously to a depth of approximately 17 feet below ground surface (bgs) and at 5-foot intervals below that depth using Standard Penetration Test (SPT) methods in both borings. The MaineDOT drill rig is equipped with an automatic hammer to drive the split spoon. The MaineDOT calibrated automatic hammer delivers approximately 48 percent more energy during driving than the standard rope and cathead system. All N-values discussed in this report are corrected values computed by applying an average energy transfer factor of 0.886 to the raw field N-values.

The MaineDOT Geotechnical Team member selected the boring and probe locations, drilling methods, designated type and depth of sampling, reviewed field logs for accuracy and identified field and laboratory testing requirements. Experienced North East Transportation Training and Certification Program (NETTCP) certified subsurface investigators logged the subsurface conditions encountered. The boring and probe were located in the field by taping to surveyed site features after completion of the drilling program.

#### **4.0 LABORATORY TESTING**

A laboratory testing program was conducted on select soil samples obtained in the test borings to assist in soil classification, evaluation of engineering properties of the soils and geologic assessment of the project site. Laboratory testing consisted of eleven (11) standard grain size analyses and natural water content. The results of the laboratory tests are in Appendix B – Laboratory Test Results. Laboratory test results are also summarized on the boring logs in Appendix A.

#### **5.0 SUBSURFACE CONDITIONS**

Subsurface conditions encountered at the test borings generally consisted of pavement and fill soils underlain by stream alluvium. The boring locations are shown on Sheet 2 – Boring Location Plan. The boring logs are in Appendix A – Boring Logs.

Borings HB-CAN-101 and HB-CAN-102 were drilled to a depth of approximately 42.0 feet bgs and did not encounter a refusal surface.

##### **5.1 Pavement and Fill Soils**

The subsurface investigations found areas of pavement and roadway fill soils along the project. The pavement thickness was approximately 6 inches. The fill soils consisted of:

- Brown to dark brown, dry, fine to coarse sand, little to some gravel, trace to little silt.

The thickness of the fill ranged from approximately 1.0 feet to 2.5 feet. SPT  $N_{60}$  -values obtained in the fill ranged from 21 to 41 blows per foot (bpf) indicating that the fill is medium dense to dense in consistency.

A water content from one (1) sample obtained within the fill layer was approximately 3%. Grain size analyses conducted on one (1) sample of the fill resulted in the soil being classified as an A-1-b under the AASHTO Soil Classification System and an SW-SM under the Unified Classification System.

## 5.2 Stream Alluvium

The fill layer is underlain by stream alluvium. The stream alluvium consisted of:

- Red, reddish-brown, and grey, damp to wet, fine to coarse sand, trace to some silt, trace to some gravel.
- Brown, wet, gravelly fine to coarse sand, trace silt.

The thickness of the stream alluvium ranged from approximately 39.0 to 40.5 feet but was not fully penetrated in the borings. Twenty-four (24) SPT  $N_{60}$  -values obtained in the stream alluvium ranged from 1 to 22 bpf indicating that the stream alluvium is very loose to medium dense in consistency.

Water contents from five (5) samples obtained within the stream alluvium range from approximately 7% to 29%. Grain size analyses conducted on ten (10) samples of the stream alluvium resulted in the soil being classified as an A-1-b, A-2-4 or A-3 under the AASHTO Soil Classification System and an SM, SP, SW, SW-SM, or SP-SM under the Unified Soil Classification System.

## 5.3 Groundwater

Groundwater level was observed in boring HB-CAN-101. The measured groundwater level in the boring was approximately 14.0 feet bgs. The water level is indicated on the boring log in Appendix A. Groundwater levels can be expected to fluctuate subject to seasonal variations, local soil conditions, topography, precipitation, and construction activity.

## 6.0 GEOTECHNICAL ANALYSES AND RECOMMENDATIONS

The project scope includes shifting Route 140 away from the river to flatten the slopes along the river and provide a maximum slope of 2H:1V armored with 4 feet of heavy riprap. The riprap will be keyed into the riverbed at the toe of the proposed slope. Guardrail will be installed along Route 140 where necessary. The roadway will transition back to the existing road and slopes beyond the area impacted by erosion. The following sections discuss the geotechnical-related analyses and recommendations of the proposed riprap slope.

### 6.1 Slope Stability Analyses

Three (3) cross sections along the slope were analyzed to evaluate the existing and proposed slope stability. The cross sections were chosen to represent three (3) proposed slope angles that will be constructed. Geostudio Slope/W software was used to evaluate the slopes. The stability analyses were based on subsurface conditions encountered in the borings drilled in the roadway shoulder at the crest of the existing slope. In accordance with AASHTO LRFD Bridge Design Specifications 8<sup>th</sup> Edition 2017 (LRFD) Article 11.6.2.3 evaluation of earth slopes that do not support or contain a structural element should achieve a factor of safety of 1.3 (equivalent to a resistance factor of 0.75). The results of these analyses are presented in the following table:

Station	Existing Slope Angle	Existing Slope Factor of Safety	Proposed Slope Angle	Proposed Slope Factor of Safety without Riprap	Proposed Slope Factor of Safety with 4 feet of Heavy Riprap
20+00	Variable	1.03	2H:1V	1.17	1.30
22+00	Variable	0.91	3H:1V	1.41	1.50
27+00	Variable	0.80	4H:1V	1.59	1.65

Based on these analyses, the slopes flatter than 2H:1V do not require riprap for stability but riprap shall be included on all of the slopes to minimize future scour and erosion caused by hydraulic forces in the river. Appendix C – Slope Stability Analyses presents the final slope configuration results from these slope stability analyses.

