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GEOTECHNICAL DATA REPORT

TOWN FARM ROAD BRIDGE NO. 5785 OVER INTERSTATE 95
MAINE DOT WIN 29486.00 (LEGACY WIN 27266.00)
SIDNEY, MAINE

June 2025
09.0026242.00

Prepared for:
Maine Department of Transportation
Augusta, Maine

Prepared by:
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1.0 INTRODUCTION

We are pleased to provide this Geotechnical Data Report, which includes geotechnical data related to the replacement of Maine Department of Transportation (MaineDOT) Town Farm Road Bridge No. 5785 in Sidney, Maine. Our work was completed in accordance with GZA's Project Contract for the above referenced project dated July 22, 2024, and our Proposal No. 09.P000130.24a, dated December 18, 2023, and the *Limitations* Included in **Appendix A** of this report.

1.1 BACKGROUND

The Town Farm Road Bridge No. 5785 was constructed circa 1958 and spans east to west, carrying Town Farm Road over Interstate 95 (I-95), as shown in **Figure 1**. Bridge No. 5785 is a 303-foot-long, five-span, continuous bridge with steel beams and a reinforced concrete deck. The bridge is 29 feet wide and supported by concrete piers and concrete stub abutments.

The 1958 as-built plans indicate that the two stub abutments are supported by HP 10x42 piles that are either plumb or battered at 2.5:12. Abutments 1 and 2 are supported by 9 and 12 piles, respectively. The piles were designed using an allowable design capacity of 37 and 30 tons for Abutments 1 and 2, respectively. The piles supporting the abutments were estimated to be between 30 to 40 feet long. The four pier stems are shown to be supported by spread footings bearing on marine sand or glacial till. The pier spread footings were designed an allowable bearing pressure of 2.5 tons per square foot (tsf). The existing approach embankments are approximately 13 to 19 feet above original grades. The available historic foundation drawings are attached in **Appendix B**.

Elevations referenced in this report are in feet and refer to the North American Vertical Datum of 1988 (NAVD88) unless noted otherwise. Elevations shown on the 1958 drawings are in feet and refer to the National Geodetic Vertical Datum of 1929 (NGVD29). Stantec indicated that a datum shift of approximately -0.7 feet can be used to convert from NGVD29 to NAVD88.

It is GZA's understanding that a full bridge replacement is planned for this project. The bridge will be designed and constructed as part of a Design-Build bundle. Requirements for on- or off-alignment bridge replacement alternatives will be specified in the MaineDOT Design-Build Request for Proposals (RFP).

1.2 OBJECTIVES AND SCOPE OF SERVICES

The objectives of our work were to collect data on the subsurface conditions as the Owner's Geotechnical Consultant to be provided to prospective Design-Build teams in the MaineDOT Design-Build Request for Proposals (RFP). To meet these objectives, GZA completed the following Scope of Services:

- Conducted a site visit to observe surficial conditions and reviewed existing bridge plans, historical topography, historical geotechnical reports, and mapped surficial and bedrock geology of the site;

- Coordinated and observed a subsurface exploration program, consisting of four test borings, to evaluate subsurface conditions for the bridge;
- Conducted a laboratory testing program to evaluate engineering and index properties of the site soils; and
- Prepared this report summarizing our findings.

2.0 SUBSURFACE EXPLORATIONS

Details of the previous and current subsurface explorations are provided in the following sections.

2.1 PREVIOUS (1958) BORING

In 1958, MaineDOT conducted eight test borings, designated BOR #1 through #8, to explore subsurface conditions for bridge construction. All borings drilled for the design of the existing bridge were drilled prior to construction of I-95. At the time, the grades were 13 to 18 feet lower than Town Farm Road is today. Six of the eight borings were drilled through the overburden and to bedrock, and approximately 5 feet of core was collected from these six borings. Depths to bedrock ranged from 16 to 55 feet below original grades in these borings. Boring BOR #5 and BOR #6, located at the existing Abutment 2, were terminated in very dense/hard soil with gravel and boulders without confirming bedrock at depths of approximately 34 to 55 feet below original grades, respectively.

The boring log sheets from the 1958 geotechnical report are included in **Appendix B**.

2.2 RECENT BORINGS

GZA completed a preliminary subsurface exploration program consisting of four (4) test borings (BB-STFR-101 through BB-STFR-104), the locations and designations of which are shown on the attached **Boring Location Plan, Figure 2**. Borings BB-STFR-101 and -104 were completed about 15 feet behind the face of each abutment, boring BB-STFR-102 was drilled through the bridge between Pier 1 and Pier 2, and boring BB-STFR-103 was drilled through the bridge between Pier 3 and Pier 4. The as-drilled boring locations and elevations were surveyed by MaineDOT, provided to GZA and shown on the logs; the surveyed as-drilled locations are shown on **Figure 2**.

The borings were drilled to depths of approximately 30 to 79 feet below ground surface (bgs) and terminated approximately 10 to 13 feet into bedrock. Seaboard Drilling of Bangor, Maine provided drilling services and coordinated utility clearance. The drilling was completed from July 16 through July 19, 2024. GZA personnel monitored the drilling work and prepared logs of each boring, included in **Appendix C**.

The borings were drilled using solid stem augers followed by 3-inch or 4-inch casing and drive-and-wash techniques through the overburden and coring equipment in the bedrock. Standard Penetration Testing (SPT) and split-spoon sampling were performed at 5-foot typical intervals in overburden soils. SPTs were conducted according to MaineDOT requirements using an automatic hammer system calibrated in accordance with ASTM D4633-05 and MaineDOT procedures. SPTs were conducted using automatic

hammer Seaboard SN367, which had a rated hammer energy transfer ratio of 1.066 at the time of drilling. The drilling subcontractor backfilled the approach boreholes with cuttings or sand and topped them with asphalt cold patch upon completion. The bridge deck was patched with quick-set concrete. Rock core was taken from each boring using NQ (2.0-inch diameter) coring equipment.

3.0 LABORATORY TESTING

GZA retained Thielsch Engineering's Geotechnical Laboratory in Cranston, Rhode Island to complete a laboratory testing program to assess the gradation and index properties of the soil and bedrock. The testing program included:

COMPLETED LABORATORY TESTS		
Laboratory Test	**ASTM Standard**	**Number of Tests**
Grain Size Analysis	D6913	9
Hydrometer	D7928	4
Atterberg Limits	D4318	4
Moisture Content	D2216	16
Unconfined Compressive Strength (with axial and lateral strain)	D7012 Method D	2

Results of the testing are included in **Appendix D**.

4.0 SUBSURFACE CONDITIONS

4.1 SURFICIAL AND BEDROCK GEOLOGY

Based on available surficial geologic mapping[1], the surficial unit at the site is mapped as the Presumpscot Formation, which consists of marine silt, clay, and local sand beds deposited on the late-glacial sea floor. Glacial Till is mapped to the northwest of the site and consists of a poorly sorted mixture of clay, silt, and sand and can include cobbles and boulders.

Bedrock in the vicinity of the site is mapped[2] as the Waterville Formation. The Waterville formation is characterized as fine to medium grained siltstone and claystone pelite and fine grained to very fine grained, non-foliated, quartz-plagioclase, metasandstone. The Mayflower Hill formation is mapped west of the site and consists of light grey phyllite.

[1] Hildreth, Carol T., 2005, Surficial geology of the Vassalboro quadrangle, Maine: Maine Geological Survey, Open-File Map 05-8, Map, scale 1:24,000. Maine Geological Survey Maps. 1505. http://digitalmaine.com/mgs_maps/1505

[2] Osberg, Philip H., 1968, Stratigraphy, structural geology, and metamorphism of the Waterville-Vassalboro area, Maine: Maine Geological Survey (Department of Economic Development), Bulletin 20, 64 p. report, color map, cross section, scale 1:62,500. Maine Geological Survey Maps. 80. http://digitalmaine.com/mgs_maps/80

4.2 SUBSURFACE PROFILE

Four soil units, Fill, Marine Clay, Marine Sand, and Glacial Till were encountered in the test borings underlying approximately 5 to 6 inches of asphalt pavement (in Town Farm Road approaches) and overlying bedrock. The thicknesses and generalized descriptions of the soil units are presented in the following table, in descending order from existing ground surface. Detailed descriptions of the materials encountered at specific locations are provided in the boring logs in **Appendix C**.

INTERPRETED SUBSURFACE CONDITIONS		
Soil Unit	**Approximate Encountered Thickness (ft)**	**Generalized Description**
Fill	3 to 24	Varies from: Brown to grey, loose to very dense, fine to coarse SAND, trace gravel to Gravelly, trace to some silt to: brown, stiff, Clayey SILT, little sand. Typical MaineDOT Frost Classification Range= 0 to II Results from 8 Grain Size and 8 Moisture Content Analyses: • AASHTO Classification: A-1-a, A-1-b, A-2-4(0) • USCS Classifications: SW-SM, SM, GP-GM, ML • Moisture Content: 4.3 to 16.1% *Encountered in all borings*
Marine Clay	5 to 9	Brown to grey, very soft to stiff, Clayey SILT to Silty CLAY, trace to some sand. Typical MaineDOT Frost Classification = IV Results from 3 Atterberg Limits and 3 Moisture Content Analyses: • AASHTO Classification: A-4(6) • USCS Classifications: CL, ML • Liquid Limit: 22 to 29 • Plastic Limit: 16 to 19 • Plasticity Index: 6 to 10 • Moisture Content: 21.2 to 25.8% *Encountered in borings BB-STFR 101, BB-STFR-102, and BB-STFR-103*
Marine Sand	15	Brown, medium dense to very dense, Silty fine to medium SAND. *Encountered in BB-STFR-104*
Glacial Till	7 to 30	Varies from: Brown to grey, medium dense to very dense, Silty GRAVEL, Gravelly SAND, and Silty SAND to: hard, Clayey SILT, some gravel, trace to some sand. Typical MaineDOT Frost Classification Range= III to IV Results from 3 Grain Size, 1 Atterberg Limits, and 4 Moisture Content Analyses: • AASHTO Classification: A-1-a, A-4(0) • USCS Classifications: SM, GM, CL-ML • Liquid Limit: 20 • Plastic Limit: 13 • Plasticity Index: 7 • Moisture Content: 6.0 to 21.0% *Encountered in all borings*
Estimated Top of Bedrock*	Approx. El. 121 to 163 (34 to 69 feet bgs)	
*Note: Estimated top of bedrock is based on recent borings. Depths to bedrock referenced to ground surface at Town Farm Road approaches or I-295.		

4.2.1 Bedrock

Bedrock was cored in each test boring and was described as Pelite of the Waterville Formation. Pelite was generally described as medium hard to hard, fresh to slightly weathered, fine to medium grained, and grey with occasional quartzite laminae or intrusions. Joints were generally characterized as extremely close to widely spaced, low to high angle, planar to stepped, smooth to rough, fresh to discolored, and tight to open. The RQD ranged from 0 to 100 percent, indicating a Rock Quality of Very Poor to Excellent. The bedrock core data are summarized in **Table 2**. Wet and dry photographs of the collected rock core are included in **Appendix E**.

Unconfined compressive strength and elastic modulus tests were conducted on two rock specimens, the results of which are summarized in the following table.

SUMMARY OF BEDROCK STRENGTH TEST RESULTS

Boring	Depth below Existing Ground (ft)	Depth below Top of Rock (ft)	Unconfined Compressive Strength (psi)	Secant Modulus @ 50% of Failure Stress (ksi)	Unit Weight (pcf)	Rock Type
BB-STFR-101	42.0	7.6	11,932	5,480	175.5	Pelite
BB-STFR-102	23.2	3.6	5,063	3,370	172.4	Pelite

4.2.3 Groundwater

The groundwater depth was measured in all borings. Groundwater depths ranged from approximately 6.1 to 28.8 feet, corresponding to approximately El. 160.7 to El. 178.0. Groundwater levels in the borings were measured during or immediately after drilling and were likely affected by cased drilling procedures, which included introduction of water for drilling purposes.

The groundwater observations were made at the times and under the conditions stated in the boring logs. Fluctuations in groundwater level occur due to variations in season, precipitation, and construction activities in the area. Consequently, water levels during construction are likely to vary from those encountered at the time the observations were made.

SIGNATURE PAGE

This report has been prepared and reviewed by:

GZA GEOENVIRONMENTAL, INC.

Blaine Cardali
Senior Project Manager

Christopher L. Snow, P.E.
Consultant/Reviewer

Andrew R. Blaisdell, P.E.
Associate Principal

BMC/ARB/CLS:cc

TABLES

TABLE 1
Summary of Subsurface Explorations
Town Farm Road Bridge #5785 over I-95
Sidney, ME
WIN 27266.00

Boring ID	Northing	Easting	Ground Surface El. (ft)	Top of Stratum Elevation						Stratum Thickness					Depth to Bedrock (ft)	Bottom of Boring Depth (ft)	Bottom of Boring El. (ft)	Groundwater	
				Asphalt	Fill	Marine Clay	Marine Sand	Glacial Till	Bedrock	Asphalt	Fill	Marine Clay	Marine Sand	Glacial Till				El. (ft)	Depth (ft)
BB-STFR-101	606731.9	1158979.8	197.0	197.0	196.5	178.5	NE	170.0	162.6	0.5	18.0	8.5	NE	7.4	34.4	45.0	152.0	178.0	19.0
BB-STFR-102	606709.1	1159104.9	173.9	NE	173.9	168.9	NE	162.4	154.3	NE	5.0	6.5	NE	8.1	19.6	30.0	143.9	167.8	6.1
BB-STFR-103	606693.0	1159185.6	170.5	NE	170.5	167.0	NE	162.0	150.3	NE	3.5	5.0	NE	11.7	20.2	34.0	136.5	160.9	9.6
BB-STFR-104	606669.1	1159310.9	189.5	NE	189.5	NE	166.0	151.0	121.0	NE	23.5	NE	15.0	30.0	68.5	79.0	110.5	160.7	28.8

Notes:
1. Refer to the boring logs in Appendix C for additional information.
2. Project elevation datum is North American Vertical Datum (NAVD 88), unless noted otherwise.
3. Project coordinates are in survey feet and reference the North American Datum of 1983 (NAD83) Maine Coordinate System 2000 West, unless noted otherwise.
4. As-drilled locations were surveyed by MaineDOT and provided to GZA.
5. Stratum depths, thickness and elevations are rounded to the nearest 0.1 foot as interpreted on the boring logs, but this does not represent the precision of the data.

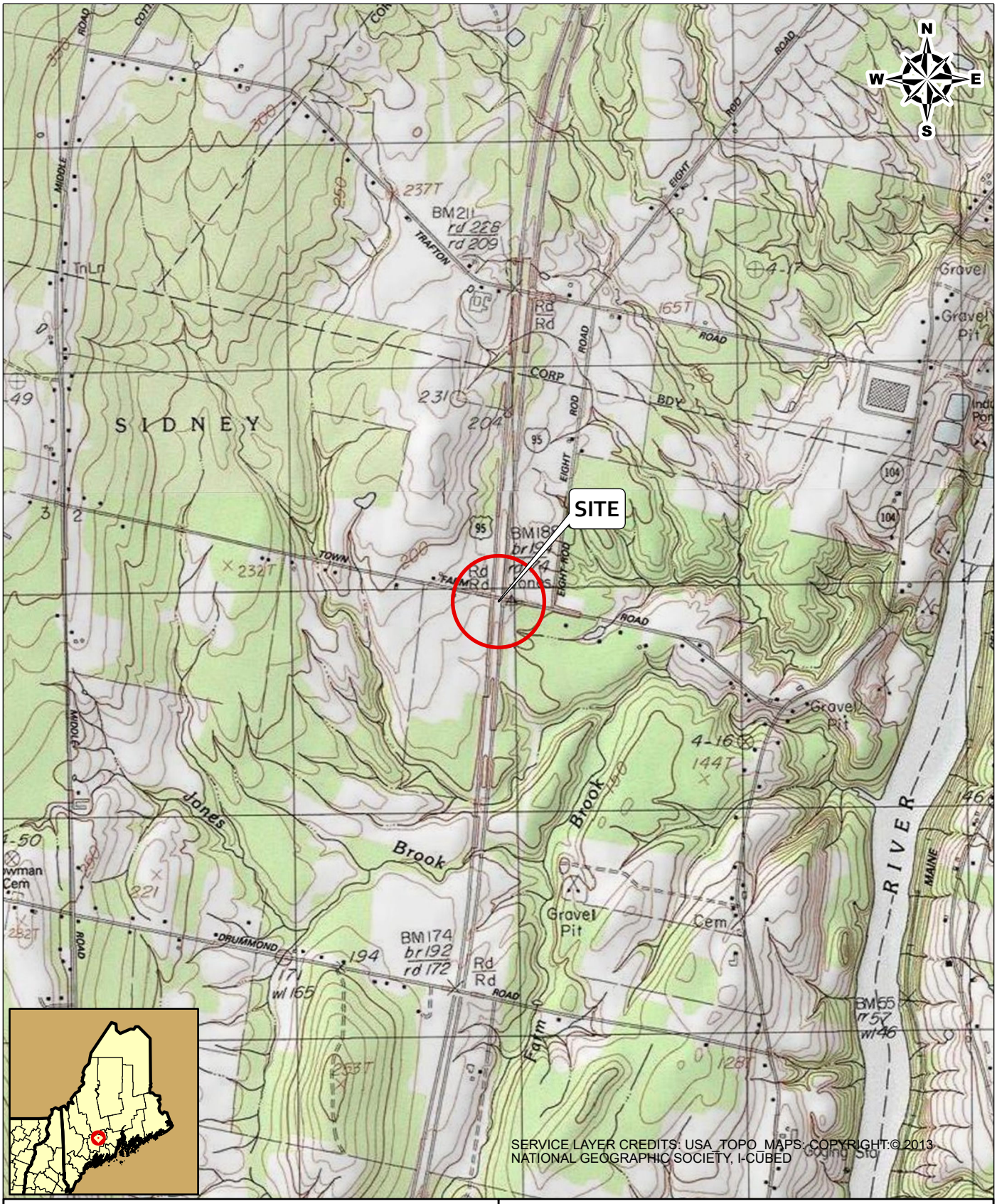
TABLE 2
Summary of Bedrock Data
Town Farm Road Bridge #5785 Over I-95
Sidney, ME
WIN 27266.00

Boring ID	Core Run	Ground Surface El. (ft)	Depth of Core Run below GS (ft)			Depth to Rock (ft)	Depth Below Top of Rock (ft)			Length of Core Run (in)	Rec (in)	Rec (%)	RQD (in)	RQD %	Joint Spacing (in)	Joint Aperture (in)	Elev. (ft)		LAB							Rock Type
			Top		Bottom		Top		Bottom								Top	Bottom	Depth of Sample (ft)	Depth of Sample into Rock (ft)	Elev Top of Sample (ft)	UCS (psi)	Poissons Ratio	Modulus (ksi)	Unit Wt (pcf)	
BB-STFR-101	R1	197.0	35.0	-	37.3	34.4	0.6	-	2.9	27.6	26	96%	14	51%	0.75-2.5	0.004-0.1	162.0	159.7								PELITE
BB-STFR-101	R2	197.0	37.3	-	39.0	34.4	2.9	-	4.6	20.4	20	100%	0	0%	0.75-0.75	0.004-0.01	159.7	158.0								PELITE
BB-STFR-101	R3	197.0	39.0	-	41.0	34.4	4.6	-	6.6	24.0	19	79%	10	50%	2.5-2.5	0.02-0.1	158.0	156.0								PELITE
BB-STFR-101	R4	197.0	41.0	-	42.0	34.4	6.6	-	7.6	12.0	10	83%	5	42%	0.75-0.75	0.004-0.1	156.0	155.0								PELITE
BB-STFR-101	R5	197.0	42.0	-	45.0	34.4	7.6	-	10.6	36.0	36	100%	36	100%	2.5-24	0.02-0.1	155.0	152.0	42.0	7.6	155.0	11,932	0.53	5,480	175.5	PELITE
BB-STFR-102	R1	173.9	20.0	-	25.0	19.6	0.4	-	5.4	60.0	59	98%	27	45%	0.75-2.5	0.01-0.02	153.9	148.9	23.2	3.6	150.7	5,063	0.38	3,370	172.4	PELITE
BB-STFR-102	R2	173.9	25.0	-	30.0	19.6	5.4	-	10.4	60.0	60	100%	40	67%	0.75-2.5	0.01-0.02	148.9	143.9								PELITE
BB-STFR-103	R1	170.5	24.0	-	29.0	20.2	3.8	-	8.8	60.0	60	100%	10	17%	0.75-2.5	0.01-0.02	146.5	141.5								PELITE
BB-STFR-103	R2	170.5	29.0	-	34.0	20.2	8.8	-	13.8	60.0	48	80%	23	48%	0.75-2.5	0.01-0.02	141.5	136.5								PELITE
BB-STFR-104	R1	189.5	69.0	-	74.0	68.5	0.5	-	5.5	60.0	58	97%	6	10%	0.75-2.5	0.01-0.02	120.5	115.5								PELITE
BB-STFR-104	R2	189.5	74.0	-	79.0	68.5	5.5	-	10.5	60.0	53	88%	19	36%	0.75-2.5	0.01-0.02	115.5	110.5								PELITE

Notes:

1. Refer to boring logs in Appendix B for additional information.
2. Project elevation datum is North American Vertical Datum (NAVD 88), unless noted otherwise.
3. As-drilled locations and elevations were surveyed by MaineDOT and provided to GZA.

