

GEOTECHNICAL DATA REPORT

INTERSTATE 95 OVER SOUADABSCOOK STREAM EAST
BRIDGES NOS. 5949 AND 1431
HAMPDEN, MAINE
MAINEDOT WIN 21729.00 AND WIN 21729.10

by Haley & Aldrich, Inc.
Portland, Maine

for Maine Department of Transportation
Augusta, Maine

File No. 129380-004
February 2019





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22 February 2019
File No. 129380-004

Maine Department of Transportation
16 State House Station
Augusta, Maine 04333-0016

Attention: Laura Krusinski, P.E.
Senior Geotechnical Engineer

Subject: Geotechnical Data Report
Interstate 95 over Souadabscook Stream East, Bridge Nos. 5949 and 1431
Hampden, Maine
MaineDOT WIN 21729.00 and WIN 21729.10

Ladies and Gentlemen:

This geotechnical data report (GDR) presents the results of subsurface investigation and geotechnical laboratory testing programs. This work has been completed in accordance with our proposal dated 10 April 2017, and your subsequent authorization.

Project Understanding

The project consists of the replacement of two existing bridges that carry Route 95 traffic northbound and southbound over the Souadabscook Stream East in Hampden, Maine. Historic drawings of the existing bridges were provided by MaineDOT and are included in this report in Appendix D. The location of the proposed pair of bridges is shown on Figure 1, Project Locus, and Figure 2, Boring Location Plan.

Horizontal Coordinate System and Elevation Datum

Plan locations of test borings are reported as northing and easting coordinates relative to the Maine State Plane Coordinate System, North American Datum of 1983 (NAD 83), Maine 2000 Central Zone (refer to Table I and boring logs in Appendix A). Elevations referenced herein are in feet and reference the North American Vertical Datum of 1988 (NAVD 88).

Geologic Setting

According to Maine Geological Survey's Hermon Quadrangle, Maine (2013), surficial geologic units mapped at the site and surrounding area consist of the Presumpscot Formation, wetlands deposits, and glacial till. The historic test borings in the northbound lane (Bridge No. 5949) drilled at the site encountered the Presumpscot Formation (i.e., glaciomarine clays, silts and sands) overlying a relatively thick deposit of glacial till. The historic test borings in the southbound lane (Bridge No. 1431) drilled at the site encountered a more dynamic subsurface strata with variable thicknesses of the Presumpscot Formation, alluvial deposits and wetland deposits. The recent test borings drilled at the site generally encountered man-placed fill overlying alluvial deposits, overlying glacial till and bedrock. The Presumpscot Formation was not encountered in any of the recent test borings. Deposition of the alluvial deposits and Wetland Deposits occurred after deglaciation had ended and up until present day.

According to Maine Geological Survey's Bedrock Geology of the Bangor Quadrangle, Maine (1976), bedrock at the site is mapped as Silurian-Ordovician age rocks of the Vassalboro Formation. Bedrock core samples collected for this site investigation consisted of metamorphic rocks composed of phyllite.

Subsurface Explorations

PRELIMINARY DESIGN PHASE EXPLORATIONS BY HALEY & ALDRICH

Haley & Aldrich conducted a preliminary design phase geotechnical exploration program at the site of the two bridges. A total of six test borings (BB-HSS-113 through BB-HSS-118) were completed to identify subsurface conditions along the proposed bridge alignment. Test borings BB-HSS-113, BB-HSS-114, BB-HSS-117, and BB-HSS-118 were drilled through the bridge approach embankments behind the existing abutments. Test borings BB-HSS-115 and BB-HSS-116 were drilled through the bridge deck and casing was advanced from the bridge deck to the river mudline below.

Boring locations were laid out in the field by taping distances from existing site features. "As-drilled" locations and ground surface elevations at boring locations were determined by MaineDOT using GPS methods. As-drilled boring locations are shown on Figure 2. Coordinate location data and ground surface elevations at exploration locations are provided on individual test boring logs provided in Appendix A and are summarized in Table I.

All test borings were drilled by New England Boring Contractors of Hermon, Maine using either a truck-mounted Mobile B59 drill rig or track-mounted Mobile B53 drill rigs. Test borings were drilled to depths ranging from 12.0 ft to 39.8 ft below ground surface (BGS).

Test borings were advanced using cased-wash drilling methods by either driving or spinning casing. Casing consisted of 4.0-in. (HW-size) inside diameter (ID) steel casing and/or 3.0-in. (NW-size) ID steel casing. Casing blow count data is provided on the logs in Appendix A. Soil samples were generally collected continuously through the man-placed fill and then typically at 5-ft intervals once native soils were encountered. The test borings were extended to bedrock and collected approximately 10 to 15 ft of rock core.

Soils samples were collected by driving a 1-3/8-in. ID split-spoon sampler with a 140-lb hammer dropped from a height of 30 in., as indicated on the test boring logs. Drilling and sampling were performed in accordance with MaineDOT specifications. The drill rigs were equipped with automatic hammers calibrated annually per MaineDOT requirements (Appendix A of MaineDOT Geotechnical Drilling Contract Specifications, revised June 2007). A calculated hammer efficiency of 0.75, 0.677 and 0.869 were used for the calibrated automatic hammer system for the steel track-mounted Mobile Drill B-53 rig, the rubber track-mounted Mobile Drill B-53 rig, and the truck-mounted Mobile Drill B-59 rig, respectively.

The number of hammer blows required to advance the sampler through each 6-in. interval was recorded and is provided on the test boring logs. The uncorrected SPT N-value is defined as the total number of blows required to advance the sampler through the middle 12 in. of the 24-in. sampling interval. The energy-corrected SPT N-value (N₆₀) is equal to the uncorrected N-value multiplied by the hammer efficiency factor divided by 0.6 (i.e., 60 percent calculated hammer efficiency). Both the raw blow count data and the corrected N-values are shown on the boring logs.

Samples of the in-situ fill soils collected during the explorations were screened in the field with a photoionization detector (PID) to assess the presence of volatile organic compounds (VOCs). No elevated PID readings were detected during the subsurface explorations. No visual or olfactory signs of contamination/environmentally impacted soils were observed during the subsurface explorations. Refer to individual boring logs provided in Appendix A for actual PID readings.

The test borings sampled 9.7 to 15.3 ft of bedrock using a 2.0-in. (NQ-size) ID diamond-tipped core barrel. Refer to rock core photographs provided in Appendix B for detailed information on bedrock core samples collected.

All soil and bedrock samples were classified in accordance with MaineDOT classification system and were preserved in glass sample jars and wooden core boxes. The samples that were not submitted for laboratory testing are available for review upon request. Soil and bedrock samples are being stored at the Haley & Aldrich laboratory facility in Portland, Maine.

Generalized Subsurface Conditions

The subsurface conditions encountered at the site consist of the following geologic units presented in order of increasing depth below ground surface: man-placed fill, alluvial deposits, organic deposit, glacial till and bedrock.

SOIL UNIT AND BEDROCK DESCRIPTIONS

Soil

Refer to Table I for a summary of the soil units and encountered thicknesses at each test boring location. A description of each soil unit is provided separately, below. Detailed soil descriptions are provided on

the test boring logs in Appendix A. Please note that the soil descriptions provided on the test boring logs and summarized below do not represent actual field conditions other than at the specific test boring locations. The actual conditions will vary from those described and shown herein.

Unit	Approximate Range in Encountered Thickness (ft)	Generalized Description
Fill	10.1 to 22.8	Medium dense to very dense SAND, trace to some gravel, trace to little silt, occasional trace asphalt pieces (SW, SW-SM, SP-SM); loose to medium dense SAND, trace to some gravel, little silt (SM); very loose SILT, some fine sand, trace medium sand (ML) <i>(encountered behind each abutment in borings BB-HSS-113, BB-HSS-114, BB-HSS-117 and BB-HSS-118)</i>
Alluvial Deposit	0.3 to 6.6	Loose to dense SAND, trace to some gravel, trace to little silt (SP, SW-SM); medium dense to very dense SAND, little gravel, trace silt to silty (SM); dense GRAVEL, little sand, trace silt (GP) <i>(encountered in all test borings except BB-HSS-114 and BB-HSS-117)</i>
Organic Deposit	2.7	Stiff SILT, trace gravel, trace clay, contains roots and moderate organic odor (ML) <i>(encountered in BB-HSS-113)</i>
Glacial Till	0.7 to 9.1	Loose to dense GRAVEL, trace to some sand, little to some silt/clay (GW-GM, GC/GM); dense SAND, some gravel to gravelly, trace silt (SW-SM); very dense silty SAND, little gravel (SM) The glacial till was weakly-bonded to well-bonded and contained occasional cobbles and boulders. <i>(encountered in BB-HSS-114, BB-HSS-117 and BB-HSS-118)</i>

Please note, test borings performed behind the abutments encountered 0.7 to 1.2 ft of bituminous concrete with a 0.5 to 0.6 ft thick concrete approach slab underlying the bituminous concrete. Test borings performed at the midpoint of the bridge penetrated the concrete bridge deck, which had a thickness of 0.8 ft.

Bedrock

Bedrock was cored in each test boring. The top of the bedrock surface ranged from approximately 2.0 to 27.4 ft BGS (El. 105.8 to El. 118.8). Test borings BB-HSS-113, BB-HSS-115 and BB-HSS-118 encountered 0.7 to 4.2 ft of weathered bedrock overlying the bedrock. Bedrock encountered at the site consisted of soft to hard PHYLLITE.

Rock quality designation (RQD) is a common parameter that is used to help assess the competency of sampled bedrock. RQD is defined as the sum of pieces of recovered bedrock greater than 4 in. in length

divided by the total length of the core run. RQD values for bedrock encountered at the site ranged between 0 and 100 percent, this correlates to a Rock Mass Quality rating of very poor to excellent.

WATER ELEVATIONS

The water level of the Souadabscook Stream was measured while performing test boring BB-HSS-116 by measuring from the bridge deck to stream. The water level of the Souadabscook Stream was approximately El. 123.2 on 18 May 2017 in test boring BB-HSS-116.

Observation wells were not installed in any of the completed boreholes. As a result, long term static water levels at test boring locations were not determined. Water levels were taken in the completed boreholes after the casing had been extracted from the borehole and are noted on the boring logs in Appendix A. Water depths ranged from 11.0 to 13.0 ft BGS (El. 121.8 to El. 123.6). Please note that the visual observations made during drilling and water levels measured in the completed boreholes may have been affected by drilling means/methods and may not be representative of actual static water levels at the site.

In general, groundwater levels can be expected to fluctuate, subject to seasonal variation, local soil conditions, topography and precipitation. Groundwater levels encountered during construction may differ from those observed in the test borings.

Flood levels in the Soudabscook Stream, as provided by McFarland Johnson, are summarized below.

Discharge	Headwater (ft, NAVD 88)
Q _{1.1}	El. 121.03
Q ₅₀	El. 125.38
Q ₁₀₀	El. 128.55 (FEMA)
Record Flood	El. 130.05 (FEMA)

Laboratory Testing Program

A preliminary design phase laboratory testing program was undertaken on soil samples collected during the field investigation to assist in soil classification/identification and scour evaluations. In general, laboratory testing was performed on disturbed soil samples collected during SPT sampling. All laboratory soil testing was performed by GeoTesting Express, Inc. of Acton, Massachusetts. Geotechnical laboratory testing was performed in accordance with applicable American Society for Testing Materials (ASTM) testing procedures.

The preliminary design phase testing program included six grain size analyses (sieve only, no hydrometer), one organic content analyses and four compressive strength/elastic moduli of rock analyses. A summary of laboratory test results is provided below. Refer to the laboratory test results provided in Appendix C of this report.

Laboratory Test	ASTM Test Designation	Soil Unit	No. of Tests Completed	Range in Test Results
Grain Size	ASTM D 422 (Sieve Only)	Fill	5	AASHTO Classification: A-4(0), A-1-b(0), A-1-b(1) USCS Classification: SW, SM, ML
		Alluvial Deposit	1	AASHTO Classification: A-1-b(0) USCS Classification: SW-SM
Moisture content and organic matter	ASTM D 2974	Organic Deposit	1	Moisture Content: 67% Organic Matter: 12%
Compressive Strength / Elastic Moduli of Rock	ASTM D 7012	Bedrock	4	Peak Compressive Stress: 5,631 psi to 7,992 psi Young's Modulus: 2,090,000 psi to 10,200,000 psi Poisson's Ratio: 0.05 to 0.37

Closure

We appreciate the opportunity to provide geotechnical services on this project. Please do not hesitate to call if you have any questions or comments.

Sincerely yours,
HALEY & ALDRICH, INC.

Erin A. Force

Erin A. Force, P.E.
Project Manager

Wayne A. Chadbourne

Wayne A. Chadbourne, P.E.
Senior Associate



Enclosures:

- Table I – Summary of Subsurface Explorations
- Figure 1 – Project Locus
- Figure 2 – Boring Location Plan
- Appendix A – Test Boring Logs
- Appendix B – Rock Core Photographs
- Appendix C – Laboratory Test Results
- Appendix D – Historic Drawings

References

1. Griffin, John R., *Bedrock Geology of the Bangor Quadrangle, Maine*, Maine Geological Survey, Department of Conservation, Augusta, Maine, Open File Report No. 76-23, 1976.
2. Weddle, Thomas K., *Surficial Geology Hermon Quadrangle, Maine*, Maine Geological Survey, Department of Conservation, Augusta, Maine, Open File Report No. 13-13, 2013.

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TABLES

TABLE I
Summary of Subsurface Explorations
Interstate 95 over Souadabscook Stream East
Bridge Nos. 5949 and 1431
Hampden, Maine
MaineDOT WIN 21729.00 and WIN 21729.10

	Test Boring No. ¹	Coordinates ²	
		Easting	Northing
North bound	BB-HSS-114	1,700,304	461,187
	BB-HSS-116	1,700,377	461,202
	BB-HSS-118	1,700,443	461,220
South bound	BB-HSS-113	1,700,213	461,354
	BB-HSS-115	1,700,280	461,376
	BB-HSS-117	1,700,353	461,390

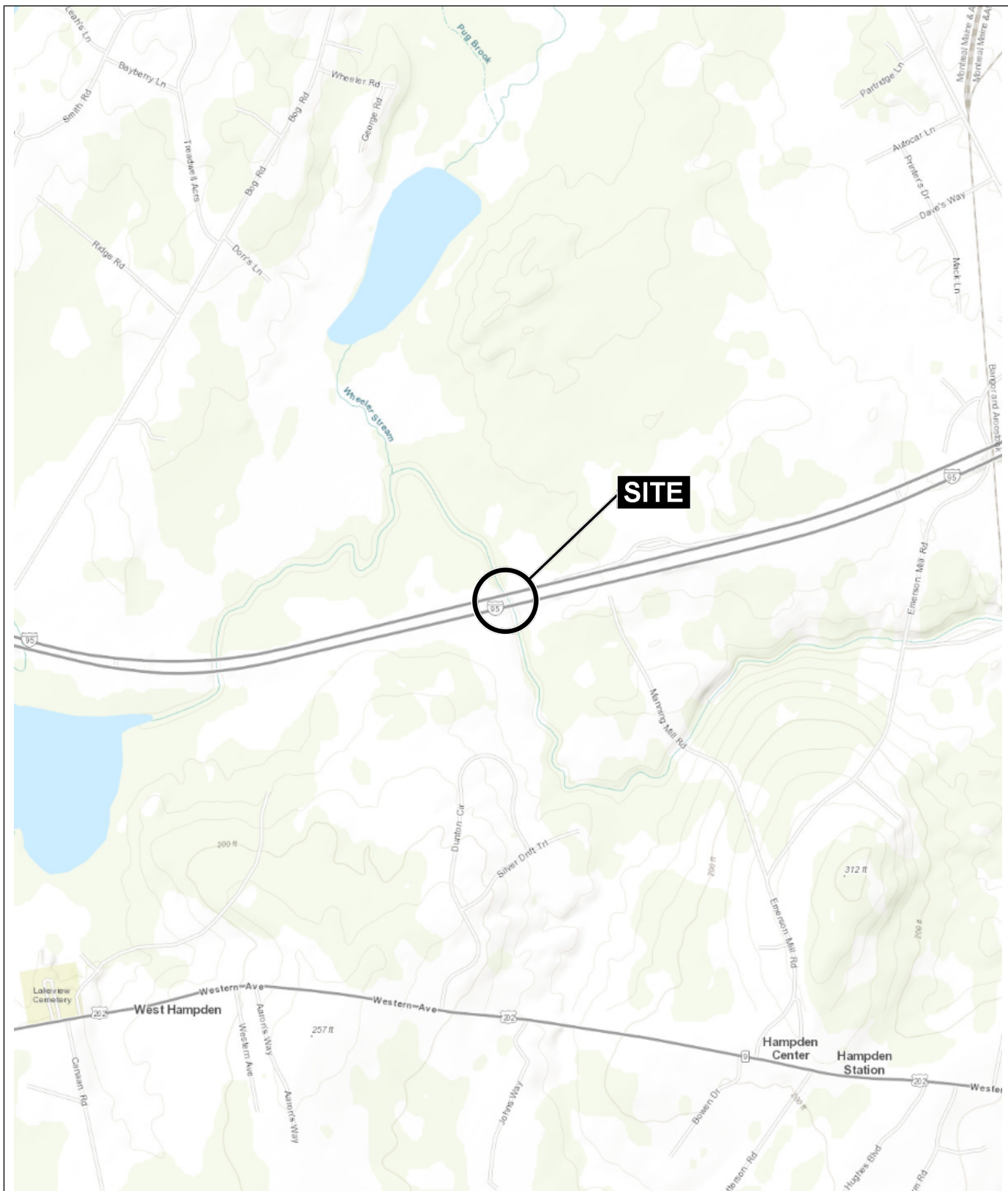
	Test Boring No. ¹	Ground Surface Elevation ^{3,4}	Approximate Strata Thickness ⁵ (ft)						Approximate Top of Bedrock Depth (ft)	Approximate Elevation of Top of Bedrock ^{3,4}	Approximate Bottom of Exploration Depth (ft)	Approximate Elevation of Bottom of Exploration ^{3,4}
			Bituminous Concrete/ Bridge Deck	Fill	Alluvial Deposit	Organic Deposit	Glacial Till	Weathered Bedrock				
North bound	BB-HSS-114	134.7	1.0	11.5	NE	NE	9.1	NE	21.6	113.1	33.4	101.3
	BB-HSS-116	114.8	0.8	NE	2.0	NE	NE	NE	2.0	112.8	12.0	102.8
	BB-HSS-118	134.6	0.9	10.1	6.6	NE	0.7	4.2	22.5	112.1	32.2	102.4
South bound	BB-HSS-113	134.8	0.7	11.6	0.3	2.7	NE	0.7	16.0	118.8	26.0	108.8
	BB-HSS-115	113.3	0.8	NE	5.7	NE	NE	1.8	7.5	105.8	22.3	91.0
	BB-HSS-117	134.8	1.2	22.8	NE	NE	3.4	NE	27.4	107.4	39.8	95.0

Notes:

- ¹ Test boring locations are shown on Figure 2, Boring Location Plan.
- ² As-drilled coordinates of test borings were determined by MaineDOT using GPS survey equipment and reference NAD 83, Maine 2000 Central Zone coordinate system.
- ³ Ground surface elevations at as-drilled test boring locations were determined by MaineDOT using GPS survey equipment.
- ⁴ Elevations are measured in feet and reference the National Geodetic Vertical Datum of 1988 (NAVD 88).
- ⁵ "NE" indicates stratum was not encountered in test boring.
- ⁶ Existing concrete bridge deck thickness encountered at both BB-HSS-115 and BB-HSS-1116 was 0.8 ft.

	Individual	Date
Prepared By:	KAR	1/11/2019
Checked By:	EAF	2/18/2019
Reviewed By:	WAC	2/21/2019

FIGURES



MAP SOURCE: ESRI

SITE COORDINATES: 44°45'55"N, 68°53'39"W



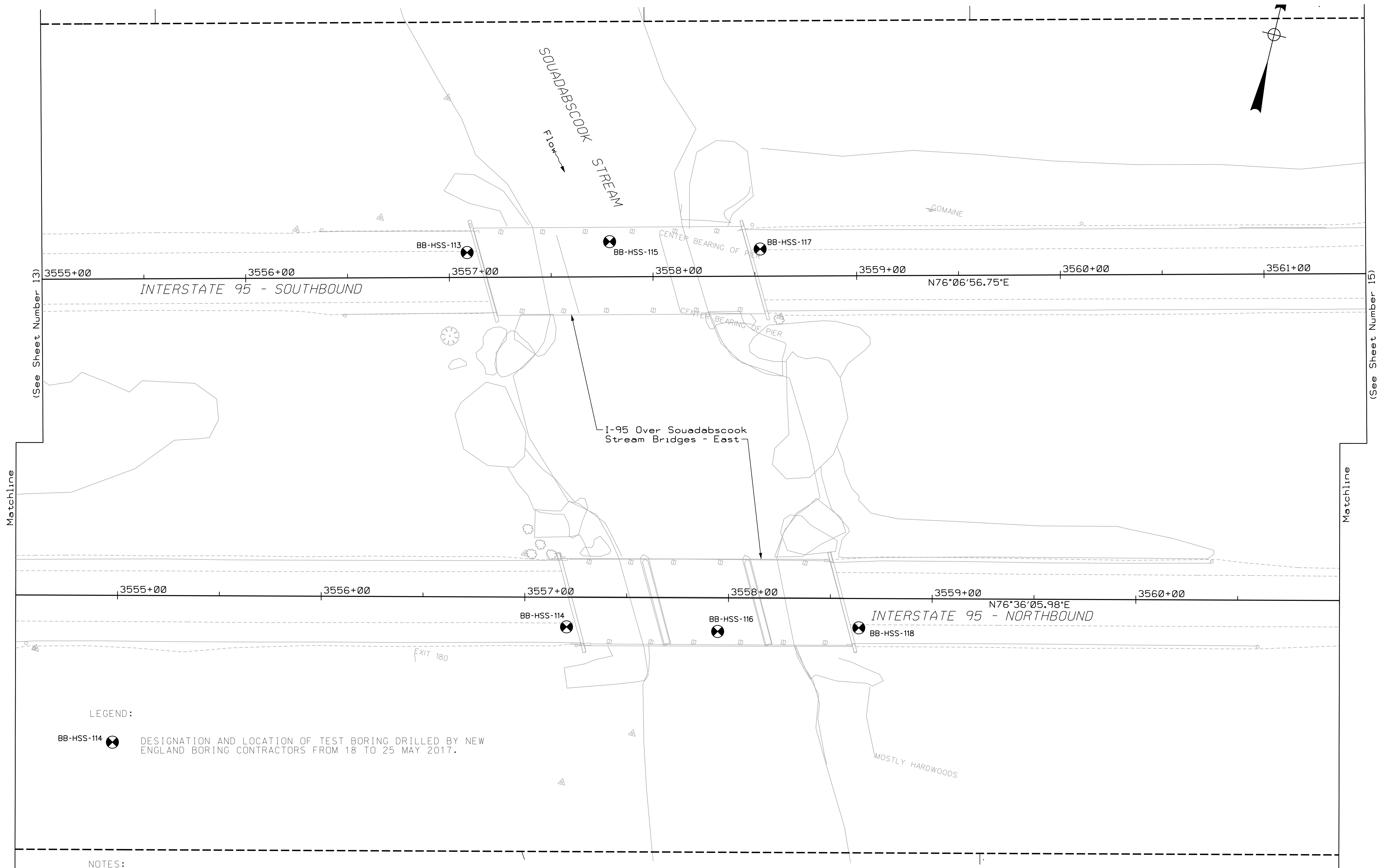
**HALEY
ALDRICH**

INTERSTATE 95 OVER SQUADABSCOOK STREAM EAST
BRIDGE NOS. 5949 AND 1431
HAMPDEN, MAINE
MAINEDOT WIN 21729.00 AND WIN 21729.10

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
FEBRUARY 2019

FIGURE 1

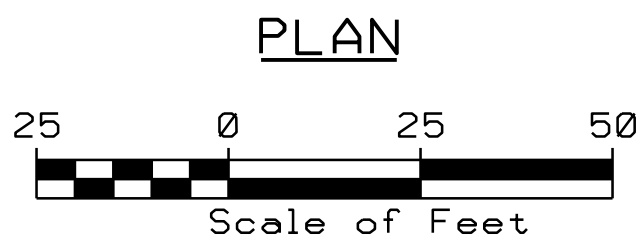


LEGEND:

BB-HSS-114 DESIGNATION AND LOCATION OF TEST BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS FROM 18 TO 25 MAY 2017.