### 6.2 Riprap Slope from Stations 18+67 to 32+33

The proposed riprap slope along the river from Station 18+67 to 32+33 should be constructed as shown on the project plans with slopes ranging from 2H:1V to 4H:1V. The Heavy Riprap shall be constructed up to elevation 386.0. Above that elevation the slope shall be vegetated with small shrubs and grasses. The slope below elevation 386.0 shall be armored with 4 feet of riprap conforming to MaineDOT Standard Specification Section 703.28 Heavy Riprap underlain by a non-woven Class 1 Erosion Control Geotextile that meets the requirements for MaineDOT Standard Specification 722.03 that is underlain by a 1-foot layer of Protective Aggregate Cushion conforming to MaineDOT Standard Specification 703.19 Granular Borrow Material for Underwater Backfill.

### 6.3 Settlement

No settlement issues are anticipated for the roadway. No soft or compressible soils were encountered in the area of the proposed fill. Placement of fill soils is not anticipated to exceed the past loading condition of the site soils.

### 6.4 Additional Construction Considerations

The Contractor shall control groundwater and surface water infiltration using temporary ditches, sumps, granular drainage blankets, stone ditch protection or hand-laid riprap with geotextile underlayment to divert groundwater and surface water to allow construction in the dry.

## 7.0 CLOSURE

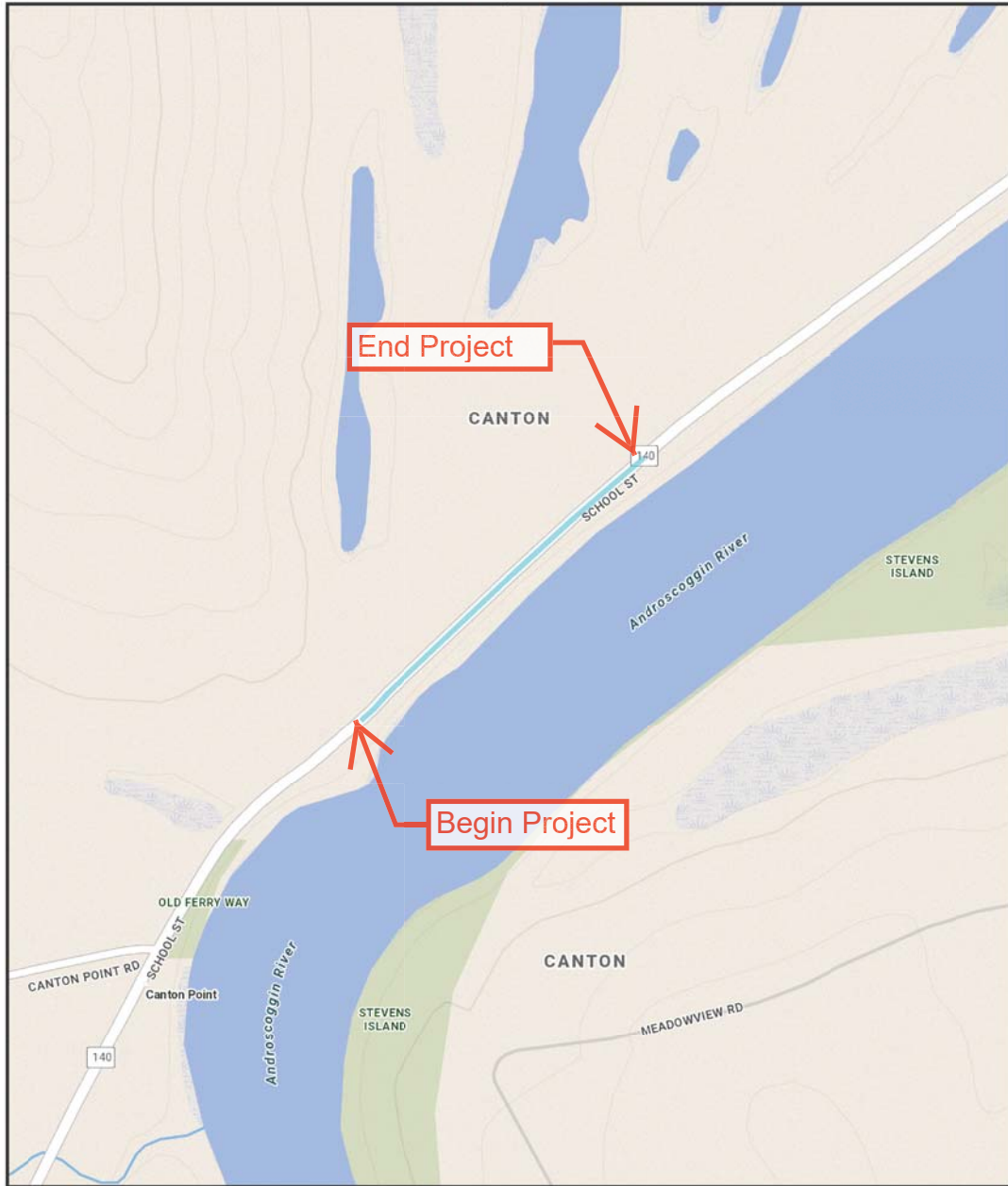
This report has been prepared for the use of the MaineDOT Highway Program for specific application to the proposed slope stabilization on Route 140 in Canton, Maine in accordance with generally accepted geotechnical and foundation engineering practices. No other intended use or warranty is expressed or implied.

In the event that any changes in the nature, design, or location of the proposed project are planned,

## **Sheets**



# CANTON, MAINE



The Maine Department of Transportation provides this publication for information only. Reliance upon this information is at user risk. It is subject to revision and may be incomplete depending upon changing conditions. The Department assumes no liability if injuries or damages result from this information. This map is not intended to support emergency dispatch.