FIGURES



SERVICE LAYER CREDITS: USA_TOPO_MAPS: COPYRIGHT:© 2013 NATIONAL GEOGRAPHIC SOCIETY, I-CUBED

0 1,000 2,000 4,000

SCALE IN FEET

TOWN FARM ROAD BRIDGE #5785 OVER I-95

SIDNEY, ME

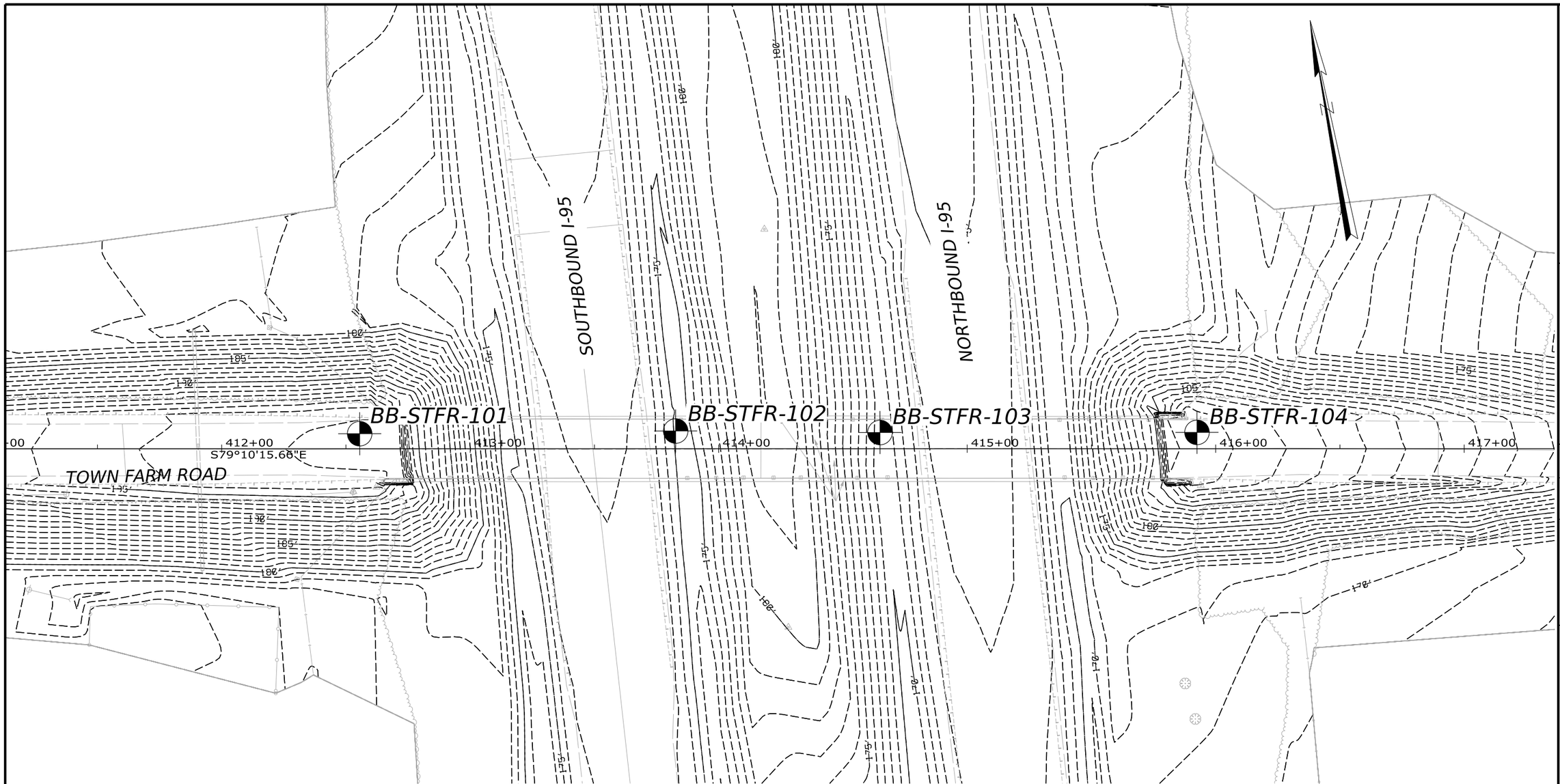
LOCUS PLAN

PREPARED BY: **GZA** GeoEnvironmental, Inc. www.gza.com

PREPARED FOR: STANTEC

PROJ MGR: BMC	REVIEWED BY: CLS	CHECKED BY: ARB	FIGURE 1
DESIGNED BY: EAF	DRAWN BY: EAF	SCALE: 1 in = 2,000 ft	
DATE: APRIL 2025	PROJECT NO: 09.0026242.00	REVISION NO:	

P:\09 Jobs\00262\00s\09.0026242.00 - Stantec - Sidney 5 Bridges Bundle\Figures\GIS\APRX\APRX.aprx, April 08, 2025 - 2:01 PM, Elizabeth.Fulton



NOTES

1) Base map developed from the Work Set electronic files provided by Stantec on April 7, 2025.

2) The as-drilled locations of the test borings were surveyed by Maine DOT and provided by Stantec in an electronic file (Topo.dgn) on April 7, 2025.

BORING LOCATION PLAN LEGEND

BB-STFR-104

PLAN

25 0 25 50

Scale of Feet

Location and designation of BB-STFR-100 series borings performed by Seaboard Drilling, LLC of Bangor, Maine and observed by GZA personnel between July 16 and 19, 2024.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

27266.00

WIN 27266.00

BRIDGE NO. 5785

HIGHWAY PLANS

	BY	DATE
PROJ MANAGER	J. BRASK	
DESIGN-DETAILED	NVW	5/15/2025
CHECKED-REVIEWED	AMB	CLS 5/16/2025
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

TOWN FARM ROAD BRIDGE
SIDNEY, MAINE

BORING LOCATION PLAN

SHEET NUMBER

2

OF 2

Username: nicholas.williams Date: 5/15/2025

Filename: P:\09 Jobs\MEDOT_ORD\WIN\27266_00\GEOTECH\Boring_Location_Plan.dgn

APPENDIX A – LIMITATIONS

GEOTECHNICAL LIMITATIONS

Use of Report

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the contract documents, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

Standard of Care

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in Proposal for Services and/or Report, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the report, as appropriate, to reflect the unanticipated changed conditions .

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

Subsurface Conditions

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

6. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our

evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

7. Water level readings have been made in test holes (as described in this Report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the Report.

8. GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.

9. Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

Compliance with Codes and Regulations

10. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

Cost Estimates

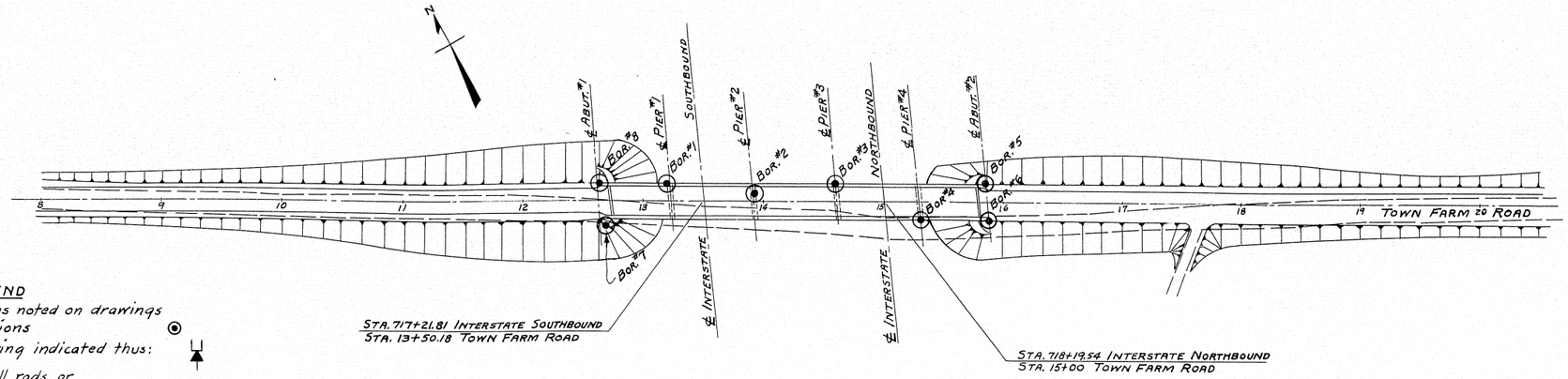
11. Unless otherwise stated, our cost estimates are only for comparative and general planning purposes. These estimates may involve approximate quantity evaluations. Note that these quantity estimates are not intended to be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over either when the work will take place or the labor and material costs required to plan and execute the anticipated work, our cost estimates were made by relying on our experience, the experience of others, and other sources of readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

Additional Services

12. GZA recommends that we be retained to provide services during any future: site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

APPENDIX B – HISTORIC GEOTECHNICAL DATA AND FOUNDATION DRAWINGS

D.P.W. No.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
N/A				
1	MAINE	I-95-6(5)117	4	18



LEGEND

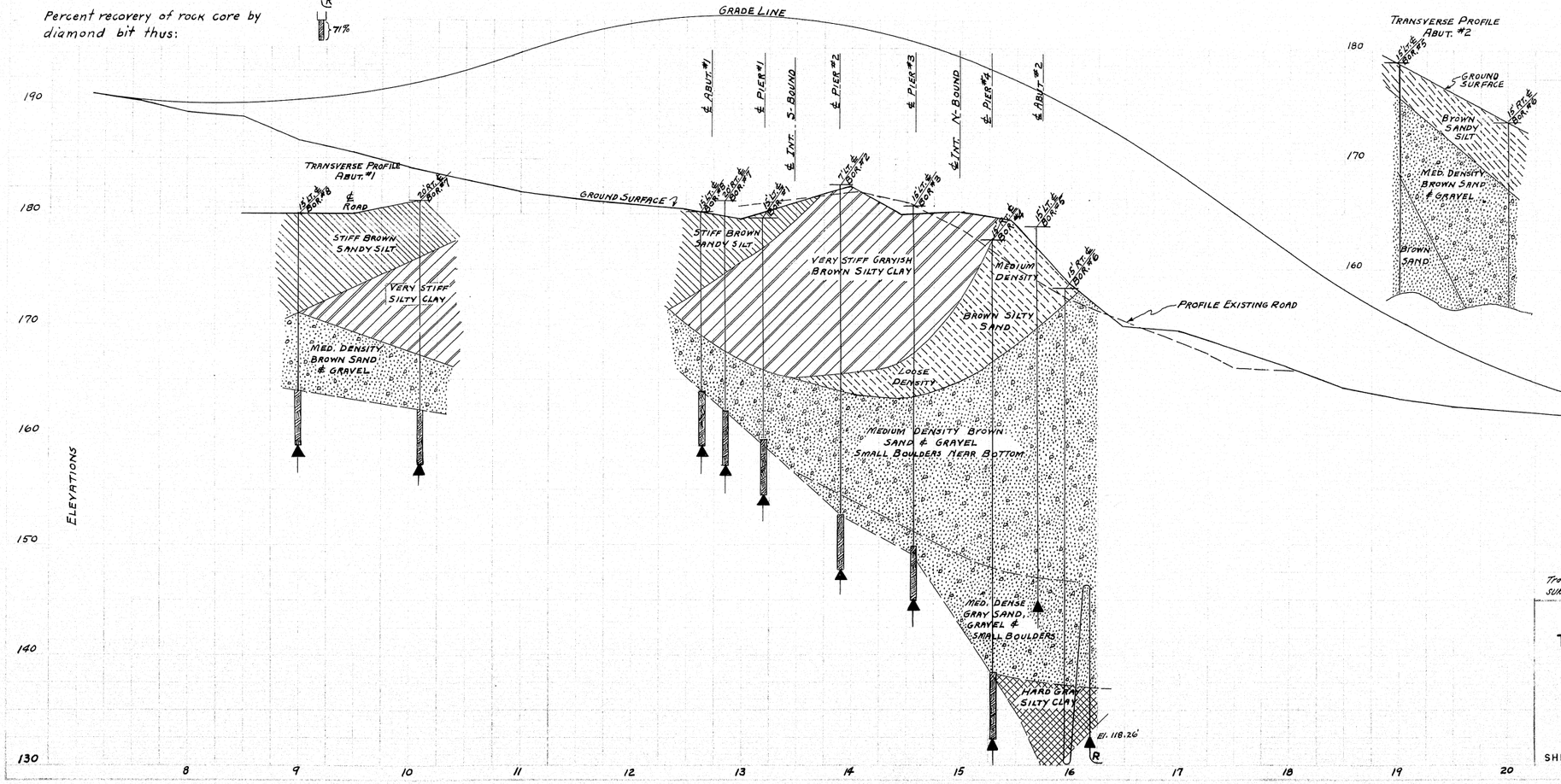
Casing size as noted on drawings

Boring locations ⊙

Bottom of boring indicated thus: ▼

Refusal of drill rods or Casings indicated thus: ▼ R

Percent recovery of rock core by diamond bit thus: 71%



Traced from plans included in report of subsurface investigation.

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

TOWN FARM ROAD BRIDGE
OVER
INTERSTATE HIGHWAY
IN THE TOWN OF
SIDNEY
KENNEBEC COUNTY

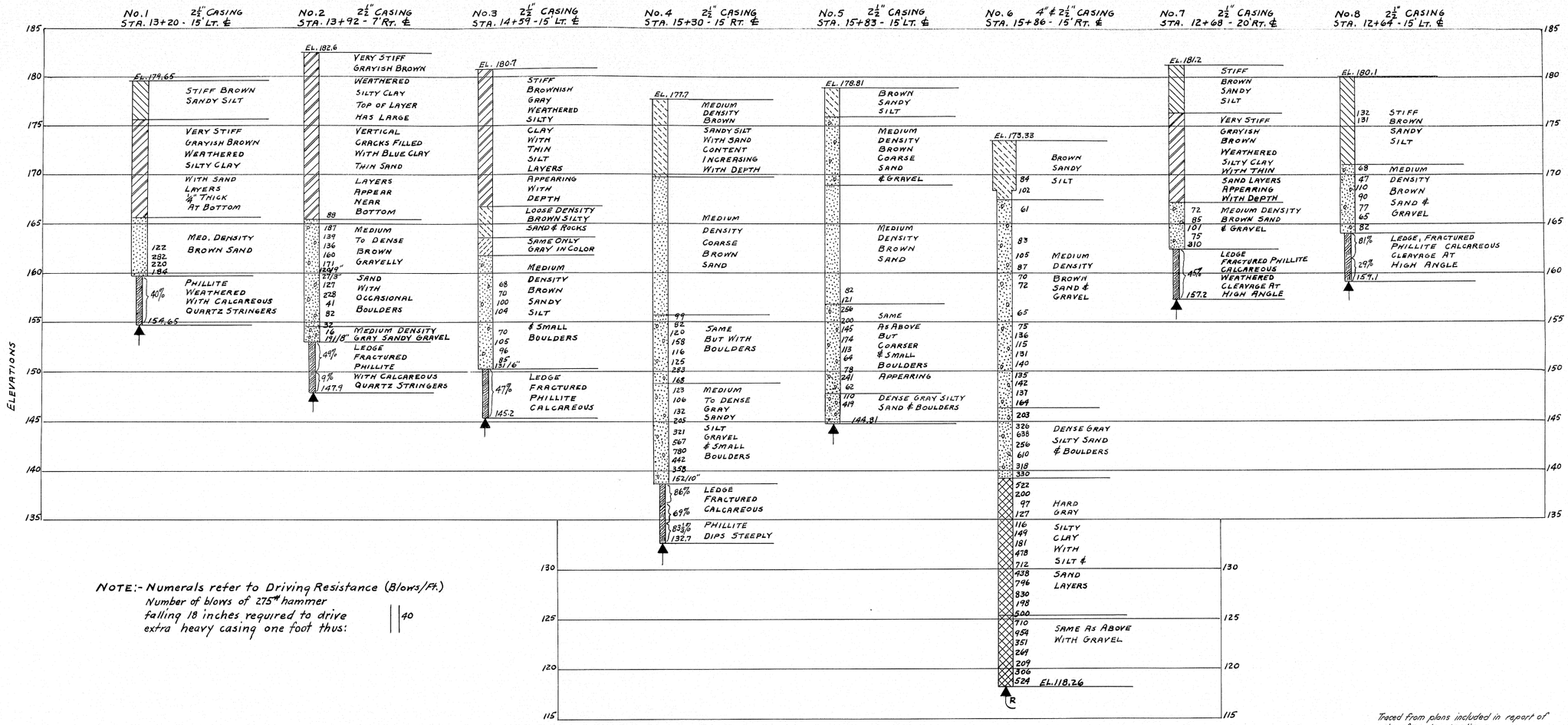
FOUNDATION SURVEY

SHEET 4 OF 18 AUGUSTA, MAINE MAY 1958

74-157

0 1 2 3 4 5 INCHES

B. P. R. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	I-95-6(15)117	5	18



NOTE:- Numerals refer to Driving Resistance (Blows/Ft.)
Number of blows of 275# hammer falling 18 inches required to drive extra heavy casing one foot thus: ||40

BORING LOGS
Scale 1" = 5'

Traced from plans included in report of subsurface investigation

DESIGN –	BRIDGE NO.
TRACE – WELCH	SURVEY –
CHECK –	PLOT –

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

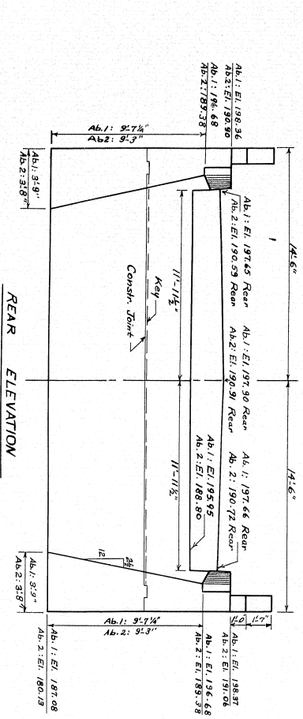
TOWN FARM ROAD BRIDGE
OVER
INTERSTATE HIGHWAY
IN THE TOWN OF
SIDNEY
KENNEBEC COUNTY

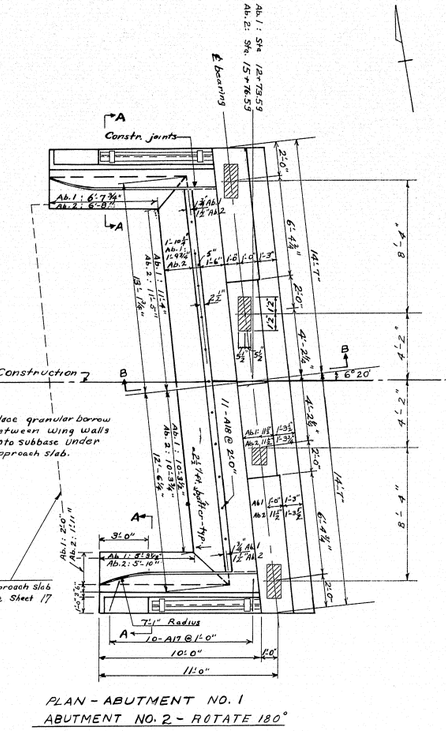
FOUNDATION SURVEY

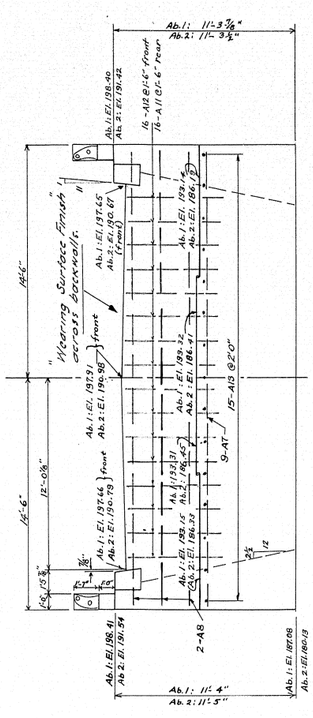
SHEET 5 OF 18 AUGUSTA, MAINE MAY 1958

74-158

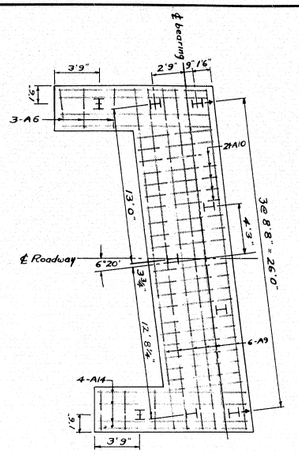
0 1 2 3 4 5 INCHES





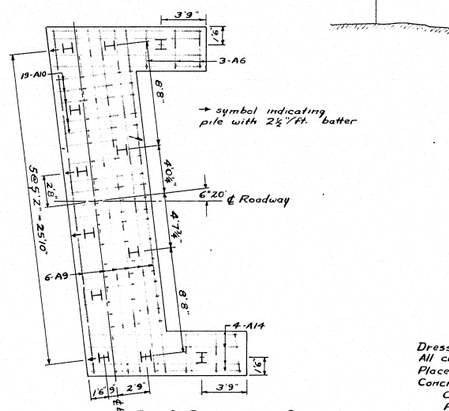


PLAN - ABUTMENT NO. 1
ABUTMENT NO. 2 - ROTATE 180°



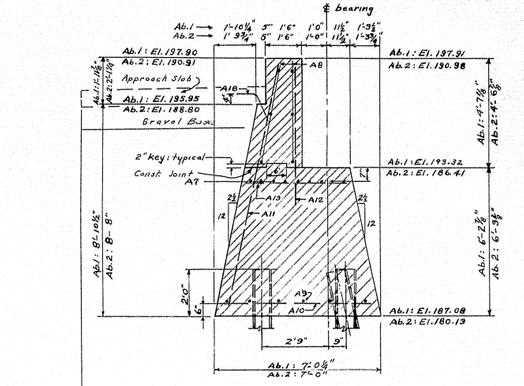
PILE & REINFORCING STEEL
PLAN - ABUTMENT No. 1

Required: 9-10"×10"×42" steel H-piles. (Driven to ledge)
Est. length 30'0". Max. pile load 37 tons.
Pile cutoff elevation 189.08.



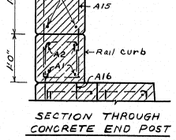
PILE & REINFORCING STEEL
PLAN - ABUTMENT No. 2

Required: 12-10"×10"×42" steel H-piles.
Est. length 40'0". Max. pile load 30 tons.
Pile cutoff elevation 182.13.

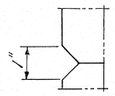


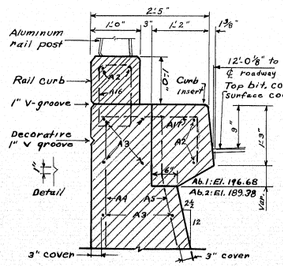
SECTION B-B

Grade areas under abutments to elevations shown before driving piles.