NOTES:

1. BASE PLAN TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY MCFARLAND JOHNSON ON 15 FEBRUARY 2019.
2. AS-DRILLED LOCATIONS OF TEST BORINGS WERE DETERMINED IN THE FIELD BY MAINEDOT USING GPS SURVEY EQUIPMENT.
3. SUBSURFACE EXPLORATIONS SHOWN WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BRIDGE NOS.
5949 & 1431

WIN
21730.00 - 21730.10

BRIDGE PLANS

HAMPDEN BRIDGE BUNDLE
INTERSTATE 95
HAMPDEN, MAINE PENOBSCOT COUNTY

BORING LOCATION PLAN

SHEET NUMBER
2
OF 2

DESIGNED	02-21-19	SIGNATURE
CHECKED	02-21-19	
DESIGNED		P.E. NUMBER
CHECKED		
DESIGNED		DATE
CHECKED		
DESIGNED		FIELD CHANGES
CHECKED		

APPENDIX A

Test Boring Logs

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges Location: Hampden, Maine		Boring No.: BB-HSS-113 WIN: 21729.10					
Driller: New England Boring Contractors		Elevation (ft.): 134.8		Auger ID/OD: --							
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon-1.375 in. ID							
Logged By: M. Snow		Rig Type: Mobile Drill B-53		Hammer Wt./Fall: SS-140#/30;HW-300#/18							
Date Start/Finish: 5-25-17/5-25-17		Drilling Method: NW Drive		Core Barrel: NQ-2.0 in. ID							
Boring Location: Bridge #1431: E1700213; N461354		Casing ID/OD: HW-4.0 in. ID		Water Level*: 11.6 ft							
Hammer Efficiency Factor: 0.750		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							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
0							HW Spun	134.1		-BITUMINOUS CONCRETE-	
	1D	7/5	1.0 - 1.6	21/50(1.0)				133.2		Brown, dry, very dense, fine to coarse SAND, some gravel, trace silt -FILL-(SW) PID=0.0 ppm	
	2D	24/10	2.5 - 4.5	1/10/16/13	26	33		132.6		-CONCRETE-	
										Brown, dry, medium dense, fine to coarse SAND, some gravel, trace silt -FILL-(SW) PID=0.0 ppm	
5	3D	24/14	4.5 - 6.5	9/7/8/10	15	19	↘			Brown, dry, medium dense, fine to medium SAND, some gravel, trace coarse sand, trace silt -FILL-(SW) PID=0.0 ppm	
							35				
	4D	24/18	6.5 - 8.5	9/8/16/14	24	30	33			Brown, dry, medium dense, fine to medium SAND, some gravel, trace coarse sand, trace silt -FILL-(SW) PID=0.0 ppm	
							46				
	5D	24/12	8.5 - 10.5	10/6/10/13	16	20	46			Brown, wet, medium dense, fine to medium SAND, little silt, trace coarse sand, trace gravel -FILL-(SM) PID=0.0 ppm	
							33				
10	6D	24/14	10.5 - 12.5	4/3/1/5	4	5	36	124.8		Brown, wet, medium dense, fine to medium SAND, some gravel, little silt, trace coarse sand, moderately bonded -FILL-(SM) PID=0.0 ppm	G#426883 A-4 (0) ML
							17			Brown moist to wet, very loose, SILT, some fine sand, trace medium sand -FILL-(ML) PID=0.0 ppm	OC#426881 WC=67% OC=12%
	7D	24/18	12.5 - 14.5	4/5/4/5	9	11	26	122.5			
							31			Dark brown, wet, stiff, SILT with organics, moderate organic odor -ORGANIC DEPOSIT-(ML) Dark brown-grey, wet, stiff, SILT, trace clay, trace gravel, roots throughout sample -ORGANIC DEPOSIT-(ML)	
							51				
15	8D	7/6	15.0 - 15.6	25/40(1.0)			NW	119.8			
	R1	60/60	16.0 - 21.0	RQD = 47%			↘	119.5		Dark brown, wet, very dense, fine SAND, little silt, trace medium to coarse sand -ALLUVIAL DEPOSIT-(SM)	
								118.8			
										-WEATHERED BEDROCK-	
										Top of Bedrock at El.118.8 R1: Greenish-grey, fine grained to aphanitic, PHYLLITE, moderately hard, fresh to slight weathering. Joints dipping at moderate to steep angles, parallel to foliation, very close to close, planar to undulating, smooth to rough, tight to open. Frequent oxidized joint surfaces, quartz/calcite veins up to 0.5 in. thickness throughout core stem. Rock Mass Quality=Poor Recovery=100% R1 Core Times (min:sec): 16.0-17.0' (1:47); 17.0-18.0' (2:21); 18.0-19.0' (2:13); 19.0-20.0' (2:35); 20.0-21.0' (3:27) R2: Greenish-grey, fine grained to aphanitic, PHYLLITE, moderately hard, fresh to slight weathering. Joints dipping at moderate to steep angles, parallel to foliation, very close to close, planar to undulating, smooth to rough, tight to open. Secondary low angle joints. One	qp=5,951 psi
20											
	R2	60/60	21.0 - 26.0	RQD = 53%							
25											
Remarks: OC=Organic Content											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 1 of 2	
* 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.										Boring No.: BB-HSS-113	

Maine Department of Transportation <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				Project: Souadabscook Stream East Bridges		Boring No.: BB-HSS-113				
				Location: Hampden, Maine		WIN: 21729.10				
Driller: New England Boring Contractors		Elevation (ft.) 134.8		Auger ID/OD: --						
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon-1.375 in. ID						
Logged By: M. Snow		Rig Type: Mobile Drill B-53		Hammer Wt./Fall: SS-140#/30;HW-300#/18						
Date Start/Finish: 5-25-17/5-25-17		Drilling Method: NW Drive		Core Barrel: NQ-2.0 in. ID						
Boring Location: Bridge #1431: E1700213; N461354		Casing ID/OD: HW-4.0 in. ID		Water Level*: 11.6 ft						
Hammer Efficiency Factor: 0.750		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 _u = 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							Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows			
25								108.8	 quartz vein 1.5-in. thick at approximately 25.0 ft, thinner quartz/caliche veins throughout core stem. Rock Mass Quality=Fair Recovery=100% R2 Core Times (min:sec): 21.0-22.0' (2:35); 22.0-23.0' (2:50); 23.0-24.0' (2:31); 24.0-25.0' (3:12); 25.0-26.0' (2:43) Bottom of Exploration at 26.0 feet below ground surface.	
Remarks:	OC=Organic Content									
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.									Page 2 of 2	
* 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.									Boring No.: BB-HSS-113	

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges Location: Hampden, Maine		Boring No.: BB-HSS-114 WIN: 21729.00	
Driller: New England Boring Contractors		Elevation (ft.): 134.7		Auger ID/OD: --			
Operator: M. Porter		Datum: NAVD 88		Sampler: Split Spoon-1.375 in. ID			
Logged By: K. Russ		Rig Type: Mobile Drill B-53		Hammer Wt./Fall: SS-140#/30;HW/NW-300#/18			
Date Start/Finish: 5-18-17/5-19-17		Drilling Method: HW/NW Drive		Core Barrel: NQ-2.0 in. ID			
Boring Location: Bridge #5949: E1700304; N461187		Casing ID/OD: HW-4.0 in. ID/NW-3.0 in. ID		Water Level*:			
Hammer Efficiency Factor: 0.750		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							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
0							1	133.7		-BITUMINOUS CONCRETE-	
	1D	10/8	1.0 - 1.8	32/50(4.0)			5	132.9		Brown, dry, very dense, fine to coarse SAND, some gravel, well graded, contains asphalt	
	2D	24/18	2.5 - 4.5	8/10/20/20	30	38	17	132.4		-FILL-(SW) PID=0.0 ppm	
							10			-CONCRETE-	
	3D	24/15	4.5 - 6.5	15/17/12/12	29	36	9			Brown, dry, medium dense, fine to coarse SAND, little gravel, well graded	
5							10			-FILL-(SW) PID=0.0 ppm	
	4D	24/12	6.5 - 8.5	10/12/16/21	28	35	25			Brown, dry, medium dense, fine to coarse SAND, little gravel, well graded	
							32			-FILL-(SW) PID=0.0 ppm	
	5D	24/14	8.5 - 10.5	7/5/6/15	11	14	52			Brown, moist, medium dense, fine to coarse SAND, little fine gravel, trace silt and coarse gravel	
							27			-FILL-(SW) PID=0.0 ppm	
10							30			Brown, wet, medium dense, fine to coarse SAND, trace silt and gravel, well graded	
	6D	24/13	11.0 - 13.0	7/5/4/8	9	11	35			-FILL-(SW) PID=0.0 ppm	
							39	122.2		Brown, wet, loose, fine to coarse SAND, some gravel, trace silt, well graded	
							52			-FILL-(SW) PID=0.0 ppm	
							78	120.2		Olive-grey, moist, loose, GRAVEL, some silty clay, trace fine to coarse sand, loosely bonded	
15										-GLACIAL TILL-(GC/GM)	
	7D	24/16	15.0 - 17.0	14/19/16/16	35	44	25			Note: Drill cuttings indicate strata change at 14.5 ft.	
							16			Olive-grey, moist, dense, fine to coarse GRAVEL, little silt and coarse sand, trace fine to medium sand, well bonded	
							25			-GLACIAL TILL-(GW-GM)	
							67	116.2			
							61	115.7		Note: Drill action indicates cobble from 18.5 to 19.0 ft.	
20										-COBBLE-	
	8D	19/14	20.0 - 21.6	21/22/45/50(1.0)	67	84	25			Olive-grey, moist, very dense, silty fine SAND, trace medium to coarse sand and fine gravel, loosely to moderately bonded, weathered bedrock in spoon tip	
	R1	19/19	21.6 - 23.2	RQD = 100%			29(0.4)	113.1		-GLACIAL TILL-(SM)	
										Note: Drove NW casing to 21.4 ft. Advanced rollerbit to 21.6 ft, begin NQ rock core.	
	R2	59/57	23.2 - 28.1	RQD = 58%						Top of Bedrock at El.113.1	
25										R1: Grey to greenish-grey, aphanitic, PHYLLITE, hard to moderately hard, fresh. Joints steeply dipping parallel to foliation, moderately close, tight, planar, smooth, slightly oxidized joint surfaces.	

Remarks:

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.

Page 1 of 2

Boring No.: BB-HSS-114

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS						Project: Souadabscook Stream East Bridges		Boring No.: BB-HSS-114			
						Location: Hampden, Maine		WIN: 21729.00			
Driller: New England Boring Contractors			Elevation (ft.): 134.7			Auger ID/OD: --					
Operator: M. Porter			Datum: NAVD 88			Sampler: Split Spoon-1.375 in. ID					
Logged By: K. Russ			Rig Type: Mobile Drill B-53			Hammer Wt./Fall: SS-140#/30;HW/NW-300#/18					
Date Start/Finish: 5-18-17/5-19-17			Drilling Method: HW/NW Drive			Core Barrel: NQ-2.0 in. ID					
Boring Location: Bridge #5949: E1700304; N461187			Casing ID/OD: HW-4.0 in. ID/NW-3.0 in. ID			Water Level*:					
Hammer Efficiency Factor: 0.750			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 Information								Graphic Log	Laboratory Testing Results/AASHTO and Unified Class.	
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)			
25									 Rock Mass Quality=Excellent Recovery=100% R1 Core Times (min:sec): 21.6-22.6' (2:47); 22.6-23.2' (2:51) R2: Grey to greenish-grey, aphanitic, PHYLLITE, moderately hard, moderately weathered to fresh. Primary joints moderately dipping, parallel to foliation, moderately close to very close, tight, planar, smooth, slightly oxidized joint surfaces. Single quartz vein at 24.7 ft. Rock Mass Quality=Fair Recovery=97% R2 Core Times (min:sec): 23.2-24.2' (2:06); 24.2-25.2' (3:56); 25.2-26.2' (2:33); 26.2-27.2' (2:23); 27.2-28.1' (2:00) R3: Grey to greenish-grey, aphanitic, PHYLLITE, moderately hard to soft, severely weathered to fresh. Joints moderately dipping, moderately close, open, undulating, rough, highly weathered, silt coatings on highly weathered rock and joint surfaces. Quartz veins at 29.3, 30.2 and 30.5 ft. Moderate weathering at 30.2 ft. Rock Mass Quality=Fair Recovery=84% R3 Core Times (min:sec): 28.1-29.1' (2:11); 29.1-30.1' (2:13); 30.1-31.1' (2:13); 31.1-32.1' (2:17); 32.1-33.4' (1:28) Bottom of Exploration at 33.4 feet below ground surface.		
	R3	64/54	28.1 - 33.4	RQD = 66%							
30											
40											
50											
Remarks:											
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.											
Page 2 of 2										Boring No.: BB-HSS-114	

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges Location: Hampden, Maine				Boring No.: BB-HSS-115 WIN: 21729.10				
Driller: New England Boring Contractors				Elevation (ft.): 113.3				Auger ID/OD: --				
Operator: B. Enos				Datum: NAVD 88				Sampler: Split Spoon-1.375 in. ID				
Logged By: C. Simmons				Rig Type: Mobile Drill B-59				Hammer Wt./Fall: SS-140#/30;HW-300#/18				
Date Start/Finish: 5-25-17/5-25-17				Drilling Method: HW Drive				Core Barrel: NQ-2.0 in. ID				
Boring Location: Bridge #1431: E1700280; N461376				Casing ID/OD: HW-4.0 in. ID				Water Level*:				
Hammer Efficiency Factor: 0.869				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								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows					
0	1D	24/6	0.0 - 2.0	1/20/11/8	31	45						
	R1	23/12	2.6 - 4.5					110.7				
	2D	20/16	4.5 - 6.2	5/6/64/100(2.0)	68	98		108.8				
5								107.6				
	R2	20/15	7.0 - 8.7	RQD = 40%				106.3				
	R3	47/13	8.7 - 12.6	RQD = 17%				105.8				
10												
	R4	19/15	12.6 - 14.2	RQD = 0%				100.5				
	R5	34/20	14.2 - 17.0	RQD = 29%								
15												
	R6	19/16	17.0 - 18.6	RQD = 21%								
	R7	44/44	18.6 - 22.3	RQD = 89%								
20												
								91.0				
25												
Remarks:												
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.											Page 1 of 2 Boring No.: BB-HSS-115	

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges Location: Hampden, Maine		Boring No.: BB-HSS-115 WIN: 21729.10					
Driller: New England Boring Contractors		Elevation (ft.) 113.3		Auger ID/OD: --							
Operator: B. Enos		Datum: NAVD 88		Sampler: Split Spoon-1.375 in. ID							
Logged By: C. Simmons		Rig Type: Mobile Drill B-59		Hammer Wt./Fall: SS-140#/30;HW-300#/18							
Date Start/Finish: 5-25-17/5-25-17		Drilling Method: HW Drive		Core Barrel: NQ-2.0 in. ID							
Boring Location: Bridge #1431: E1700280; N461376		Casing ID/OD: HW-4.0 in. ID		Water Level*:							
Hammer Efficiency Factor: 0.869		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_u = Unconfined Compressive Strength (ksf) N-uncorrected = Raw Field SPT N-value Hammer Efficiency Factor = Rig Specific Annual Calibration Value N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N₆₀ = (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								Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)			
25									Recovery=84% R6 Core Times (min:sec): 17.0-18.0' (2:34); 18.0-18.6' (2:31) R7: Grey, fine grained to aphanitic, PHYLLITE, medium hard, fresh to slightly weathered. Joints dipping at steep angles, close, tight to open. No distinct foliation equi granular, one secondary low angle joint at 21.5 ft. Rock Mass Quality=Very Poor Recovery=100% R7 Core Times (min:sec): 18.6-19.6' (1:02); 19.6-20.6' (1:11); 20.6-21.6' (1:13); 21.6-22.3' (1:39) Bottom of Exploration at 22.3 feet below ground surface.	22.3	
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 2 of 2	
* 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.										Boring No.: BB-HSS-115	

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges Location: Hampden, Maine				Boring No.: BB-HSS-116 WIN: 21729.00																																																																																																																																																																																																																																																									
Driller: New England Boring Contractors				Elevation (ft.): 114.8				Auger ID/OD: --																																																																																																																																																																																																																																																									
Operator: B. Enos				Datum: NAVD 88				Sampler: Split Spoon-1.375 in. ID																																																																																																																																																																																																																																																									
Logged By: T. Snow				Rig Type: Mobile Drill B-53				Hammer Wt./Fall: SS-140#/30;NW-300#/18																																																																																																																																																																																																																																																									
Date Start/Finish: 5-18-17/5-18-17				Drilling Method: NW Drive				Core Barrel: NQ-2.0 in. ID																																																																																																																																																																																																																																																									
Boring Location: Bridge #5949: E1700377; N461202				Casing ID/OD: NW-4.0 in. ID				Water Level*: 11.6 ft from bridge deck																																																																																																																																																																																																																																																									
Hammer Efficiency Factor: 0.677				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 N₆₀ = SPT N-uncorrected Corrected for Hammer Efficiency N₆₀ = (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																																																																																																																																																																																																																																																																	
<table><tr><th rowspan="2">Depth (ft.)</th><th colspan="8">Sample Information</th><th rowspan="2">Graphic Log</th><th rowspan="2">Visual Description and Remarks</th><th rowspan="2">Laboratory Testing Results/ AASHTO and Unified Class.</th></tr><tr><th>Sample No.</th><th>Pen./Rec. (in.)</th><th>Sample Depth (ft.)</th><th>Blows (/6 in.) Shear Strength (psf) or RQD (%)</th><th>N-uncorrected</th><th>N₆₀</th><th>Casing Blows</th><th>Elevation (ft.)</th></tr><tr><td rowspan="4">0</td><td>1D</td><td>1/0.5</td><td>0.0 - 0.1</td><td>50(0.25)</td><td></td><td></td><td></td><td></td><td rowspan="4">112.8</td><td rowspan="4"></td><td rowspan="4">Note: Deck concrete thickness 9-in. Deck to mudline 20.0 ft. All samples are referenced to depth below mudline. Gray, wet, GRAVEL -ALLUVIAL DEPOSIT- Note: Split spoon refusal at 0.1 ft. Drove casing to 2.0 ft. Begin core run at 2.0 ft.</td><td rowspan="4">qp=7,992 psi</td></tr><tr><td>R1</td><td>36/36</td><td>2.0 - 5.0</td><td>RQD = 42%</td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="4">5</td><td>R2</td><td>38/39</td><td>5.0 - 8.2</td><td>RQD = 34%</td><td></td><td></td><td></td><td></td><td rowspan="4">102.8</td><td rowspan="4"></td><td rowspan="4">Top of Bedrock at El.112.8 R1: Grey, very fine grained, PHYLLITE with quartz veins, hard, slightly weathered joint surfaces. Primary joints high angle, very close to close, open to tight, smooth. Secondary joints horizontal, very close to close, open, rough. Rock Mass Quality=Poor Recovery=100% R1 Core Times (min:sec): 2.0-3.0' (3.45); 3.0-4.0' (3:30); 4.0-5.0' (3:30) R2: Grey, very fine grained, PHYLLITE with quartz veins, hard, slightly weathered joint surfaces. Primary joints high angle, very close to close open to tight, smooth. Secondary joints horizontal, very close to close, open, rough. Rock Mass Quality=Poor Recovery=100% R2 Core Times (min:sec): 5.0-6.0' (2:30); 6.0-7.0' (2:45); 7.0-8.0' (2:30) R3: Grey, very fine grained, PHYLLITE with quartz veins, hard, slightly weathered joint surfaces. Primary joints high angle, very close to close open to tight, smooth. Secondary joints horizontal, very close to close, open, rough. Rock Mass Quality=Fair Recovery=100% R3 Core Times (min:sec): 8.2-9.0' (3:30) R4: Grey, very fine grained, PHYLLITE with quartz veins, hard, slightly weathered joint surfaces. Primary joints high angle, very close to close open to tight, smooth. Secondary joints horizontal, very close to close, open, rough. Rock Mass Quality=Fair Recovery=100% R4 Core Times (min:sec): 9.0-10.0' (3:00); 10.0-11.0' (3:00); 11.0-12.0' (2:45)</td><td rowspan="4"></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="4">10</td><td>R3</td><td>10/10</td><td>8.2 - 9.0</td><td>RQD = 60%</td><td></td><td></td><td></td><td></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td></tr><tr><td>R4</td><td>36/36</td><td>9.0 - 12.0</td><td>RQD = 69%</td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="4">15</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="4">20</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="4">25</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>												Depth (ft.)	Sample Information								Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)	0	1D	1/0.5	0.0 - 0.1	50(0.25)					112.8		Note: Deck concrete thickness 9-in. Deck to mudline 20.0 ft. All samples are referenced to depth below mudline. Gray, wet, GRAVEL -ALLUVIAL DEPOSIT- Note: Split spoon refusal at 0.1 ft. Drove casing to 2.0 ft. Begin core run at 2.0 ft.	qp=7,992 psi	R1	36/36	2.0 - 5.0	RQD = 42%																					5	R2	38/39	5.0 - 8.2	RQD = 34%					102.8		Top of Bedrock at El.112.8 R1: Grey, very fine grained, PHYLLITE with quartz veins, hard, slightly weathered joint surfaces. Primary joints high angle, very close to close, open to tight, smooth. Secondary joints horizontal, very close to close, open, rough. Rock Mass Quality=Poor Recovery=100% R1 Core Times (min:sec): 2.0-3.0' (3.45); 3.0-4.0' (3:30); 4.0-5.0' (3:30) R2: Grey, very fine grained, PHYLLITE with quartz veins, hard, slightly weathered joint surfaces. Primary joints high angle, very close to close open to tight, smooth. Secondary joints horizontal, very close to close, open, rough. Rock Mass Quality=Poor Recovery=100% R2 Core Times (min:sec): 5.0-6.0' (2:30); 6.0-7.0' (2:45); 7.0-8.0' (2:30) R3: Grey, very fine grained, PHYLLITE with quartz veins, hard, slightly weathered joint surfaces. Primary joints high angle, very close to close open to tight, smooth. Secondary joints horizontal, very close to close, open, rough. Rock Mass Quality=Fair Recovery=100% R3 Core Times (min:sec): 8.2-9.0' (3:30) R4: Grey, very fine grained, PHYLLITE with quartz veins, hard, slightly weathered joint surfaces. Primary joints high angle, very close to close open to tight, smooth. Secondary joints horizontal, very close to close, open, rough. 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Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges Location: Hampden, Maine		Boring No.: BB-HSS-117 WIN: 21729.10	
Driller: New England Boring Contractors		Elevation (ft.): 134.8		Auger ID/OD: --			
Operator: B. Enos		Datum: NAVD 88		Sampler: Split Spoon-1.375 in. ID			
Logged By: C. Simmons		Rig Type: Mobile Drill B-59		Hammer Wt./Fall: SS-140#/30;HW-300#/18			
Date Start/Finish: 5-25-17/5-25-17		Drilling Method: NW Drive		Core Barrel: NQ-2.0 in. ID			
Boring Location: Bridge #1431: E1700353; N461390		Casing ID/OD: HW-4.0 in. ID		Water Level*: 13.0 ft			
Hammer Efficiency Factor: 0.869		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								Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows					
0											-BITUMINOUS CONCRETE-	
									133.6			
									133.3		-CRUSHED STONE-	1.2
	1D	24/15	2.0 - 4.0	3/6/8/8	14	20			132.8		-CONCRETE-	1.5
												2.0
5	2D	24/2	4.0 - 6.0	7/7/5/8	12	17					Brown and grey, dry, medium dense, fine to medium SAND, little coarse sand, little fine gravel, trace silt, trace coarse gravel -FILL-(SW-SM) PID=0.5 ppm	
											Brown, dry, medium dense, fine to medium sand, little coarse sand, little fine gravel, trace silt -FILL-(SW-SM) PID=0.6 ppm	
	3D	24/15	6.0 - 8.0	7/11/13/12	24	35					Brown, dry, medium dense, fine to medium SAND, little coarse sand, little fine gravel, trace silt -FILL-(SW-SM) PID=0.0 ppm	
	4D	24/19	8.0 - 10.0	5/5/6/7	11	16					Brown, dry, medium dense, fine to medium SAND, little coarse sand, trace silt, trace gravel -FILL-(SW-SM) PID=0.0 ppm	
10												
	5D	24/24	10.0 - 12.0	11/8/10/8	18	26					Brown, dry, medium dense, fine to medium SAND, little fine gravel, little coarse sand, little silt, trace coarse gravel -FILL-(SW-SM) PID=0.1 ppm	
	6D	24/21	12.0 - 14.0	14/14/12/11	26	38					Brown, moist, medium dense, fine to medium SAND, little silt, trace coarse sand and gravel -FILL-(SM) PID=0.0 ppm	
	7D	24/7	14.0 - 16.0	13/12/15/17	27	39					Brown, wet, medium dense, fine SAND, some medium sand, trace coarse sand, trace silt -FILL-(SP-SM) PID=0.1 ppm	
15												
	8D	24/18	16.0 - 18.0	8/5/5/11	10	14					Brown, wet, loose, fine to coarse SAND, some fine gravel, little silt -FILL-(SM) PID=0.0 ppm	G#426886 A-1-b (0) SM
	9D	24/8	18.0 - 20.0	7/7/19/15	26	38					Brown, wet, medium dense, fine to coarse SAND, trace gravel, trace silt -FILL-(SW-SM) PID=0.0 ppm	
20												
	10D	24/8	20.0 - 22.0	12/14/10/7	24	35					Brown, wet, medium dense, fine to coarse SAND, little gravel, trace silt -FILL-(SM) PID=0.0 ppm	
	11D	24/0	22.0 - 24.0	12/11/10/7	21	30					No Recovery	
25	12D	24/4	24.0 - 26.0	11/16/32/22	48	70			110.8		Grey, wet, dense, gravelly fine to coarse SAND, trace silt	24.0

Remarks:

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.

Page 1 of 2

Boring No.: BB-HSS-117

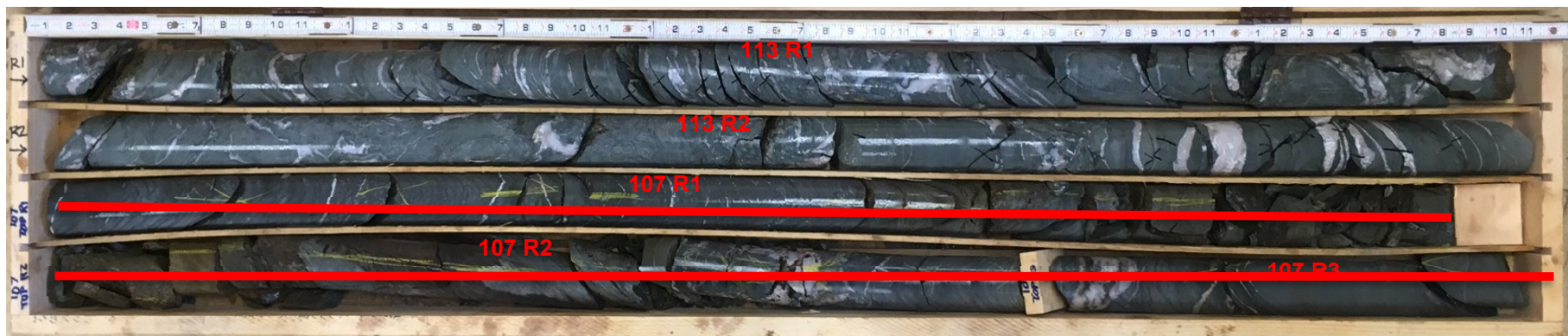
Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges Location: Hampden, Maine		Boring No.: BB-HSS-117 WIN: 21729.10					
Driller: New England Boring Contractors			Elevation (ft.) 134.8		Auger ID/OD: --						
Operator: B. Enos			Datum: NAVD 88		Sampler: Split Spoon-1.375 in. ID						
Logged By: C. Simmons			Rig Type: Mobile Drill B-59		Hammer Wt./Fall: SS-140#/30;HW-300#/18						
Date Start/Finish: 5-25-17/5-25-17			Drilling Method: NW Drive		Core Barrel: NQ-2.0 in. ID						
Boring Location: Bridge #1431: E1700353; N461390			Casing ID/OD: HW-4.0 in. ID		Water Level*: 13.0 ft						
Hammer Efficiency Factor: 0.869			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 _u = 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							Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows				
25										-GLACIAL TILL-(SW-SM)	
	13D	17/11	26.0 - 27.4	16/20/50(5.0)	70	101		107.4		Grey, wet, very dense, fine to coarse SAND, some gravel, trace silt -GLACIAL TILL-(SM) Top of Bedrock at El.107.4 Note: Begin NQ rock core at 30.0 ft.	
30											
	R1	56/56	30.0 - 34.7	RQD = 82%						R1: Grey, fine grained to aphanitic, PHYLLITE, moderately hard, fresh to slightly weathered. Joints dipping at low to moderate angles, open joints. Quartz veins present throughout core stem, moderate to high angle foliation. Oxidized joint surfaces. Rock Mass Quality=Good Recovery=100% R1 Core Times (min:sec): 30.0-31.0' (1:52); 31.0-32.0' (1:58); 32.0-33.0' (2:17); 33.0-34.0' (2:48); 34.0-35.0' (1:55)	
35											
	R2	61/61	34.7 - 39.8	RQD = 75%						R2: Grey, fine grained to aphanitic, PHYLLITE, moderately hard to medium, fresh to slightly weathered. Joints dipping at low to moderate angles, open joints. Quartz intrusion at 37.3 ft. Joint surfaces are slightly to moderately weathered. Rock Mass Quality=Fair Recovery=100% R2 Core Times (min:sec): 35.0-36.0' (1:49); 36.0-37.0' (1:51); 37.0-38.0' (2:21); 38.0-39.0' (2:24); 39.0-39.8' (3:03)	
40								95.0		Bottom of Exploration at 39.8 feet below ground surface.	
45											
50											
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 2 of 2	
* 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.										Boring No.: BB-HSS-117	