**0.1 Miles**  
1 inch = 0.11 miles

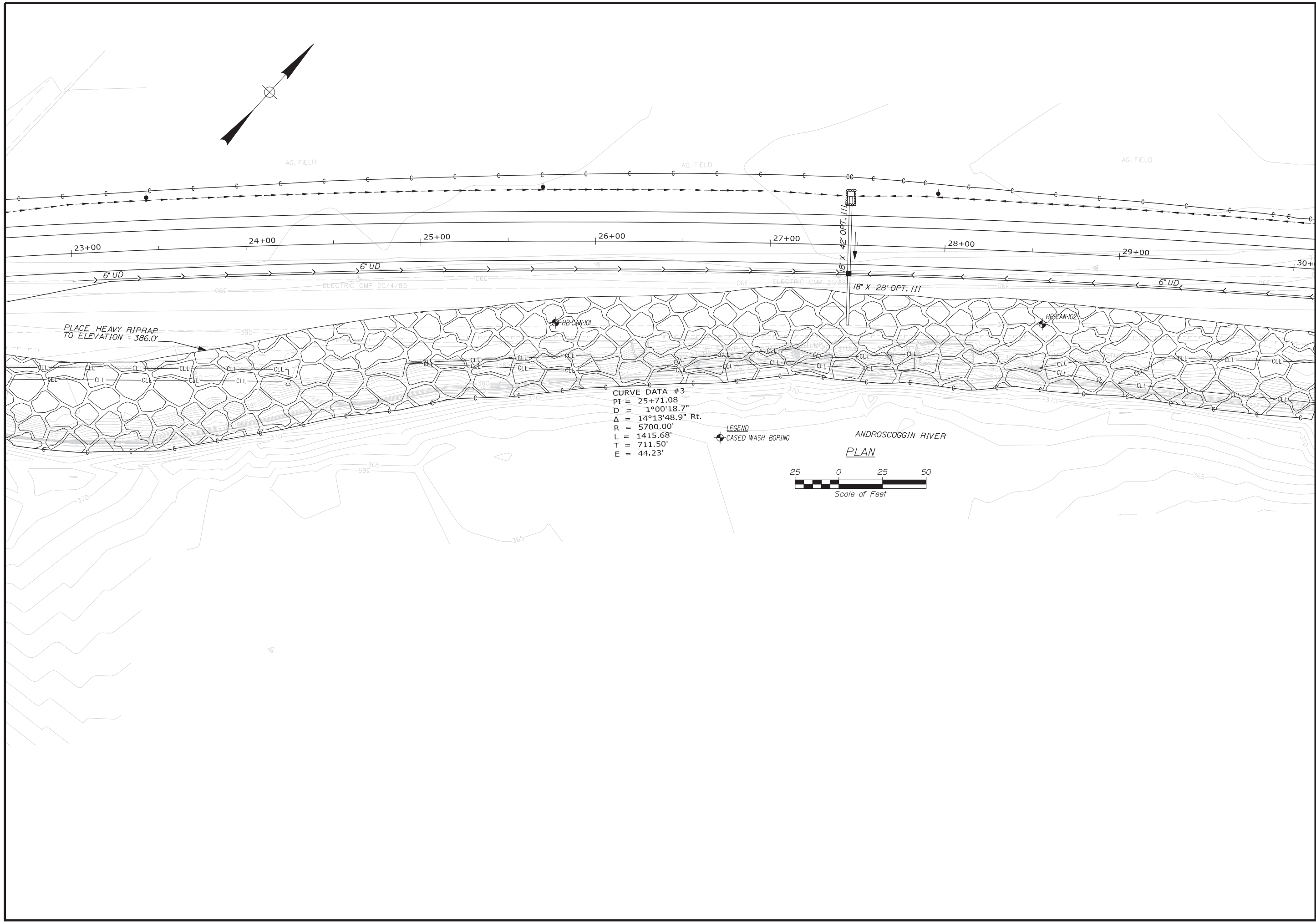
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Time: 8:19:37 AM

SHEET NUMBER  <b>1</b>  OF 2	CANTON  ROUTE 140	STATE OF MAINE DEPARTMENT OF TRANSPORTATION	
		<b>024083.00</b>	
	LOCATION MAP	<b>WIN</b> <b>24083.00</b>	HIGHWAY PLANS

Date: 7/27/2020

Username: Cody A. Russell

Filename: ... \00\GEOTECH\MSTA\002\_BLP1.dgn Division: GEOTECH



STATE OF MAINE  
 DEPARTMENT OF TRANSPORTATION  
 24083.00  
 WIN  
 24083.00  
 HIGHWAY PLANS

PROJ. MANAGER	RHODE	MOULTON	BY	DATE
DESIGN-DETAILED	DANA	PRIDE		
CHECKED-REVIEWED				
DESIGN-DETAILED	C. RUSSELL	T. WHITE		NOV. 2019
DESIGN-DETAILED				
REVISIONS 1				
REVISIONS 2				
REVISIONS 3				
REVISIONS 4				
FIELD CHANGES				

CANTON  
 ROUTE 140  
 BORING LOCATION PLAN

SHEET NUMBER  
 2  
 OF 2

## **Appendix A**

Boring Logs





<b>Maine Department of Transportation</b> Soil/Rock Exploration Log US CUSTOMARY UNITS	<b>Project:</b> Route 140 Slope Stabilization  <b>Location:</b> Canton, Maine	<b>Boring No.:</b> HB-CAN-101  <b>WIN:</b> 24083.00
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<b>Driller:</b> MaineDOT	<b>Elevation (ft.):</b> 390.6	<b>Auger ID/OD:</b> 5" Solid Stem
<b>Operator:</b> Daggett/Westrack/Niles	<b>Datum:</b> NAVD88	<b>Sampler:</b> Standard Split Spoon
<b>Logged By:</b> C. Russell	<b>Rig Type:</b> CME 45C	<b>Hammer Wt./Fall:</b> 140#/30"
<b>Date Start/Finish:</b> 11/4/2019; 09:00-13:00	<b>Drilling Method:</b> Cased Wash Boring	<b>Core Barrel:</b> N/A
<b>Boring Location:</b> 25+77, 46.6 ft Rt.	<b>Casing ID/OD:</b> NW-3"	<b>Water Level*:</b> 14.0 ft bgs.