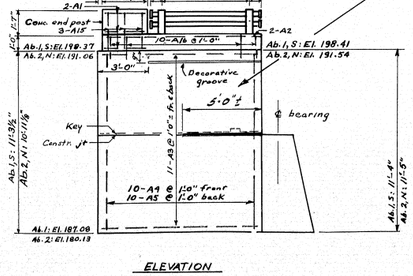


SECTION THROUGH CONCRETE END POST

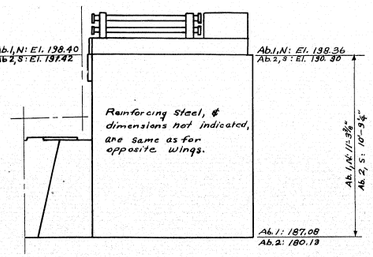




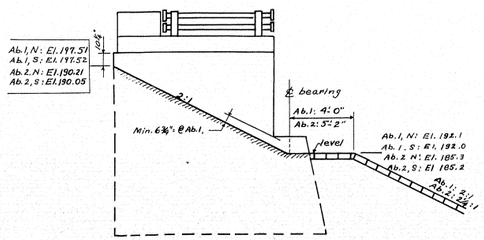
SECTION A-A



ELEVATION
South Wing Abutment No. 1
North Wing Abutment No. 2



ELEVATION
North Wing Abutment No. 1
South Wing Abutment No. 2

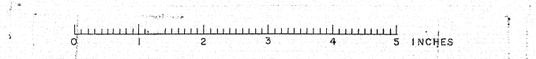


SLOPES AT ABUTMENTS

Abutment No.1, South Wing, & Abutment No.2, North Wing: As shown. Other Wings: Opp. Hand.

GENERAL NOTES

Dress shaded areas to exact bridge seat elevations shown.
All chamfers to be ½" and V-grooves 1".
Place reinforcing steel in bridge seats to clear anchor bolts
Concrete and posts, rail curbs and curb inserts to be Class A concrete, and to be paid for under Item 701-33, PCC abutments and retaining walls.
Backwall to be built after structural steel is erected.
See sheet 18 for setting expansion dams in backwalls.



REG.	PROJECT NO.	SHEET NO.	TOTAL SHEETS
	I-95-6(15)117	11	18

DESIGN - DRESELLY
TRACE - WM. to R.D.
CHECK - N. Jose, F. Smith

BRIDGE NO.
SURVEY —
PLOT —

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

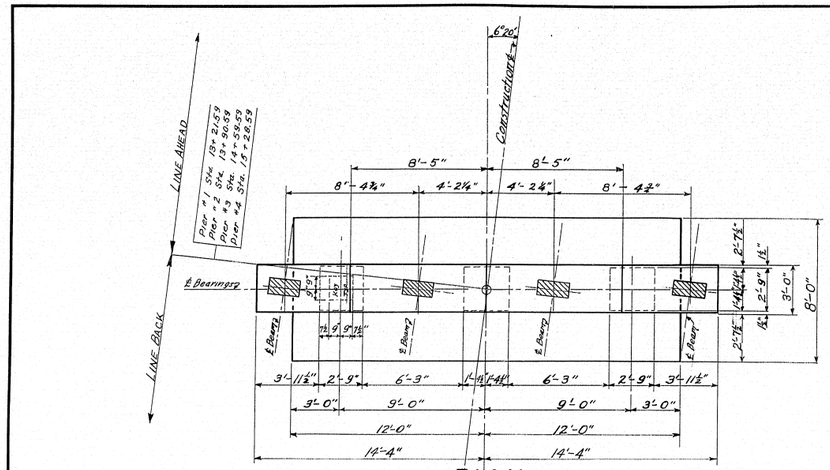
TOWN FARM ROAD BRIDGE
OVER
INTERSTATE HIGHWAY
IN THE TOWN OF
SIDNEY
KENNEBEC COUNTY

ABUTMENTS

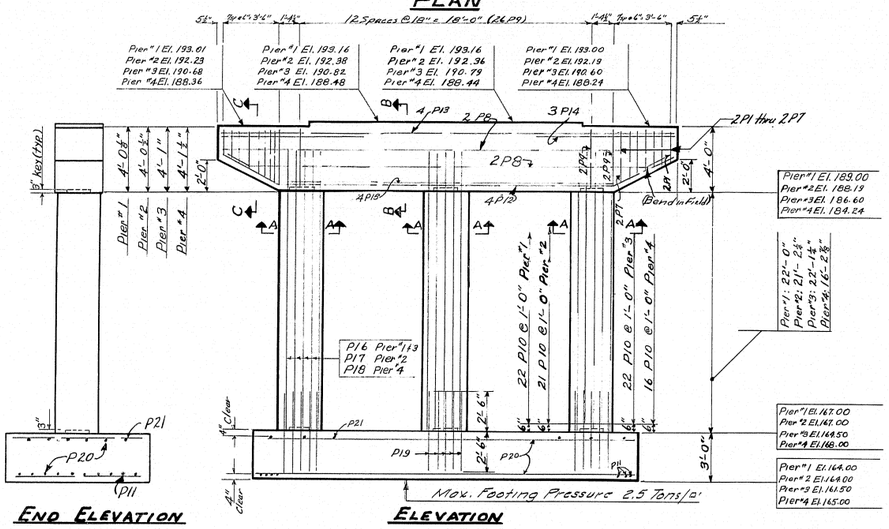
SHEET 11 OF 18 AUGUSTA, MAINE MARCH, 1958

74-164

B. P. R. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	I-95-6(15)117	12	18

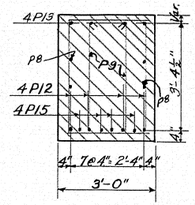


PLAN

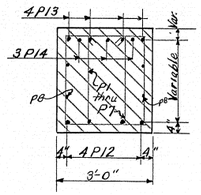


END ELEVATION

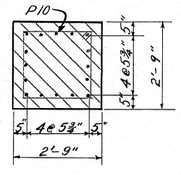
ELEVATION



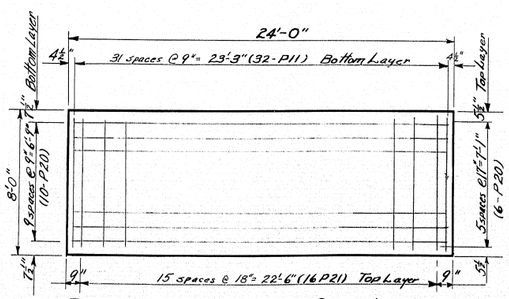
SECTION B-B



SECTION C-C



SECTION A-A



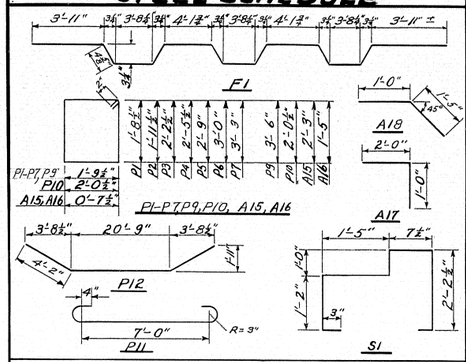
FOOTING PLAN - REINFORCING STEEL LAYOUT

NOTE:

Dress bearing areas 1" larger all around than bearing plates to exact elevation.

Place reinforcing steel in bridge seat to clear anchor bolts.

STEEL SCHEDULE



BENT BARS

MARK	SIZE	NO	LENGTH	LOCATION
F1	#5	365	29'-6"	Slab
S1	#4	420	6'-11"	Slab, Curb & Rail curb
A15	#4	12	6'-1"	End Posts (Abutments)
A16	#4	40	4'-5"	Rail Curbs "
A17	#4	40	3'-0"	Curbs "
A18	#6	22	2'-5"	Abutments
P1	#4	16	7'-4"	Pier Cap
P2			7'-10"	" "
P3			8'-4"	" "
P4			8'-10"	" "
P5			9'-5"	" "
P6			9'-11"	" "
P7			10'-5"	" "
P9	#4	120	10'-11"	" "
P10	#4	243	8'-6"	" Columns
P11	#7	128	9'-3	" Footings
P12	#6	16	24'-1"	" Caps

STRAIGHT BARS

MARK	SIZE	NO.	LENGTH	LOCATION
F2	#5	728	28'-10"	Slab
F3	#4	106	24'-2"	"
F4		106	46'-8"	"
F5		159	22'-8"	"
F6		106	45'-8"	"
F7		64	19'-0"	"
F8		64	22'-0"	"
C1	#4	20	24'-2"	Curb & Rail Curb (Slab)
C2	#4	20	23'-8"	" "
C3	#4	90	22'-8"	" "
AS1	#6	176	14'-8"	Approach Slab
AS2	#4	40	21'-10"	" "
A1	#4	24	2'-5"	Abutment-End Post
A2	#4	16	9'-5"	" Rail Curb & Curb
A3	#5	88	9'-6"	" Wings Horz.
A4	#5	40	10'-2	" " Vert.
A5	#5	40	10'-5	" " "
A6	#6	12	3'-2"	" " @ piles
A7	#6	18	28'-8"	" " bridge seat
A8	#4	12	28'-8"	" " backwall
A9	#6	12	28'-8"	" " @ piles
A10	#6	40	6'-5"	" " "
A11	#6	32	10'-0"	" " backwall
A12	#5	32	5'-9"	" " "
A13	#5	30	4'-3"	" bridge seat
A14	#6	16	12'-3"	" @ piles
P8	#6	16	28'-3"	PIER CAP
P13	#9	16	28'-3"	" "
P14	#9	24	8'-0"	" "
P15	#6	16	20'-9"	" "
P16	#8	96	24'-7"	" #1 & 3 Columns
P17	#8	48	23'-8"	" #2 "
P18	#8	48	18'-9"	" #4 "
P19	#8	192	5'-0"	" FOOTINGS
P20	#7	64	23'-6"	" "
P21	#4	64	7'-6"	" "

DESIGN - DRESSELLY DET. F.SMITH
TRACE - M.W.M.
CHECK - MCR, F.S.Smith
BRIDGE NO.
SURVEY -
PLOT -

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

TOWN FARM ROADBRIDGE
OVER
INTERSTATE HIGHWAY
IN THE TOWN OF
SIDNEY
KENNEBEC COUNTY

PIERS & REINF. STEEL

SHEET 12 OF 18 AUGUSTA, MAINE APRIL 1958

74-165

0 1 2 3 4 5 INCHES

APPENDIX C – TEST BORING LOGS

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS (more than half of material is larger than No. 200 sieve size)	GRAVELS (more than half of coarse fraction is larger than No. 4 sieve size)	CLEAN GRAVELS (little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel sand mixtures, little or no fines.
		GRAVEL WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (more than half of coarse fraction is smaller than No. 4 sieve size)	CLEAN SANDS (little or no fines)	SW	Well-graded sands, Gravelly sands, little or no fines
			SP	Poorly-graded sands, Gravelly sand, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures.
FINE-GRAINED SOILS (more than half of material is smaller than No. 200 sieve size)	SILTS AND CLAYS (liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, Silty or Clayey fine sands, or Clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, Gravelly clays, Sandy clays, Silty clays, lean clays.
			OL	Organic silts and organic Silty clays of low plasticity.
	SILTS AND CLAYS (liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine Sandy or Silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
	HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils.

Desired Soil Observations (in this order, if applicable):

Color (Munsell color chart)
Moisture (dry, damp, moist, wet)
Density/Consistency (from above right hand side)
Texture (fine, medium, coarse, etc.)
Name (Sand, Silty Sand, Clay, etc., including portions - trace, little, etc.)
Gradation (well-graded, poorly-graded, uniform, etc.)
Plasticity (non-plastic, slightly plastic, moderately plastic, highly plastic)
Structure (layering, fractures, cracks, etc.)
Bonding (well, moderately, loosely, etc.,)
Cementation (weak, moderate, or strong)
Geologic Origin (till, marine clay, alluvium, etc.)
Groundwater level

Maine Department of Transportation
Geotechnical Section
Key to Soil and Rock Descriptions and Terms
Field Identification Information

MODIFIED BURMISTER SYSTEM

Descriptive Term	Portion of Total (%)
trace	0 - 10
little	11 - 20
some	21 - 35
adjective (e.g. Sandy, Clayey)	36 - 50

TERMS DESCRIBING DENSITY/CONSISTENCY

Coarse-grained soils (more than half of material is larger than No. 200 sieve): Includes (1) clean gravels; (2) Silty or Clayey gravels; and (3) Silty, Clayey or Gravelly sands. Density is rated according to standard penetration resistance (N-value).

Density of Cohesionless Soils	Standard Penetration Resistance N_{60}-Value (blows per foot)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

Fine-grained soils (more than half of material is smaller than No. 200 sieve): Includes (1) inorganic and organic silts and clays; (2) Gravelly, Sandy or Silty clays; and (3) Clayey silts. Consistency is rated according to undrained shear strength as indicated.

Consistency of Cohesive soils	SPT N_{60}-Value (blows per foot)	Approximate Undrained Shear Strength (psf)	Field Guidelines
Very Soft	WOH, WOR, WOP, <2	0 - 250	Fist easily penetrates
Soft	2 - 4	250 - 500	Thumb easily penetrates
Medium Stiff	5 - 8	500 - 1000	Thumb penetrates with moderate effort
Stiff	9 - 15	1000 - 2000	Indented by thumb with great effort
Very Stiff	16 - 30	2000 - 4000	Indented by thumbnail
Hard	>30	over 4000	Indented by thumbnail with difficulty

Rock Quality Designation (RQD):

$$RQD\ (\%) = \frac{\text{sum of the lengths of intact pieces of core* > 4 inches}}{\text{length of core advance}}$$

*Minimum NQ rock core (1.88 in. OD of core)

Rock Quality Based on RQD

Rock Quality	RQD (%)
Very Poor	≤25
Poor	26 - 50
Fair	51 - 75
Good	76 - 90
Excellent	91 - 100

Desired Rock Observations (in this order, if applicable):

Color (Munsell color chart)
Texture (aphanitic, fine-grained, etc.)
Rock Type (granite, schist, sandstone, etc.)
Hardness (very hard, hard, mod. hard, etc.)
Weathering (fresh, very slight, slight, moderate, mod. severe, severe, etc.)
Geologic discontinuities/jointing:
-dip (horiz - 0-5 deg., low angle - 5-35 deg., mod. dipping - 35-55 deg., steep - 55-85 deg., vertical - 85-90 deg.)
-spacing (very close - <2 inch, close - 2-12 inch, mod. close - 1-3 feet, wide - 3-10 feet, very wide >10 feet)
-tightness (tight, open, or healed)
-infilling (grain size, color, etc.)
Formation (Waterville, Ellsworth, Cape Elizabeth, etc.)
RQD and correlation to rock quality (very poor, poor, etc.)
ref: ASTM D6032 and FHWA NHI-16-072 GEC 5 - Geotechnical Site Characterization, Table 4-12
Recovery (inch/inch and percentage)
Rock Core Rate (X.X ft - Y.Y ft (min:sec))

Sample Container Labeling Requirements:

WIN
Bridge Name / Town
Boring Number
Sample Number
Sample Depth
Blow Counts
Sample Recovery
Date
Personnel Initials

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785
Location: Sidney, Maine

Boring No.: BB-STFR-101
WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	197.0	**Auger ID/OD:**	4.0/4.5"
Operator:	K. Hanscom	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	J. Cozens	**Rig Type:**	D-53 Mobile	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-19-24/7-19-24	**Drilling Method:**	Drive & Wash and SSA	**Core Barrel:**	NQ
Boring Location:	N606731.9, E1158979.8	**Casing ID/OD:**	4.0/4.5"	**Water Level*:**	19'
Hammer Efficiency Factor:	1.066	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = 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: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	196.5		Top 6": Hot Mix Asphalt (HMA) 0.5	
	1D	24/6	1.5 - 3.5	13-12-20-10	32	57				Brown/grey, moist, very dense, Gravely fine to coarse SAND, some silt, (Fill).	G#24-S-3634 A-1-b, SM WC = 4.3%
5	2D	24/15	5.0 - 7.0	2-2-4-4	6	11				Brown, moist, medium dense, fine to medium SAND, some silt, trace gravel, (Fill).	G#24-S-3635 A-2-4(0), SM WC = 8.3%
10	3D	24/15	10.0 - 12.0	5-4-3-3	7	12	36			(Top 12"): Brown, moist, medium dense, Silty SAND, some gravel, trace clay, (Fill). (Bottom 3"): Brown, moist, stiff, Clayey SILT, little sand, (Fill).	
							20				
							106				
							76				
							72				
15	4D	24/9	15.0 - 17.0	10-21-10-14	31	55	39			Brown, moist, very dense, fine to coarse SAND, some gravel, little silt, (Fill).	G#24-S-3636 A-1-b, SM WC = 9.6%
							86				
							121				
							80	178.5		18.5	
							50				
20	5D	24/20	20.0 - 22.0	2-1-2-6	3	5	51			Brown, moist, stiff, SILT, little fine sand, (Marine Clay) PP = 2.0 tsf	
							89				
							59				
							139				
25							121				

Remarks:

1. Fine Grained Soil Descriptions on this log are based on plasticity estimated using visual manual classification techniques of laboratory Atterberg Limit Tests if available, rather than the MaineDot Standard based percentages passing specific grain sizes.
2. Automatic hammer Seaboard Drilling #D50 Energy Transfer Ratio = 1.066.
3. Water level measured immediately after removal of casing.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785
Location: Sidney, Maine

Boring No.: BB-STFR-101
WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	197.0	**Auger ID/OD:**	4.0/4.5"
Operator:	K. Hanscom	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	J. Cozens	**Rig Type:**	D-53 Mobile	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-19-24/7-19-24	**Drilling Method:**	Drive & Wash and SSA	**Core Barrel:**	NQ
Boring Location:	N606731.9, E1158979.8	**Casing ID/OD:**	4.0/4.5"	**Water Level*:**	19'
Hammer Efficiency Factor: 1.066		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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 140 lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = 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 No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25	6D	24/24	25.0 - 27.0	3-2-3-5	5	9	66			Brown, wet, medium stiff, Clayey SILT, little sand, with sand seams, (Marine Clay). PP = 0.25, 0.75, 1.0 tsf	G#24-S-3637 LL = 29 PL = 19 PI = 10 WC = 25.8%
							67				
							102	170.0		27.0	
							116				
							131				
30	7D	24/12	30.0 - 32.0	14-16-16-8	32	57	120			Brown, wet, very dense, Gravelly SAND, some silt, (Glacial Till).	
							127				
							142				
							122				
							73	162.6		34.4	
35	R1	27/26	35.0 - 37.3	RQD = 51%			NQ			Casing refusal at 34.4', probable top of bedrock at 34.4'. Advanced to 35.0' and set up to core. R1: Hard, fresh, fine to medium grained, grey, PELITE, with occasional quartzite laminae. 35.0-36.0': Joints are close, horizontal, stepped, rough, fresh, open to tight. 36.0-37.2': Joints are extremely close to very close, high angle, planar tostepped, smooth to rough, fresh to discolored, tight to open, with siltinfilling. Recovery = 96% Rock Quality = Fair Rock Core Times (min:sec): 35.0-36.0' (4:17), 36.0-37.0'(3:26), 37.0-37.2' (1:17)	
	R2	20/20	37.3 - 39.0	RQD = 0%						R2: Hard, fresh, fine to medium grained, grey, PELITE, with occasional quartzite laminae. Joints are very close, high angle, planar, smooth, discolored, tight, with silt infilling. Recovery = 95% Rock Quality = Very Poor Rock Core Times (min:sec): 37.3-38.3' (1:31), 38.3-39.0'(2:42)	
	R3	24/19	39.0 - 41.0	RQD = 50%						R3: Hard, fresh, fine to medium grained, grey, PELITE, with occasional quartzite laminae. Joints are close, high angle, planar, smooth, discolored, open, with silt infilling. Recovery = 79% Rock Quality = Poor Rock Core Times (min:sec): 39.0-40.0' (2:26), 40.0-41.0' (2:41)	
40	R4	12/10	41.0 - 42.0	RQD = 42%						R4: Hard, fresh, fine to medium grained, grey, PELITE, with occasional quartzite laminae. Joints are extremely close, vertical, planar, smooth, discolored, tight to open. Recovery = 83% Rock Quality = Poor Rock Core Times (min:sec): 41.0-42.0' (3:09)	
	R5	36/36	42.0 - 45.0	RQD = 100%						R5: Hard, fresh, fine to medium grained, grey, PELITE,with occasional quartzite laminae. Joints are widely spaced to close, moderately dipping, planar, smooth, discolored, open. Recovery = 100%	q_p=1718 ksf
45								152.0			
50											

Remarks:

1. Fine Grained Soil Descriptions on this log are based on plasticity estimated using visual manual classification techniques of laboratory Atterberg Limit Tests if available, rather than the MaineDot Standard based percentages passing specific grain sizes.
2. Automatic hammer Seaboard Drilling #D50 Energy Transfer Ratio = 1.066.
3. Water level measured immediately after removal of casing.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785

Location: Sidney, Maine

Boring No.: BB-STFR-101

WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	197.0	**Auger ID/OD:**	4.0/4.5"
Operator:	K. Hanscom	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	J. Cozens	**Rig Type:**	D-53 Mobile	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-19-24/7-19-24	**Drilling Method:**	Drive & Wash and SSA	**Core Barrel:**	NQ
Boring Location:	N606731.9, E1158979.8	**Casing ID/OD:**	4.0/4.5"	**Water Level*:**	19'
Hammer Efficiency Factor:	1.066	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
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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_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = 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: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
50										Rock Quality = Excellent Rock Core Times (min:sec): 42.0-43.0' (3:04), 43.0-44.0' (3:44), 44.0-45.0' (3:11)	
										45.0 **Bottom of Exploration at 45.0 feet below ground surface.**	
55											
60											
65											
70											
75											

Remarks:

1. Fine Grained Soil Descriptions on this log are based on plasticity estimated using visual manual classification techniques of laboratory Atterberg Limit Tests if available, rather than the MaineDot Standard based percentages passing specific grain sizes.
2. Automatic hammer Seaboard Drilling #D50 Energy Transfer Ratio = 1.066.
3. Water level measured immediately after removal of casing.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785
Location: Sidney, Maine