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: Souadabscook Stream East Bridges Location: Hampden, Maine		Boring No.: BB-HSS-118 WIN: 21729.00					
Driller: New England Boring Contractors		Elevation (ft.) 134.6		Auger ID/OD: --							
Operator: B. Enos		Datum: NAVD 88		Sampler: Split Spoon-1.375 in. ID							
Logged By: T. Snow		Rig Type: Mobile Drill B-53		Hammer Wt./Fall: SS-140#/30;NW-300#/18							
Date Start/Finish: 5-18-17/5-18-17		Drilling Method: NW Drive		Core Barrel: NQ-2.0 in. ID							
Boring Location: Bridge #5949: E1700443; N461220		Casing ID/OD: NW-3.0 in. ID		Water Level*: 11.0 ft							
Hammer Efficiency Factor: 0.677		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								Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N ₆₀	Casing Blows	Elevation (ft.)			
0								133.7	-BITUMINOUS CONCRETE-		
									-CONCRETE/COARSE GRAVEL-	0.9	
								132.0		2.6	
	1D	24/16	3.0 - 5.0	17/25/16/16	41	46			Brown to grey, dry, dense, medium SAND and GRAVEL, some fine sand, little coarse sand, little silt -FILL-(SW) PID=0.0 ppm		
5											
	2D	24/18	5.0 - 7.0	17/11/12/13	23	26			Brown, dry, medium dense, fine to coarse SAND, little gravel, little silt -FILL-(SM) PID=0.0 ppm		G#426887 A-1-b (0) SM
	3D	24/14	7.0 - 9.0	19/21/16/18	37	42			Brown, moist, dense, fine to medium SAND, little coarse sand, little gravel, trace silt, well graded -FILL-(SM) PID=0.0 ppm		
	4D	20/16	9.0 - 10.7	19/17/20/21	37	42			Brown, moist, dense, fine to medium SAND, little coarse sand, little gravel, trace silt -FILL-(SM) PID=0.0 ppm		
10								123.6		11.0	
	5D	24/24	11.0 - 13.0	16/16/20/21	36	41			Brown, wet, dense, fine to medium SAND, trace coarse sand, trace gravel, poorly graded -ALLUVIAL DEPOSIT-(SP)		
	6D	24/10	13.0 - 15.0	10/14/12/10	26	29			Brown, wet, medium dense, fine to medium SAND, little coarse sand, little gravel, trace silt -ALLUVIAL DEPOSIT-(SM)		
15											
	7D	24/9	15.0 - 17.0	9/4/1/1	5	6			Brown to grey-brown, wet, loose, fine to coarse SAND, some gravel, little silt, silt lens at 16.8 ft -ALLUVIAL DEPOSIT-(SW-SM)		G#426888 A-1-b(0) SW-SM
								117.0		17.6	
								116.3	-GLACIAL TILL-	18.3	
20											
	8D	14/-	20.0 - 21.2	71/43/50(2.0)					Grey, wet, very dense, GRAVEL, little sand, trace silt -WEATHERED BEDROCK-(GP)		
	R1	8/8	22.5 - 23.2	RQD = 0%				112.1		22.5	
	R2	22/18	23.2 - 25.0	RQD = 73%					Top of Bedrock at El. 112.1 R1: Grey, fine grained, PHYLLITE with quartz veins, hard, joint surfaces slightly weathered. Primary joints high angle, very close to close, open to tight, smooth. Secondary joints horizontal, close to moderate, open, rough.		
25											
Remarks:											
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.										Page 1 of 2 Boring No.: BB-HSS-118	

Maine Department of Transportation <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				Project: Souadabscook Stream East Bridges Location: Hampden, Maine				Boring No.: BB-HSS-118 WIN: 21729.00																																																																																																																																																																																	
Driller: New England Boring Contractors				Elevation (ft.) 134.6				Auger ID/OD: --																																																																																																																																																																																	
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Boring Location: Bridge #5949: E1700443; N461220				Casing ID/OD: NW-3.0 in. ID				Water Level*: 11.0 ft																																																																																																																																																																																	
Hammer Efficiency Factor: 0.677				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																																																																																																																																																																																	
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<table><tr><td rowspan="3">25</td><td>R3</td><td>11/11</td><td>25.0 - 25.9</td><td>RQD = 82%</td><td></td><td></td><td></td><td></td><td rowspan="3">102.4</td><td rowspan="3"></td><td rowspan="3">Rock Mass Quality=Very Poor Recovery=100% R1 Core Times (min:sec): 22.5-23.2' (3:00) R2: Grey, fine grained, PHYLLITE with quartz veins, hard, joint surfaces slightly weathered. Primary joints high angle, very close to close, open to tight, smooth. Secondary joints horizontal, close to moderate, open, rough. Rock Mass Quality=Good Recovery=82% R2 Core Times (min:sec): 23.2-24.2' (2:30); 24.2-25.0' (2:00) R3: Grey, fine grained, PHYLLITE with quartz veins, hard, joint surfaces slightly weathered. Primary joints high angle, very close to close, open to tight, smooth. Secondary joints horizontal, close to moderate, open, rough. 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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.																																																																																																																																																																																									
Page 2 of 2																																																																																																																																																																																									
Boring No.: BB-HSS-118																																																																																																																																																																																									

APPENDIX B

Rock Core Photographs



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. ^{NOTE 1}	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-113	R1	16.0 to 21.0	118.8 to 113.8	60	100	28	47
BB-HSS-113	R2	21.0 to 26.0	113.8 to 108.8	60	100	32	53
BB-HSS-107	R1	38.9 to 43.9	95.8 to 90.8	56	93	35	58
BB-HSS-107	R2	43.9 to 47.3	90.8 to 87.4	32	78	15	37
BB-HSS-107	R3	47.3 to 48.9	87.4 to 85.8	19	100	19	100

NOTES:

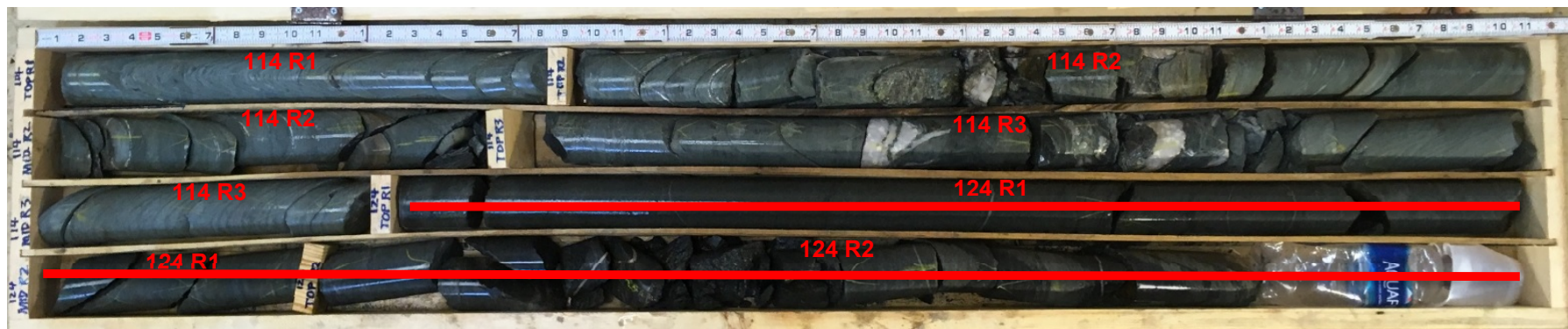
1. ELEVATIONS ARE MEASURED IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. "RQD" INDICATES ROCK QUALITY DESIGNATION (PERCENT OF ROCK PIECES RECOVERED EQUAL TO OR GREATER THAN 4 IN. IN LENGTH).
3. RED LINES DRAWN THROUGH ROCK CORE PHOTOGRAPHS/TABLE INDICATE THAT ROCK CORE WAS COLLECTED FROM AN ADJACENT BRIDGE STRUCTURE. REFER TO OTHER BRIDGE REPORTS.

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BRIDGE NOS. 5949 AND 1431
HAMDEN, MAINE
MAINEDOT WIN 21729.00 AND WIN 21729.10

**PHOTOGRAPH OF
BEDROCK CORE
BORING: BB-HSS-113**



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. ^{NOTE 1}	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-114	R1	21.6 to 23.2	113.1 to 111.5	19	100	19	100
BB-HSS-114	R2	23.2 to 28.1	111.5 to 106.6	57	97	34	58
BB-HSS-114	R3	28.1 to 33.4	106.6 to 101.3	54	84	42	66
BB-HSS-124	R1	37.5 to 42.5	125.3 to 120.3	55	92	52	87
BB-HSS-124	R2	42.5 to 45.5	120.3 to 117.3	36	100	28	78

NOTES:

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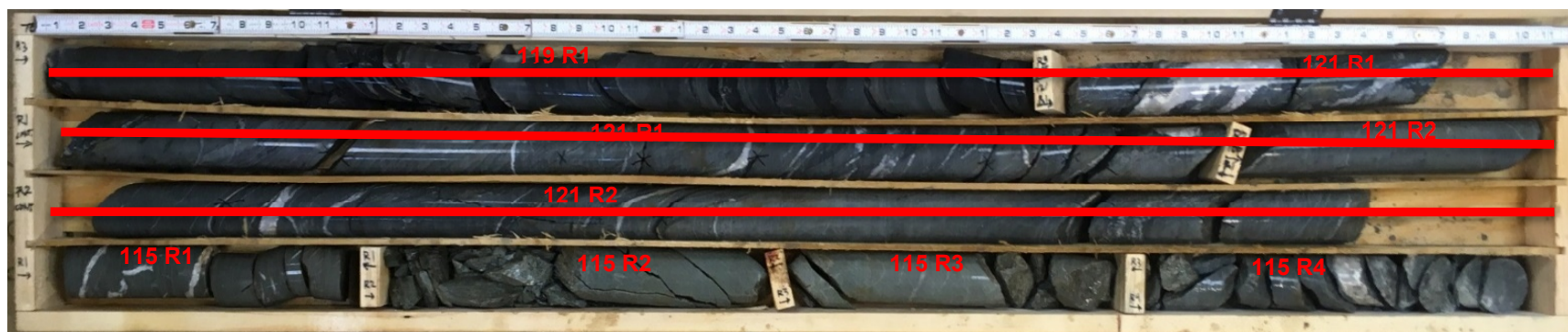
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**PHOTOGRAPH OF
BEDROCK CORE
BORING: BB-HSS-114**

FILE NO. 129380-004

February 2019



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. ^{NOTE 1}	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-119	R3	62.0 to 65.4	101.8 to 98.4	38	93	29	71
BB-HSS-121	R1	28.7 to 33.7	110.7 to 105.7	59	98	48	60
BB HSS 121	R2	33.7 to 38.7	105.7 to 100.7	59	98	59	98
BB-HSS-115	R1 (BOULDER)	2.6 to 4.5	110.7 to 108.8	NA	NA	NA	NA
BB-HSS-115	R2	7.0 to 8.7	106.3 to 104.6	15	75	8	40
BB-HSS-115	R3	8.7 to 12.6	104.6 to 100.7	13	28	8	17
BB-HSS-115	R4	12.6 to 14.2	100.7 to 99.1	15	79	0	0

NOTES:

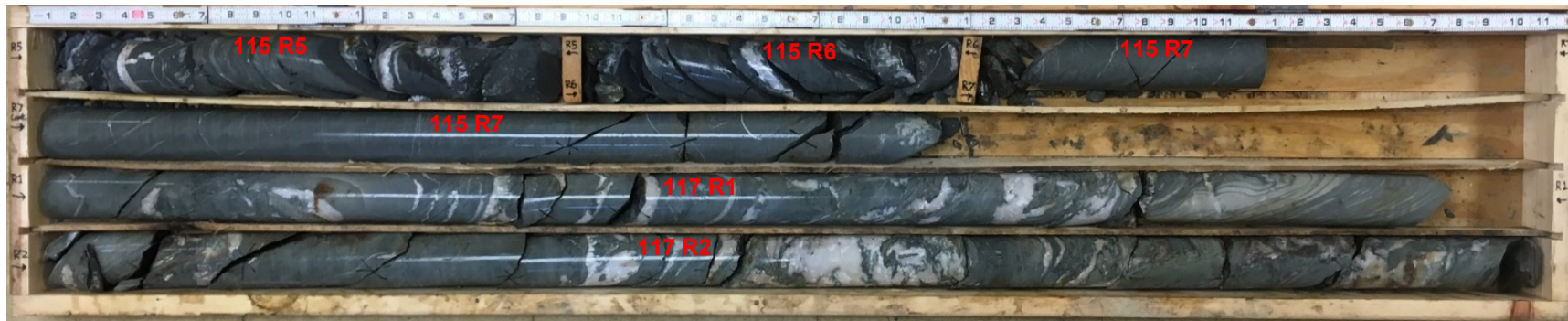
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**PHOTOGRAPH OF
BEDROCK CORE
BORING: BB-HSS-115**



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. ^{NOTE 1}	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-115	R5	14.2 to 17.0	99.1 to 96.3	20	59	10	29
BB-HSS-115	R6	17.0 to 18.6	96.3 to 94.7	16	84	4	21
BB-HSS-115	R7	18.6 to 22.3	94.7 to 91.0	44	100	39	89
BB-HSS-117	R1	30.0 to 34.7	104.8 to 100.1	56	100	46	82
BB-HSS-117	R2	34.7 to 39.8	100.1 to 95.0	61	100	46	75

NOTES:

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**PHOTOGRAPH OF
BEDROCK CORE
BORING: BB-HSS-115
AND BB-HSS-117**



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. ^{NOTE 1}	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-116	R1	2.0 to 5.0	112.8 to 109.8	36	100	15	42
BB-HSS-116	R2	5.0 to 8.2	109.8 to 106.6	39	100	13	34
BB-HSS-116	R3	8.2 to 9.0	106.6 to 105.8	10	100	6	60
BB-HSS-116	R4	9.0 to 12.0	105.8 to 102.8	36	100	25	69
BB-HSS-122	R3	28.7 to 32.7	111.9 to 107.9	48	100	38	79

NOTES:

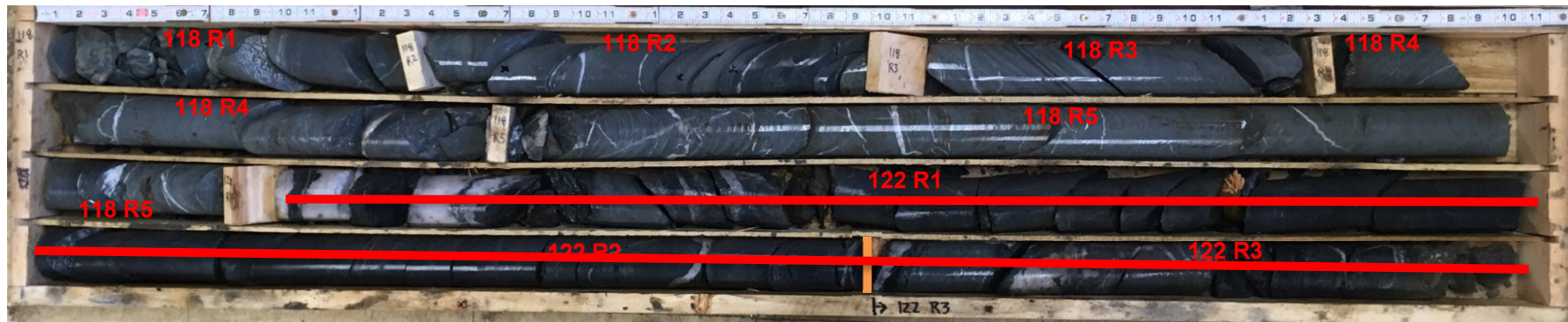
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**PHOTOGRAPH OF
BEDROCK CORE
BORING: BB-HSS-116**



BORING ID	CORE ID	CORE RUN DEPTH (FT)	CORE RUN EL. ^{NOTE 1}	RECOVERY		RQD ^{NOTE 2}	
				IN.	%	IN.	%
BB-HSS-118	R1	22.5 to 23.2	112.1 to 111.4	8	100	0	0
BB-HSS-118	R2	23.2 to 25.0	111.4 to 109.6	18	82	16	73
BB-HSS-118	R3	25.0 to 25.9	109.6 to 108.7	11	100	9	82
BB-HSS-118	R4	25.9 to 27.9	108.7 to 106.7	20	83	15	63
BB-HSS-118	R5	27.9 to 32.2	106.7 to 102.4	49	94	39	75
BB-HSS-122	R1	22.5 to 25.7	118.1 to 114.9	38	100	27	71
BB-HSS-122	R2	25.7 to 28.7	114.9 to 111.9	36	100	31	86
BB-HSS-122	R3	28.7 to 32.7	111.9 to 107.9	48	100	38	79

NOTES:

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BRIDGE NOS. 5949 AND 1431
HAMDEN, MAINE
MAINEDOT WIN 21729.00 AND WIN 21729.10

**PHOTOGRAPH OF
BEDROCK CORE
BORING: BB-HSS-118**

FILE NO. 129380-004

February 2019

APPENDIX C

Laboratory Test Results



Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East #1431 and 5949		
Location:	Hampden, ME	Project No:	GTX-307096
Boring ID:	BB-HSS-113	Sample Type:	jar
Sample ID:	6DB	Test Date:	10/06/17
Depth :	12.3-12.5 ft	Test Id:	426881
Test Comment:	---		
Visual Description:	Moist, very dark brown sandy clay with organics		
Sample Comment:	---		

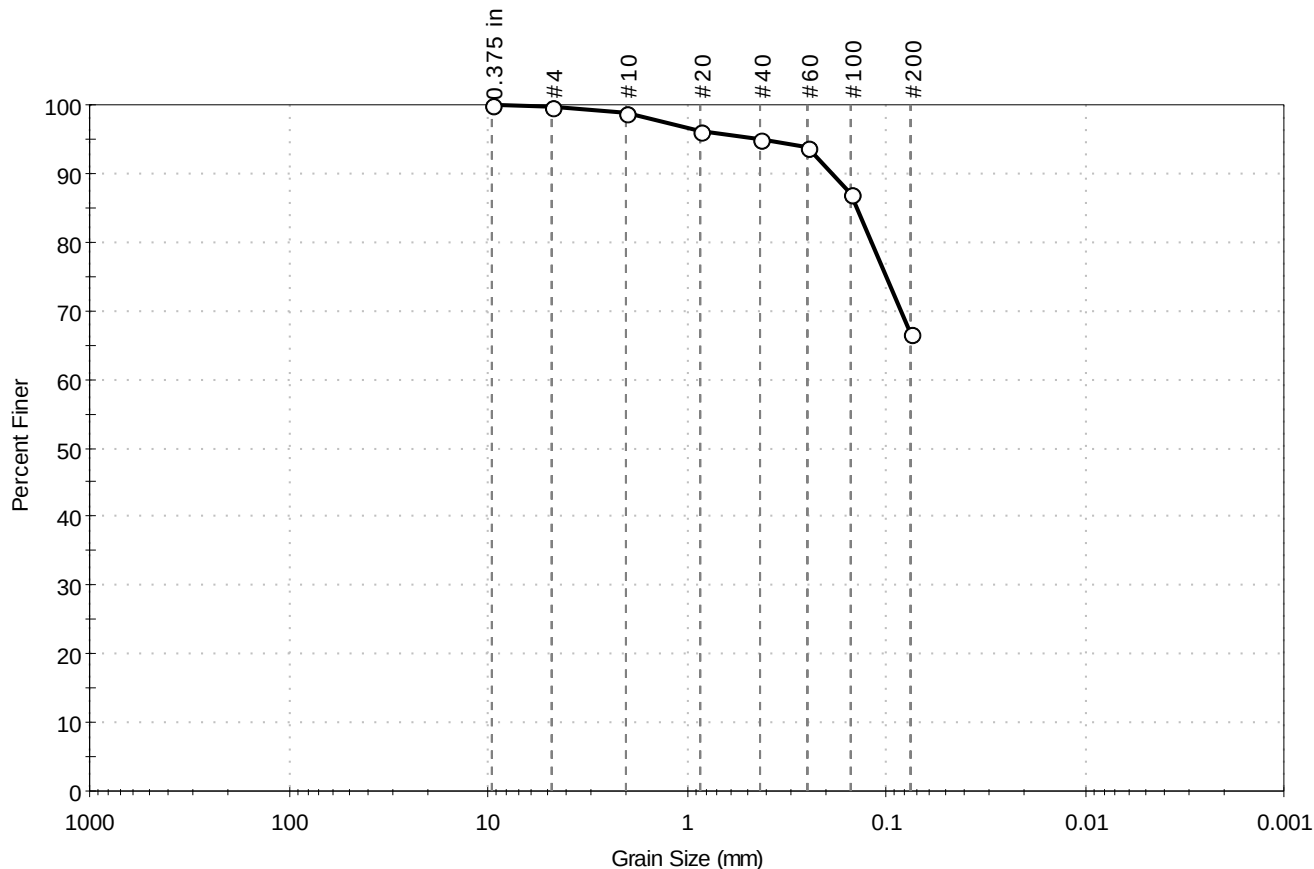
Moisture, Ash, and Organic Matter - ASTM D2974

Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
BB-HSS-113	6DB	12.3-12.5 ft	Moist, very dark brown sandy clay with organics	67	88.0	12.0

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass;
dried to a constant mass at temperature of 105° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C

Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East #1431 and 5949		
Location:	Hampden, ME	Project No:	GTX-307096
Boring ID:	BB-HSS-113	Sample Type:	jar
Sample ID:	6DA	Test Date:	10/06/17
Depth :	10.5-12.3 ft	Test Id:	426883
Test Comment:	---		
Visual Description:	Moist, olive sandy silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.3	32.9	66.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	99		
#20	0.85	96		
#40	0.42	95		
#60	0.25	94		
#100	0.15	87		
#200	0.075	67		

Coefficients

D ₈₅ = 0.1403 mm	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

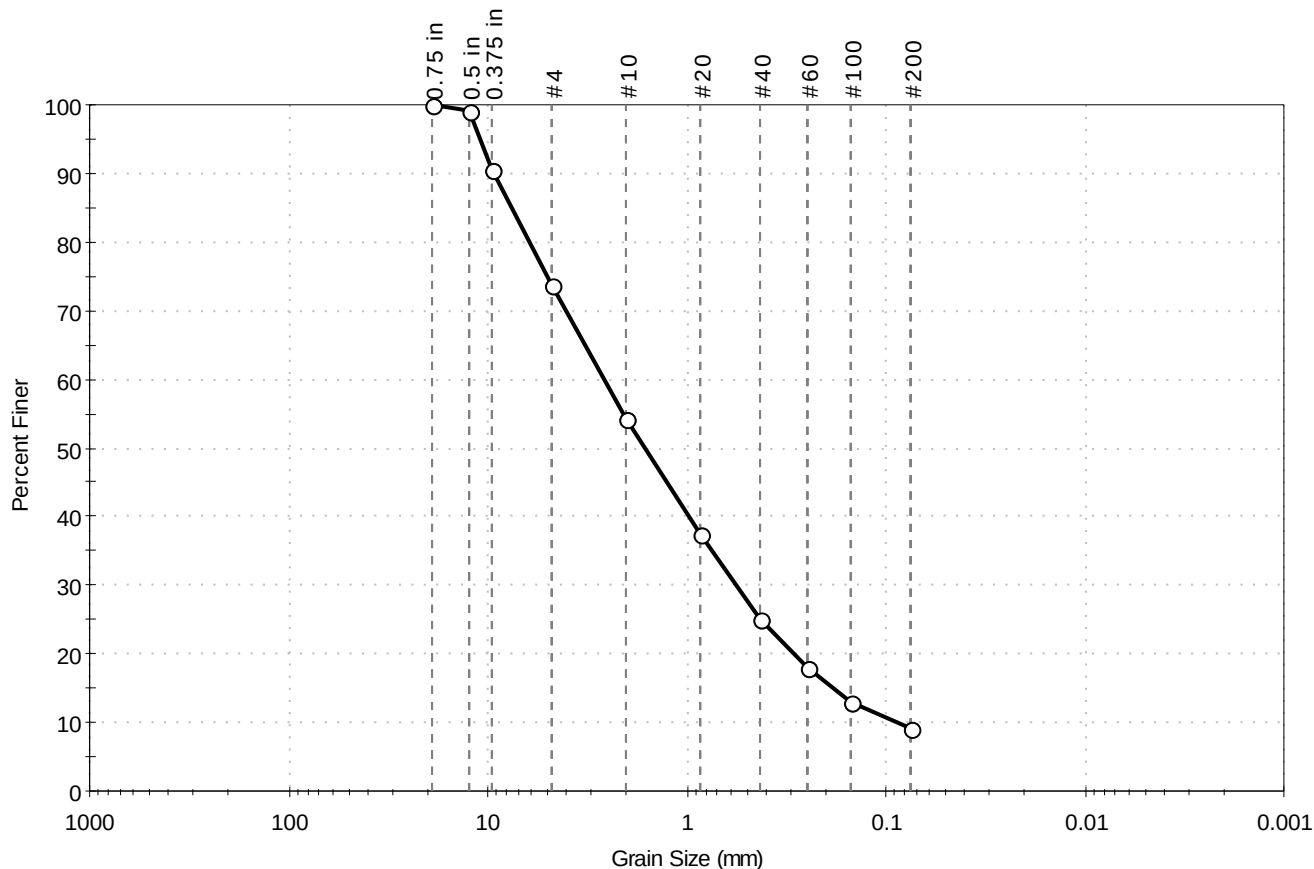
Sample / Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East #1431 and 5949		
Location:	Hampden, ME	Project No:	GTX-307096
Boring ID:	BB-HSS-114	Sample Type:	jar
Sample ID:	6D	Test Date:	10/06/17
Depth :	11.0-12.5 ft	Test Id:	426884
Test Comment:	---		
Visual Description:	Moist, grayish brown sand with silt and gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	26.2	64.7	9.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	99		
0.375 in	9.50	90		
#4	4.75	74		
#10	2.00	54		
#20	0.85	37		
#40	0.42	25		
#60	0.25	18		
#100	0.15	13		
#200	0.075	9.1		

Coefficients

D ₈₅ = 7.5704 mm	D ₃₀ = 0.5610 mm
D ₆₀ = 2.5828 mm	D ₁₅ = 0.1840 mm
D ₅₀ = 1.6168 mm	D ₁₀ = 0.0873 mm
C _u = 29.585	C _c = 1.396

Classification

ASTM N/A

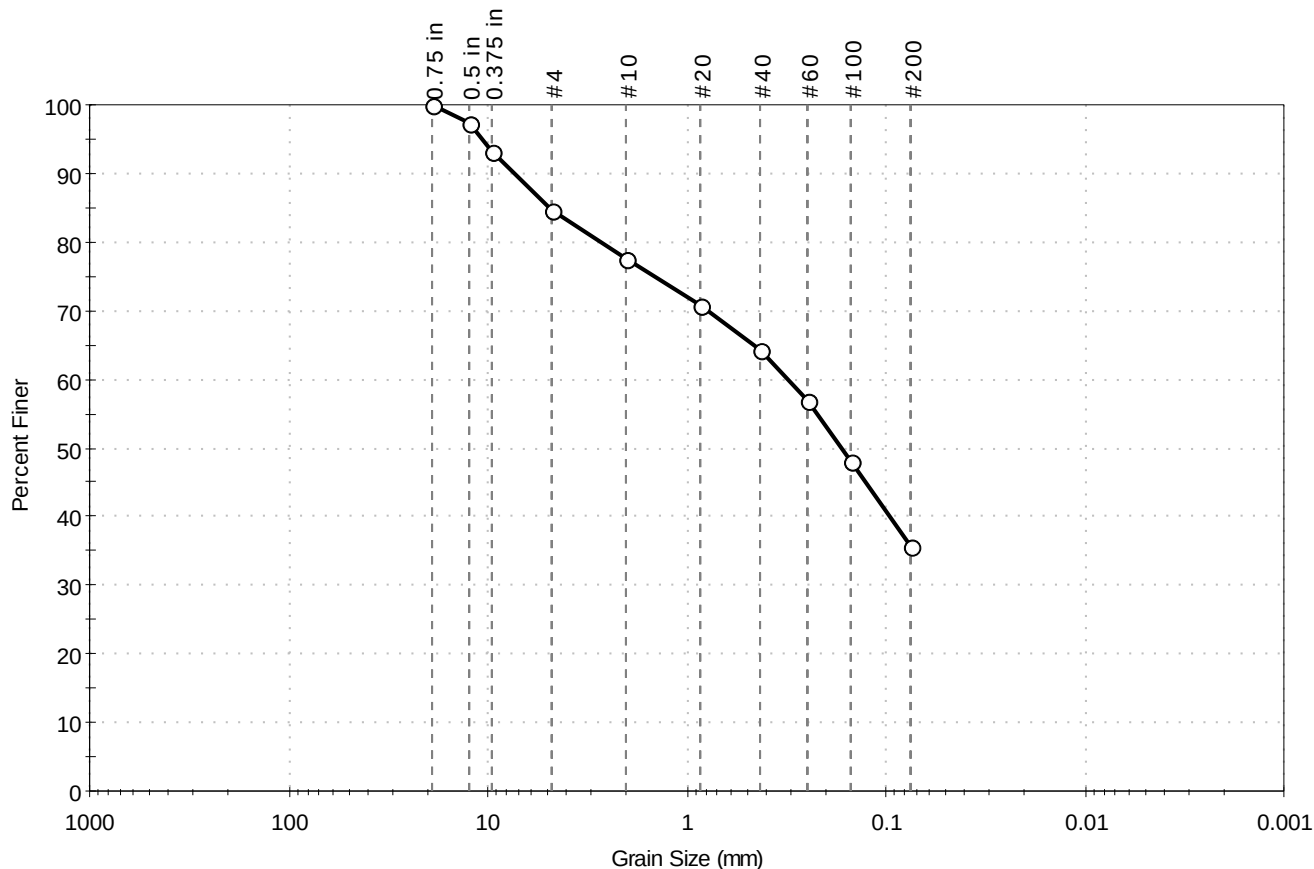
AASHTO Stone Fragments, Gravel and Sand (A-1-b (1))

Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East #1431 and 5949		
Location:	Hampden, ME	Project No:	GTX-307096
Boring ID:	BB-HSS-115	Sample Type:	jar
Sample ID:	2DA	Test Date:	10/06/17
Depth :	4.5-6.2 ft	Test Id:	426885
Test Comment:	---		
Visual Description:	Moist, olive silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	15.4	48.8	35.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	97		
0.375 in	9.50	93		
#4	4.75	85		
#10	2.00	78		
#20	0.85	71		
#40	0.42	64		
#60	0.25	57		
#100	0.15	48		
#200	0.075	36		

Coefficients

D ₈₅ = 4.9308 mm	D ₃₀ = N/A
D ₆₀ = 0.3117 mm	D ₁₅ = N/A
D ₅₀ = 0.1677 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

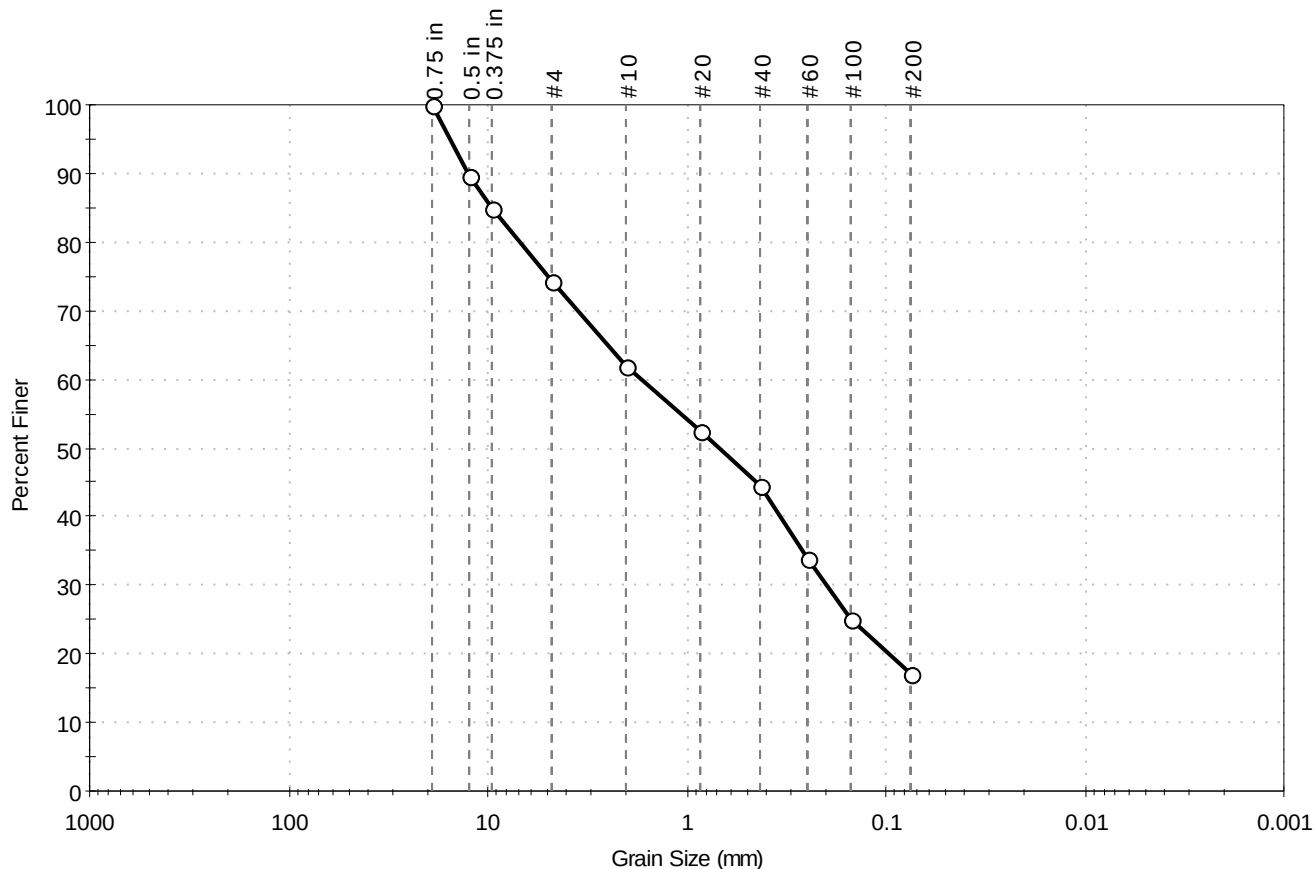
AASHTO Silty Soils (A-4 (0))

Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East #1431 and 5949		
Location:	Hampden, ME	Project No:	GTX-307096
Boring ID:	BB-HSS-117	Sample Type:	jar
Sample ID:	8D	Test Date:	10/06/17
Depth :	16.0-18.0 ft	Test Id:	426886
Test Comment:	---		
Visual Description:	Moist, grayish brown silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	25.6	57.3	17.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	90		
0.375 in	9.50	85		
#4	4.75	74		
#10	2.00	62		
#20	0.85	53		
#40	0.425	44		
#60	0.25	34		
#100	0.15	25		
#200	0.075	17		

Coefficients

D ₈₅ = 9.4773 mm	D ₃₀ = 0.1991 mm
D ₆₀ = 1.6644 mm	D ₁₅ = N/A
D ₅₀ = 0.6794 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

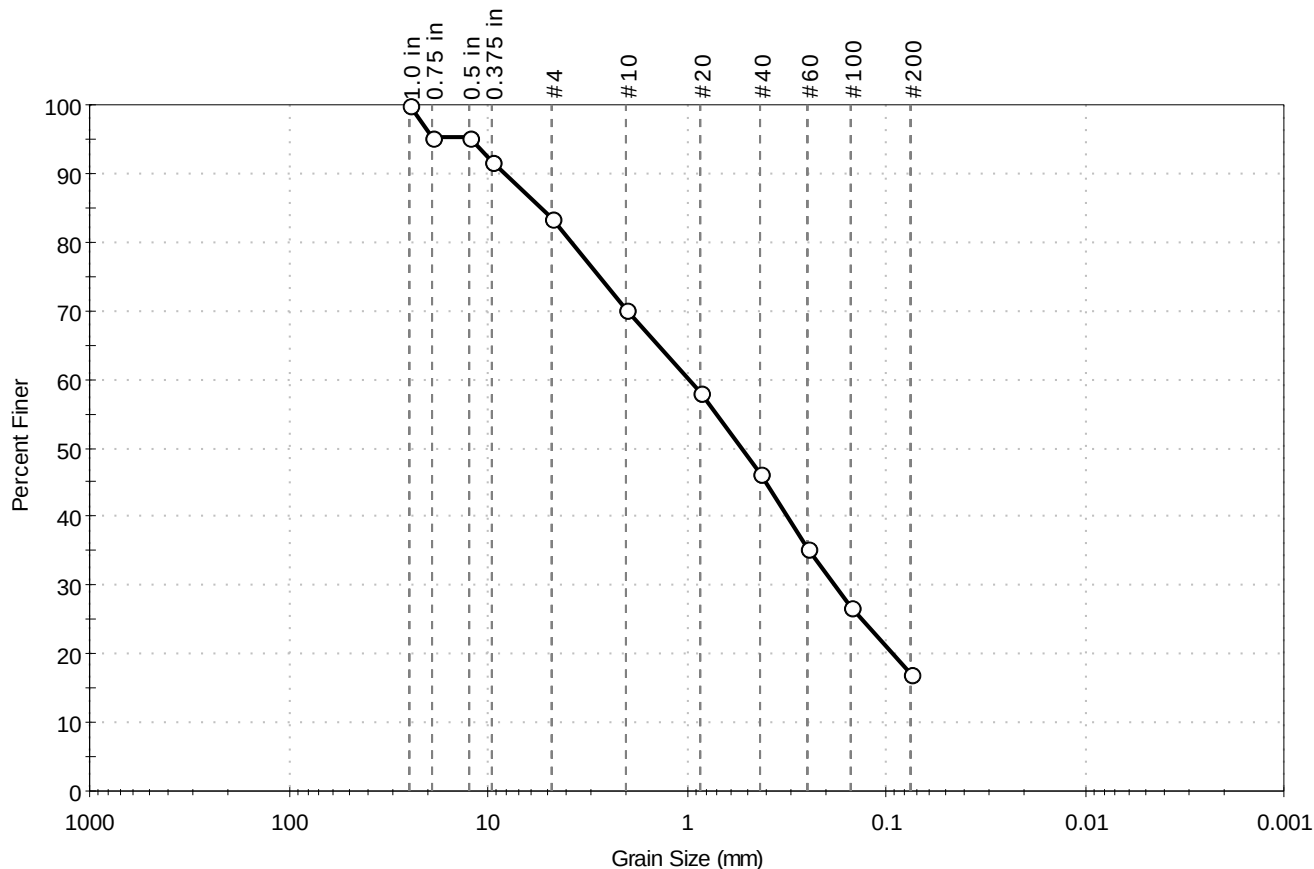
AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East #1431 and 5949		
Location:	Hampden, ME	Project No:	GTX-307096
Boring ID:	BB-HSS-118	Sample Type:	jar
Sample ID:	2D	Test Date:	10/06/17
Depth :	5.0-7.0 ft	Test Id:	426887
Test Comment:	---		
Visual Description:	Moist, olive brown silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	16.6	66.4	17.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.0 in	25.00	100		
0.75 in	19.00	95		
0.5 in	12.50	95		
0.375 in	9.50	92		
#4	4.75	83		
#10	2.00	70		
#20	0.85	58		
#40	0.42	46		
#60	0.25	36		
#100	0.15	27		
#200	0.075	17		

Coefficients

D ₈₅ = 5.4272 mm	D ₃₀ = 0.1811 mm
D ₆₀ = 0.9648 mm	D ₁₅ = N/A
D ₅₀ = 0.5274 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

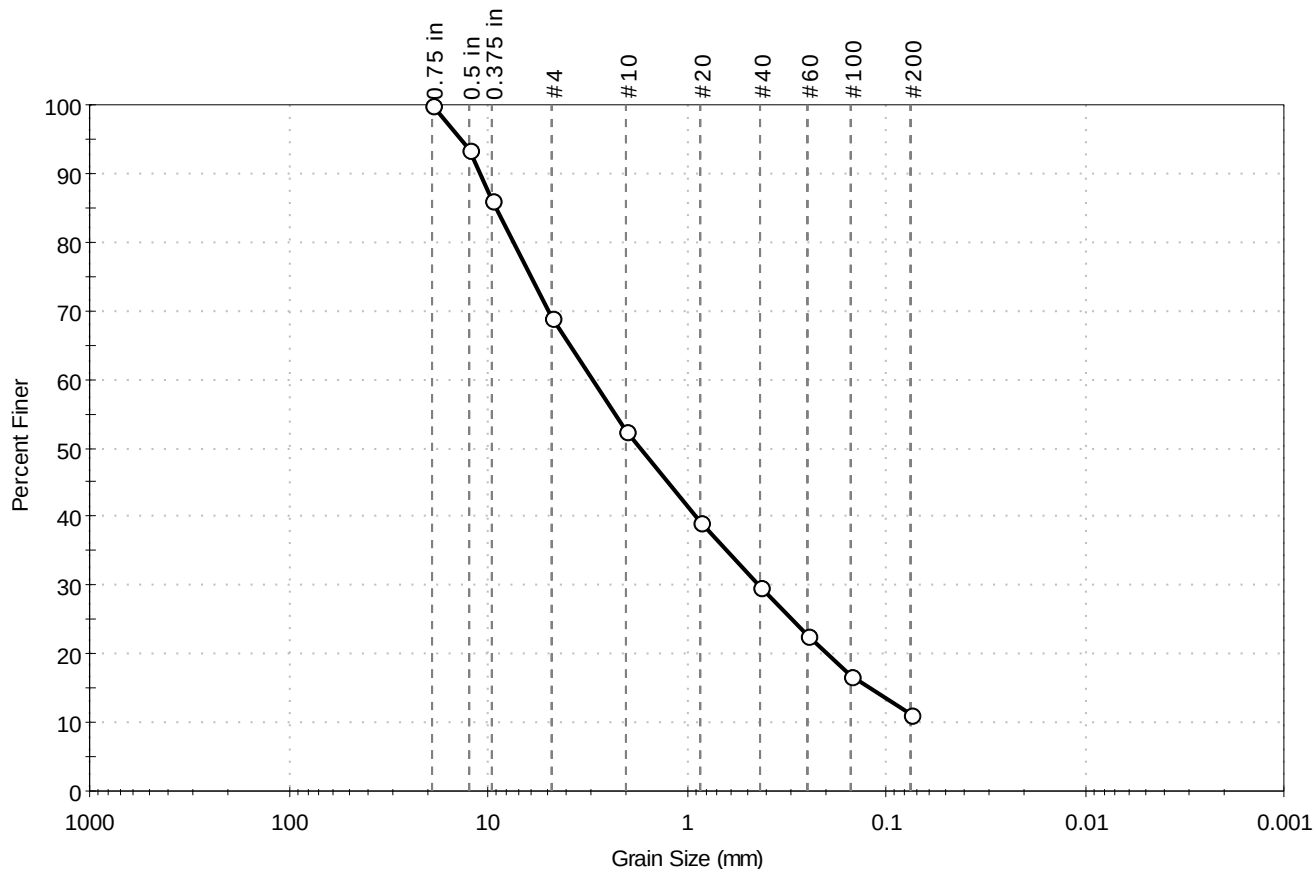
AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD

Client:	Haley & Aldrich, Inc.		
Project:	Souadabscook East #1431 and 5949		
Location:	Hampden, ME	Project No:	GTX-307096
Boring ID:	BB-HSS-118	Sample Type:	jar
Sample ID:	7D	Test Date:	10/06/17
Depth :	15.0-17.0 ft	Test Id:	426888
Test Comment:	---		
Visual Description:	Moist, grayish brown sand with silt and gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	31.2	57.5	11.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	94		
0.375 in	9.50	86		
#4	4.75	69		
#10	2.00	53		
#20	0.85	39		
#40	0.42	30		
#60	0.25	23		
#100	0.15	17		
#200	0.075	11		

Coefficients

D ₈₅ = 9.1176 mm	D ₃₀ = 0.4357 mm
D ₆₀ = 2.9702 mm	D ₁₅ = 0.1180 mm
D ₅₀ = 1.7018 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

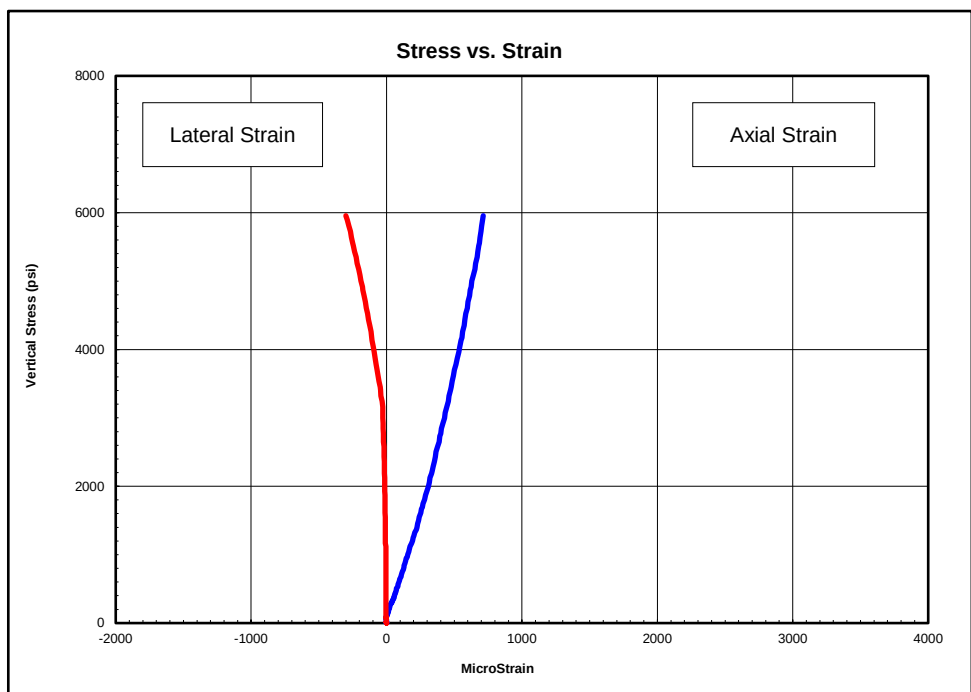
Sample / Test Description

Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Haley & Aldrich, Inc.
Project Name:	Souadabscook East #1431 and 5949
Project Location:	Hampden, ME
GTX #:	307096
Test Date:	10/6/2017
Tested By:	rlc
Checked By:	jsc
Boring ID:	BB-HSS-113
Sample ID:	R2
Depth, ft:	21.22-21.57
Sample Type:	rock core
Sample Description:	See photographs Discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 5,951 psi

One axial strain gauge failed to record meaningful data. Young's Modulus and Poisson's Ratio reported based on results of a single axial strain gauge.

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
600-2200	6,510,000	0.05
2200-3800	8,840,000	0.37
3800-5400	10,200,000	---

Notes: Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

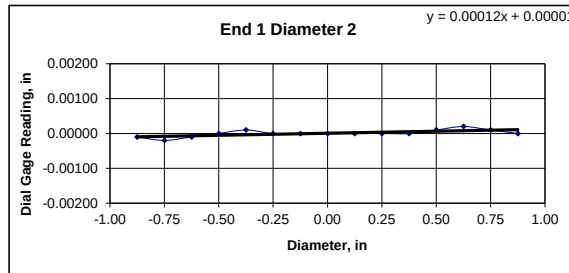
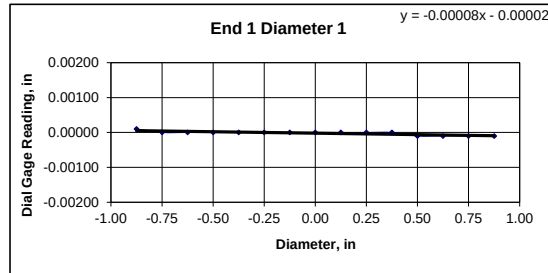


Client:	Haley & Aldrich, Inc.	Test Date:	10/4/2017
Project Name:	Soudabscocook East #1431 and 5949	Tested By:	rlc
Project Location:	Hampden, ME	Checked By:	jsc
GTX #:	307096		
Boring ID:	BB-HSS-113		
Sample ID:	R2		
Depth:	21.22-21.57 ft		
Visual Description:	See photographs		

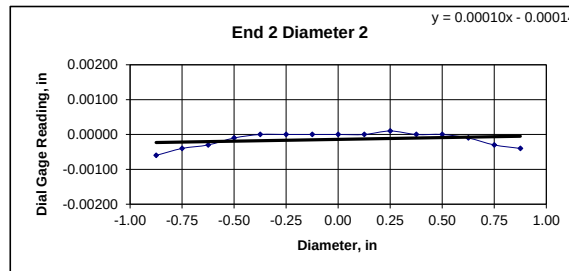
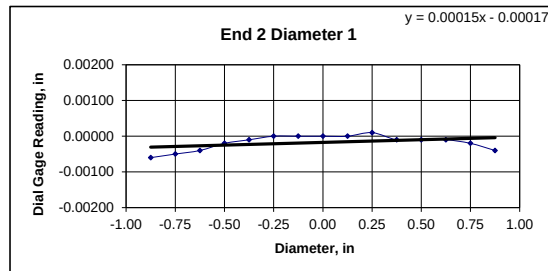
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap $\leq$ 0.02 in.? YES	
Specimen Length, in:	3.98	3.98	3.98	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.99	1.99	1.99	Straightness Tolerance Met? YES	
Specimen Mass, g:	557.86				
Bulk Density, lb/ft ³ :	171	Minimum Diameter Tolerance Met? YES			
Length to Diameter Ratio:	2.0	Length to Diameter Ratio Tolerance Met? YES			

END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010
Diameter 2, in (rotated 90°)	-0.00010	-0.00020	-0.00010	0.00000	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00010	0.00000
Difference between max and min readings, in:															
0° = 0.00020 90° = 0.00040															
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00060	-0.00050	-0.00040	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	-0.00010	-0.00010	-0.00010	-0.00020	-0.00040
Diameter 2, in (rotated 90°)	-0.00060	-0.00040	-0.00030	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00000	0.00000	-0.00010	-0.00030	-0.00040
Difference between max and min readings, in:															
0° = 0.0007 90° = 0.0007															
Maximum difference must be < 0.0020 in. Difference = ± 0.00035															
Flatness Tolerance Met? YES															



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00008
Angle of Best Fit Line:	0.00458
End 2:	
Slope of Best Fit Line	0.00015
Angle of Best Fit Line:	0.00859
Maximum Angular Difference:	0.00401
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00012
Angle of Best Fit Line:	0.00688
End 2:	
Slope of Best Fit Line	0.00010
Angle of Best Fit Line:	0.00573
Maximum Angular Difference:	0.00115
Parallelism Tolerance Met? Spherically Seated	YES

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	(Calculated from End Flatness and Parallelism measurements above)						
	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00020	1.990	0.00010	0.006	YES		
Diameter 2, in (rotated 90°)	0.00040	1.990	0.00020	0.012	YES	Perpendicularity Tolerance Met?	YES
END 2							
Diameter 1, in	0.00070	1.990	0.00035	0.020	YES		
Diameter 2, in (rotated 90°)	0.00070	1.990	0.00035	0.020	YES		



Client:	Haley & Aldrich, Inc.
Project Name:	Souadabscook East #1431 and 5949
Project Location:	Hampden, ME
GTX #:	307096
Test Date:	10/6/2017
Tested By:	rlc
Checked By:	jsc
Boring ID:	BB-HSS-113
Sample ID:	R2
Depth, ft:	21.22-21.57



After cutting and grinding

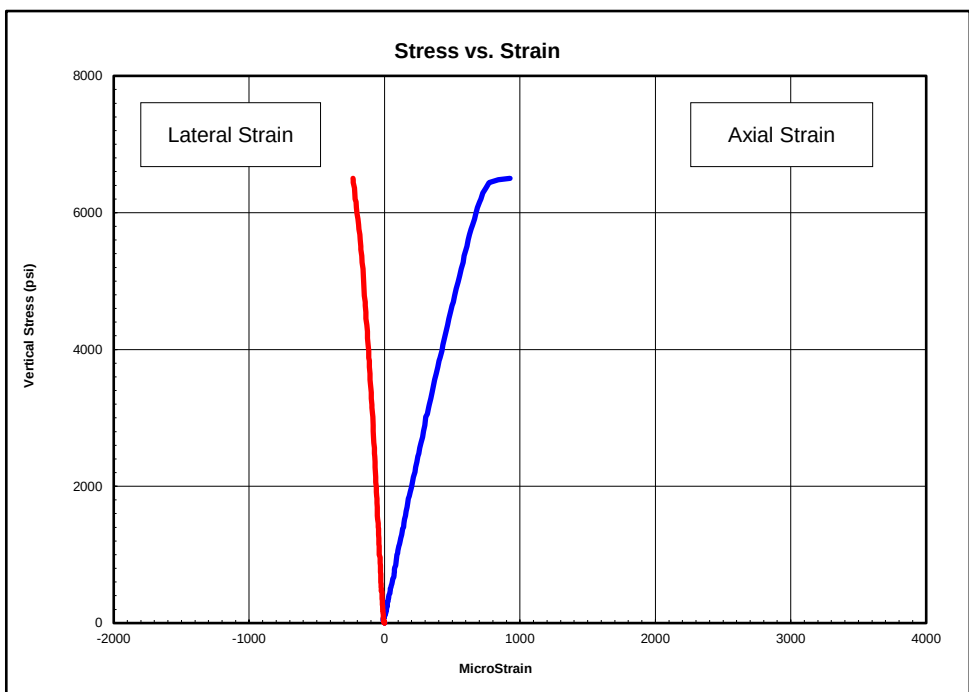


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Souadabscook East #1431 and 5949
Project Location:	Hampden, ME
GTX #:	307096
Test Date:	10/6/2017
Tested By:	rlc
Checked By:	jsc
Boring ID:	BB-HSS-115
Sample ID:	R3
Depth, ft:	8.85-9.21
Sample Type:	rock core
Sample Description:	See photographs Discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 6,498 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
700-2400	9,660,000	0.25
2400-4100	8,870,000	0.26
4100-5900	8,060,000	0.31

Notes: Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

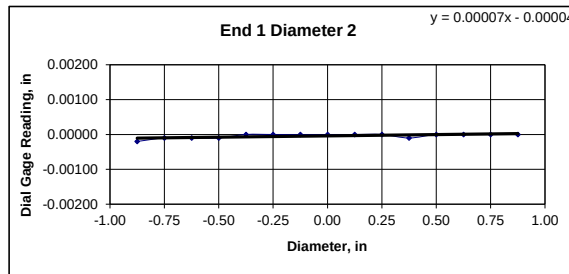
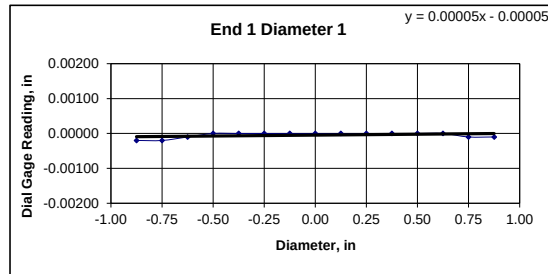


Client:	Haley & Aldrich, Inc.	Test Date:	10/4/2017
Project Name:	Soudabscok East #1431 and 5949	Tested By:	rlc
Project Location:	Hampden, ME	Checked By:	jsc
GTX #:	307096		
Boring ID:	BB-HSS-115		
Sample ID:	R3		
Depth:	8.85-9.21 ft		
Visual Description:	See photographs		