<b>Hammer Efficiency Factor:</b> 0.886	<b>Hammer Type:</b> Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>	
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Definitions: R = Rock Core Sample, SSA = Solid Stem Auger, HSA = Hollow Stem Auger, RC = Roller Cone, WOH = Weight of 140 lb. Hammer, WOR/C = Weight of Rods or Casing, WO1P = Weight of One Person  
 S<sub>u</sub> = Peak/Remolded Field Vane Undrained Shear Strength (psf), S<sub>u</sub>(lab) = Lab Vane Undrained Shear Strength (psf), q<sub>p</sub> = Unconfined Compressive Strength (ksf), N-uncorrected = Raw Field SPT N-value, Hammer Efficiency Factor = Rig Specific Annual Calibration Value, N<sub>60</sub> = SPT N-uncorrected Corrected for Hammer Efficiency, N<sub>60</sub> = (Hammer Efficiency Factor/60%)\*N-uncorrected  
 T<sub>v</sub> = Pocket Torvane Shear Strength (psf), WC = Water Content, percent, LL = Liquid Limit, PL = Plastic Limit, PI = Plasticity Index, G = Grain Size Analysis, C = Consolidation Test

Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.			
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows /6 in. Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing Blows								
25	10D	24/10	25.00 - 27.00	4/6/7/10	13	19	18	355.6	355.6	Red, wet, medium dense, fine to coarse SAND, some gravel, trace silt.	G#340648 A-1-b, SW WC=12.8%				
							42								
							63								
							50								
							42								
30	11D	24/8	30.00 - 32.00	5/4/4/8	8	12	25							Grey and red, wet, medium dense, fine to coarse SAND, some gravel, trace silt.	
							41								
							49								
							37								
							48								
35	12D	24/6	35.00 - 37.00	1/2/1/3	3	4	19			Grey, wet, very loose, fine to coarse SAND, some gravel, trace silt.					
							31								
							50								
							53								
40	13D	24/10	40.00 - 42.00	2/4/5/6	9	13				Grey, wet, medium dense, fine to coarse SAND, trace gravel, trace silt.	G#340649 A-3, SP WC=22.0%				
							68								
								348.6		Bottom of Exploration at 42.0 feet below ground surface. NO REFUSAL					
50															

**Remarks:**

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Route 140 Slope Stabilization Location: Canton, Maine				Boring No.: HB-CAN-102 WIN: 24083.00							
Driller: MaineDOT				Elevation (ft.): 390.0				Auger ID/OD: 5" Solid Stem							
Operator: Daggett/Westrack/Niles				Datum: NAVD88				Sampler: Standard Split Spoon							
Logged By: C. Russell/B. Wilder				Rig Type: CME 45C				Hammer Wt./Fall: 140#/30"							
Date Start/Finish: 11/4/2019; 13:00-14:10				Drilling Method: Cased Wash Boring				Core Barrel: N/A							
Boring Location: 28+57.8, 41.1 ft Rt.				Casing ID/OD: NW-3"				Water Level*: None Observed							
Hammer Efficiency Factor: 0.886				Hammer Type: Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathead <input type="checkbox"/>											
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt				R = Rock Core Sample SSA = Solid Stem Auger HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person				S <sub>u</sub> = Peak/Remolded Field Vane Undrained Shear Strength (psf) S <sub>u</sub> (lab) = Lab Vane Undrained Shear Strength (psf) q <sub>p</sub> = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N <sub>60</sub> = SPT N-uncorrected Corrected for Hammer Efficiency N <sub>60</sub> = (Hammer Efficiency Factor/60%)*N-uncorrected				T <sub>v</sub> = Pocket Torvane Shear Strength (psf) WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test			
Depth (ft.)	Sample Information								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.			
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing Blows								
0								389.5		6" HMA Pavement.					
	1D	24/24	1.00 - 3.00	8/9/5/6	14	21		388.5		Dark brown, dry, medium dense, fine to coarse SAND, some gravel, trace silt, (Fill).	G#340650 A-1-b, SW-SM WC=2.9%				
	2D	24/21	3.00 - 5.00	2/3/2/2	5	7				Red, damp, loose, fine to coarse SAND, little silt, trace gravel.					
5	3D	24/19	5.00 - 7.00	2/1/2/2	3	4				Red, damp, very loose, fine to coarse SAND, little silt, trace gravel.					
	4D	24/20	7.00 - 9.00	1/2/2/4	4	6				Red, damp, loose, fine to coarse SAND, little silt, trace gravel.	G#340651 A-2-4, SM WC=7.4%				
	5D	24/24	9.00 - 11.00	2/1/2/2	3	4				Red, damp, very loose, fine to coarse SAND, little silt, trace gravel.					
10	6D	24/22	11.00 - 13.00	2/1/2/2	3	4				Red, damp, very loose, fine to coarse SAND, little silt, trace gravel.					
	7D	24/24	13.00 - 15.00	2/3/5/6	8	12				Red, moist, medium dense, fine to medium SAND, some silt.	G#340652 A-2-4, SM WC=29.2%				
15	8D	24/4	15.00 - 17.00	7/5/4/4	9	13	5	375.0		Red and grey, wet, medium dense, fine to coarse SAND, little gravel, little silt.	G#340653 A-2-4, SM WC=17.5%				
20	9D	24/13	20.00 - 22.00	5/5/7/8	12	18	15			Brown, wet, medium dense, Gravelly fine to coarse SAND, trace silt. Roller Coned ahead to 25.0 ft bgs.	G#340654 A-1-b, SW WC=13.7%				
25															

**Remarks:**

Russell drilled to 15.0 ft bgs, then Wilder continued on a separate field log on 11/5/2019; 08:00-10:30.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

\* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

<b>Maine Department of Transportation</b> Soil/Rock Exploration Log US CUSTOMARY UNITS	<b>Project:</b> Route 140 Slope Stabilization  <b>Location:</b> Canton, Maine	<b>Boring No.:</b> HB-CAN-102  <b>WIN:</b> 24083.00
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<b>Driller:</b> MaineDOT	<b>Elevation (ft.):</b> 390.0	<b>Auger ID/OD:</b> 5" Solid Stem
<b>Operator:</b> Daggett/Westrack/Niles	<b>Datum:</b> NAVD88	<b>Sampler:</b> Standard Split Spoon
<b>Logged By:</b> C. Russell/B. Wilder	<b>Rig Type:</b> CME 45C	<b>Hammer Wt./Fall:</b> 140#/30"
<b>Date Start/Finish:</b> 11/4/2019; 13:00-14:10	<b>Drilling Method:</b> Cased Wash Boring	<b>Core Barrel:</b> N/A
<b>Boring Location:</b> 28+57.8, 41.1 ft Rt.	<b>Casing ID/OD:</b> NW-3"	<b>Water Level*:</b> None Observed

<b>Hammer Efficiency Factor:</b> 0.886	<b>Hammer Type:</b> Automatic <input checked="" type="checkbox"/> Hydraulic <input type="checkbox"/> Rope & Cathed <input type="checkbox"/>	
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Definitions: R = Rock Core Sample SSA = Solid Stem Auger S<sub>u</sub> = Peak/Remolded Field Vane Undrained Shear Strength (psf) T<sub>v</sub> = Pocket Torvane Shear Strength (psf)  
 D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MU = Unsuccessful Thin Wall Tube Sample Attempt V = Field Vane Shear Test, PP = Pocket Penetrometer MV = Unsuccessful Field Vane Shear Test Attempt  
 HSA = Hollow Stem Auger RC = Roller Cone WOH = Weight of 140 lb. Hammer WOR/C = Weight of Rods or Casing WO1P = Weight of One Person  
 S<sub>u</sub>(lab) = Lab Vane Undrained Shear Strength (psf) q<sub>u</sub> = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N<sub>60</sub> = SPT N-uncorrected Corrected for Hammer Efficiency N<sub>60</sub> = (Hammer Efficiency Factor/60%)\*N-uncorrected  
 WC = Water Content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test

Depth (ft.)	Sample Information							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N <sub>60</sub>	Casing Blows				
25	10D	24/14	25.00 - 27.00	6/8/7/8	15	22	40	357.0	33.0	Brown, wet, medium dense, Gravelly fine to coarse SAND, trace silt.	
							41				
							49				
							66				
							63				
30	11D	24/16	30.00 - 32.00	2/3/4/4	7	10	21	357.0	33.0	Brown, wet, loose, Gravelly fine to coarse SAND, trace silt.	
							26				
							44				
							43				
35	12D	24/11	35.00 - 37.00	2/3/3/5	6	9	9	357.0	33.0	Grey, wet, loose, fine to coarse SAND, trace silt, trace gravel.	
							47				
40	13D	24/18	40.00 - 42.00	3/4/6/10	10	15	15	348.0	42.0	Grey, wet, medium dense, fine to coarse SAND, trace silt, trace gravel.	G#340655 A-3, SP-SM WC=26.5%
										<b>Bottom of Exploration at 42.0 feet below ground surface. NO REFUSAL</b>	
50											

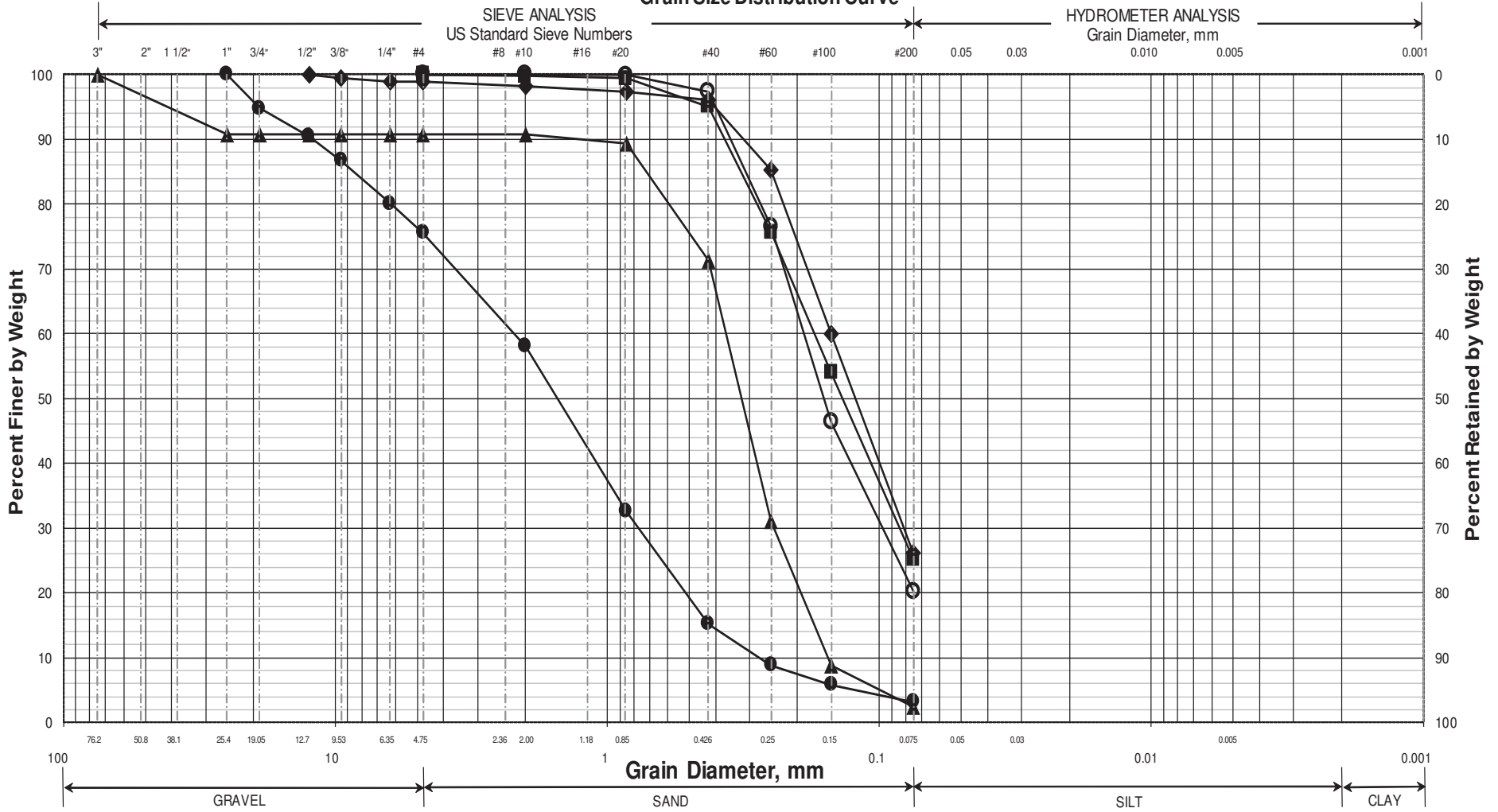
**Remarks:**  
Russell drilled to 15.0 ft bgs, then Wilder continued on a separate field log on 11/5/2019; 08:00-10:30.