Boring No.: BB-STFR-102
WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	173.9	**Auger ID/OD:**	4.0/4.5"
Operator:	K. Hanscom	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	L. Hailey	**Rig Type:**	ATV	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-16-24/7-16-24	**Drilling Method:**	Drive & Wash	**Core Barrel:**	NQ
Boring Location:	N606709.1, E1159104.9	**Casing ID/OD:**	4.0/4.5", 3.0/3.5"	**Water Level*:**	6.1'
Hammer Efficiency Factor: 1.066		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_V = 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 No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/10	0.0 - 2.0	2-4-15-16	19	34	21			Brown, wet, dense, fine to medium SAND, little gravel, trace silt, (Fill).	G#24-S-3638 A-1-b, SW-SM WC = 16.1%
							34				
							37				
							20				
							27				
5							29	168.9		5.0	
							34				
							33				
	2D	24/24	8.0 - 10.0	2-3-4-5	7	12	24			Brown, wet, stiff, Clayey SILT, trace sand, (Marine Clay).	G#24-S-3639 CL LL = 24 PL = 16 PI = 8 WC = 22.1%
							42				
10							81				
							135	162.4		11.5	
							128				
	3D	24/14	13.0 - 15.0	40-42-35-3	77	137	RC			Brown, wet, very dense, Gravelly SAND, little silt, (Glacial Till).	G#24-S-3640 A-1-a, SM WC = 6.0%
15											
	4D	12/10	18.0 - 19.0	13-110	110	195				Brown, wet, very dense, Silty fine SAND, (Glacial Till).	
								154.3		19.6	
20	R1	60/59	20.0 - 25.0	RQD = 45%			NQ			Increased roller cone resistance at 19.6', probable top of rock at 19.6'. Advanced roller cone to 20.0' and set up to core. R1: Medium hard, slightly weathered, medium grained, grey, PELITE, with occasional quartzite laminae and intrusions. Joints are very close to closely spaced, moderately dipping to high angle, undulating, rough, discolored, partially open. Recovery = 98% Rock Quality = Poor Rock Core Times (min:sec): 20.0-21.0' (1:48), 21.0-22.0' (2:29), 22.0-23.0' (3:48), 23.0-24.0' (3:35), 24.0-25.0' (3:01)	q_p=729 ksf
25											

Remarks:

1. Fine Grained Soil Descriptions on this log are based on plasticity estimated using visual manual classification techniques of laboratory Atterberg Limit Tests if available, rather than the MaineDot Standard based percentages passing specific grain sizes.
2. Automatic hammer Seaboard Drilling #D50 Energy Transfer Ratio =1.066.
3. Water level measured immediately after removal of casing.
4. Measured 22.5 feet froom bridge deck to ground surface.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785

Location: Sidney, Maine

Boring No.: BB-STFR-102

WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	173.9	**Auger ID/OD:**	4.0/4.5"
Operator:	K. Hanscom	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	L. Hailey	**Rig Type:**	ATV	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-16-24/7-16-24	**Drilling Method:**	Drive & Wash	**Core Barrel:**	NQ
Boring Location:	N606709.1, E1159104.9	**Casing ID/OD:**	4.0/4.5", 3.0/3.5"	**Water Level*:**	6.1'
Hammer Efficiency Factor:	1.066	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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
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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_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = 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: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25	R2	60/60	25.0 - 30.0	RQD = 67%						R2: Medium hard, slightly weathered, medium grained, grey, PELITE, with occasional quartzite laminae and intrusions. Joints are very close to closely spaced, moderately dipping to high angle, undulating, rough, discolored, partially open. Recovery = 100% Rock Quality = Fair Rock Core Times (min:sec): 25.0-26.0' (2:56), 26.0-27.0' (3:12), 27.0-28.0' (2:41), 28.0-29.0' (4:50), 29.0-30.0' (3:46)	
30								143.9		30.0 **Bottom of Exploration at 30.0 feet below ground surface.**	
35											
40											
45											
50											

Remarks:

1. Fine Grained Soil Descriptions on this log are based on plasticity estimated using visual manual classification techniques of laboratory Atterberg Limit Tests if available, rather than the MaineDot Standard based percentages passing specific grain sizes.
2. Automatic hammer Seaboard Drilling #D50 Energy Transfer Ratio =1.066.
3. Water level measured immediately after removal of casing.
4. Measured 22.5 feet froom bridge deck to ground surface.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785
Location: Sidney, Maine

Boring No.: BB-STFR-103
WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	170.5	**Auger ID/OD:**	4.0/4.5"
Operator:	K. Hanscom	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	L. Hailey	**Rig Type:**	ATV	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-17-24/7-18-24	**Drilling Method:**	Drive and Wash	**Core Barrel:**	NQ
Boring Location:	N606693.0, E1159185.6	**Casing ID/OD:**	4.0/4.5", 3.0/3.5"	**Water Level*:**	9.6'
Hammer Efficiency Factor: 1.066		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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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_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = 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 No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/6	0.0 - 2.0	13-8-8-6	16	28	105			Brown, dry, medium dense, GRAVEL, some fine to coarse sand, trace silt, (Fill).	G#24-S-3641 A-1-a, GP-GM WC = 14.3%
							47				
							24				
							22	167.0		3.5	
							20				
5	2D	24/12	5.0 - 7.0	1-WOH-WOH-WOH	--		6			Brown-grey, wet, very soft to soft, Clayey SILT, (Marine Clay).	G#24-S-3642 CL LL = 22 PL = 16 PI = 6 WC = 21.2%
							7				
							19				
							25	162.0		8.5	
							49				
10	3D	24/15	10.0 - 12.0	4-7-7-6	14	25	42			Brown, wet, medium dense, Silty fine SAND, some Gravel, (Glacial Till).	G#24-S-3643 A-4(0), SM WC = 21.0%
							64				
							65				
							77				
							59				
15	4D	24/18	15.0 - 17.0	7-23-23-43	46	82	R/C			Brown, wet, very dense, Silty fine to medium SAND, some gravel, (Glacial Till).	
20	5D	2/0	20.0 - 20.2	50/2"				150.3		No recovery. 20.2	
										Spoon refusal at 20.2', probable top of rock at 20.2'. Advanced roller cone to 24.0' and set up to core at 24.0'.	
25	R1	60/60	24.0 - 29.0	RQD = 17%			NQ			R1: Medium hard, slightly weathered, medium grained, grey, PELITE, with occasional quartzite laminae. Joints are very close to closely	

Remarks:

1. Fine Grained Soil Descriptions on this log are based on plasticity estimated using visual manual classification techniques of laboratory Atterberg Limit Tests if available, rather than the MaineDot Standard based percentages passing specific grain sizes.
2. Automatic hammer Seaboard Drilling #D50 Energy Transfer Ratio = 1.066.
3. Water level measured within the casing after waiting overnight.
4. Measured 24' from bridge deck to ground surface.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785

Location: Sidney, Maine

Boring No.: BB-STFR-103

WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	170.5	**Auger ID/OD:**	4.0/4.5"
Operator:	K. Hanscom	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	L. Hailey	**Rig Type:**	ATV	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-17-24/7-18-24	**Drilling Method:**	Drive and Wash	**Core Barrel:**	NQ
Boring Location:	N606693.0, E1159185.6	**Casing ID/OD:**	4.0/4.5", 3.0/3.5"	**Water Level*:**	9.6'
Hammer Efficiency Factor:	1.066	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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MU = Unsuccessful Thin Wall Tube Sample Attempt
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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 140 lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = 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: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25										spaced, moderately dipping to high angle, undulating, rough, partially open. Recovery = 100% Rock Quality = Very Poor Rock Core Times (min:sec): 24.0-25.0' (2:38), 25.0-26.0' (2:20), 26.0-27.0' (2:03), 27.0-28.0' (2:47), 28.0-29.0' (2:09)	
	R2	60/48	29.0 - 34.0	RQD = 48%						R2: Medium hard, slightly weathered, medium grained, grey, PELITE, with occasional quartzite laminae. Joints are very close to closely spaced, moderately dipping to high angle, undulating, rough, discolored, partially open. Recovery = 80% Rock Quality = Poor Rock Core Times (min:sec): 29.0-30.0' (2:01), 30.0-31.0' (3:34), 31.0-32.0' (1:07), 32.0-33.0' (2:49), 33.0-34.0' (2:34)	
30								136.5		34.0 **Bottom of Exploration at 34.0 feet below ground surface.**	
35											
40											
45											
50											

Remarks:

1. Fine Grained Soil Descriptions on this log are based on plasticity estimated using visual manual classification techniques of laboratory Atterberg Limit Tests if available, rather than the MaineDot Standard based percentages passing specific grain sizes.
2. Automatic hammer Seaboard Drilling #D50 Energy Transfer Ratio = 1.066.
3. Water level measured within the casing after waiting overnight.
4. Measured 24' from bridge deck to ground surface.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785
Location: Sidney, Maine

Boring No.: BB-STFR-104
WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	189.5	**Auger ID/OD:**	4.0/4.5"
Operator:	E. Baron	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	L. Hailey	**Rig Type:**	ATV	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-16-24/7-16-24	**Drilling Method:**	Drive and Wash	**Core Barrel:**	NQ
Boring Location:	N606669.1, E1159310.9	**Casing ID/OD:**	4.0/4.5", 3.0/3.5"	**Water Level*:**	28.8'
Hammer Efficiency Factor: 1.066		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = 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 No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA				
	1D	4/1	1.0 - 1.3	20/4"	--					Brown, dry, Gravelly SAND, some silt, (Fill). Spoon refusal at 1.3' due to concrete approach slab.	G#24-S-3644 A-1-b, SM WC = 2.1%
	2D	24/19	2.1 - 4.1	4-4-3-2	7	12				Brown, dry, medium dense, fine to medium SAND, some silt, trace gravel, (Fill).	G#24-S-3645 A-2-4(0), SM WC = 8.1%
5	3D	24/9	5.0 - 7.0	3-5-4-4	9	16				Brown, dry, medium dense, fine to medium SAND, some gravel, (Fill).	
10	4D	24/18	10.0 - 12.0	3-5-5-5	10	18				Brown, dry, medium dense, fine to medium SAND, some silt, trace gravel, (Fill).	G#24-S-3646 A-2-4(0), SM WC = 8.0%
15	5D	24/22	15.0 - 17.0	7-7-6-5	13	23				Brown, moist, medium dense, fine to medium SAND, some gravel, some silt, (Fill).	
20	6D	24/19	20.0 - 22.0	4-5-5-5	10	18				Brown, moist, medium dense, fine to medium SAND, little silt, (Fill).	G#24-S-3647 A-2-4(0), SW-SM WC = 5.0%
								166.0		23.5	
25											

Remarks:

1. Fine Grained Soil Descriptions on this log are based on plasticity estimated using visual manual classification techniques of laboratory Atterberg Limit Tests if available, rather than the MaineDot Standard based percentages passing specific grain sizes.
2. Automatic hammer Seaboard Drilling #D50 Energy Transfer Ratio = 1.066.
3. Water level measured immediately after removal of casing.

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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785

Location: Sidney, Maine

Boring No.: BB-STFR-104

WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	189.5	**Auger ID/OD:**	4.0/4.5"
Operator:	E. Baron	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	L. Hailey	**Rig Type:**	ATV	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-16-24/7-16-24	**Drilling Method:**	Drive and Wash	**Core Barrel:**	NQ
Boring Location:	N606669.1, E1159310.9	**Casing ID/OD:**	4.0/4.5", 3.0/3.5"	**Water Level*:**	28.8'
Hammer Efficiency Factor:	1.066	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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 140 lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = 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 No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
				Sample Information							
25	7D	24/23	25.0 - 27.0	6-6-6-7	12	21				Brown, moist, medium dense, Silty fine to medium SAND, (Marine Sand).	
30	8D	24/19	30.0 - 32.0	5-4-6-8	10	18	54			Brown, wet, medium dense, Silty fine to medium SAND, (Marine Sand).	
							76				
							124				
							150				
							98				
35	9D	24/9	35.0 - 37.0	18-18-20-22	38	68	33			Brown-grey, wet, very dense, Silty fine to medium SAND, some gravel, (Marine Sand). Wash ahead attempted, hole collapsed at 38.5'.	
							36				
							42				
							116	151.0		38.5	
							157				
40	10D	24/12	40.0 - 42.0	13-12-12-15	24	43	R/C			Grey, wet, dense, Silty GRAVEL, little sand, (Glacial Till).	G#24-S-3648 A-4(0), GM WC = 14.1%
45	11D	24/8	45.0 - 47.0	9-12-11-10	23	41				(Top 4"): Brown, wet, dense, Silty fine SAND, some gravel, (Glacial Till). (Bottom 4"): Grey, wet, hard, Silty CLAY, (Glacial Till).	
50											

Remarks:

1. Fine Grained Soil Descriptions on this log are based on plasticity estimated using visual manual classification techniques of laboratory Atterberg Limit Tests if available, rather than the MaineDot Standard based percentages passing specific grain sizes.
2. Automatic hammer Seaboard Drilling #D50 Energy Transfer Ratio = 1.066.
3. Water level measured immediately after removal of casing.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.
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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785

Location: Sidney, Maine

Boring No.: BB-STFR-104

WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	189.5	**Auger ID/OD:**	4.0/4.5"
Operator:	E. Baron	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	L. Hailey	**Rig Type:**	ATV	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-16-24/7-16-24	**Drilling Method:**	Drive and Wash	**Core Barrel:**	NQ
Boring Location:	N606669.1, E1159310.9	**Casing ID/OD:**	4.0/4.5", 3.0/3.5"	**Water Level*:**	28.8'
Hammer Efficiency Factor:	1.066	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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MD = Unsuccessful Split Spoon Sample Attempt
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V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
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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_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = 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 No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
50	12D	24/13	50.0 - 52.0	11-13-15-18	28	50				Grey, wet, hard, Clayey SILT, some gravel, trace sand, (Glacial Till).	G#24-S-3649 CL LL = 20 PL = 13 PI = 7 WC = 19.3%
55	13D	24/24	55.0 - 57.0	19-26-25-27	51	91				Grey, wet, hard, Clayey SILT, some sand, (Glacial Till).	
60	14D	24/24	60.0 - 62.0	17-36-56-37	92	163				Grey, wet, hard, Clayey SILT, some sand, (Glacial Till).	
65	15D	24/16	65.0 - 67.0	22-15-33-22	48	85				Grey, wet, hard, Clayey SILT, some sand, some gravel, (Glacial Till).	
								121.0		68.5	
	R1	60/58	69.0 - 74.0	RQD = 10%			NQ			Increased roller cone resistance at 68.5', probable top of rock. Advanced casing to 69.0' and set up to core. R1: Medium hard, slightly weathered, medium grained, grey, PELITE. Joints are very close to closely spaced, moderately dipping, undulating, rough, discolored partially open. Recovery = 97% Rock Quality = Very Poor Rock Core Times (min:sec): 69.0-70.0' (2:59), 70.0-71.0' (1:40), 71.0-72.0' (2:08), 72.0-73.0' (2:25), 73.0-74.0' (2:40)	
70	R2	60/53	74.0 - 79.0	RQD = 36%						R2: Medium hard, slightly weathered, medium grained, grey, PELITE with occasional quartzite laminae or intrusions.. Joints are very close	
75											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Town Farm Road Bridge #5785

Location: Sidney, Maine

Boring No.: BB-STFR-104

WIN: 27266.00

Driller:	Seaboard Drilling	**Elevation (ft.)**	189.5	**Auger ID/OD:**	4.0/4.5"
Operator:	E. Baron	**Datum:**	NAVD88	**Sampler:**	Standard Splitspoon
Logged By:	L. Hailey	**Rig Type:**	ATV	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	7-16-24/7-16-24	**Drilling Method:**	Drive and Wash	**Core Barrel:**	NQ
Boring Location:	N606669.1, E1159310.9	**Casing ID/OD:**	4.0/4.5", 3.0/3.5"	**Water Level*:**	28.8'
Hammer Efficiency Factor:	1.066	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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MD = Unsuccessful Split Spoon Sample Attempt
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MV = Unsuccessful Field Vane Shear Test Attempt
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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_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = 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: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
75										to closely spaced, moderately dipping to high angle, undulating, rough, discolored, partially open. Recovery = 88% Rock Quality = Very Poor Rock Core Times (min:sec): 74.0-75.0' (1:50), 75.0-76.0' (1:52), 76.0-77.0' (1:55), 77.0-78.0' (2:04), 78.0-79.0' (2:19)	
								110.5		79.0 **Bottom of Exploration at 79.0 feet below ground surface.**	
80											
85											
90											
95											
100											

Remarks:

1. Fine Grained Soil Descriptions on this log are based on plasticity estimated using visual manual classification techniques of laboratory Atterberg Limit Tests if available, rather than the MaineDot Standard based percentages passing specific grain sizes.
2. Automatic hammer Seaboard Drilling #D50 Energy Transfer Ratio = 1.066.
3. Water level measured immediately after removal of casing.

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APPENDIX D – LABORATORY TESTING RESULTS

Thielsch
DIVISION OF THE R SE GROUP

CTS Laboratory
195 Frances Ave, Cranston RI 02910
401.467.6454 | cts.thielsch.com

State of Maine - Department of Transportation
Laboratory Testing Summary Sheet

Project ID: Town Farm Road Bridge #5785 **MDOT Project Number:**

Town(s): Sidney, ME **GZA Project Number:** 09.0026242.00 Task 01

Boring & Sample	Station	Sample	Depth	Lab	Organic	WC	LL	PI	Classification		
ID Number	(Feet)	No.	(Feet)	Number	%	%			Unified	AASHTO	Frost
BB-STFR-101		1D	1.5-2.5	S-3634		4.3	NV	NP	SM	A-1-b	II
BB-STFR-101		2D	5-7	S-3635		8.3	NV	NP	SM	A-2-4(0)	II
BB-STFR-101		4D	15-17	S-3636		9.6	NV	NP	SM	A-1-b	II
BB-STFR-101		6D	25-27	S-3637		25.8	29	10	CL		IV
BB-STFR-102		1D	0-2	S-3638		16.1	NV	NP	SW-SM	A-1-b	0
BB-STFR-102		2D	8-10	S-3639		22.1	24	8	CL	A-4(6)	IV
BB-STFR-102		3D	10-12	S-3640		6.0	NV	NP	SM	A-1-a	II

Classification of these soil samples is in accordance with AASHTO Classification System M-145-95. This classification is followed by the "Frost Susceptibility Rating" from zero (non-frost susceptible) to Class IV (highly frost susceptible). The "Frost Susceptibility Rating" is based upon the MDOT and Corps of Engineers Classification Systems.

GSDC = Grain Size Distribution Curve as determined by AASHTO T 88-19 and/or ASTM D 7928-21e1 (Last Updated June 2021)

WC = water content as determined by AASHTO T 265-19 and/or ASTM D 2216-19

LL = Liquid limit as determined by AASHTO T 89-17 and/or ASTM D 4318-17E01

PI = Plasticity Index as determined by AASHTO 90-16 and/or ASTM D4318-17E01

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State of Maine - Department of Transportation
Laboratory Testing Summary Sheet

Project ID: Town Farm Road Bridge #5785 **MDOT Project Number:**

Town(s): Sidney, ME **GZA Project Number:** 09.0026242.00 Task 01

Boring & Sample	Station	Sample	Depth	Lab	Organic	WC	LL	PI	Classification		
ID Number	(Feet)	No.	(Feet)	Number	%	%			Unified	AASHTO	Frost
BB-STFR-103		1D	0-2	S-3641		14.3	NV	NP	GP-GM	A-1-a	0
BB-STFR-103		2D	5-7	S-3642		21.2	22	8	CL		IV
BB-STFR-103		3D	10-12	S-3643		21.0			SM	A-4(0)	III
BB-STFR-104		1D	0-2	S-3644		2.1	NV	NP	SM	A-1-b	II
BB-STFR-104		2D	2.1-4.1	S-3645		8.1	NV	NP	SM	A-2-4(0)	II
BB-STFR-104		4D	10-12	S-3646		8.0	NV	NP	SM	A-2-4(0)	II
BB-STFR-104		6D	20-22	S-3647		5.0	NV	NP	SW-SM	A-2-4(0)	II
BB-STFR-104		10D	40-42	S-3648		14.1			GM	A-4(0)	III
BB-STFR-104		12D	50-52	S-3649		19.3	20	7	CL		IV

Classification of these soil samples is in accordance with AASHTO Classification System M-145-95. This classification is followed by the "Frost Susceptibility Rating" from zero (non-frost susceptible) to Class IV (highly frost susceptible). The "Frost Susceptibility Rating" is based upon the MDOT and Corps of Engineers Classification Systems.