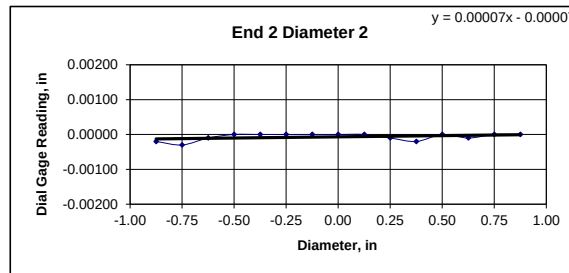
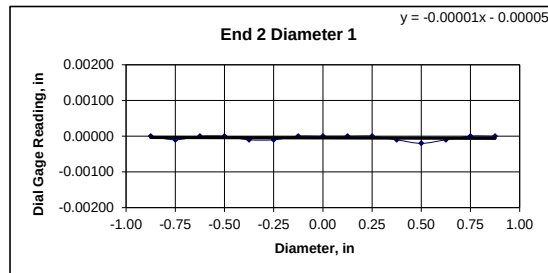
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap $\leq$ 0.02 in.? YES	
Specimen Length, in:	4.21	4.21	4.21	Maximum difference must be $<$ 0.020 in.	
Specimen Diameter, in:	1.99	1.99	1.99	Straightness Tolerance Met? YES	
Specimen Mass, g:	563.52				
Bulk Density, lb/ft ³ :	164				
Length to Diameter Ratio:	2.1	Minimum Diameter Tolerance Met? YES			
		Length to Diameter Ratio Tolerance Met? YES			

END FLATNESS AND PARALLELISM (Procedure FP1)																
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875	
Diameter 1, in	-0.00020	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	
Diameter 2, in (rotated 90°)	-0.00020	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	0.00000	0.00000	0.00000	0.00000	
Difference between max and min readings, in:																
0° =												0.00020		90° =		0.00020
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875	
Diameter 1, in	0.00000	-0.00010	0.00000	0.00000	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00010	0.00000	0.00000	
Diameter 2, in (rotated 90°)	-0.00020	-0.00030	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	0.00000	-0.00010	0.00000	0.00000	
Difference between max and min readings, in:																
0° =												0.0002		90° =		0.0003
Maximum difference must be < 0.0020 in. Difference = ± 0.00015																
Flatness Tolerance Met? YES																



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00005
Angle of Best Fit Line:	0.00286
End 2:	
Slope of Best Fit Line	0.00001
Angle of Best Fit Line:	0.00057
Maximum Angular Difference:	0.00229
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00007
Angle of Best Fit Line:	0.00401
End 2:	
Slope of Best Fit Line	0.00007
Angle of Best Fit Line:	0.00401
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES

PERPENDICULARITY (Procedure P1)						(Calculated from End Flatness and Parallelism measurements above)	
END 1		Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?	Maximum angle of departure must be $\leq$ 0.25°
Diameter 1, in		0.00020	1.990	0.00010	0.006	YES	
Diameter 2, in (rotated 90°)		0.00020	1.990	0.00010	0.006	YES	Perpendicularity Tolerance Met? YES
END 2							
Diameter 1, in		0.00020	1.990	0.00010	0.006	YES	
Diameter 2, in (rotated 90°)		0.00030	1.990	0.00015	0.009	YES	

Client:	Haley & Aldrich, Inc.
Project Name:	Soudabscook East #1431 and 5949
Project Location:	Hampden, ME
GTX #:	307096
Test Date:	10/6/2017
Tested By:	rlc
Checked By:	jsc
Boring ID:	BB-HSS-115
Sample ID:	R3
Depth, ft:	8.85-9.21



After cutting and grinding

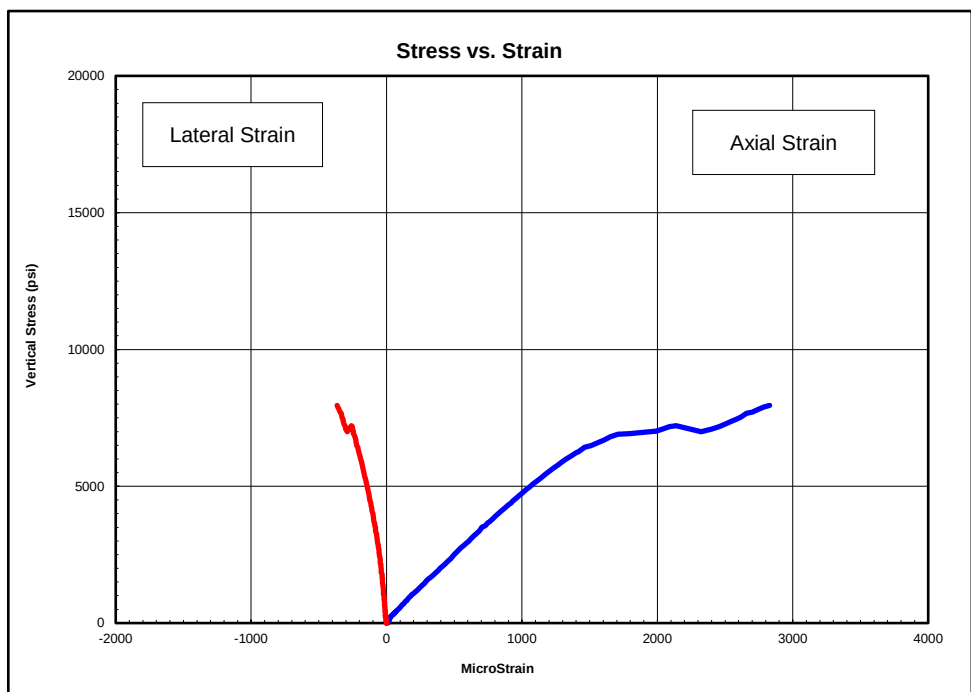


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Souadabscook East #1431 and 5949
Project Location:	Hampden, ME
GTX #:	307096
Test Date:	10/6/2017
Tested By:	rlc
Checked By:	jsc
Boring ID:	BB-HSS-116
Sample ID:	R2
Depth, ft:	5.88-6.21
Sample Type:	rock core
Sample Description:	See photographs Discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 7,992 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
800-2900	4,710,000	0.10
2900-5000	4,400,000	0.17
5000-7200	2,090,000	0.11

Notes: Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

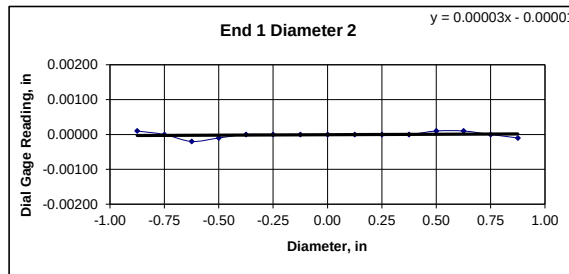
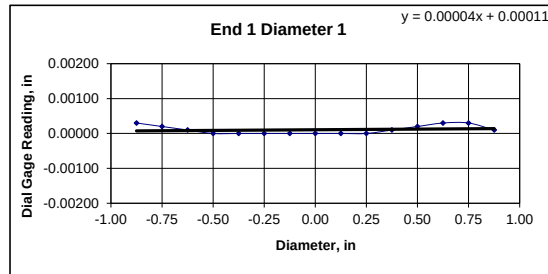


Client:	Haley & Aldrich, Inc.	Test Date:	10/4/2017
Project Name:	Soudabscocook East #1431 and 5949	Tested By:	rlc
Project Location:	Hampden, ME	Checked By:	jsc
GTX #:	307096		
Boring ID:	BB-HSS-116		
Sample ID:	R2		
Depth:	5.88-6.21 ft		
Visual Description:	See photographs		

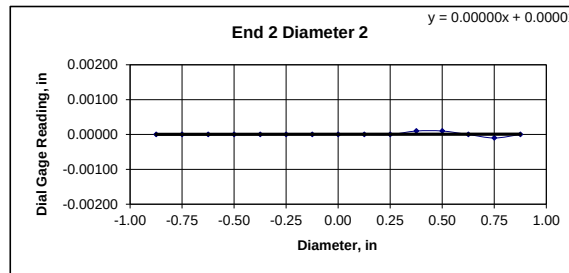
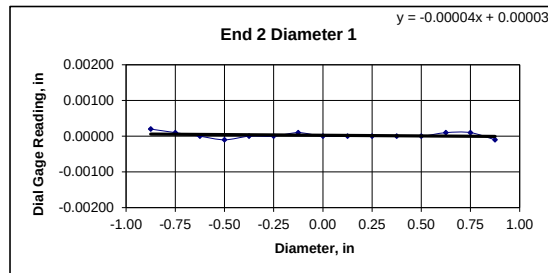
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap $\leq$ 0.02 in.? YES	
Specimen Length, in:	4.09	4.09	4.09	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.99	1.99	1.99	Straightness Tolerance Met? YES	
Specimen Mass, g:	566.03				
Bulk Density, lb/ft ³ :	169				
Length to Diameter Ratio:	2.1	Minimum Diameter Tolerance Met? YES			
		Length to Diameter Ratio Tolerance Met? YES			

END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00030	0.00020	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00030	0.00030	0.00010
Diameter 2, in (rotated 90°)	0.00010	0.00000	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00000	-0.00010
Difference between max and min readings, in:															
0° = 0.00030 90° = 0.00030															
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00020	0.00010	0.00000	-0.00010	0.00000	0.00000	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	-0.00010
Diameter 2, in (rotated 90°)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00000	-0.00010	0.00000
Difference between max and min readings, in:															
0° = 0.0003 90° = 0.0002															
Maximum difference must be < 0.0020 in. Difference = ± 0.00015															
Flatness Tolerance Met? YES															



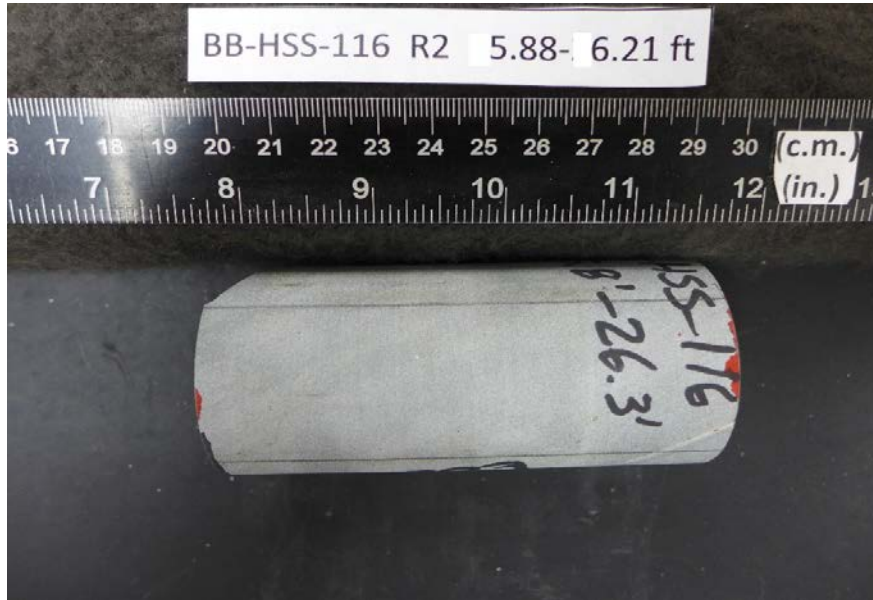
DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00004
Angle of Best Fit Line:	0.00229
End 2:	
Slope of Best Fit Line	0.00004
Angle of Best Fit Line:	0.00229
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00003
Angle of Best Fit Line:	0.00172
End 2:	
Slope of Best Fit Line	0.00000
Angle of Best Fit Line:	0.00000
Maximum Angular Difference:	0.00172
Parallelism Tolerance Met? Spherically Seated	YES

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00030	1.990	0.00015	0.009	YES		
Diameter 2, in (rotated 90°)	0.00030	1.990	0.00015	0.009	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00030	1.990	0.00015	0.009	YES		
Diameter 2, in (rotated 90°)	0.00020	1.990	0.00010	0.006	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Souadabscook East #1431 and 5949
Project Location:	Hampden, ME
GTX #:	307096
Test Date:	10/6/2017
Tested By:	rlc
Checked By:	jsc
Boring ID:	BB-HSS-116
Sample ID:	R2
Depth, ft:	5.88-6.21



After cutting and grinding

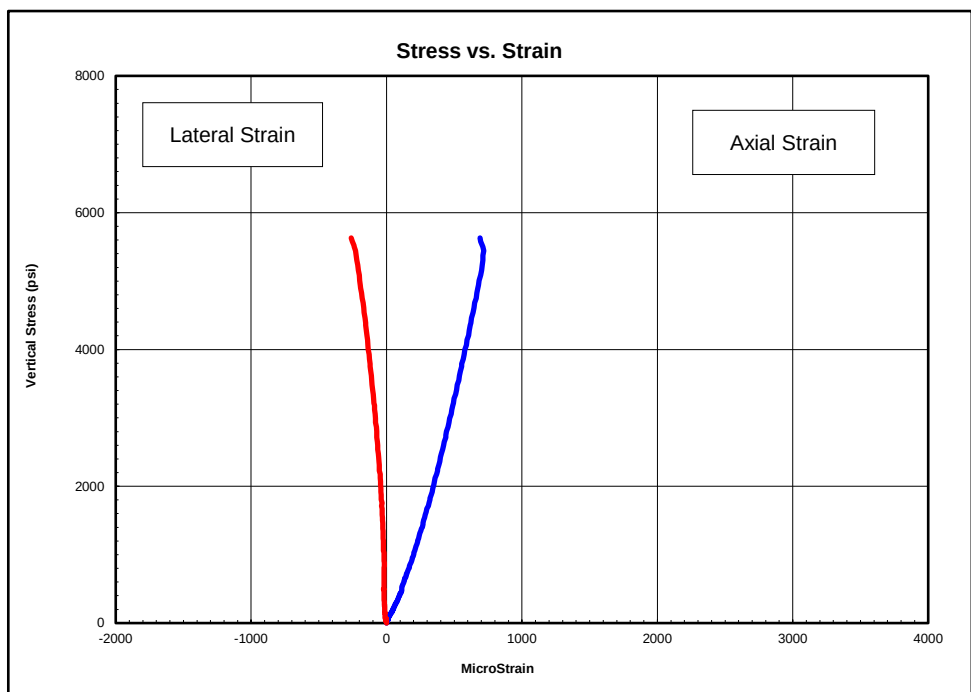


After break



Client:	Haley & Aldrich, Inc.
Project Name:	Souadabscook East #1431 and 5949
Project Location:	Hampden, ME
GTX #:	307096
Test Date:	10/6/2017
Tested By:	rlc
Checked By:	jsc
Boring ID:	BB-HSS-118
Sample ID:	R4
Depth, ft:	26.2-26.56
Sample Type:	rock core
Sample Description:	See photographs Discontinuity failure

Compressive Strength and Elastic Moduli of Rock by ASTM D7012 - Method D



Peak Compressive Stress: 5,631 psi

Stress Range, psi	Young's Modulus, psi	Poisson's Ratio
600-2100	6,420,000	0.13
2100-3600	8,390,000	0.36
3600-5100	9,440,000	---

Notes: Test specimen tested at the approximate as-received moisture content and at standard laboratory temperature.
The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
Young's Modulus and Poisson's Ratio calculated using the tangent to the line in the stress range listed.
Calculations assume samples are isotropic, which is not necessarily the case.

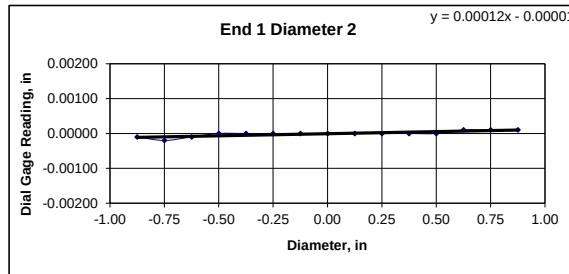
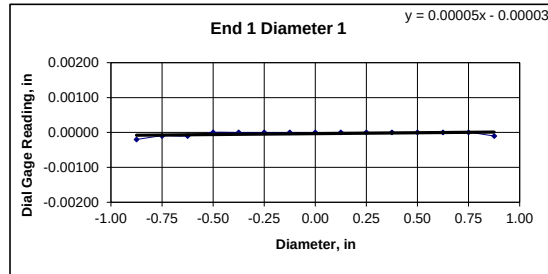


Client:	Haley & Aldrich, Inc.	Test Date:	10/4/2017
Project Name:	Soudabscocook East #1431 and 5949	Tested By:	rlc
Project Location:	Hampden, ME	Checked By:	jsc
GTX #:	307096		
Boring ID:	BB-HSS-118		
Sample ID:	R4		
Depth:	26.2-26.56 ft		
Visual Description:	See photographs		

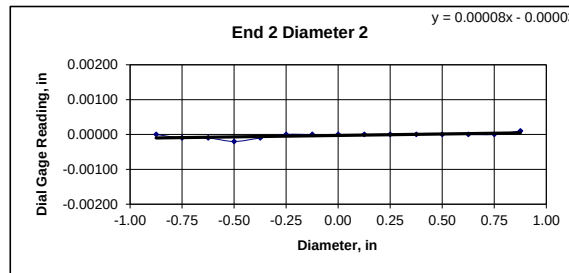
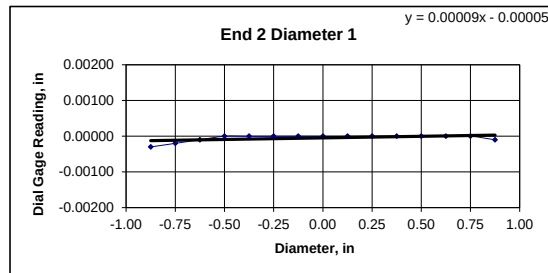
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)	
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap $\leq$ 0.02 in.? YES	
Specimen Length, in:	4.28	4.28	4.28	Maximum difference must be < 0.020 in.	
Specimen Diameter, in:	1.98	1.99	1.99	Straightness Tolerance Met? YES	
Specimen Mass, g:	588.48				
Bulk Density, lb/ft ³ :	169				
Length to Diameter Ratio:	2.2	Minimum Diameter Tolerance Met? YES			
		Length to Diameter Ratio Tolerance Met? YES			

END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00020	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010
Diameter 2, in (rotated 90°)	-0.00010	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00010
Difference between max and min readings, in: 0° = 0.00020 90° = 0.00030															
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010
Diameter 2, in (rotated 90°)	0.00000	-0.00010	-0.00010	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010
Difference between max and min readings, in: 0° = 0.0003 90° = 0.0003 Maximum difference must be < 0.0020 in. Difference = ± 0.00015															
Flatness Tolerance Met? YES															



DIAMETER 1	
End 1:	
Slope of Best Fit Line	0.00005
Angle of Best Fit Line:	0.00286
End 2:	
Slope of Best Fit Line	0.00009
Angle of Best Fit Line:	0.00516
Maximum Angular Difference:	0.00229
Parallelism Tolerance Met? Spherically Seated	YES



DIAMETER 2	
End 1:	
Slope of Best Fit Line	0.00012
Angle of Best Fit Line:	0.00688
End 2:	
Slope of Best Fit Line	0.00008
Angle of Best Fit Line:	0.00458
Maximum Angular Difference:	0.00229
Parallelism Tolerance Met? Spherically Seated	YES

PERPENDICULARITY (Procedure P1)						Maximum angle of departure must be $\leq 0.25^\circ$	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00020	1.985	0.00010	0.006	YES		
Diameter 2, in (rotated 90°)	0.00030	1.985	0.00015	0.009	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00030	1.985	0.00015	0.009	YES		
Diameter 2, in (rotated 90°)	0.00030	1.985	0.00015	0.009	YES		

Client:	Haley & Aldrich, Inc.
Project Name:	Souadabscook East #1431 and 5949
Project Location:	Hampden, ME
GTX #:	307096
Test Date:	10/6/2017
Tested By:	rlc
Checked By:	jsc
Boring ID:	BB-HSS-118
Sample ID:	R4
Depth, ft:	26.2-26.56



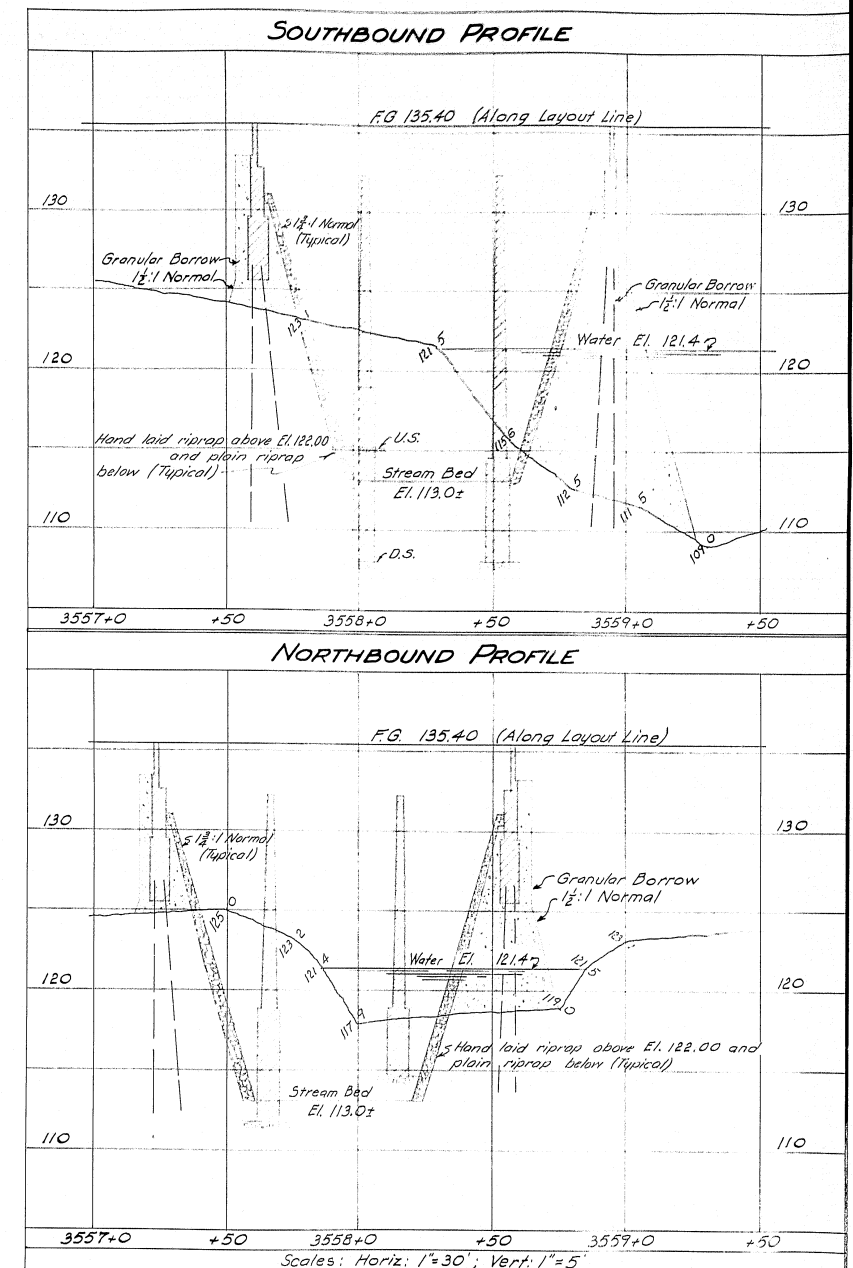
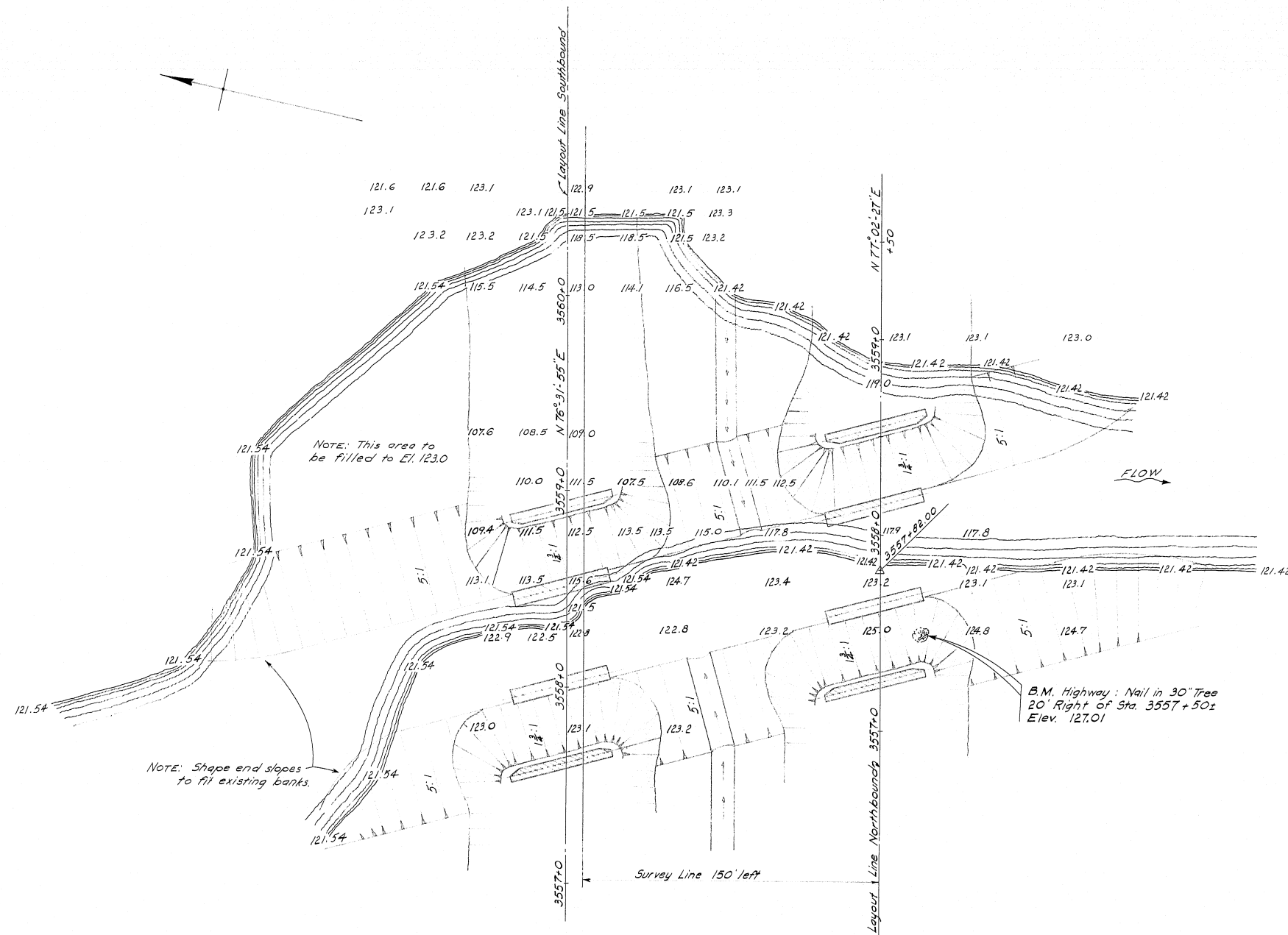
After cutting and grinding



After break

APPENDIX D

Historic Drawings



NOTE: Granular borrow to be placed up to elevation bottom of footings before driving piles.
Stones not to exceed 6 inch diameter in area where piles are to be driven.

High water El. 130.5 in 1936 and 1955 Flat bog with meandering stream.

DESIGN - R.W.L. & W.B.H.
SURVEY - Blake
CHECK - R.W.L.