## **Appendix B**

Laboratory Test Results



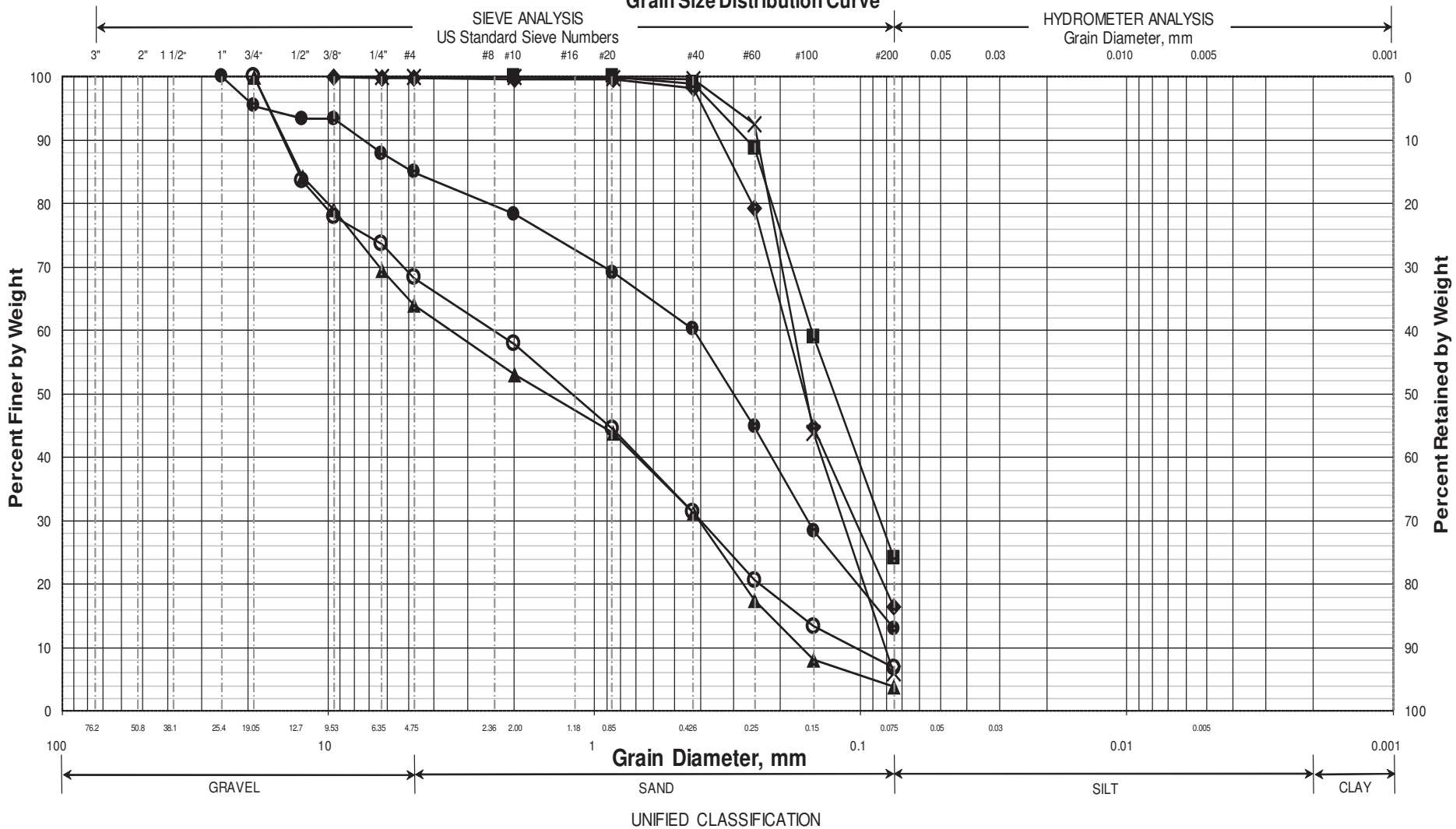
## Maine Department of Transportation Grain Size Distribution Curve



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	WC, %	LL	PL	PI
○	HB-CAN-101/2D	25+77	46.6 RT	3.0-5.0	SAND, little silt.	10.5			
◆	HB-CAN-101/5D	25+77	46.6 RT	9.0-11.0	SAND, some silt, trace gravel.	11.4			
■	HB-CAN-101/8D	25+77	46.6 RT	15.0-17.0	SAND, some silt.	29.0			
●	HB-CAN-101/10D	25+77	46.6 RT	25.0-27.0	SAND, some gravel, trace silt.	12.8			
▲	HB-CAN-101/13D	25+77	46.6 RT	40.0-42.0	SAND, trace gravel, trace silt.	22.0			
X									