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Thielsch
DIVISION OF THE RISE GROUP

195 Frances Avenue
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Phone: (401)-467-6454
Fax: (401)-467-2398
cts.thielsch.com
Let's Build a Solid Foundation

Client Information:	
GZA GeoEnvironmental, Inc.	
South Portland, ME	
Project Manager:	Logan Hailey
Assigned By:	Logan Hailey
Collected By:	GZA

Project Information:	
Town Farm Road Bridge #5785	
Sidney, Maine	
Project Number:	09.0026242.00 Task 1
Summary Page:	1 of 1
Report Date:	9/23/2024

LABORATORY TESTING DATA SHEET, Report No.: 7424-J-167

Boring No.	Sample ID	Depth (ft)	Laboratory No.	Identification Tests									Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Rcvd Moisture Content %	LL %	PL %	OD LL	Gravel %	Sand %	Fines %	Org. %	pH	g_d MAX (pcf) W_{opt} (%)	g_d MAX (pcf) W_{opt} (%) (Corr.)	Dry unit wt. (pcf)	Test Moisture Content %	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318			D6913			D2974	D4792	D1557								
BB-STFR-101	1D	1.5-2.5	24-S-3634	4.3				35.3	43.7	21.0											Brown f-c SAND and f-c GRAVEL, some Silt
BB-STFR-101	2D	5-7	24-S-3635	8.3				4.3	71.8	23.9											Brown f-m SAND, some Silt, trace fine Gravel
BB-STFR-101	4D	15-17	24-S-3636	9.6				34.4	48.8	16.8											Brown f-c SAND, some f-c Gravel, little Silt
BB-STFR-101	6D	25-27	24-S-3637	25.8	29	19															Grey SILT & CLAY
BB-STFR-102	1D	0-2	24-S-3638	16.1				13.8	77.6	8.6											Brown f-m SAND, little fine Gravel, trace Silt
BB-STFR-102	2D	8-10	24-S-3639	22.1	24	16		0.0	4.2	95.8											Brown SILT & CLAY, trace fine Sand
BB-STFR-102	3D	10-12	24-S-3640	6.0				38.9	47.4	13.7											Brown GRAVELLY SAND, little Silt

Date Received: **9/10/2024** Reviewed By: Date Reviewed: **9/23/2024**

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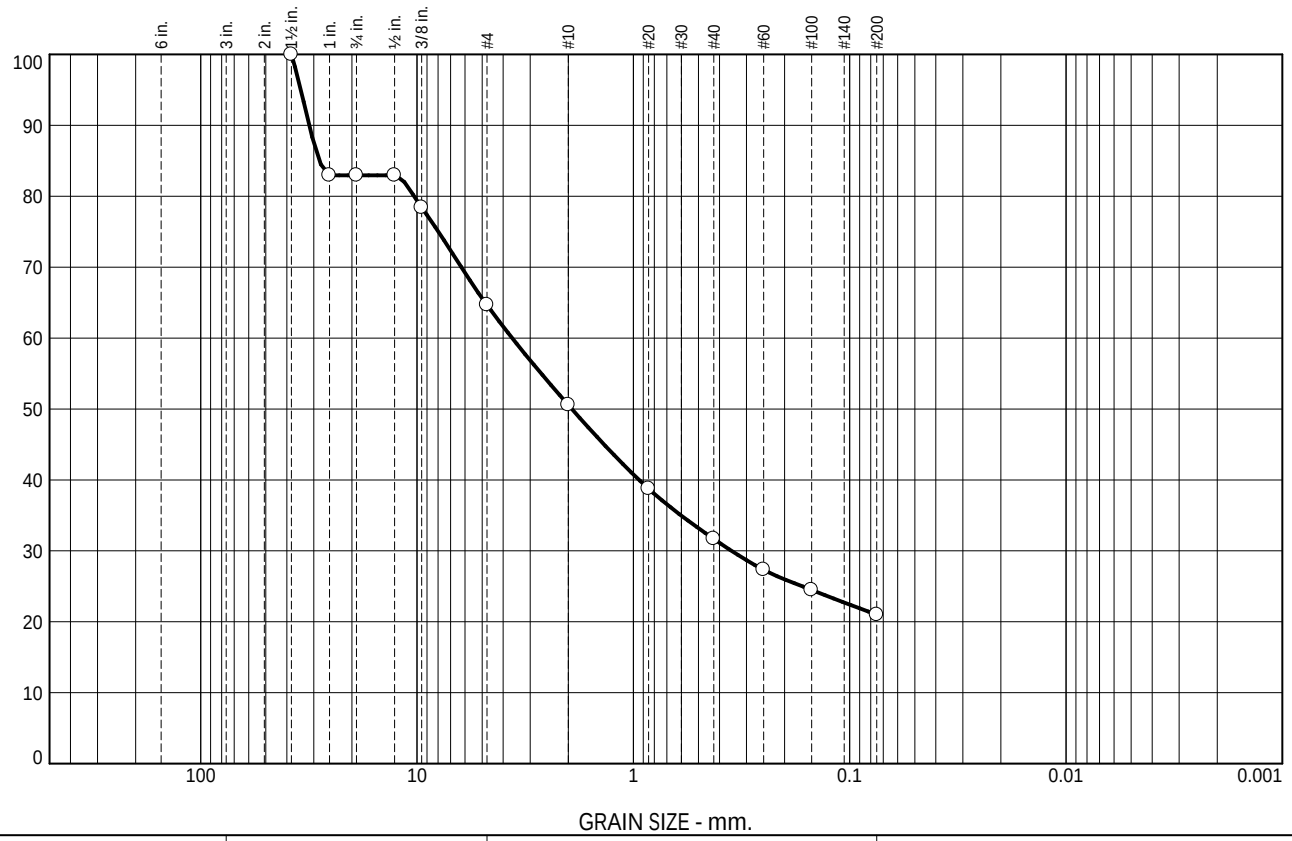
Project Information:	
Town Farm Road Bridge #5785	
Sidney, Maine	
Project Number:	09.0026242.00 Task 1
Summary Page:	1 of 1
Report Date:	9/23/2024

LABORATORY TESTING DATA SHEET, Report No.: 7424-J-168

Boring No.	Sample ID	Depth (ft)	Laboratory No.	Identification Tests									Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Rcvd Moisture Content %	LL %	PL %	OD LL	Gravel %	Sand %	Fines %	Org. %	pH	g_d MAX (pcf) W_{opt} (%)	g_d MAX (pcf) W_{opt} (%) (Corr.)	Dry unit wt. (pcf)	Test Moisture Content %	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318			D6913			D2974	D4792	D1557								
BB-STFR-103	1D	0-2	24-S-3641	14.3				60.0	30.8	9.2											Dark Brown f-c GRAVEL, some f-c Sand, trace Silt
BB-STFR-103	2D	5-7	24-S-3642	21.2	22	16															Brown SILT & CLAY
BB-STFR-103	3D	10-12	24-S-3643	21.0				20.5	33.4	46.1											Brown CLAYEY SILT, some f-m Sand, some f-c Gravel
BB-STFR-104	1D	0-2	24-S-3644	2.1				39.1	40.3	20.6											Brown GRAVELLY SAND, some Silt
BB-STFR-104	2D	2.1-4.1	24-S-3645	8.1				1.3	74.5	24.2											Brown f-m SAND, some Silt, trace fine Gravel
BB-STFR-104	4D	10-12	24-S-3646	8.0				2.4	76.3	21.3											Brown f-m SAND, some Silt, trace fine Gravel
BB-STFR-104	6D	20-22	24-S-3647	5.0				0.0	88.9	11.1											Brown f-m SAND, little Silt
BB-STFR-104	10D	40-42	24-S-3648	14.1				35.2	19.0	45.8											Brown CLAYEY SILT and f-c GRAVEL, little f-c Sand
BB-STFR-104	12D	50-52	24-S-3649	19.3	20	13															Grey SILT & CLAY

Date Received: **9/10/2024** Reviewed By: Date Reviewed: **9/23/2024**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	17.0	18.3	14.1	18.9	10.7	21.0	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 1/2"	100.0		
1"	83.0		
3/4"	83.0		
1/2"	83.0		
3/8"	78.4		
#4	64.7		
#10	50.6		
#20	38.8		
#40	31.7		
#60	27.3		
#100	24.5		
#200	21.0		

* (no specification provided)

Soil Description

Brown f-c SAND and f-c GRAVEL, some Silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 31.4945 D_{85}= 28.2586 D_{60}= 3.6308
D_{50}= 1.9246 D_{30}= 0.3519 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: BB-STFR-101 Depth: 1.5-2.5'
Sample Number: 1D

Date: 9.12.24

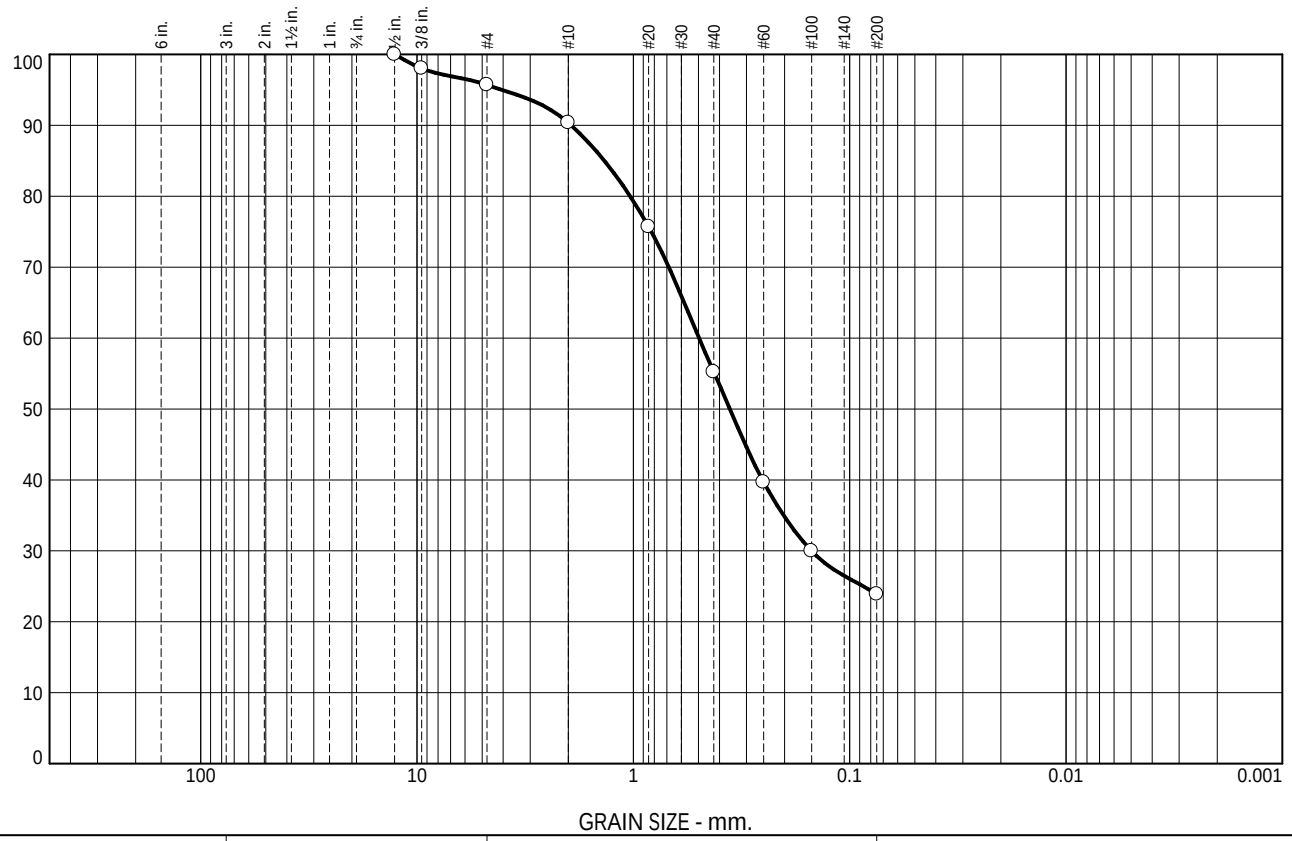
Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3634

Tested By: MCS Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.3	5.3	35.2	31.3	23.9	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	98.0		
#4	95.7		
#10	90.4		
#20	75.7		
#40	55.2		
#60	39.7		
#100	30.0		
#200	23.9		

* (no specification provided)

Soil Description

Brown f-m SAND, some Silt, trace fine Gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 1.9404 D_{85}= 1.3612 D_{60}= 0.4969
D_{50}= 0.3580 D_{30}= 0.1503 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Source of Sample: BB-STFR-101 Depth: 5-7'
Sample Number: 2D

Date: 9.12.24

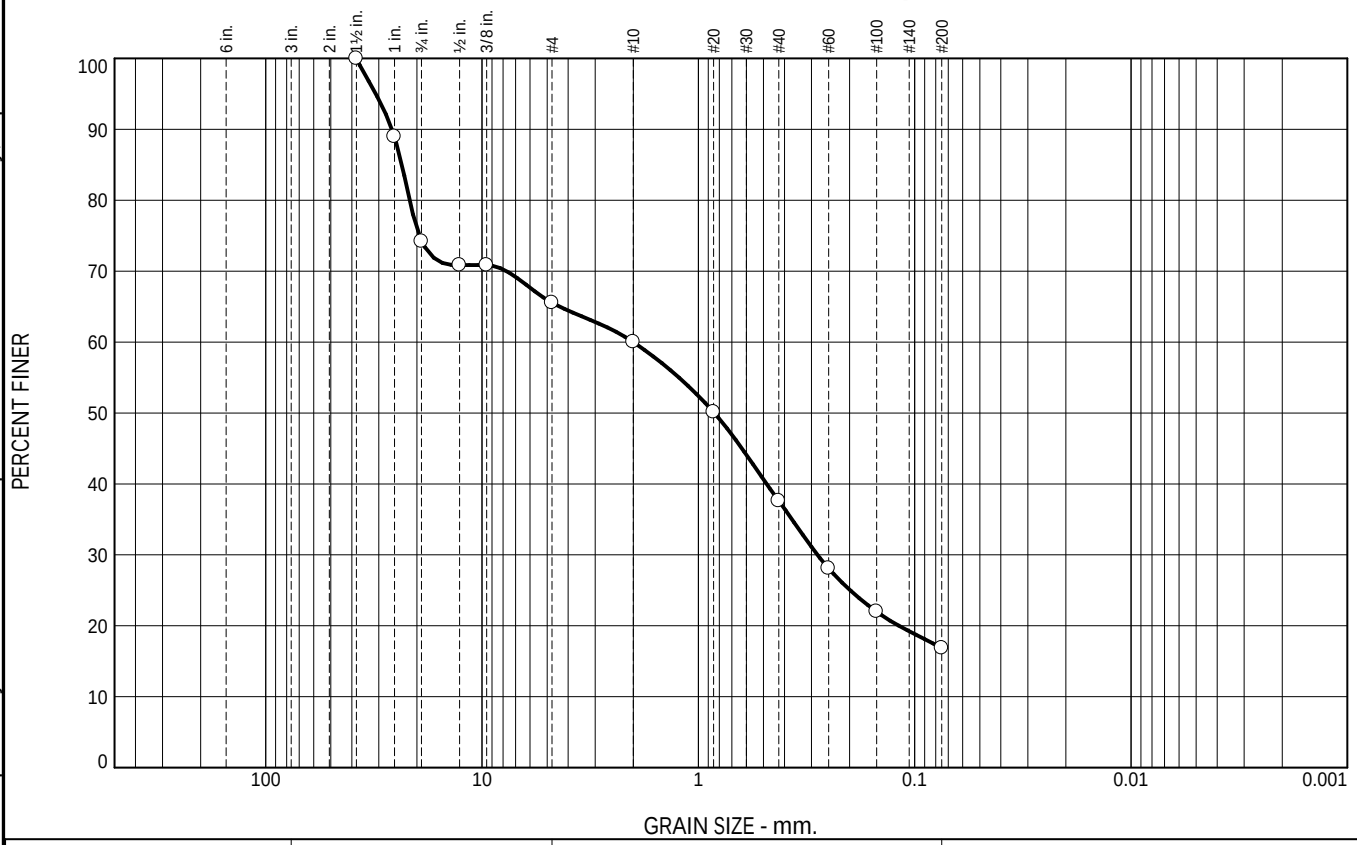
Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3635

Tested By: MCS Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	25.8	8.6	5.6	22.4	20.8	16.8	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 1/2"	100.0		
1"	89.0		
3/4"	74.2		
1/2"	70.9		
3/8"	70.9		
#4	65.6		
#10	60.0		
#20	50.1		
#40	37.6		
#60	28.1		
#100	22.0		
#200	16.8		

* (no specification provided)

Soil Description

Brown f-c SAND, some f-c Gravel, little Silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 26.0932 D_{85}= 23.4660 D_{60}= 1.9994
D_{50}= 0.8435 D_{30}= 0.2817 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: BB-STFR-101 Depth: 15-17'
Sample Number: 4D

Date: 9.12.24

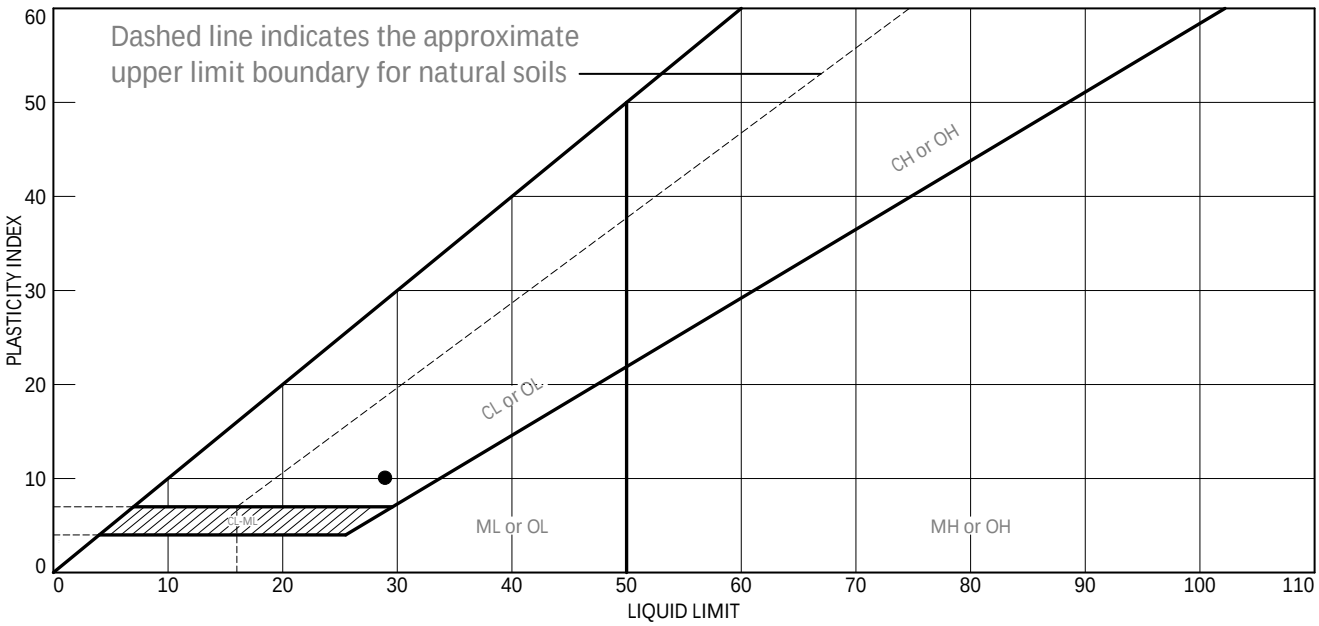
Thielsch Engineering Inc.

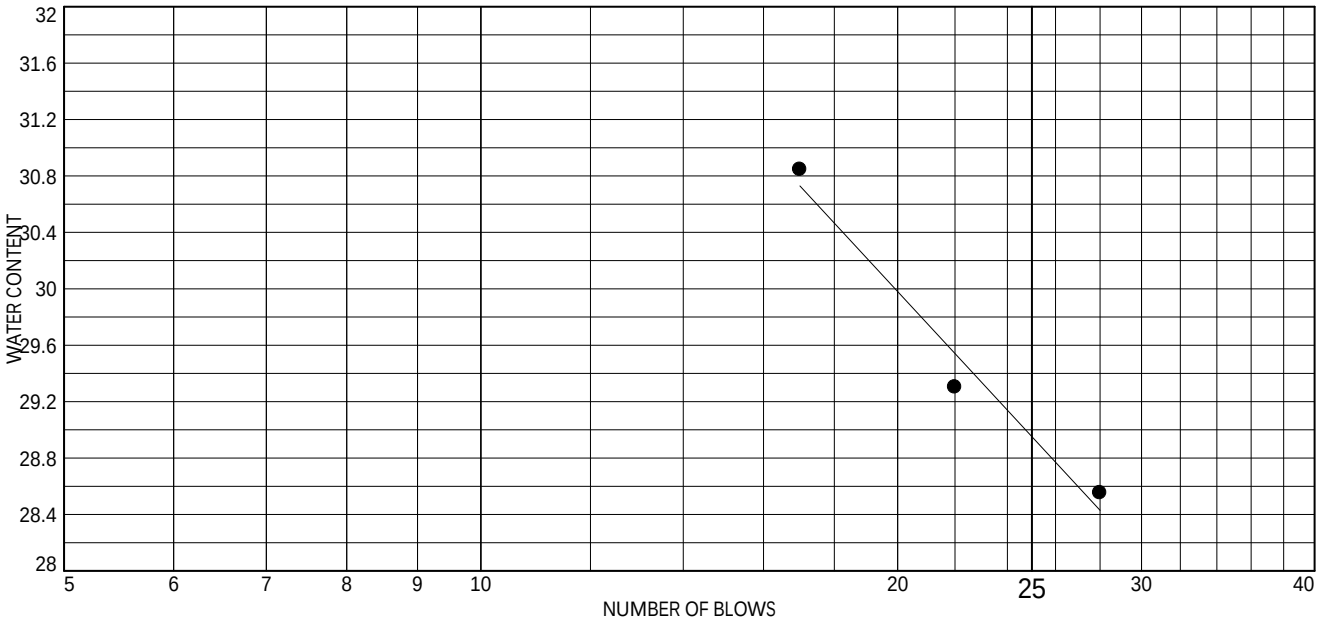
Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3636

Tested By: MCS Checked By: Kris Roland

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey SILT & CLAY	29	19	10			

Project No. 09.0026242.00 Task 1 Client: GZA GeoEnvironmental

Project: Town Farm Roade Bridge #5785

Sidney, ME

Source of Sample: BB-STFR-101 Depth: 25-27'

Sample Number: 6D

Remarks:

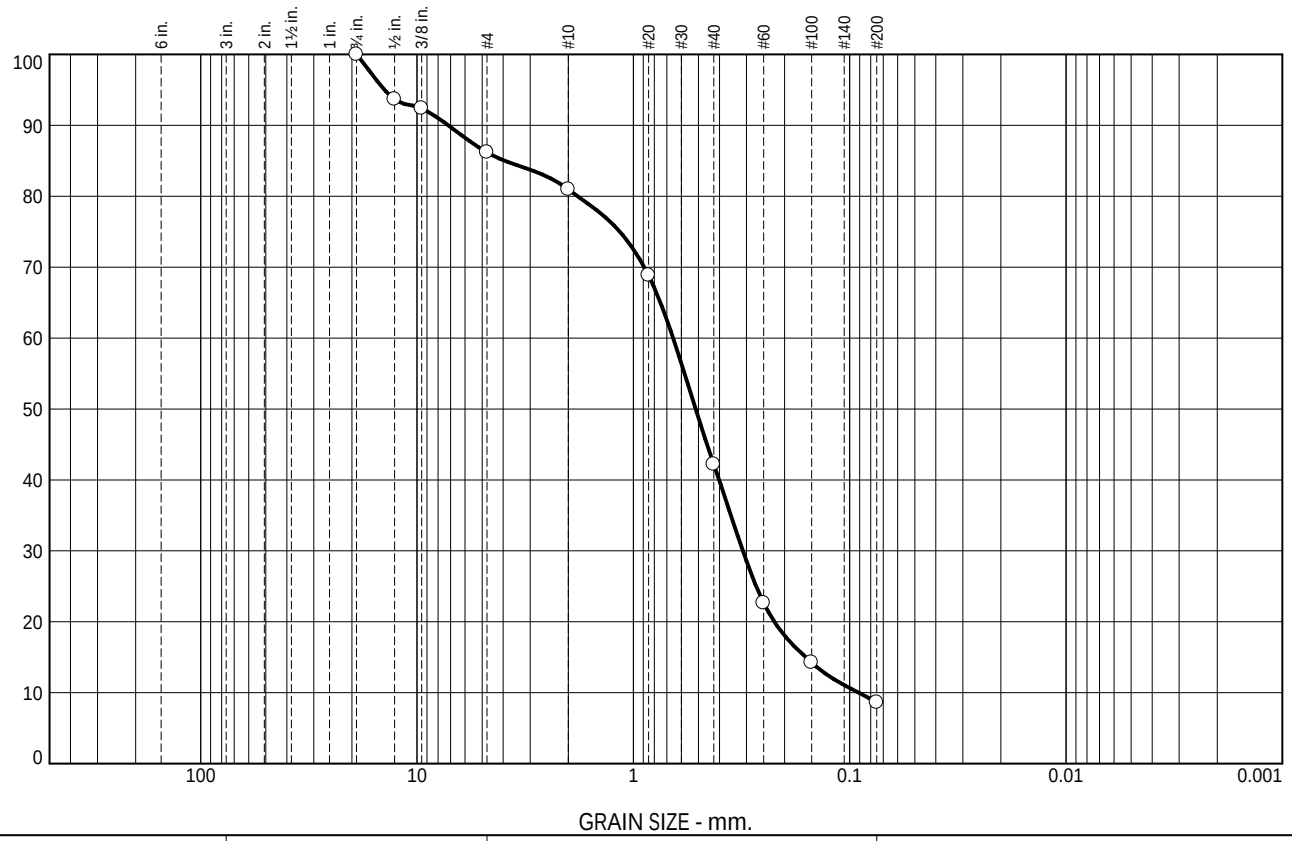
Thielsch Engineering Inc.