BRIDGE NO. 1
STATE HIGHWAY COMMISSION
ROAD DIVISION

SQUADABSCOOK STREAM BRIDGE EAST

IN THE TOWN OF

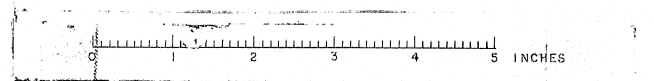
HAMPDEN

PENOBSCOT COUNTY

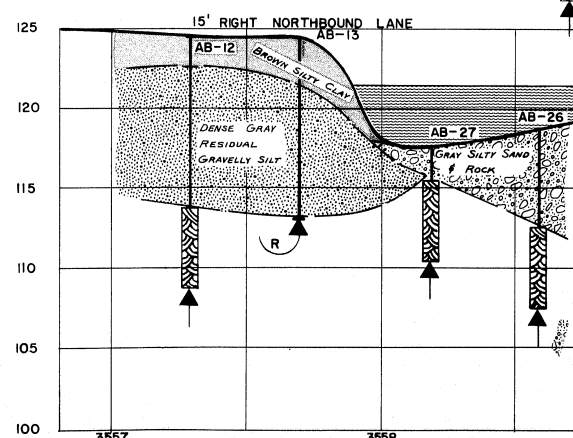
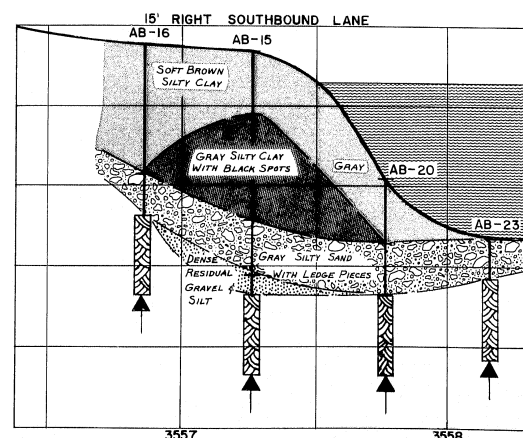
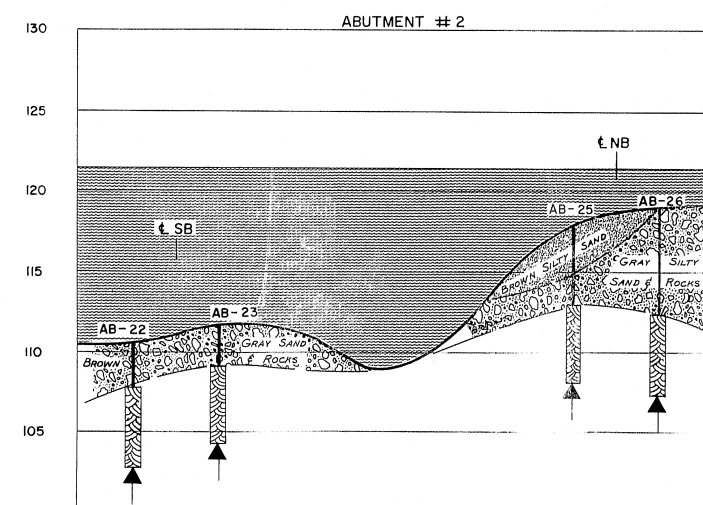
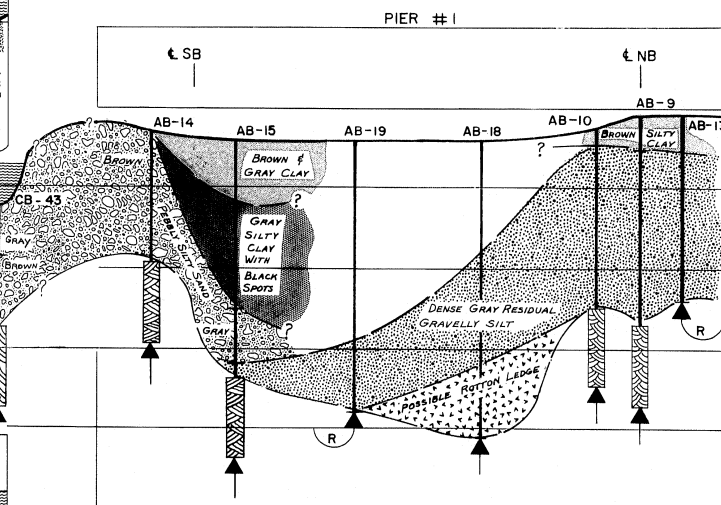
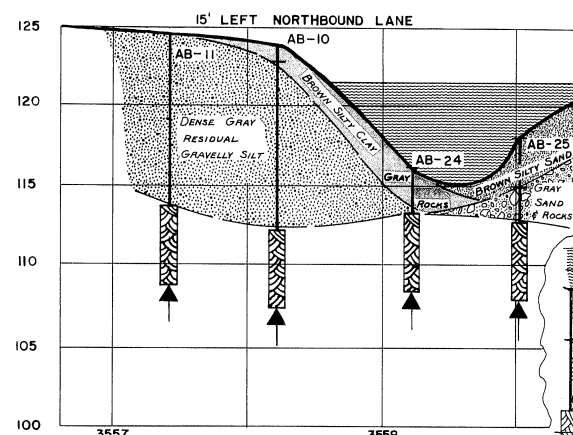
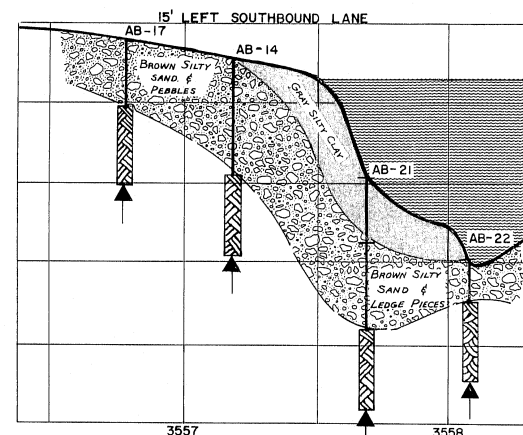
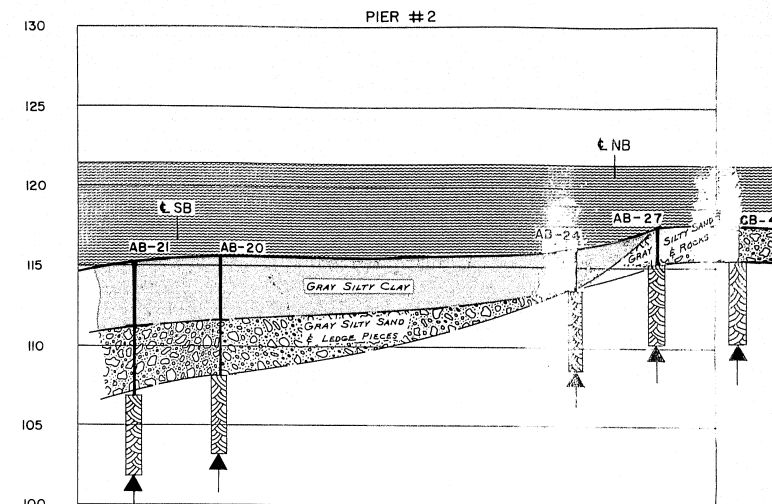
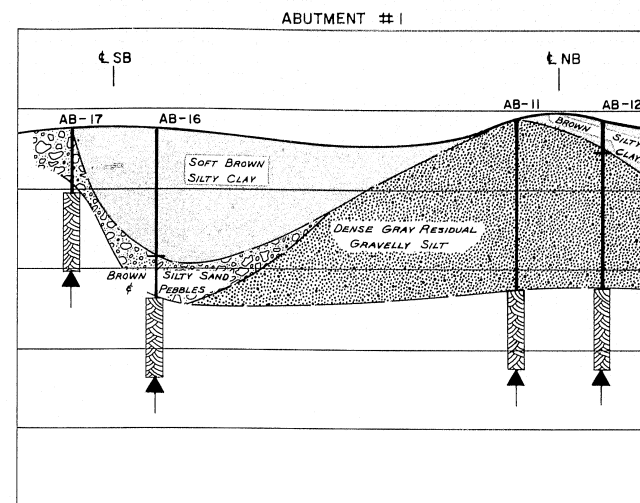
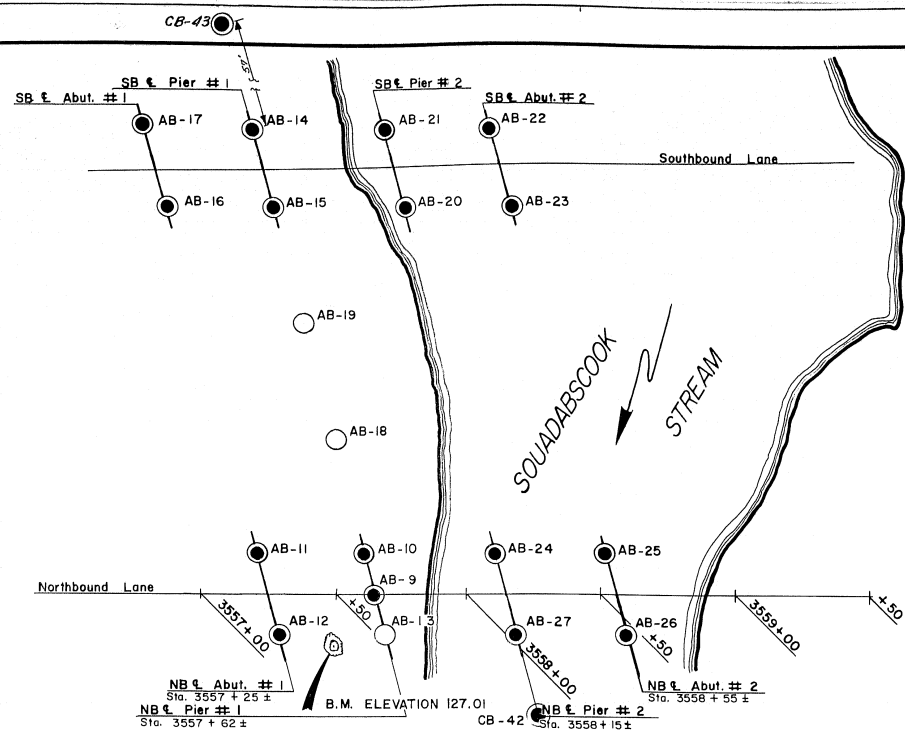
SURVEY

SHEET 1 OF 14 AUGUSTA, MAINE MARCH 1960

M-1527



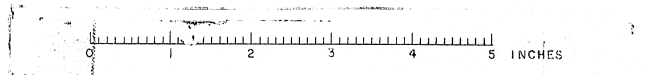
TRANSVERSE SECTIONS

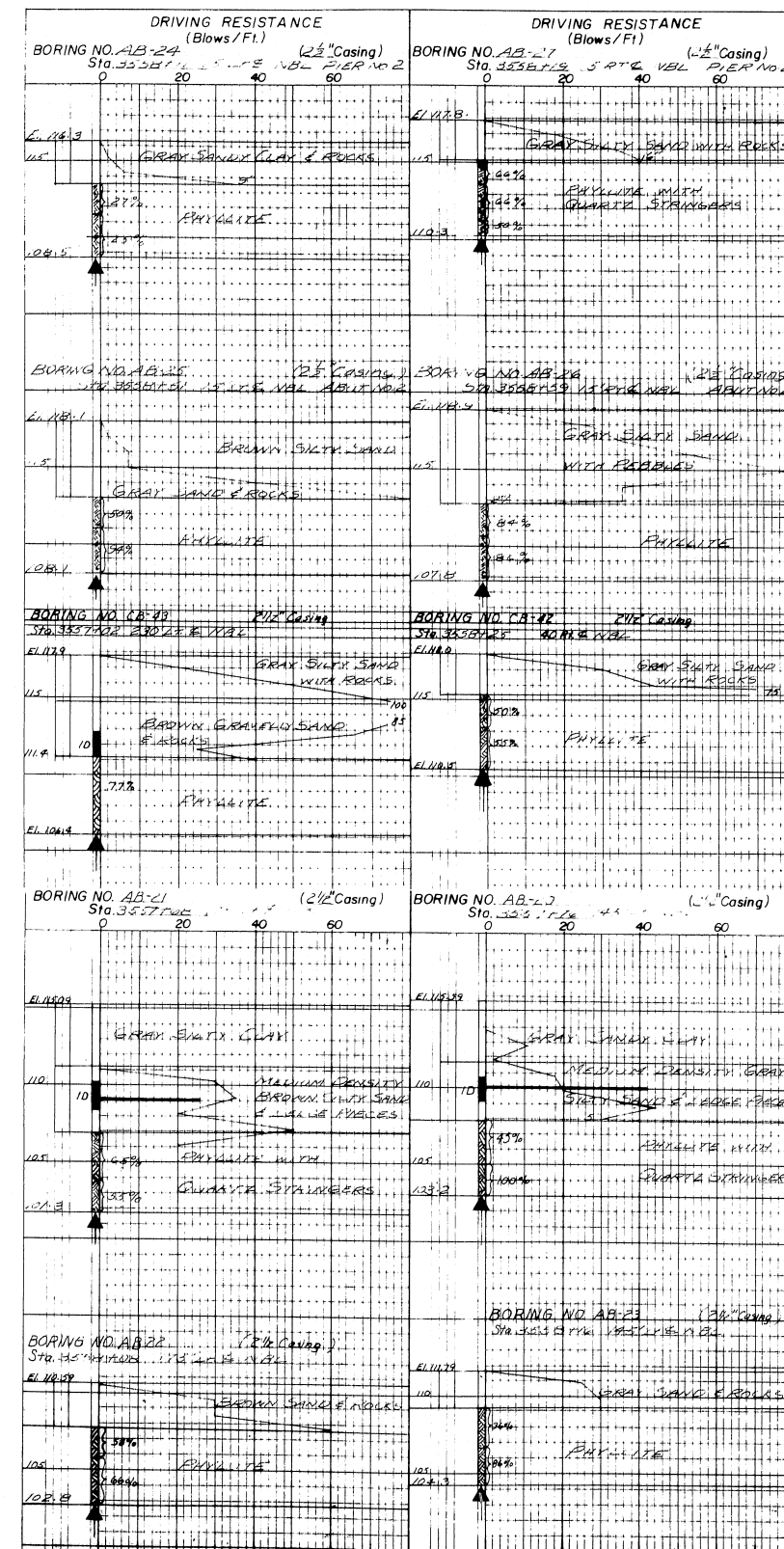
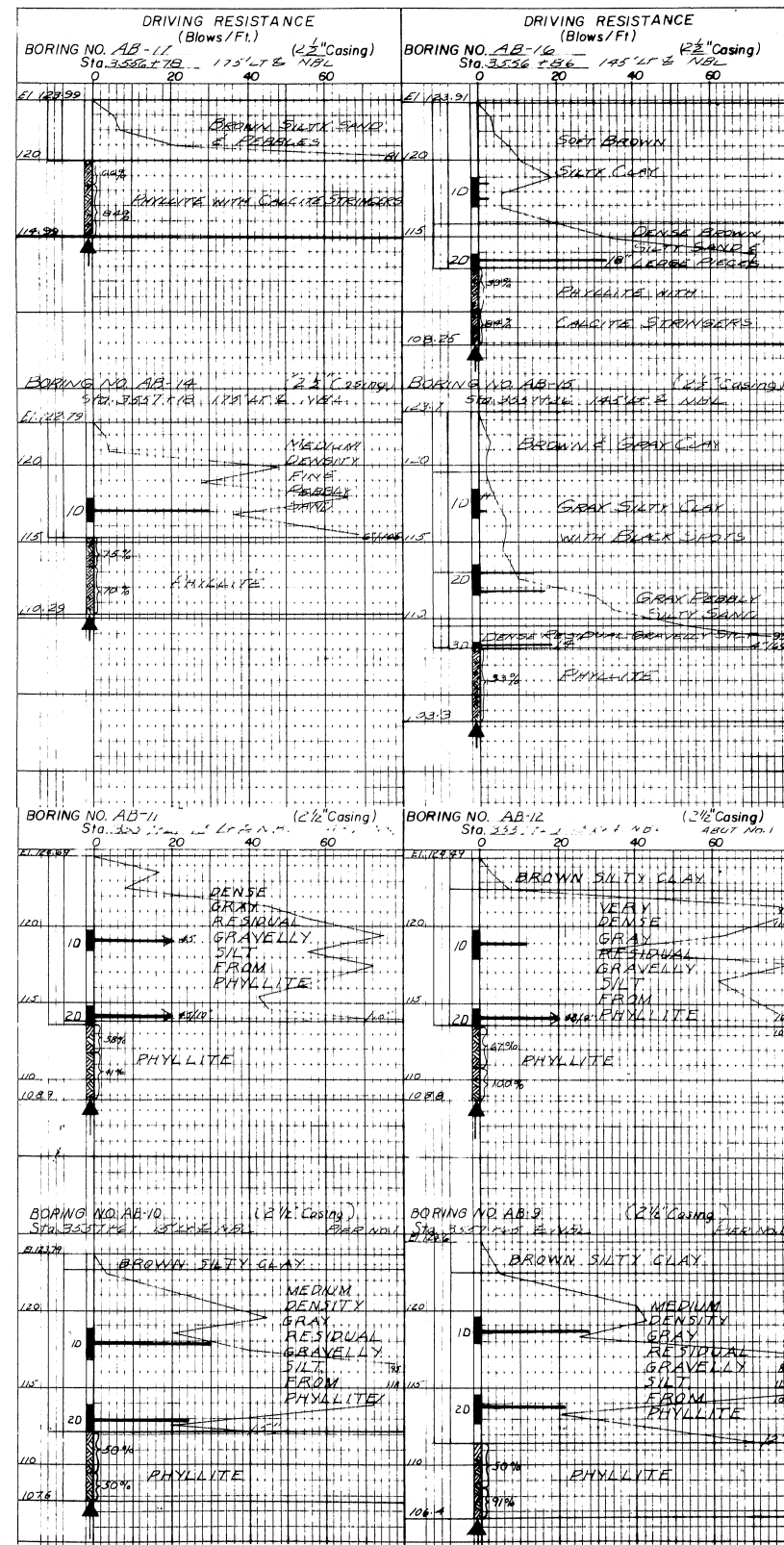


WATER ELEVATION
SPRING 1961, 121.42'
HIGH WATER ELEVATION
1936 & 1955, 130.5'

DESIGN - Soils Division
TRACE -
CHECK -
BRIDGE NO. 100
SURVEY - BOYCE
PLOT -
STATE HIGHWAY COMMISSION
GE DIVISION
SQUADABCOOK STREAM BRIDGE
EAST
IN THE TOWN OF
HAMPTON
PENOBSCOT COUNTY
FOUNDATION SURVEY
SHEET 2 OF 14 AUGUSTA, MAINE MARCH 1961

M-1528





- BORING NOTES
- All samples and vials are made ahead of casing.
 - Soils and casing size as noted on drawings.
 - Ground water table indicated thus:
 - Number of blows of 75# hammer falling 18 inches required to drive extra heavy casing one foot thus:
 - Location and designation of "dry" samples taken in 18" O.D. 16 ga. seamless tubing indicated thus:
 - Location and designation of "dry" samples taken in 2" O.D. 16 ga. seamless tubing indicated thus:
 - Location and designation of "dry" samples taken in 1/4" O.D. 16 ga. seamless tubing indicated thus:
 - Location and designation of wash samples indicated thus:
 - Unsuccessful attempts to secure dry sample indicated thus, followed by type of sampler:
 - Location of field vane test indicated thus:
 - Number of blows of 75# hammer falling 18" required to drive spoon or tubing one foot indicated thus:
 - Sampling spoon or seamless tubing driven by static weight of drill rods and 75# hammer indicated thus:
 - 16" O.D. "dry" samples taken with piston sampler:
 - Natural water contents, given as percent of dry weight are indicated thus:
 - Bottom of boring indicated thus:
 - Refusal of drill rods or casing in 400# tons:
 - Percent recovery of rock core by diamond bit thus:

DESIGN - SOILS DIVISION

BRIDGE NO. - SURVEY - BOYCE

STATE HIGHWAY COMMISSION

BRIDGE DIVISION

SQUADABSCOOK STREAM BRIDGE

EAST

IN THE TOWN OF

HAMPDEN

PENOBSCOT COUNTY

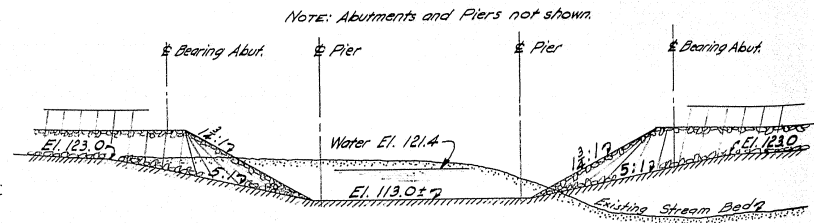
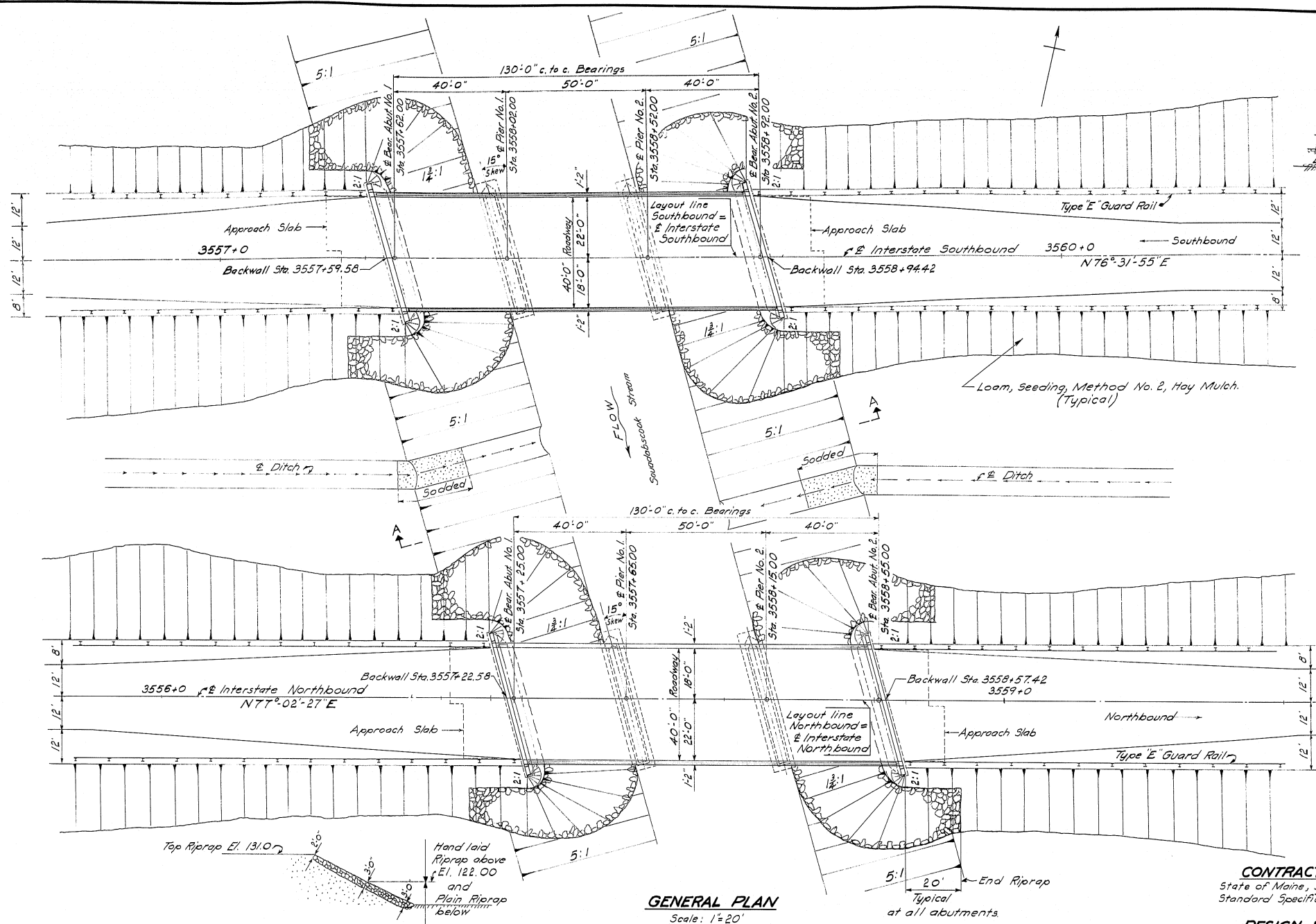
BORINGS

SHEET 3

AUGUSTA, MAINE

MARCH 1961

M-1529



SECTION A-A
 Note: Do not excavate ledge to provide channel section shown.
 Embankment adjacent to abutments to be placed by the controlled density method. For limits see Highway Plans.

ESTIMATED QUANTITIES

Structural Earth Excavation, Piers	135	c.y.
Structural Rock Excavation, Piers	10	c.y.
Structural Earth Excavation, Channel	12,650	c.y.
Common Borrow	4,650	c.y.
Granular Borrow	2,900	c.y.
Gravel Base Course, In Place Measurement	100	c.y.
Bituminous Concrete Surface Course, Type "A"	130	Tons
Portland Cement Concrete, Abutments and Retaining Walls	265	c.y.
Portland Cement Concrete, Piers	330	c.y.
Portland Cement Concrete, Piers (Placed under water)	385	c.y.
Portland Cement Concrete, Roadway and Sidewalk Slabs on Steel Bridges	365	c.y.
Portland Cement	2,000	bbls.
Structural Steel, fabricated and Delivered	23,640	lbs.
Structural Steel, Erection	23,640	lbs.
Structural Steel, Field Painting	23,640	lbs.
Bronze or Copper-Alloy Bearing and Expansion Plates, Delivered	400	lbs.
Bronze or Copper-Alloy Bearing and Expansion Plates, Placing	400	lbs.
Reinforcing Steel, Delivered	108,100	lbs.
Reinforcing Steel, Placing	108,100	lbs.
Steel H-Beam Piles, 42 lbs./ft.	1,130	L.F.
Cofferdam for Pier No. 1, Southbound, Souadabscook Stream Bridge, East	Lump	Sum
Cofferdam for Pier No. 2, Southbound, Souadabscook Stream Bridge, East	Lump	Sum
Cofferdam for Pier No. 1, Northbound, Souadabscook Stream Bridge, East	Lump	Sum
Cofferdam for Pier No. 2, Northbound, Souadabscook Stream Bridge, East	Lump	Sum
Aluminum Rail	522	L.F.
Membrane Waterproofing	1,170	s.y.
Plain Riprap	650	c.y.
Hand Laid Riprap	680	c.y.

Not part of this Contract.

CONTRACT SPECIFICATIONS

State of Maine, State Highway Commission
 Standard Specifications, Revision of January, 1956.

DESIGN SPECIFICATIONS

A.A.S.H.O. Standard Specifications for Highway Bridges 1957 and Subsequent Revisions.