WIN
024083.00
Town
Canton
Reported by/Date
WHITE, TERRY A      7/16/2020

## Maine Department of Transportation Grain Size Distribution Curve



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	WC, %	LL	PL	PI
○	HB-CAN-102/1D	28+57.8	41.1 RT	1.0-1.5	SAND, some gravel, trace silt.	2.9			
◆	HB-CAN-102/4D	28+57.8	41.1 RT	7.0-9.0	SAND, little silt, trace gravel.	7.4			
■	HB-CAN-102/7D	28+57.8	41.1 RT	13.0-15.0	SAND, some silt.	29.2			
●	HB-CAN-102/8D	28+57.8	41.1 RT	15.0-17.0	SAND, little gravel, little silt.	17.5			
▲	HB-CAN-102/9D	28+57.8	41.1 RT	20.0-22.0	Gravelly SAND, trace silt.	13.7			
X	HB-CAN-102/13D	28+57.8	41.1 RT	40.0-42.0	SAND, trace silt, trace gravel.	26.5			

WIN
024083.00
Town
Canton
Reported by/Date
WHITE, TERRY A      7/16/2020

## **Appendix C**

### Slope Stability Analyses

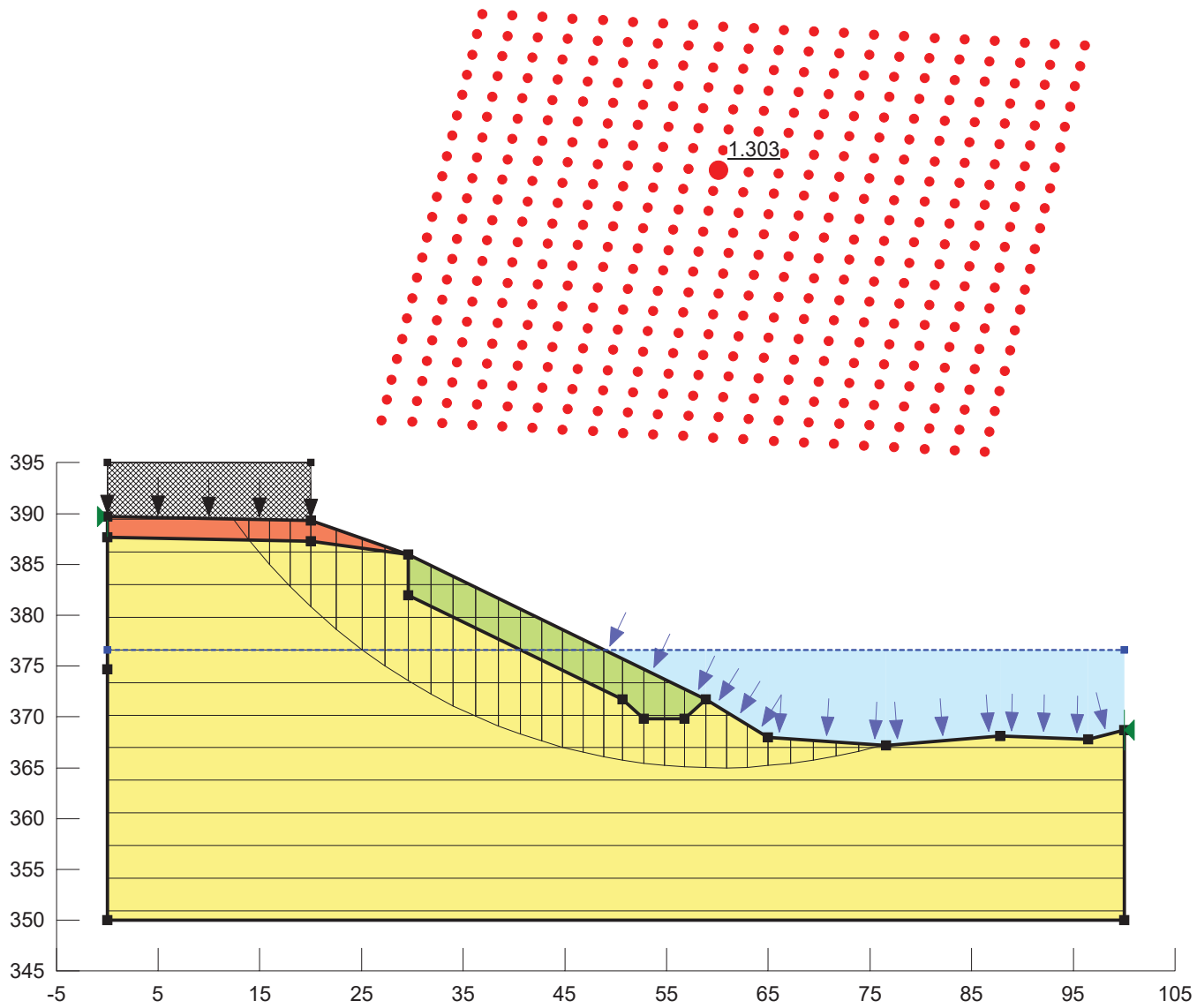
File Name: Canton 24083 Sta. 20+00 - Final Config..gsz