Cranston, RI

Fig. 24-L-3637

Tested By: AB Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	13.8	5.2	38.8	33.6	8.6	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	93.7		
3/8"	92.4		
#4	86.2		
#10	81.0		
#20	68.8		
#40	42.2		
#60	22.7		
#100	14.3		
#200	8.6		

* (no specification provided)

Soil Description

Brown f-m SAND, little fine Gravel, trace Silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 7.1703 D_{85}= 3.9192 D_{60}= 0.6549
D_{50}= 0.5154 D_{30}= 0.3120 D_{15}= 0.1595
D_{10}= 0.0908 C_u= 7.22 C_c= 1.64

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Source of Sample: BB-STFR-102 Depth: 0-2'
Sample Number: 1D

Date: 9.12.24

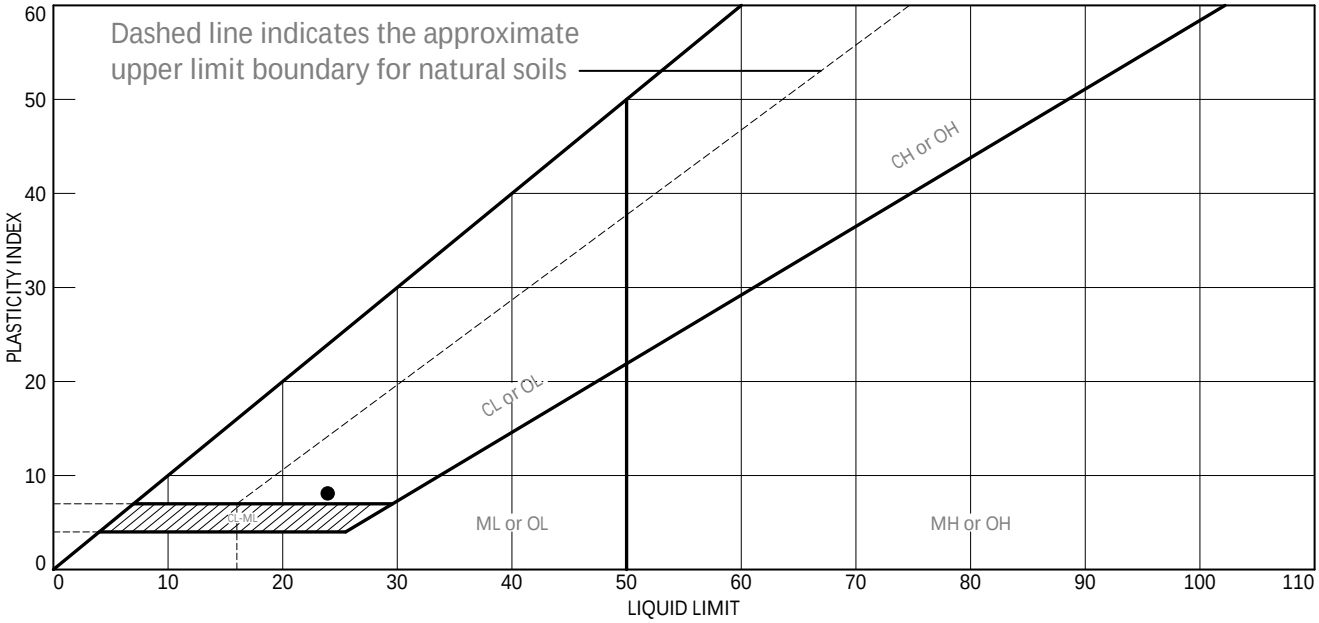
Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3638

Tested By: MCS Checked By: Kris Roland

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SILT & CLAY, trace fine Sand	24	16	8	100.0	95.8	CL

Project No. 09.0026242.00 Task 1 Client: GZA GeoEnvironmental

Project: Town Farm Roade Bridge #5785

Sidney, ME

Source of Sample: BB-STFR-102 Depth: 8-10'

Sample Number: 2D

Remarks:

Thielsch Engineering Inc.

Cranston, RI

Fig. 24-L-3639

Tested By: AB Checked By: Kris Roland

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	4.2	72.7	23.1

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#20	100.0		
#40	100.0		
#60	99.8		
#100	98.9		
#200	95.8		
0.0403 mm.	74.6		
0.0297 mm.	67.5		
0.0216 mm.	62.8		
0.0157 mm.	57.5		
0.0118 mm.	51.0		
0.0086 mm.	45.7		
0.0062 mm.	39.1		
0.0045 mm.	33.4		
0.0033 mm.	28.6		
0.0014 mm.	19.4		

* (no specification provided)

Soil Description

Brown SILT & CLAY, trace fine Sand

Atterberg Limits

PL= 16 LL= 24 PI= 8

Coefficients

D_{90}= 0.0604 D_{85}= 0.0532 D_{60}= 0.0180
D_{50}= 0.0112 D_{30}= 0.0036 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-4(6)

Remarks

Source of Sample: BB-STFR-102 Depth: 8-10'
Sample Number: 2D

Date: 9.19.24

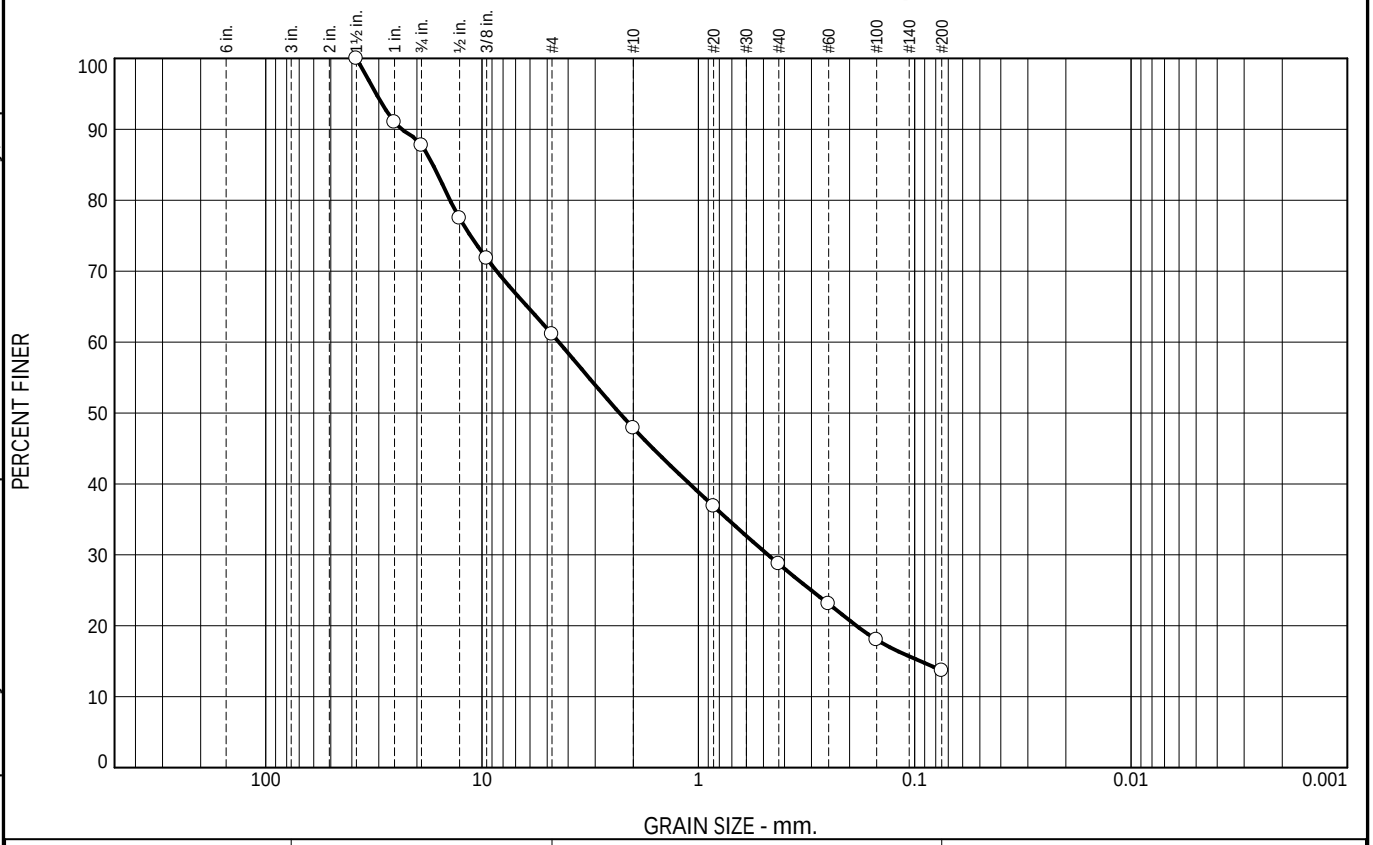
Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3639

Tested By: RB/SBR Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.3	26.6	13.2	19.2	15.0	13.7	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 1/2"	100.0		
1"	91.0		
3/4"	87.7		
1/2"	77.5		
3/8"	71.8		
#4	61.1		
#10	47.9		
#20	36.8		
#40	28.7		
#60	23.1		
#100	18.0		
#200	13.7		

* (no specification provided)

Source of Sample: BB-STFR-102 Depth: 10-12'
Sample Number: 3D

Date: 9.12.24

Soil Description

Brown GRAVELLY SAND, little Silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 23.5101 D_{85}= 16.8679 D_{60}= 4.4172
D_{50}= 2.3147 D_{30}= 0.4763 D_{15}= 0.0940
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-a

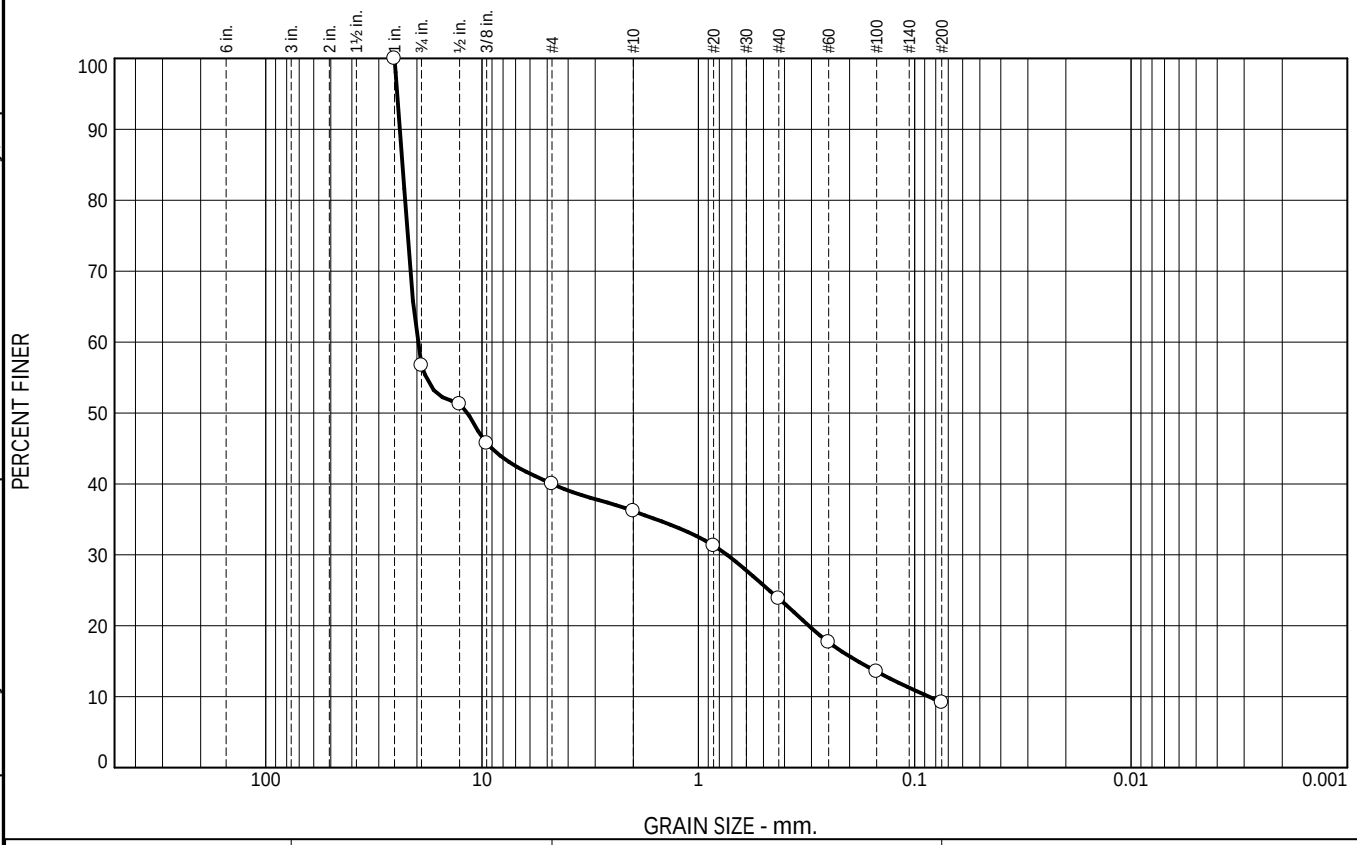
Remarks

Thielsch Engineering Inc.
Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3640

Tested By: MCS Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	43.3	16.7	3.8	12.4	14.6	9.2	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	56.7		
1/2"	51.3		
3/8"	45.7		
#4	40.0		
#10	36.2		
#20	31.3		
#40	23.8		
#60	17.7		
#100	13.5		
#200	9.2		

* (no specification provided)

Soil Description

Dark Brown f-c GRAVEL, some f-c Sand, trace Silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 23.9373 D_{85}= 23.2991 D_{60}= 19.9393
D_{50}= 11.6618 D_{30}= 0.7369 D_{15}= 0.1832
D_{10}= 0.0859 C_u= 232.02 C_c= 0.32

Classification

USCS= GP-GM AASHTO= A-1-a

Remarks

Source of Sample: BB-STFR-103 Depth: 0-2'
Sample Number: 1D

Date: 9.12.24

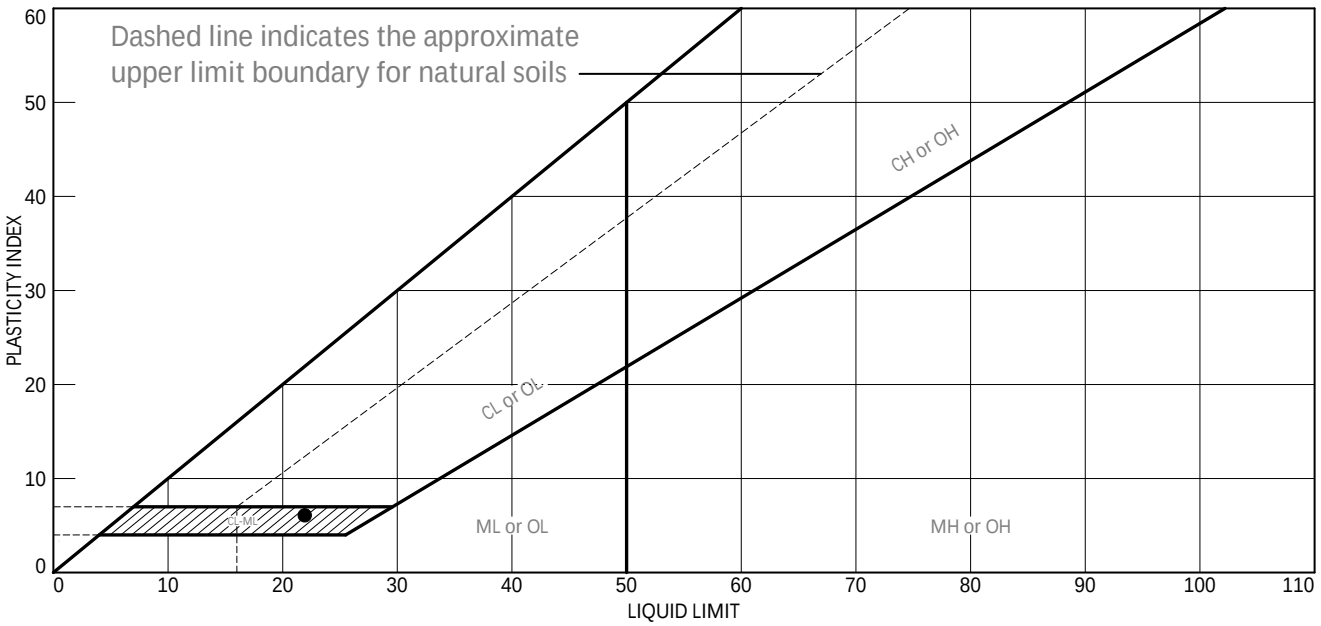
Thielsch Engineering Inc.

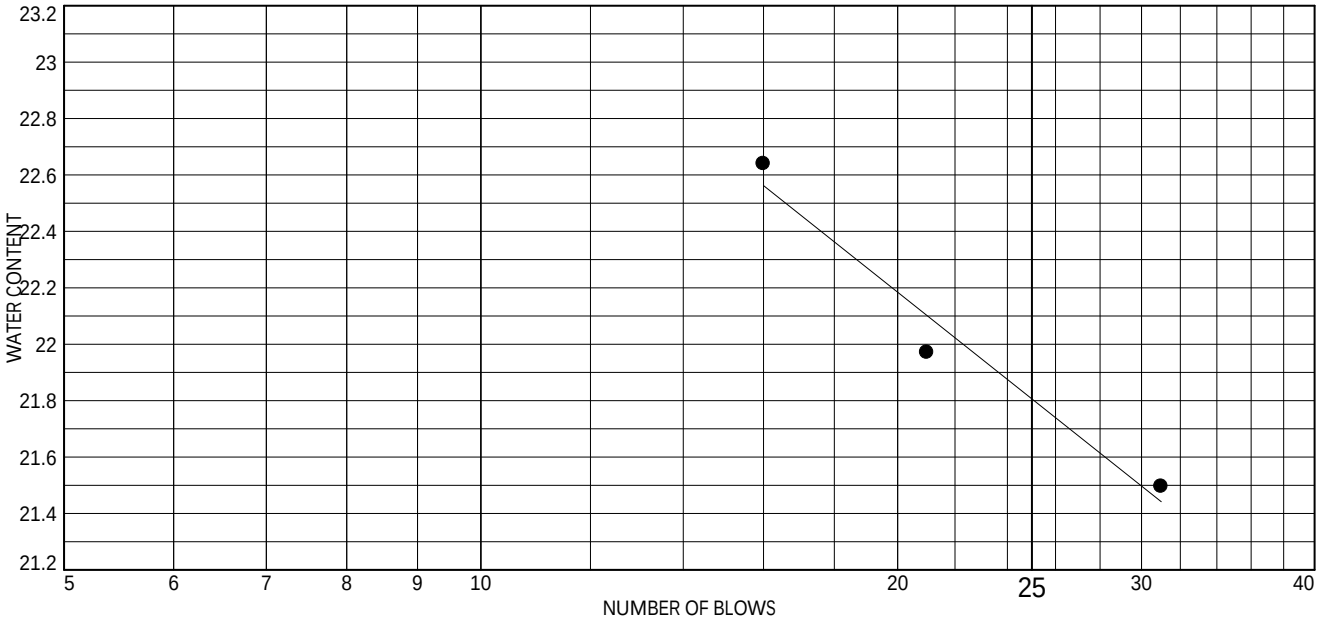
Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3641

Tested By: MCS Checked By: Kris Roland

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Brown SILT & CLAY	22	16	6			

Project No. 09.0026242.00 Task 1 Client: GZA GeoEnvironmental

Project: Town Farm Roade Bridge #5785

Sidney, ME

Source of Sample: BB-STFR-103 Depth: 5-7'

Sample Number: 2D

Remarks:

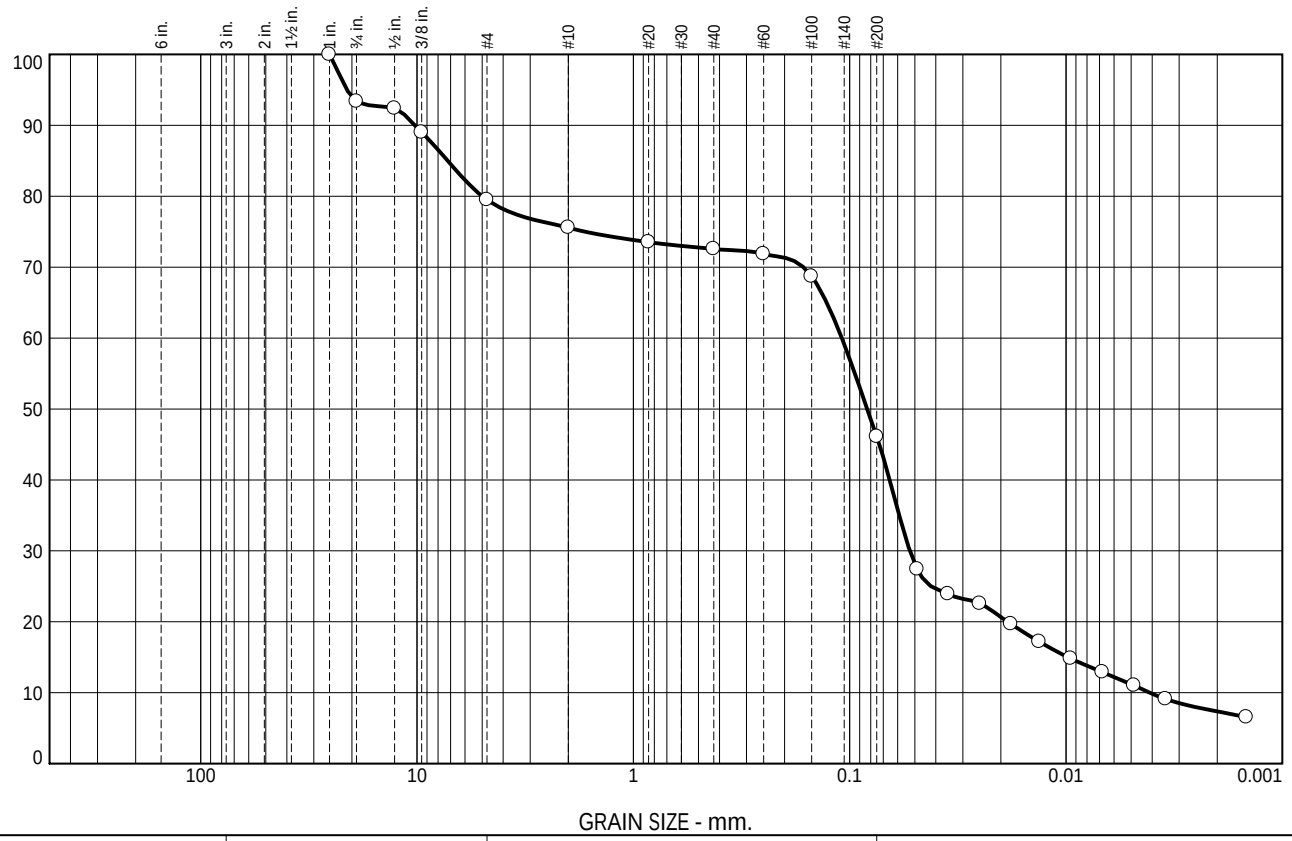
Thielsch Engineering Inc.