LOADING

H20-516-44 as modified for Interstate Highways.
 $f_s = 18,000$ psi. Str. Steel
 $f_s = 20,000$ psi. Rein. Steel
 $f_c = 1,200$ psi.
 $n = 10$

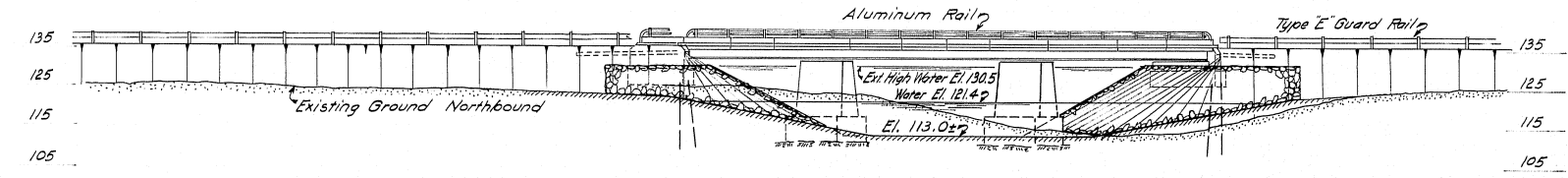
TRAFFIC

A.D.T. - 1960 - 7390
 A.D.T. - 1980 - 10310
 D.H.V. - 1235
 D - 60
 T - 11
 V - 60

CONCRETE CLASSIFICATION

Class "A" Abutments, Superstructure and Approach Slabs.
 Class "B" Pier Shafts
 Class "C" Pier Footings

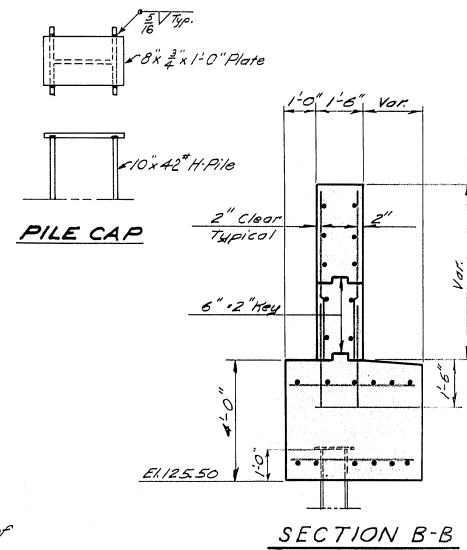
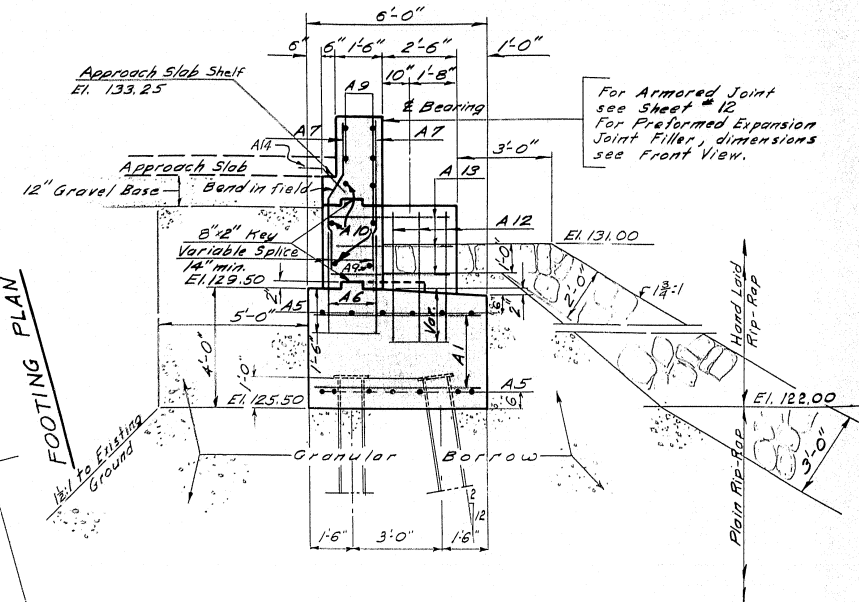
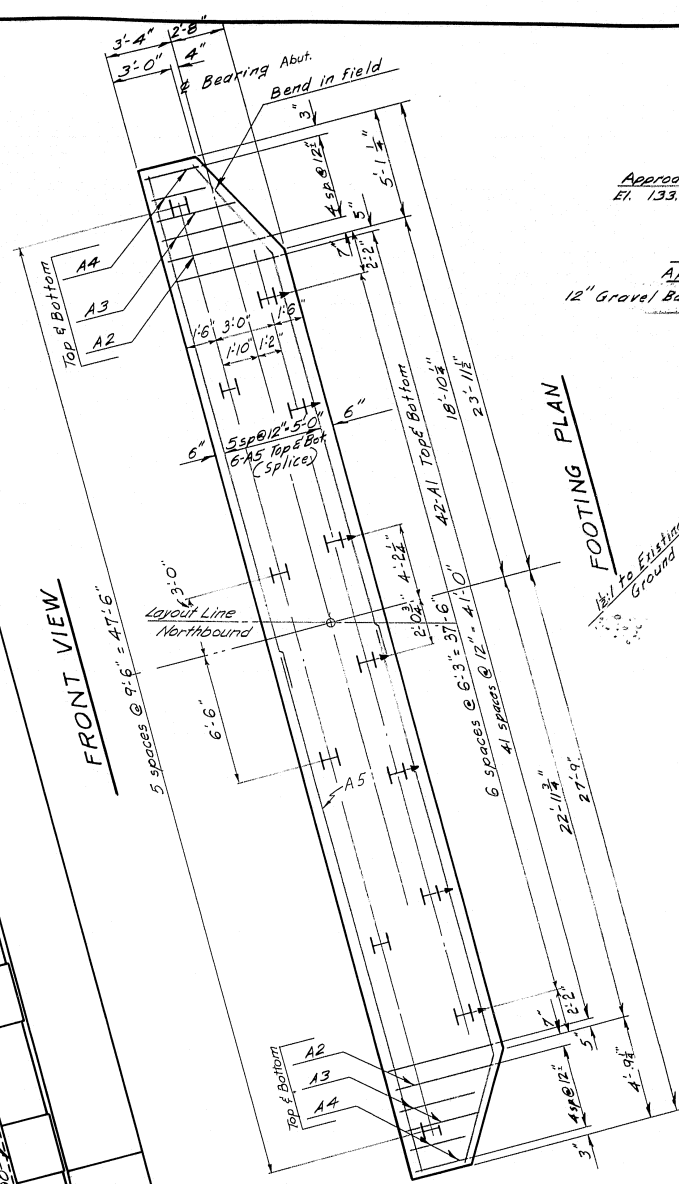
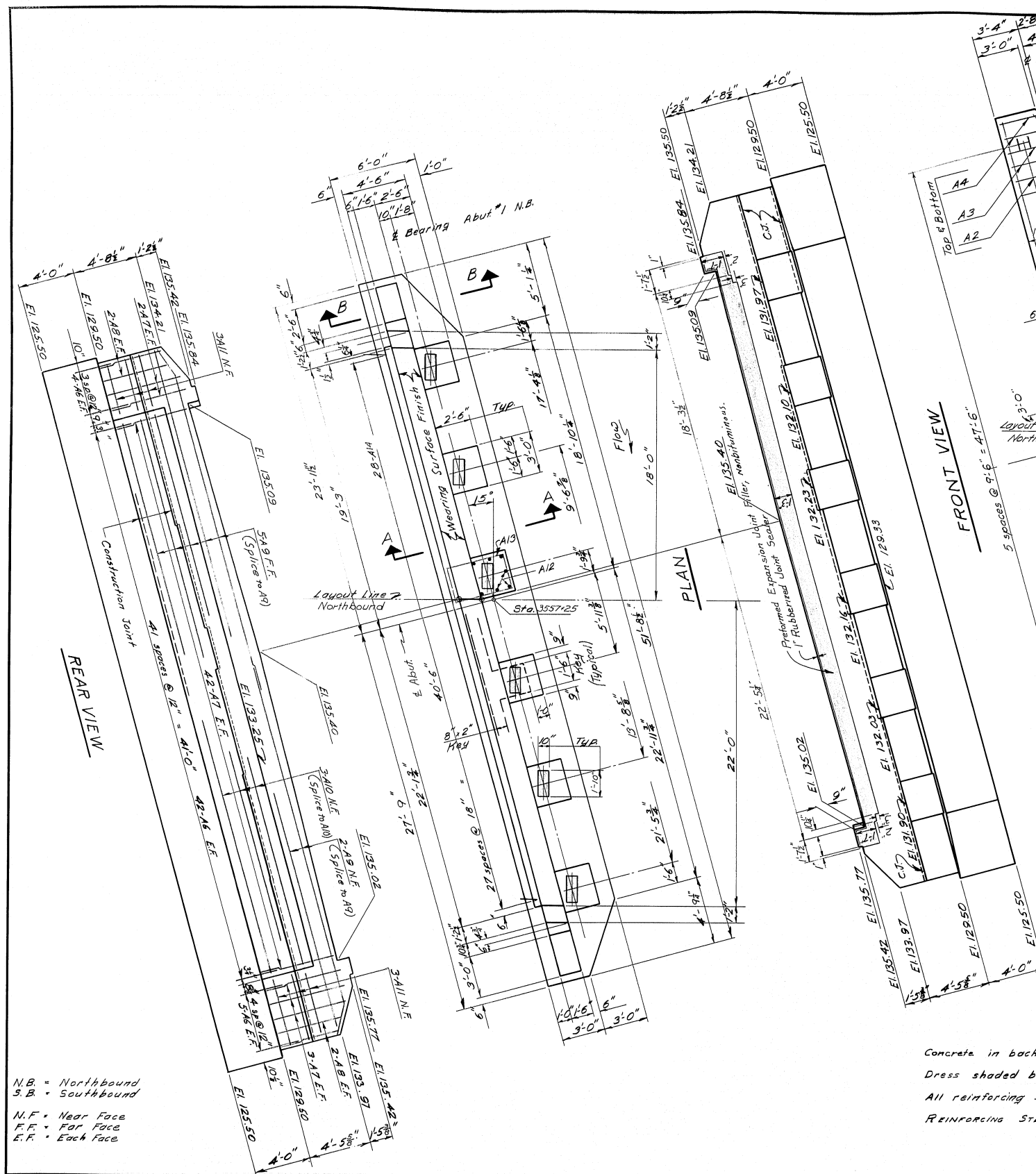
RIPRAP SECTION



ELEVATION NORTHBOUND LANE

Scale: 1" = 20'

M-1530



PILE NOTES:
 10 x 42" Steel H Piles.
 Pile load - 37 tons. Drive to ledge or practical refusal.
 Piles shown to be battered 2" / ft.
 Cut-offs to be 1'0" above bottoms of footings.
 Abutment No. 1, Northbound, Reqd 13 @ 20'0" (Estimated Length)
 Abutment No. 2, Northbound, " 13 @ 20'0" (Estimated Length)
 Reqd - 26 - Pile Cap Plates 8' x 1'0"

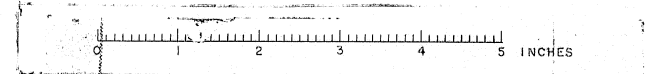
GENERAL NOTES

Concrete in backwall and bridge seat pedestals to be placed integrally.
 Dress shaded bearing areas to dimensions & exact elevations shown.
 All reinforcing steel to be 2" clear unless otherwise shown.
 REINFORCING STEEL & SECTIONS A-A & B-B ARE TYPICAL FOR ALL FOUR ABUTMENTS.

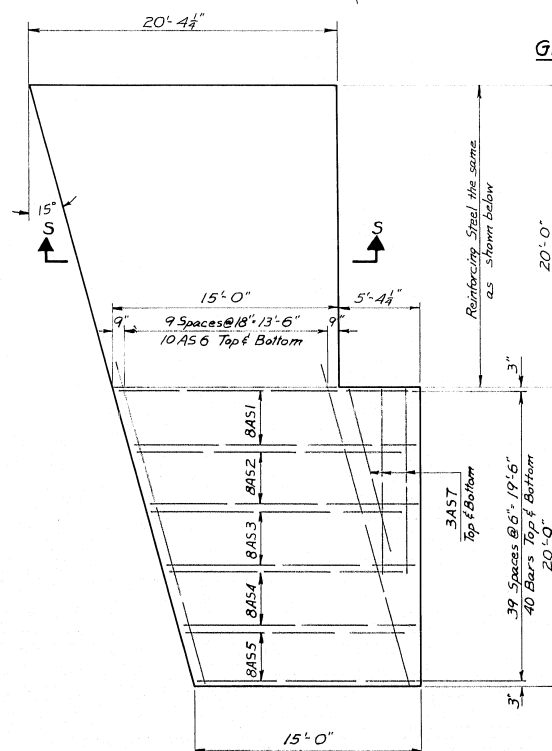
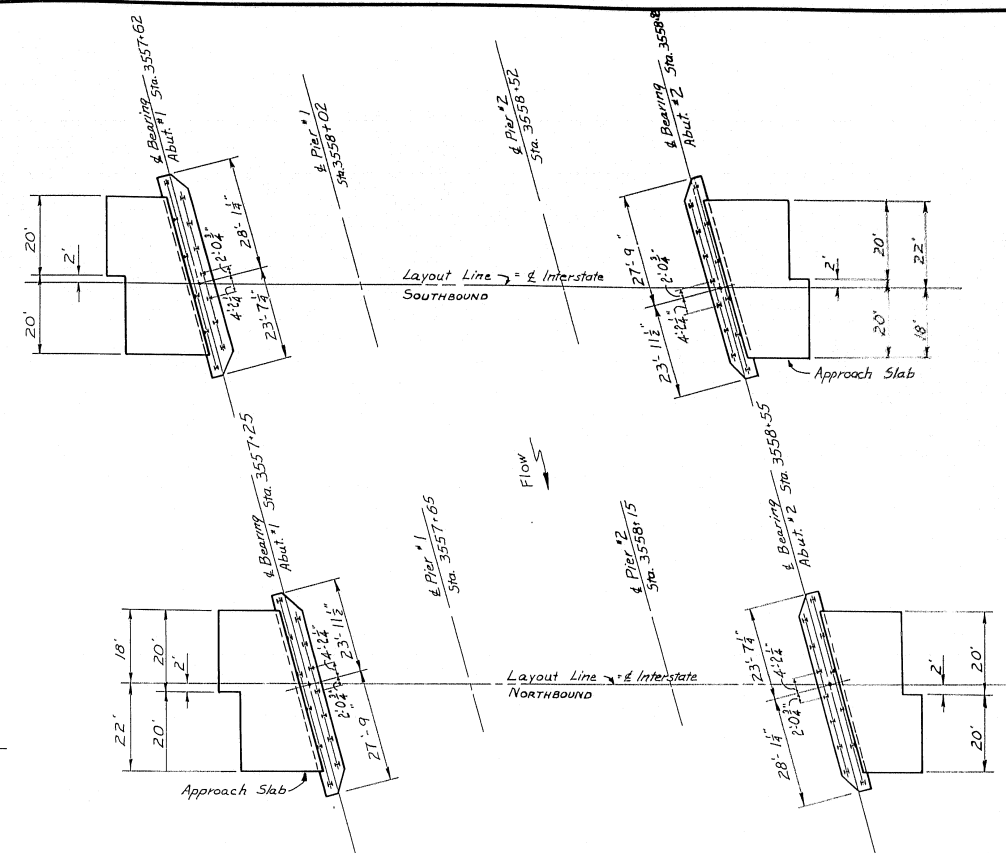
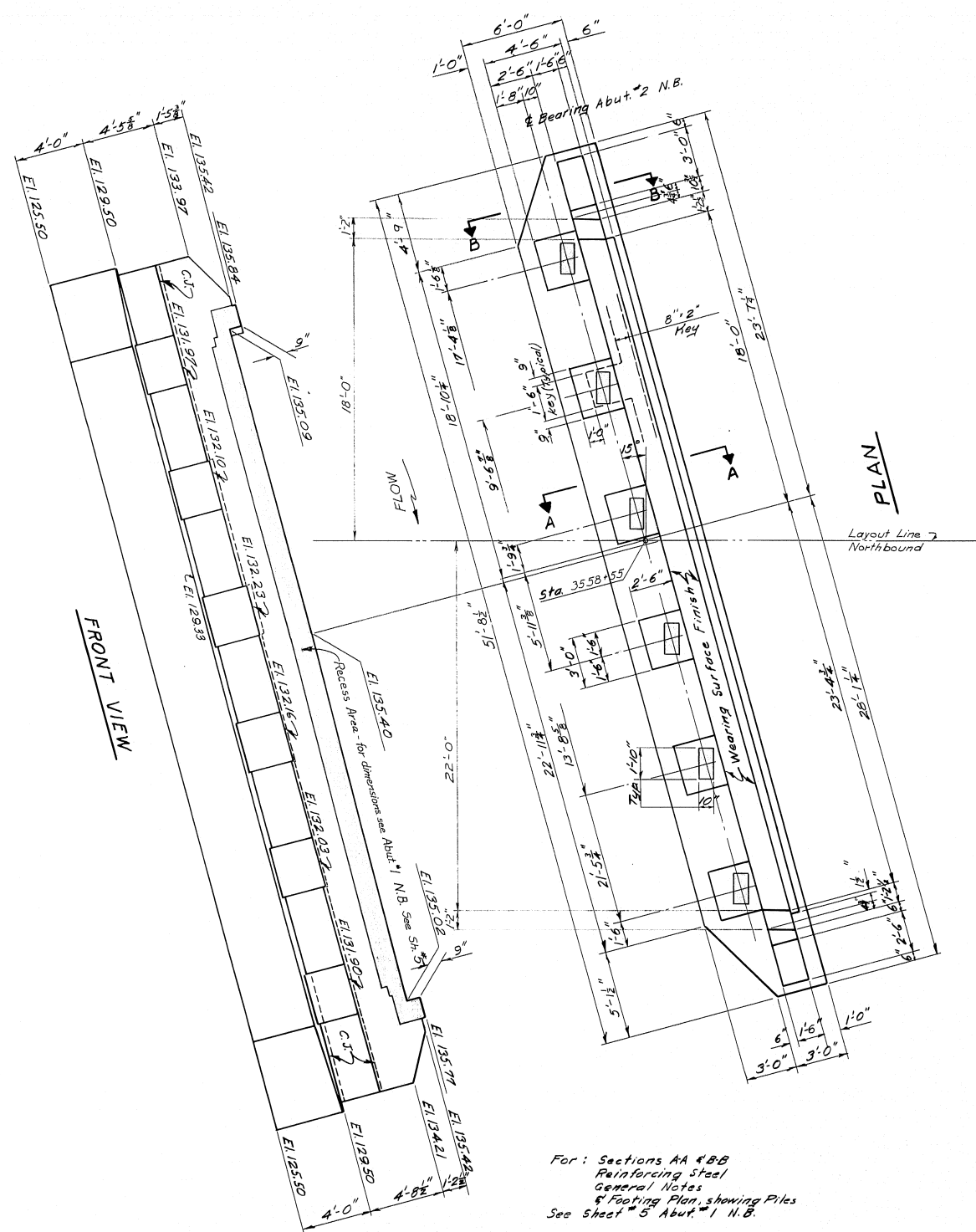
N.B. = Northbound
 S.B. = Southbound
 N.F. = Near Face
 F.F. = Far Face
 E.F. = Each Face

Work this sheet with Sh. # 6.
 DESIGN - T.H.K.
 TRACE - R.W.L.
 CHECK - H.L.D.
 BRIDGE NO. SURVEY - PLOT -
 STATE HIGHWAY COMMISSION
 BRIDGE DIVISION
SOUADABSCOOK STREAM BRIDGE EAST
 IN THE TOWN OF
HAMPDEN
PENOBSCOT COUNTY
 ABUTMENT NO. 1 NORTHBOUND
 SHEET 5 OF 14 AUGUSTA, MAINE MARCH 1961

M-1531



B. P. R. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEET
1	MAINE	F.A.P. I-95-7(14)	40	145



Approach Slab concrete to be class A and to be paid for under Item 701-40, Portland Cement Concrete Roadway and Sidewalk Slabs on Steel Bridges.

Work this sheet with Sh. #5.

For location see GENERAL LAYOUT above

DESIGN- T.H.K.	BRIDGE
----------------	--------

DESIGN- <i>T.H.K.</i> TRACE- <i>R.W.L.</i> CHECK- <i>H.L.D.</i>	BRIDGE NO. SURVEY- PLOT-
---	--------------------------------

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

SQUADABSCOOK STREAM BRIDGE

EAST

IN THE TOWN OF

HAMPDEN

PENOBSCOT COUNTY

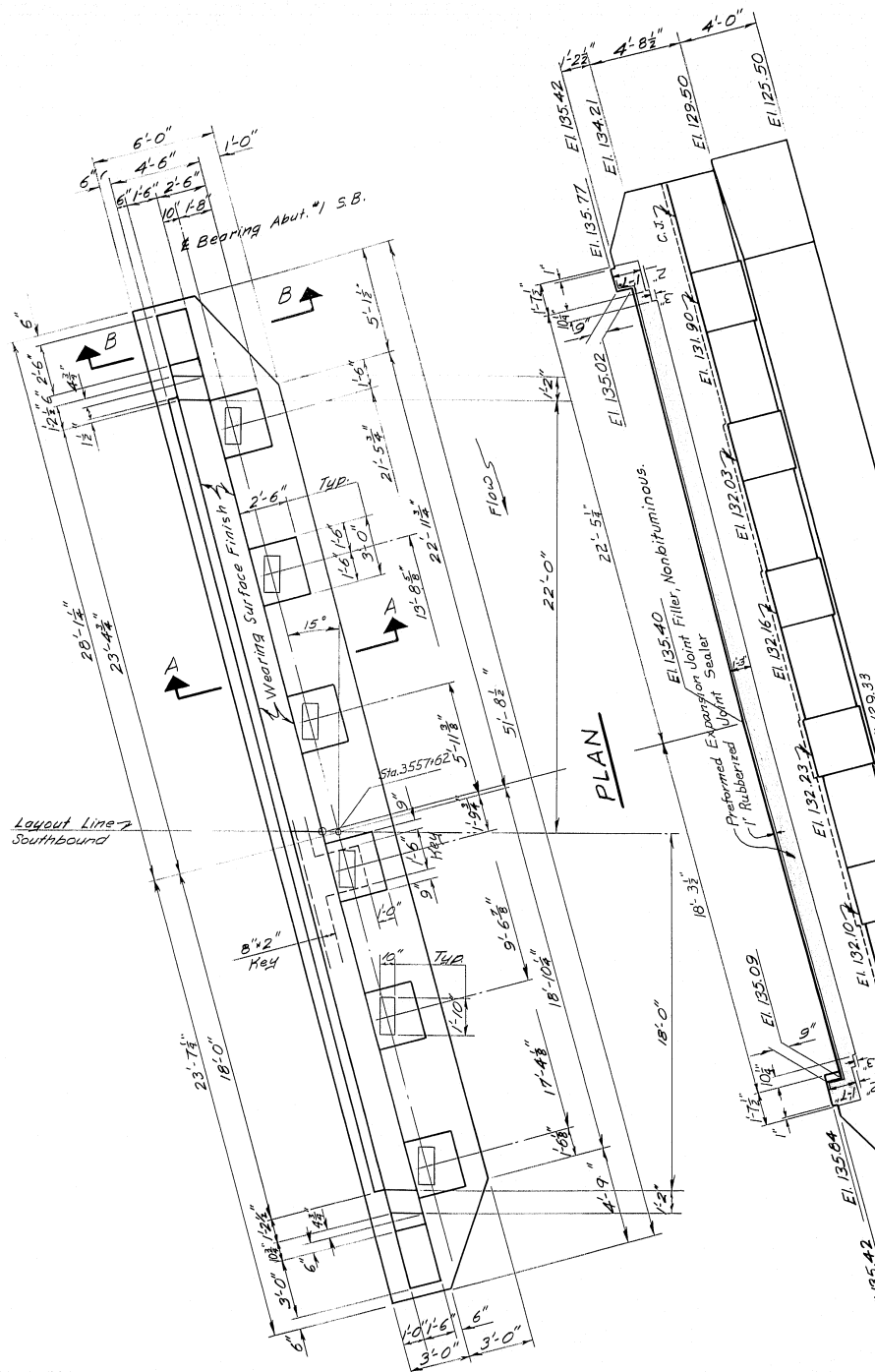
ABUTMENT NO. 2 NORTHBOUND

SHEET *6* OF *14* AUGUSTA, MAINE MARCH 1961

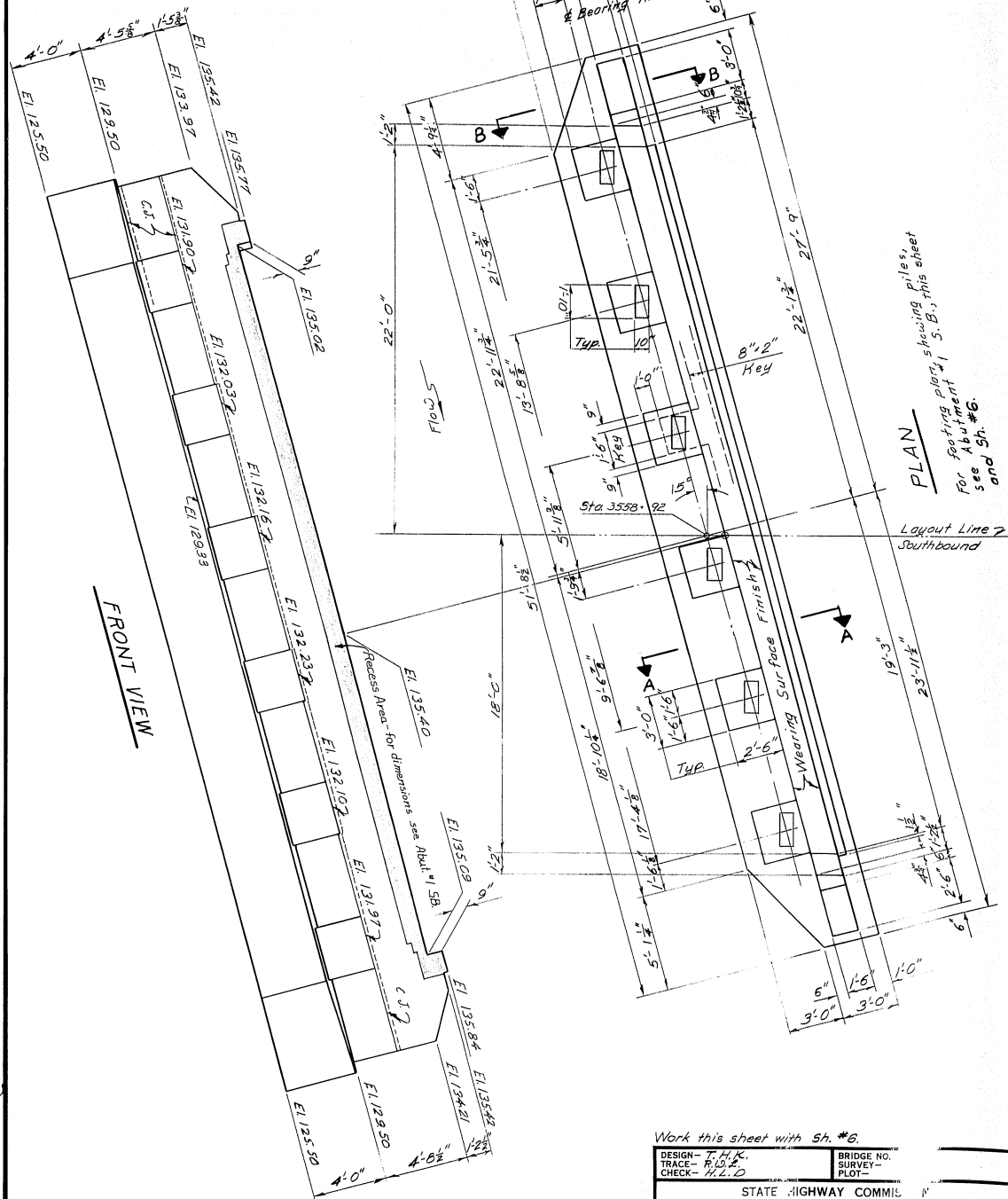
M-532

M-153Z

SOUTHBOUND
ABUTMENT NO. 1



SOUTHBOUND
ABUTMENT NO. 2



PILE NOTES:
 10" x 42" Steel H Piles
 Pile load - 37 Tons. Drive to ledge or
 practical refusal.
 Piles shown to be battered 2" / ft
 Cutoffs to be 1'0" above bottoms of footings.
 Abutment No. 1, Southbound Road 4 @ 10' (23' 11")
 9 @ 18' 0" (")
 Abutment No. 2, Southbound Road 13 @ 20' 0" (")
 Road - 26 Pile Cap Plates 5' x 2' x 1' 0"
 See 5A * 5 for Pile Cap Details.