Method: Spencer

Name: Stream Alluvium Unit Weight: 120 pcf Phi': 32 °

Name: Riprap Unit Weight: 140 pcf Phi': 42 °

Name: Fill Unit Weight: 125 pcf Phi': 34 °



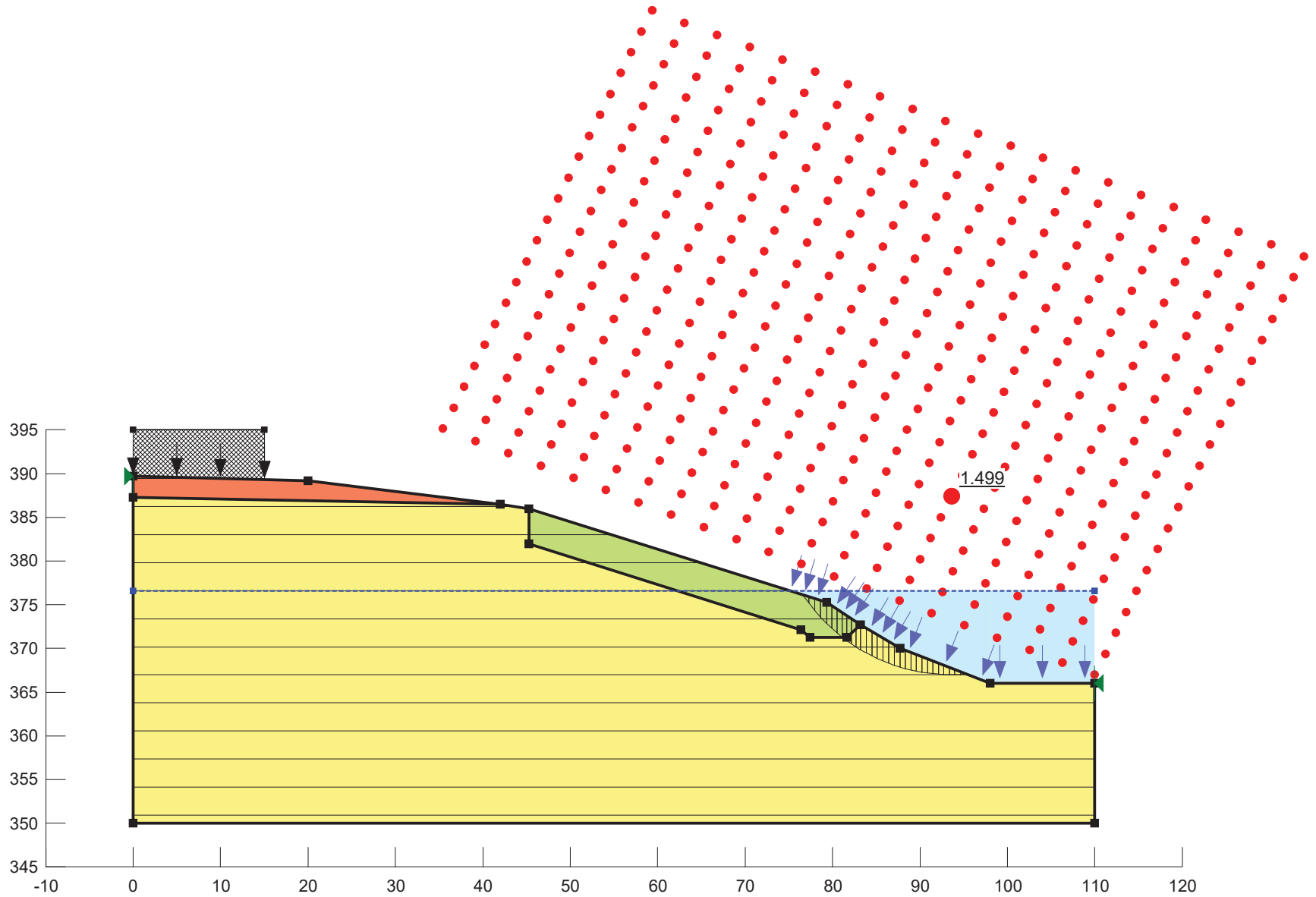
File Name: Canton 24083 Sta. 22+00 - Final Config..gsz

Method: Spencer

Name: Stream Alluvium Unit Weight: 120 pcf Phi': 32 °

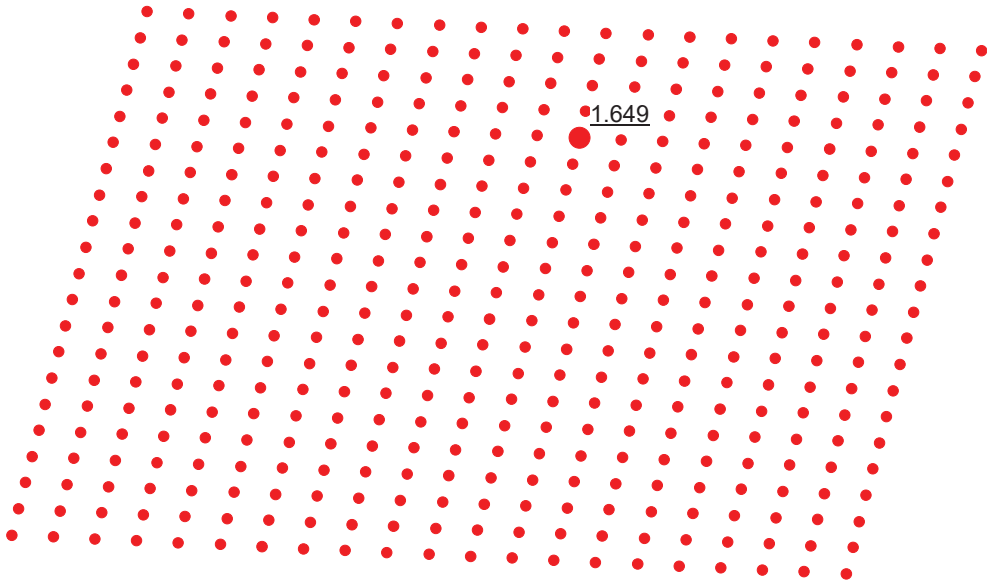
Name: Riprap Unit Weight: 140 pcf Phi': 42 °

Name: Fill Unit Weight: 125 pcf Phi': 34 °



File Name: Canton 24083 Sta. 27+00 - Final Config..gsz

Method: Spencer



Name: Stream Alluvium Unit Weight: 120 pcf Phi': 32 °  
Name: Riprap Unit Weight: 140 pcf Phi': 42 °  
Name: Fill Unit Weight: 125 pcf Phi': 34 °