Cranston, RI

Fig. 24-L-3642

Tested By: AB Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.6	13.9	3.9	3.0	26.5	38.7	7.4

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	93.4		
1/2"	92.4		
3/8"	89.0		
#4	79.5		
#10	75.6		
#20	73.5		
#40	72.6		
#60	71.9		
#100	68.7		
#200	46.1		
0.0487 mm.	27.4		
0.0351 mm.	23.9		
0.0250 mm.	22.6		
0.0180 mm.	19.7		
0.0133 mm.	17.2		
0.0095 mm.	14.8		
0.0068 mm.	12.9		
0.0048 mm.	11.0		
0.0035 mm.	9.1		
0.0015 mm.	6.5		

* (no specification provided)

Soil Description

Brown CLAYEY SILT, some f-m Sand, some f-c Gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 10.2421 D_{85}= 7.2141 D_{60}= 0.1088
D_{50}= 0.0830 D_{30}= 0.0527 D_{15}= 0.0098
D_{10}= 0.0041 C_u= 26.52 C_c= 6.22

Classification

USCS= SM AASHTO= A-4(0)

Remarks

Sample visually classified as plastic. Sample rolled to 1/4"

Source of Sample: BB-STFR-103 Depth: 10-12'
Sample Number: 3D

Date: 9.19.24

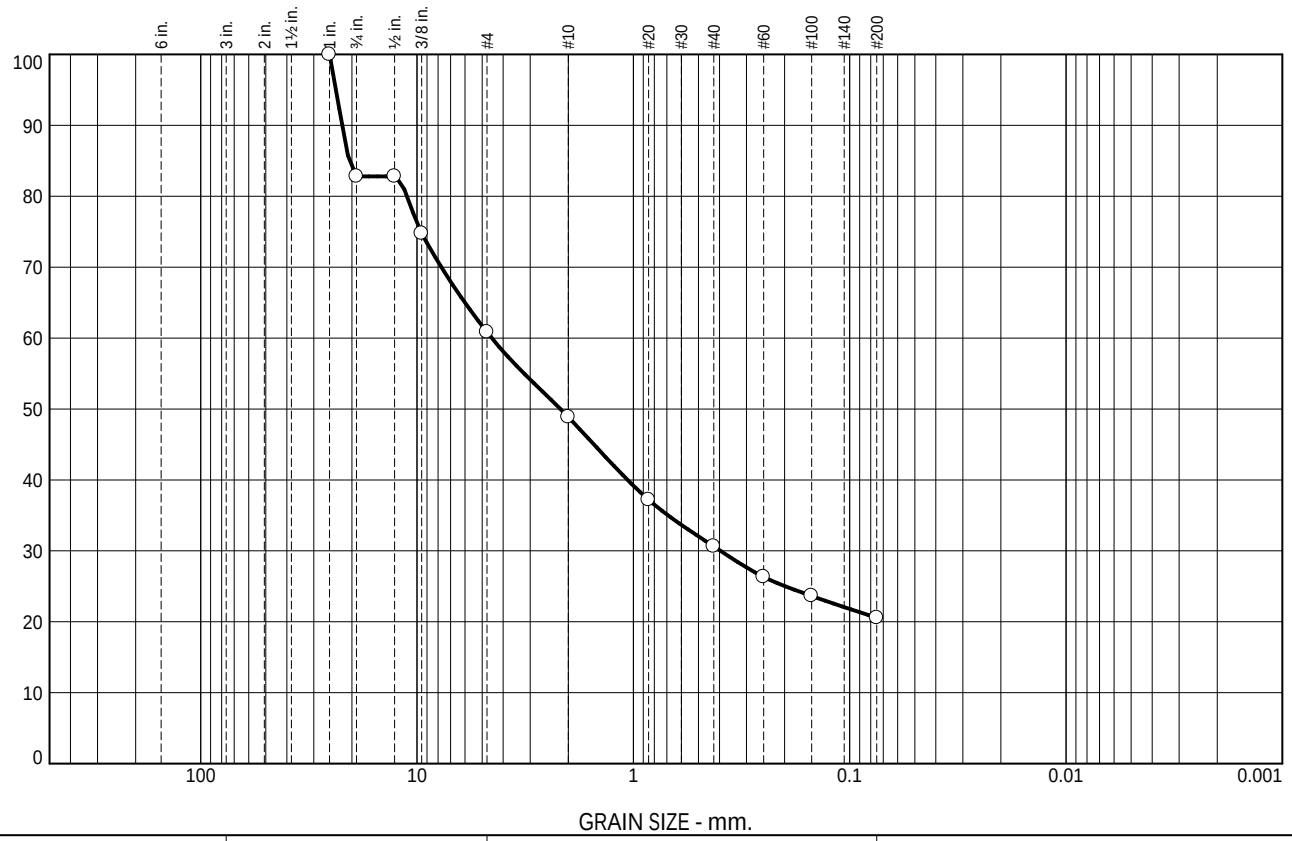
Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3643

Tested By: RB/SBR Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	17.2	21.9	12.0	18.3	10.0	20.6	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	82.8		
1/2"	82.8		
3/8"	74.7		
#4	60.9		
#10	48.9		
#20	37.2		
#40	30.6		
#60	26.3		
#100	23.6		
#200	20.6		

* (no specification provided)

Soil Description

Brown GRAVELLY SAND, some Silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 22.2139 D_{85}= 20.5964 D_{60}= 4.5118
D_{50}= 2.1751 D_{30}= 0.3958 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Source of Sample: BB-STFR-104 Depth: 0-2'
Sample Number: 1D

Date: 9.12.24

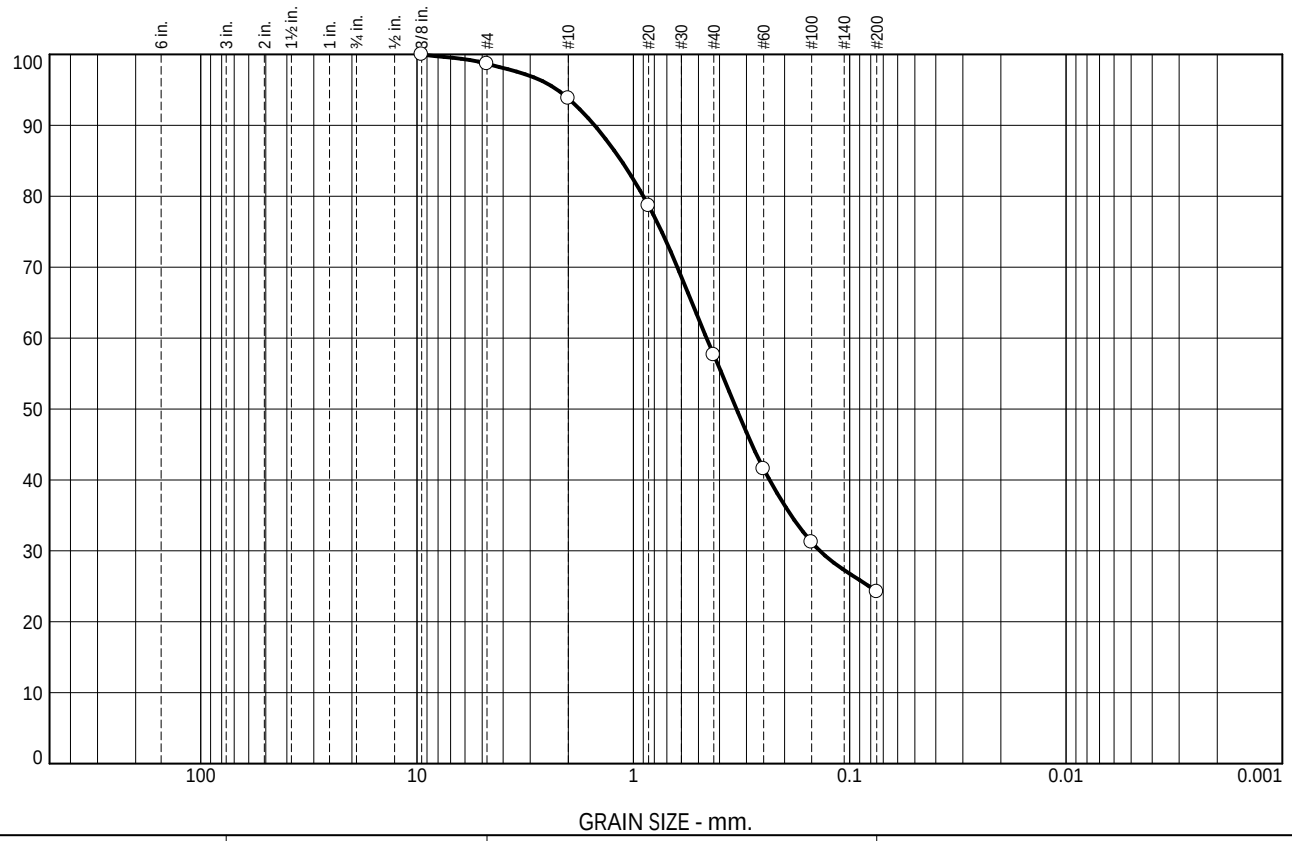
Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3644

Tested By: MCS Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.3	4.9	36.2	33.4	24.2	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	98.7		
#10	93.8		
#20	78.7		
#40	57.6		
#60	41.6		
#100	31.2		
#200	24.2		

* (no specification provided)

Source of Sample: BB-STFR-104 Depth: 2.1-4.1'
Sample Number: 2D

Date: 9.12.24

Soil Description

Brown f-m SAND, some Silt, trace fine Gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 1.5110 D_{85}= 1.1364 D_{60}= 0.4589
D_{50}= 0.3337 D_{30}= 0.1374 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

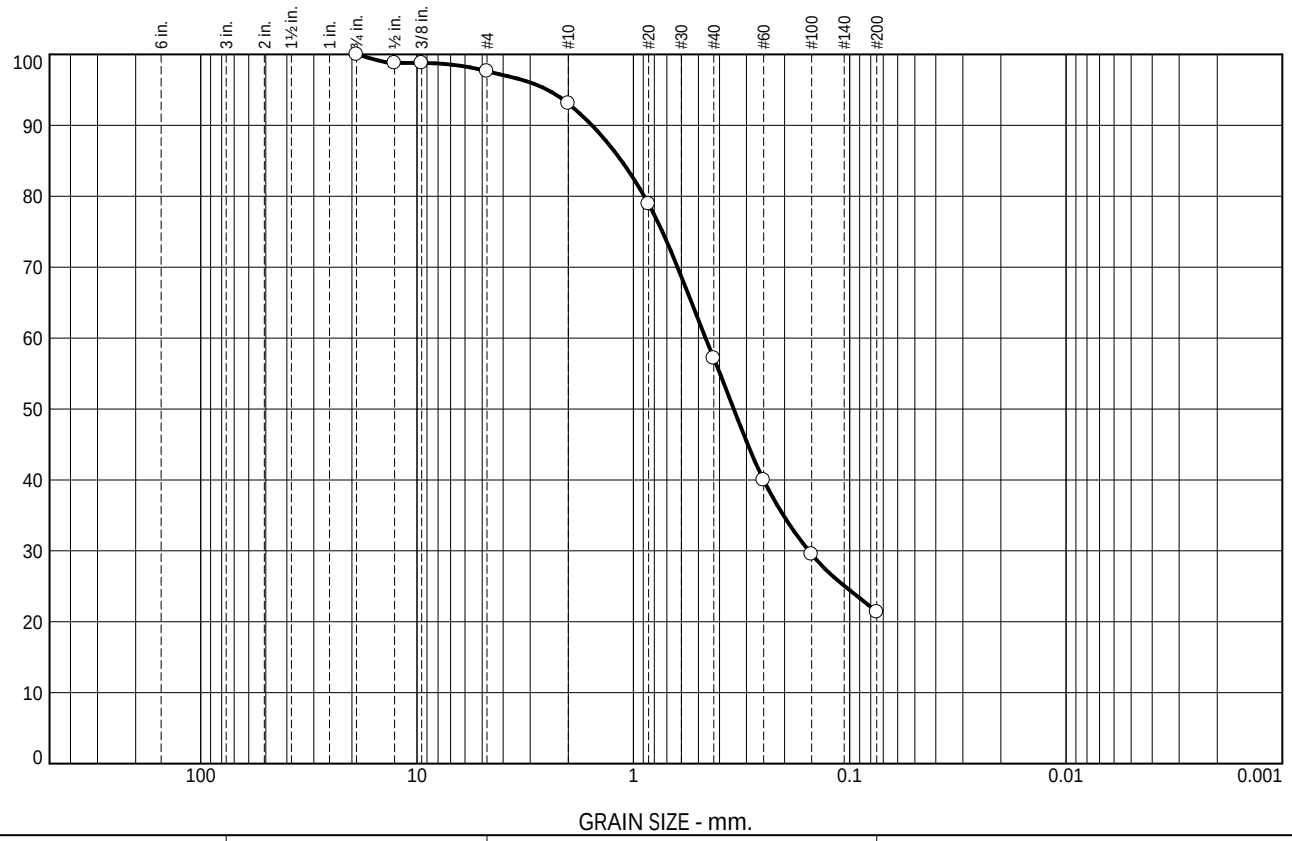
Remarks

Thielsch Engineering Inc.
Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3645

Tested By: MCS Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.4	4.5	35.9	35.9	21.3	

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	98.8		
3/8"	98.8		
#4	97.6		
#10	93.1		
#20	78.9		
#40	57.2		
#60	40.0		
#100	29.5		
#200	21.3		

* (no specification provided)

Soil Description

Brown f-m SAND, some Silt, trace fine Gravel

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 1.5532 D_{85}= 1.1345 D_{60}= 0.4638
D_{50}= 0.3436 D_{30}= 0.1544 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Source of Sample: BB-STFR-104 Depth: 10-12'
Sample Number: 4D

Date: 9.12.24

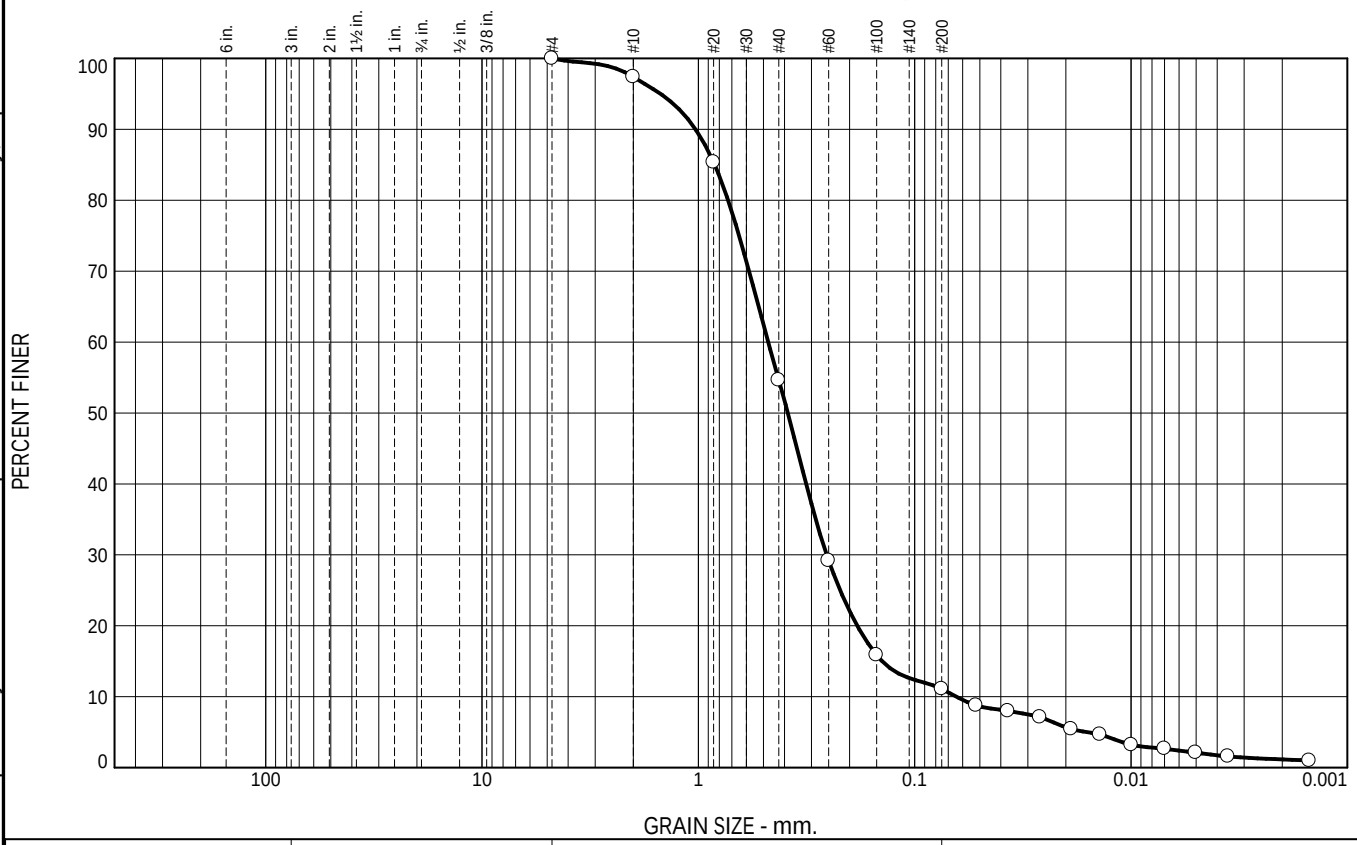
Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3646

Tested By: MCS Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	2.6	42.8	43.5	9.9	1.2

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	97.4		
#20	85.4		
#40	54.6		
#60	29.2		
#100	15.9		
#200	11.1		
0.0520 mm.	8.8		
0.0370 mm.	8.0		
0.0264 mm.	7.1		
0.0189 mm.	5.4		
0.0139 mm.	4.7		
0.0099 mm.	3.2		
0.0070 mm.	2.7		
0.0050 mm.	2.1		
0.0036 mm.	1.6		
0.0015 mm.	1.0		

* (no specification provided)

Soil Description

Brown f-m SAND, little Silt

Atterberg Limits

PL= NP LL= NV PI= NP

Coefficients

D_{90}= 1.0303 D_{85}= 0.8398 D_{60}= 0.4756
D_{50}= 0.3861 D_{30}= 0.2554 D_{15}= 0.1415
D_{10}= 0.0642 C_u= 7.41 C_c= 2.14

Classification

USCS= SW-SM AASHTO= A-2-4(0)

Remarks

Source of Sample: BB-STFR-104 Depth: 20-22'
Sample Number: 6D

Date: 9.19.24

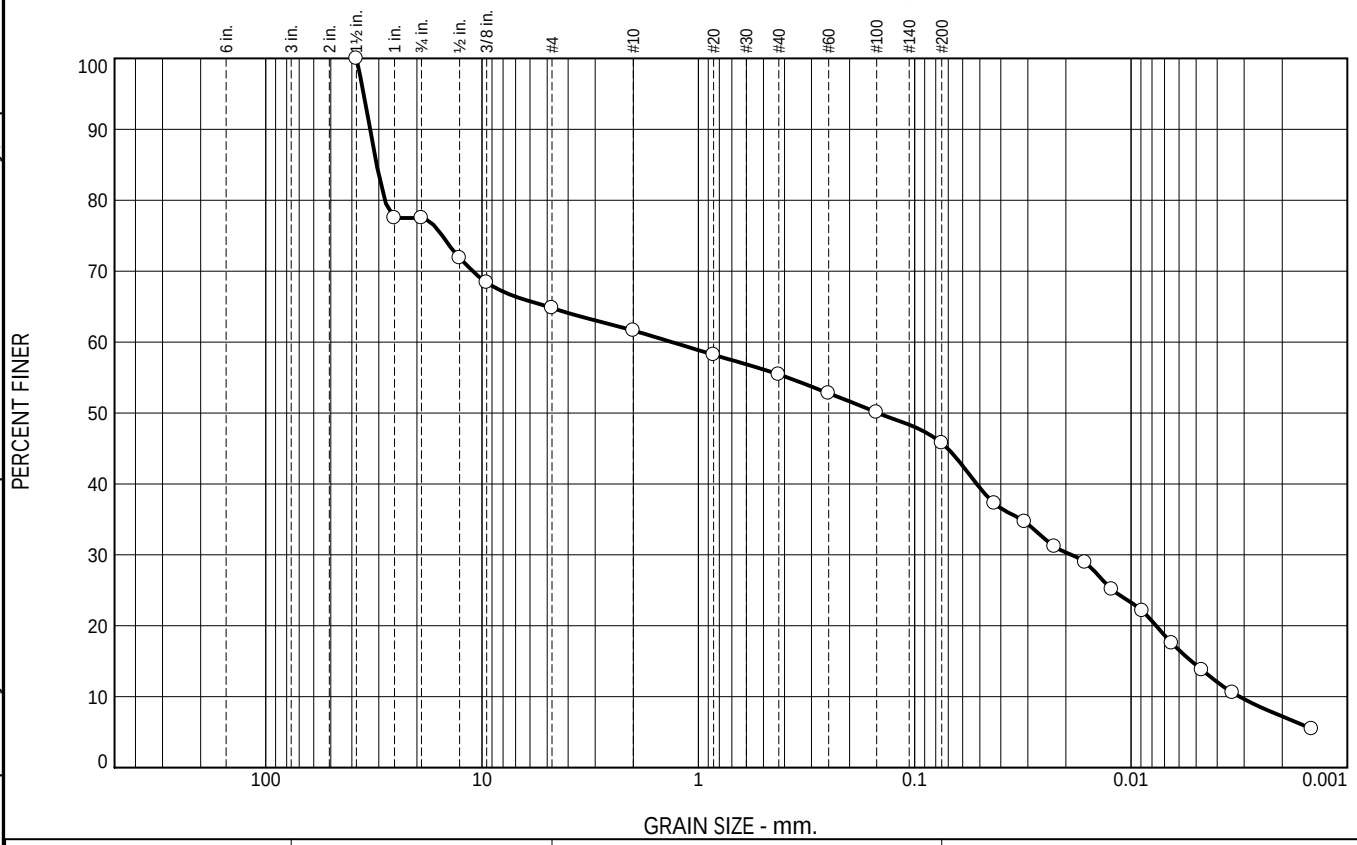
Thielsch Engineering Inc.

Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3647

Tested By: RB/SBR Checked By: Kris Roland

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.5	12.7	3.2	6.2	9.6	38.6	7.2

SIEVE SIZE OR DIAMETER	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 1/2"	100.0		
1"	77.5		
3/4"	77.5		
1/2"	71.9		
3/8"	68.4		
#4	64.8		
#10	61.6		
#20	58.2		
#40	55.4		
#60	52.8		
#100	50.1		
#200	45.8		
0.0429 mm.	37.2		
0.0310 mm.	34.7		
0.0226 mm.	31.2		
0.0163 mm.	28.9		
0.0123 mm.	25.1		
0.0089 mm.	22.1		
0.0065 mm.	17.5		
0.0047 mm.	13.8		
0.0034 mm.	10.6		
0.0015 mm.	5.5		

* (no specification provided)

Soil Description

Brown CLAYEY SILT and f-c GRAVEL, little f-c Sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 32.9094 D_{85}= 30.6832 D_{60}= 1.3245
D_{50}= 0.1481 D_{30}= 0.0188 D_{15}= 0.0053
D_{10}= 0.0032 C_u= 420.32 C_c= 0.09

Classification

USCS= GM AASHTO= A-4(0)

Remarks

Sample visually classified as plastic. Sample rolled to 1/4"

Source of Sample: BB-STFR-104 Depth: 40-42'
Sample Number: 10D

Date: 9.20.24

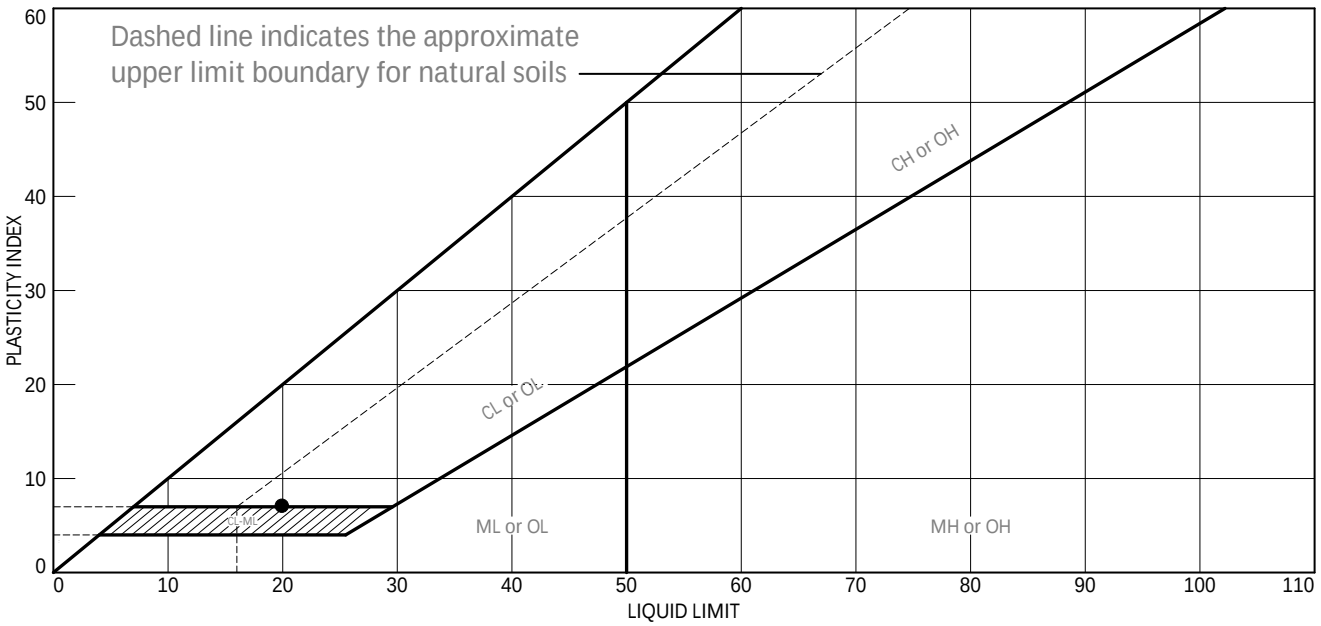
Thielsch Engineering Inc.

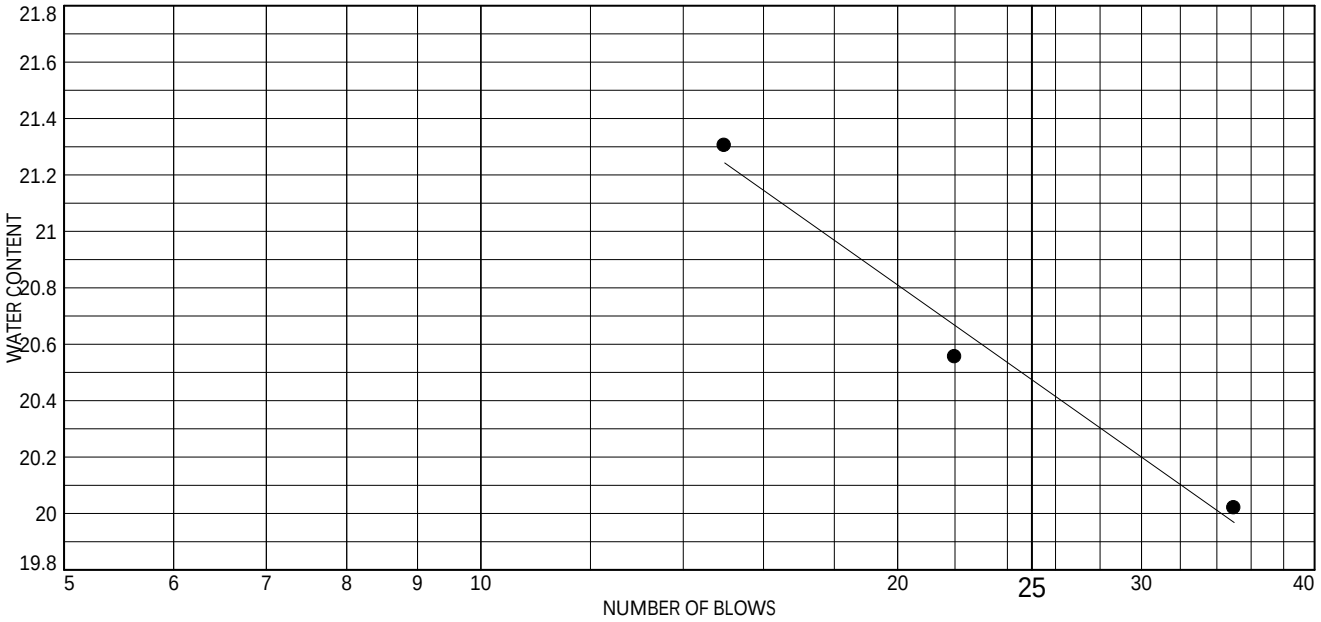
Cranston, RI

Client: GZA GeoEnvironmental
Project: Town Farm Roade Bridge #5785
Sidney, ME
Project No: 09.0026242.00 Task 1 Fig. 24-S-3648

Tested By: RB/SBR Checked By: Kris Roland

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Grey SILT & CLAY	20	13	7			

Project No. 09.0026242.00 Task 1 Client: GZA GeoEnvironmental

Project: Town Farm Roade Bridge #5785

Sidney, ME

Source of Sample: BB-STFR-104 Depth: 50-52'

Sample Number: 12D

Remarks:

Thielsch Engineering Inc.

Cranston, RI

Fig. 24-L-3649

Tested By: AB Checked By: Kris Roland

Thielsch
DIVISION OF THE RISE GROUP

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:		Project Information:	
GZA GeoEnvironmental		**Sidney Bridges**	
South Portland, ME		**Town Farm Road, Sidney, ME**	
(207) 879-9190		Project Number:	09.0026242.00 Task 1
Project Contact:	Blaine Cardali	Summary Page:	3 of 3
Collected By:	B. Cardali	Report Date:	5/21/2025

LABORATORY TESTING DATA SHEET, Report No.: 7425-E-142

Boring No.	Sample No.	Depth (ft)	Laboratory No.	Specimen Data						Compressive Strength Tests								Rock Formation or Description or Remarks
				Mohs Hard-ness	Diameter (in)	Length (in)	(1) Unit Weight (PCF)	(2) Wet Density (PCF)	Bulk G_s	(3) Other Tests	(4) Strength PSI	(5) Strain %	(6) E sec PSI EE+06	(7) Poisson's Ratio	st PSI	Is_{50} PSI	(8) s_c PSI	
BB-STFR-102	R1	23.2-24.3	25-S-1720		1.968	4.504	172.4			U	5063	0.136	3.37	0.38				Grey Gneiss
Fresh Break along foliation																		
BB-STFR-101	R5	42.0-43.7	25-S-1721		1.976	4.465	175.5			U	11932	0.243	5.48	0.53				Grey Gneiss
Fresh Break along foliation, early break at about 4000 psi																		

Notes		Notes	
(1) Volume Determined By Measuring Dimensions		(3) PLD=Point Load (diametrical),	(5) Strain at Peak Deviator Stress
(2) Determined by Measuring Dimensions and Weight of Saturated Sample		PLA= Point Load (Axial) ST= Splitting Tensile	(6) Represents Secant Modulus at 50% of Total Failure Stress
		U= Unconfined Compressive Strength	(7) Represents Secant Poisson's Ratio at 50% of Total Failure Stress
		(4) Taken at Peak Deviator Stress	(8) Estimated UCS from Table 1 of ASTM D5731 for NX cores (Is x 24)

Date Received: **5/13/2025** Reviewed By: Date Review **5/21/2025**

Thielsch
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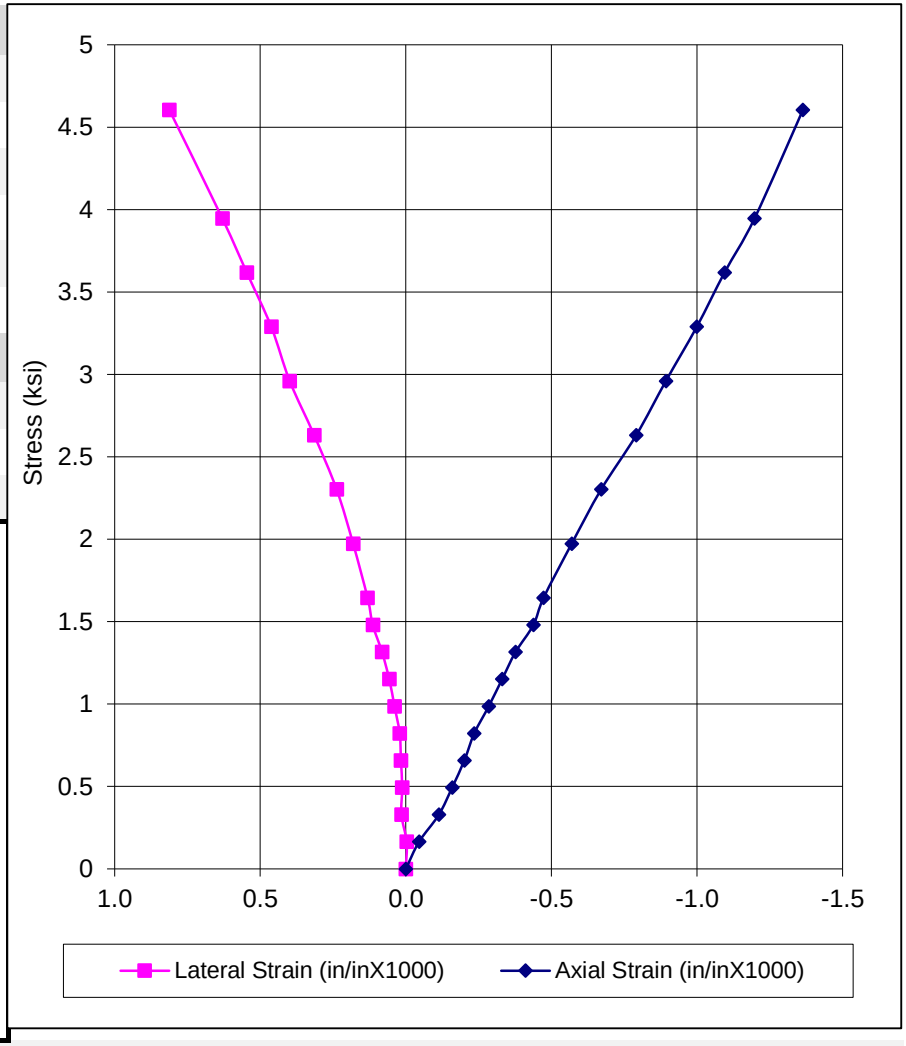
Client Information:	
GZA GeoEnvironmental	
S. Portland, ME	
Project Manager:	B. Cardali
Assigned by:	B. Cardali
Collected by:	B. Cardali

Project Information:	
Sidney Bridges	
Sidney, ME	
Project Number:	09.0026242.00 Task 1/2/4
Technician:	SBR
Report Date:	5.20.25

ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

Sample Information		**Compressive Test Information**	
Boring ID:	BB-STFR-102	**Unit Weight (pcf):**	172.4
Sample #:	R1	**Failure Stress (psi):**	5,063
Depth (ft):	23.2-24.3	**Failure Mode:**	Fresh
Tested Depth (ft):	23.8-24.2	**Time to Failure (min)**	3.27
Rock Type:	Grey Gneiss		
Features:	Fresh Break along foliation		

Test Specimen Information		**Elastic Moduli Test Information**	
Diameter, D (in):	1.968	**Poisson's Ratio @ 50%:**	0.38
Length, L (in):	4.504	**Strain %:**	0.136
L:D Ratio:	2.29	**E sec PSI @ 50%:**	3.37E+06



Testing Notes:

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Let's Build a Solid Foundation

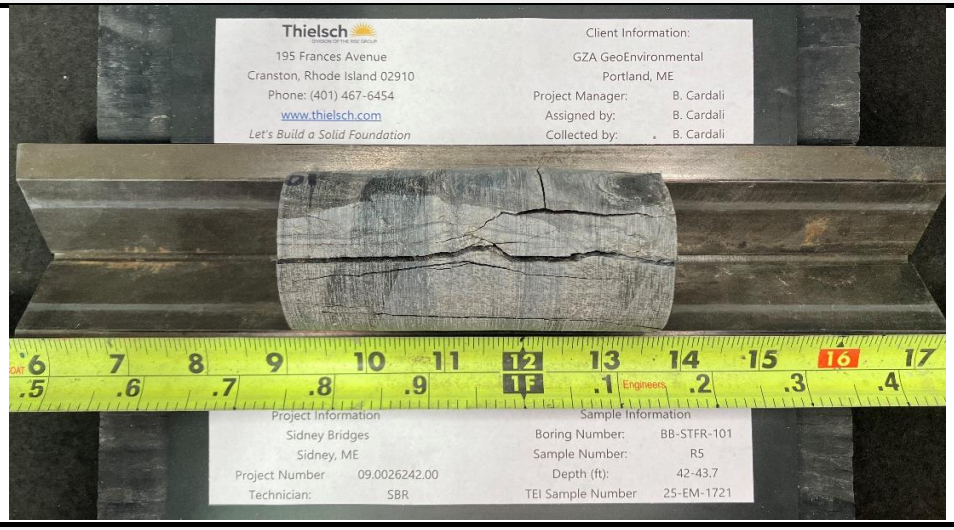
Client Information:	
GZA GeoEnvironmental	
S. Portland, ME	
Project Manager:	B. Cardali
Assigned by:	B. Cardali
Collected by:	B. Cardali

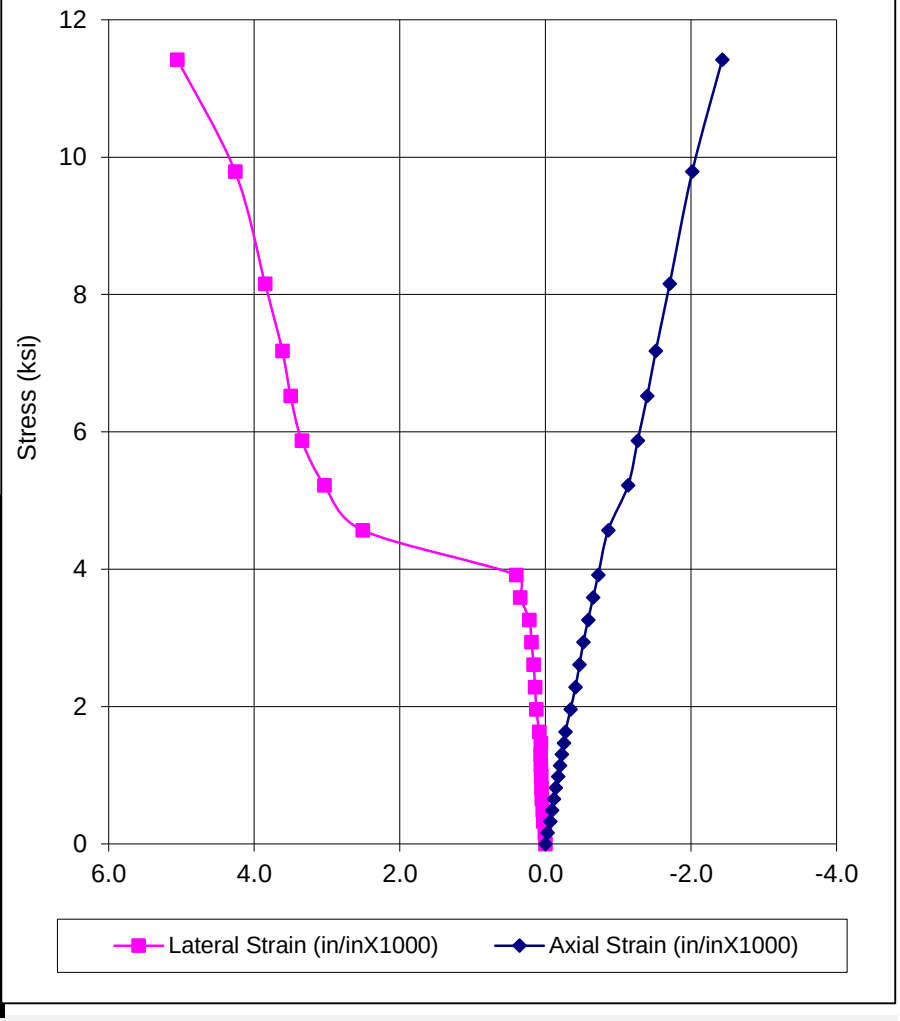
Project Information:	
Sidney Bridges	
Sidney, ME	
Project Number:	09.0026242.00 Task 1/2/4
Technician:	SBR
Report Date:	5.20.25

ASTM D7012 Compressive Strength and Elastic Moduli of Intact Rock Core Specimens

Sample Information		**Compressive Test Information**	
Boring ID:	BB-STFR-101	**Unit Weight (pcf):**	175.5
Sample #:	R5	**Failure Stress (psi):**	11,932
Depth (ft):	42-43.7	**Failure Mode:**	Fresh
Tested Depth (ft):	42.8-43.1	**Time to Failure (min)**	7.75
Rock Type:	Grey Gneiss		
Features:	Fresh Break along foliation		

Test Specimen Information		**Elastic Moduli Test Information**	
Diameter, D (in):	1.976	**Poisson's Ratio @ 50%:**	0.53
Length, L (in):	4.465	**Strain %:**	0.243
L:D Ratio:	2.26	**E sec PSI @ 50%:**	5.48E+06





Testing Notes: Early break around 12000 lbs (4000 psi)

APPENDIX E – ROCK CORE PHOTOGRAPHS

MaineDOT Bridge No. 5785
Town Farm Rd over I-95
Sidney, ME
WIN 27266.00
Rock Core Photographs

Boring No.	Run	Depth (ft)	Recovery (in)	Recovery (%)	RQD (in)	RQD (%)	Rock Type	Box Row
BB-STFR-102	R1	20.0 - 25.0	59	98%	27	45%	PELITE	1
BB-STFR-102	R2	25.0 - 30.0	60	100%	40	67%	PELITE	2
BB-STFR-101	R1	35.0 - 37.3	26	96%	13	51%	PELITE	3
BB-STFR-101	R2	37.3 - 39.0	20	100%	0	0%	PELITE	3
BB-STFR-101	R3	39.0 - 41.0	19	79%	12	50%	PELITE	3
BB-STFR-101	R4	41.0 - 42.0	10	83%	5	42%	PELITE	4
BB-STFR-101	R5	42.0 - 45.0	36	100%	36	100%	PELITE	4

Notes:

1. Box row corresponds to the core box section in which the rock core sample is contained; Row 1=Top, Row 4=Bottom.
2. Top photo is dry, bottom photo is wet.

MaineDOT Bridge No. 5785
Town Farm Rd over I-95
Sidney, ME
WIN 27266.00
Rock Core Photographs

Boring No.	Run	Depth (ft)	Recovery (in)	Recovery (%)	RQD (in)	RQD (%)	Rock Type	Box Row
BB - STFR - 104	R1	69.0 - 74.0	58	97%	6	10%	PELITE	1
BB - STFR - 104	R2	74.5 - 79.5	53	88%	19	36%	PELITE	2
BB – STFR -103	R1	24.0 - 29.0	60	100%	10	17%	PELITE	3
BB - STFR - 103	R2	28.6 - 33.6	48	80%	23	48%	PELITE	4

Notes: 1. Box row corresponds to the core box section in which the rock core sample is contained; Row 1=Top, Row 4=Bottom.
2. Top photo is dry, bottom photo is wet.