NOTES :

For Sections A-A & B-B, Reinforcing Steel, &
General Notes see sheet *5 Abutment #1 N.B.

Work this sheet with Sh. #6

DESIGN- <i>T.H.K.</i>	BRIDGE N
TRACE- <i>R.W.L.</i>	SURVEY-
CHECK- <i>H.L.D.</i>	PLOT-

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

SOUADABSCOOK STREAM BRIDGE
EAST

IN THE TOWN OF

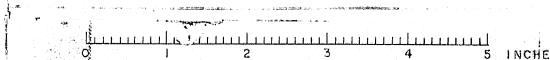
HAMPDEN

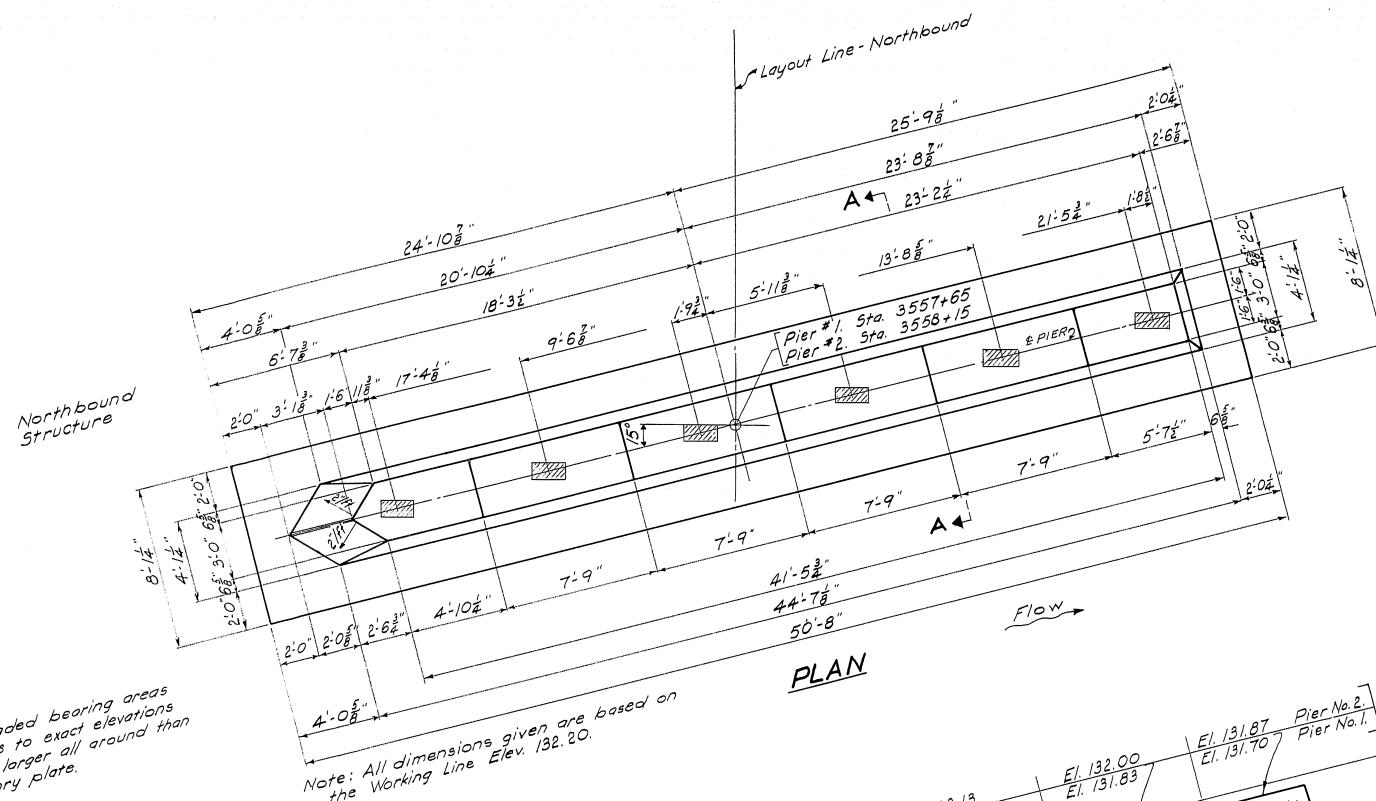
PENOBSCOT COUNTY

ABUTMENTS NO. 1 & 2 SOUTHBOUND

SHEET 7 OF 14 AUGUSTA, MAINE MARCH 196

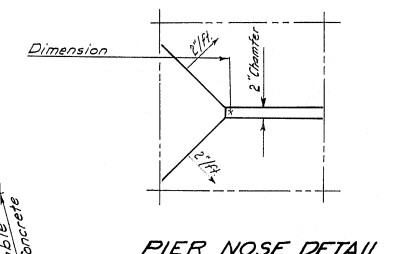
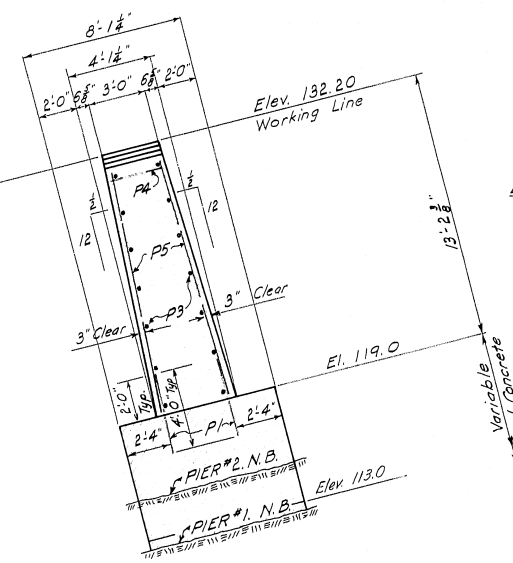
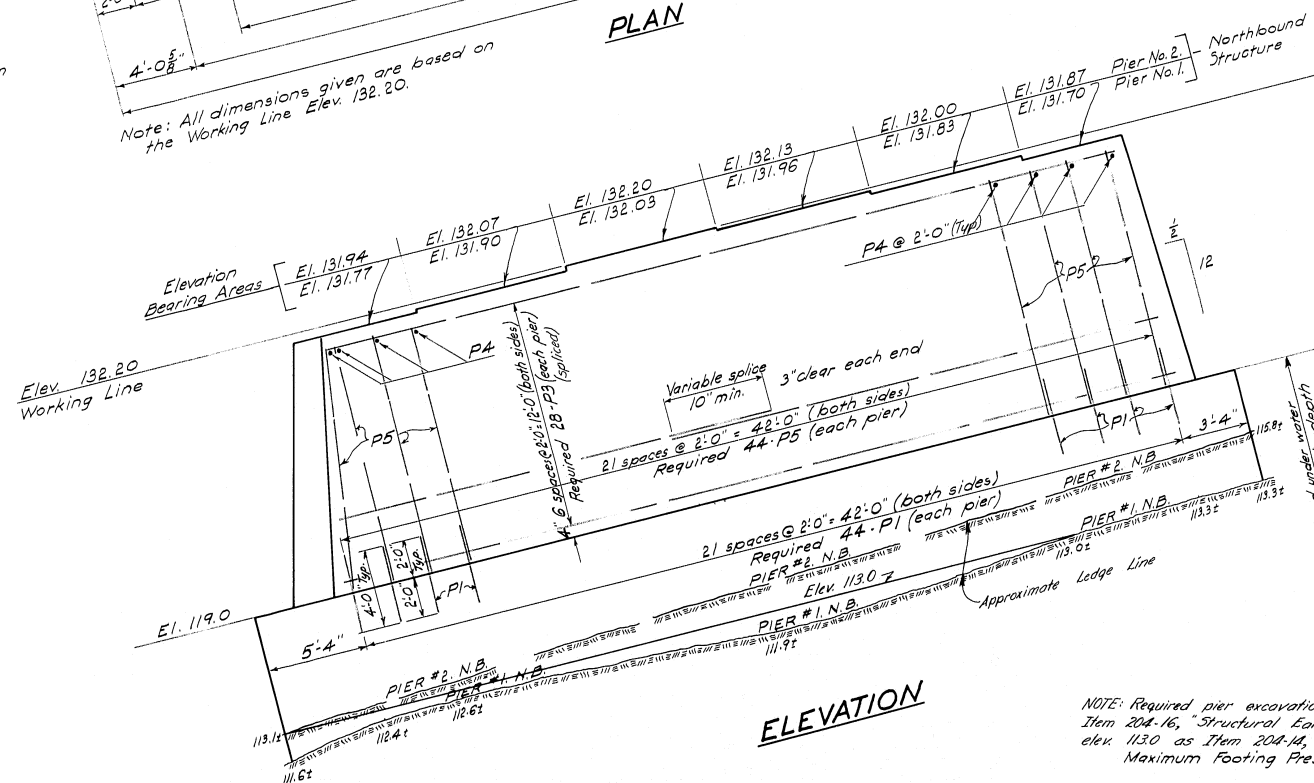
M-1532





Note: Dress shaded bearing areas on bridge seats to exact elevations shown and 1" larger all around than size of masonry plate.

Note: All dimensions given are based on the Working Line Elev. 132.20.



Note: Minimum width of bridge seat 3'-0" based on El. 132.20 (Working Line Elevation)

NOTE: Required pier excavation above elev. 113.0 to be paid as Item 204-16, "Structural Earth Excavation, Channel" and below elev. 113.0 as Item 204-14, "Structural Earth Excavation, Piers". Maximum Footing Pressure 2 Tons/sq. ft.

DESIGN - Gormley
TRACE - W.B.H.
CHECK - A.S.F.

BRIDGE NO. SURVEY - PLOT -

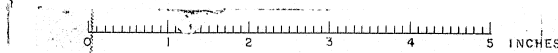
STATE HIGHWAY COMMISSION
BRIDGE DIVISION

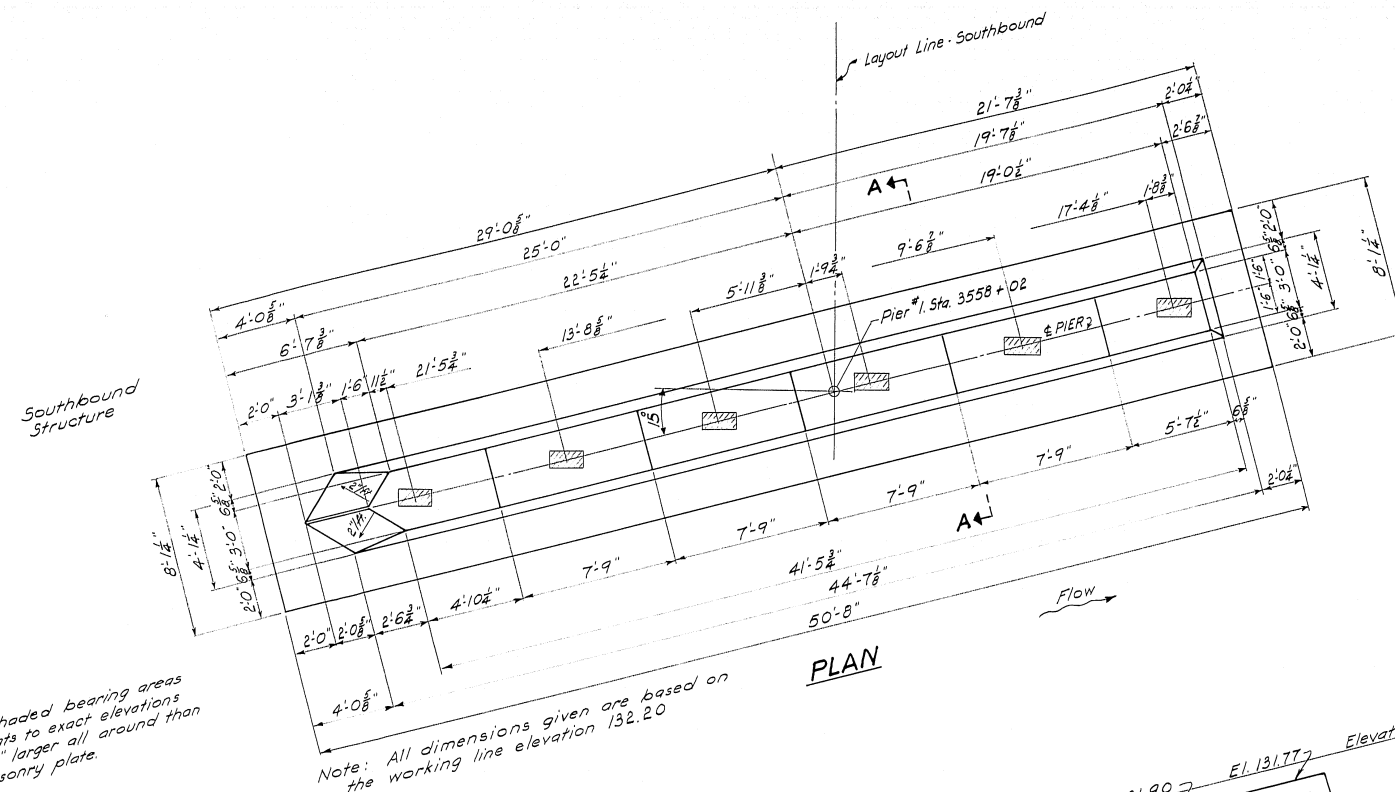
**SOUADABSCOOK STREAM BRIDGE
EAST**

IN THE TOWN OF
HAMPDEN
PENOBSCOT COUNTY
PIERS NO. 1 & 2 NORTHBOUND

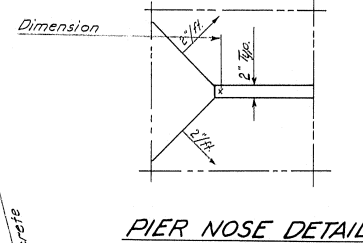
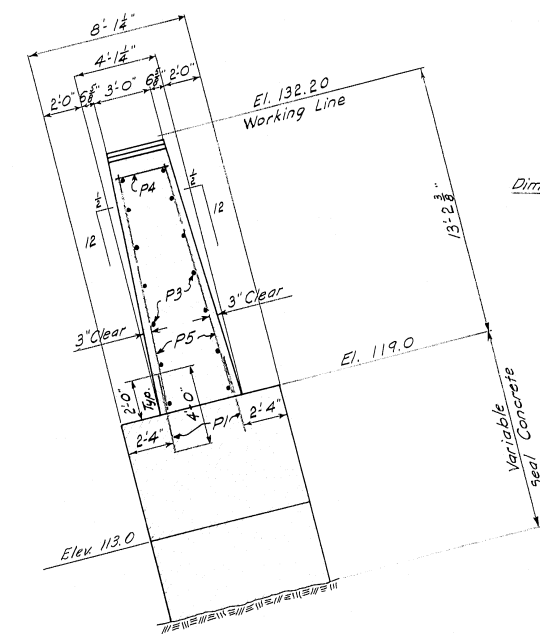
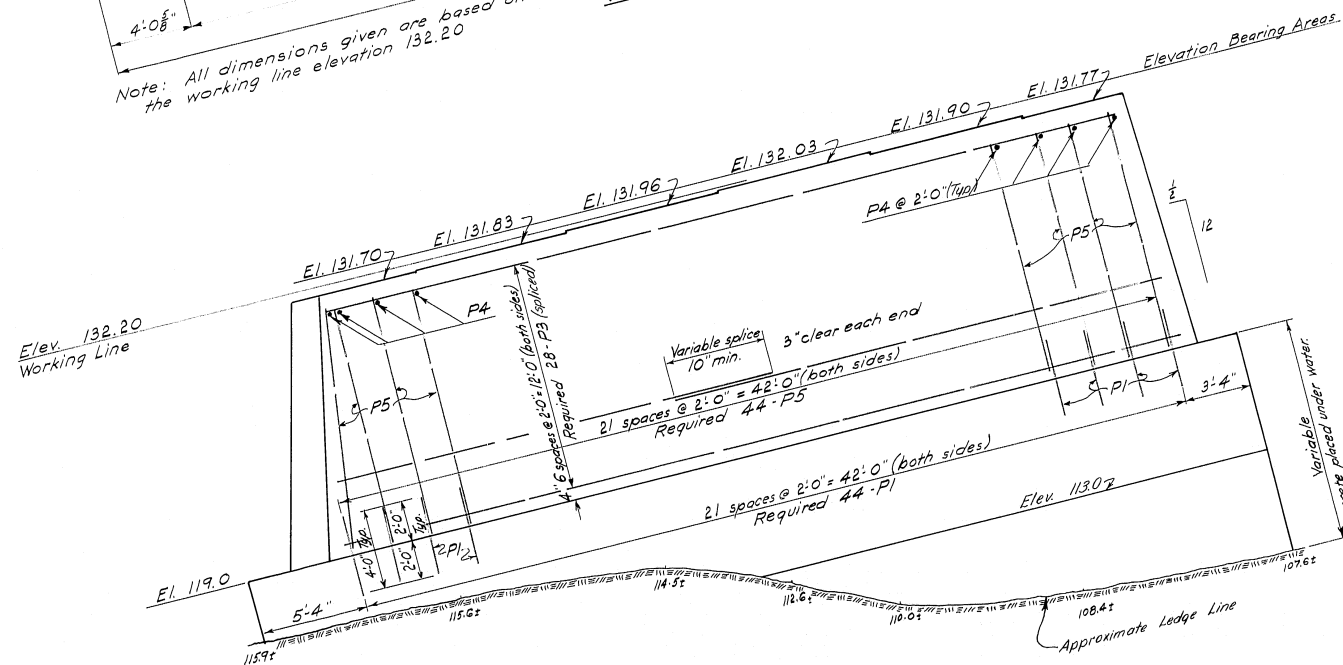
SHEET 8 OF 14 AUGUSTA, MAINE MARCH 1961

M-1534





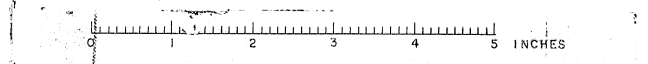
Note: Dress shaded bearing areas on bridge seats to exact elevations shown and 1" larger all around than size of masonry plate.

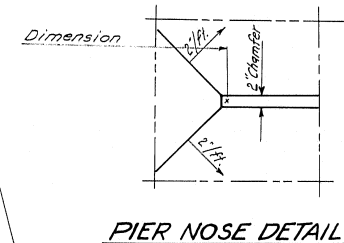
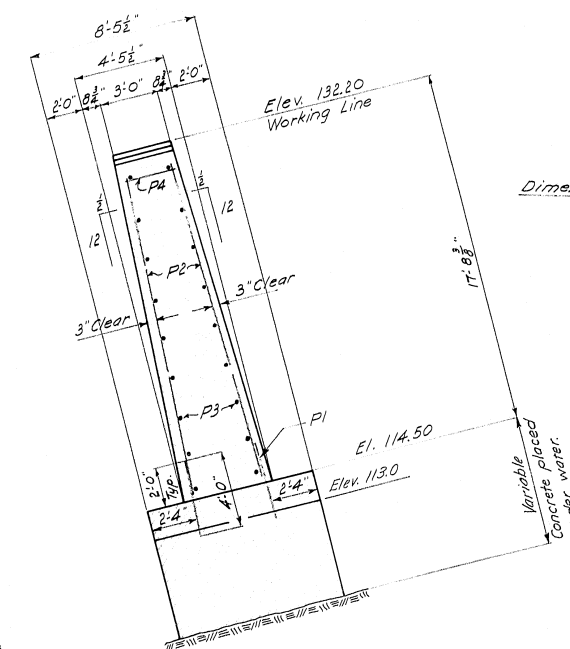
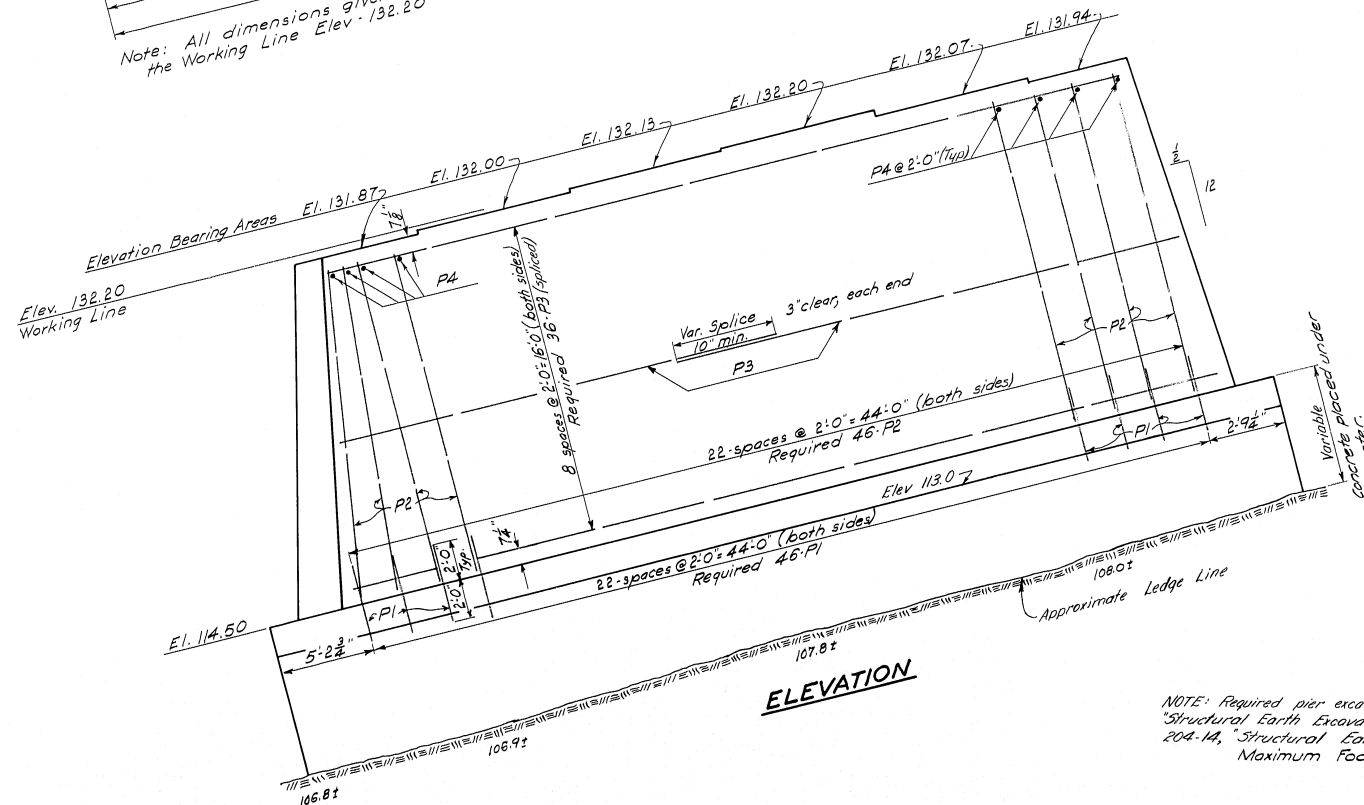
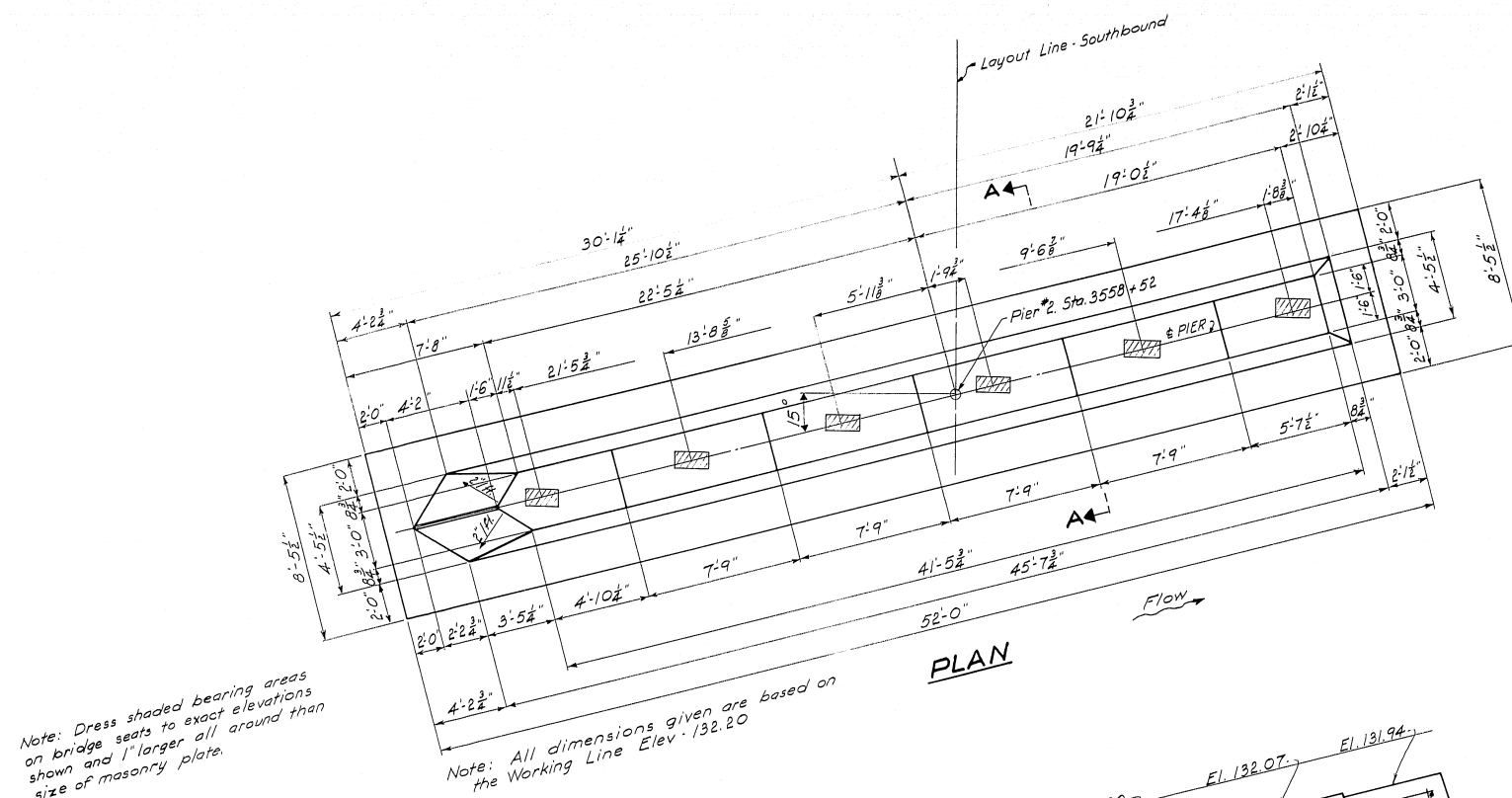


NOTE: Required pier excavation above elev. 113.0 to be paid as Item 204-16, "Structural Earth Excavation, Channel" and below elev. 113.0 as "Structural Earth Excavation, Piers".
Maximum Footing Pressure 2.5 Tons / ft².

DESIGN - Gormley	BRIDGE NO.
TRACE - W.A.H.	SURVEY -
CHECK - F.S.F.	PLOT -
STATE HIGHWAY COMMISSION BRIDGE DIVISION	
SQUADABSCOOK STREAM BRIDGE EAST	
IN THE TOWN OF HAMPDEN PENOBSCOT COUNTY	
PIER NO. 1 SOUTHBOUND	
SHEET 9 OF 14 AUGUSTA, MAINE MARCH 1961	

M-1535



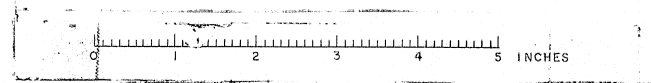


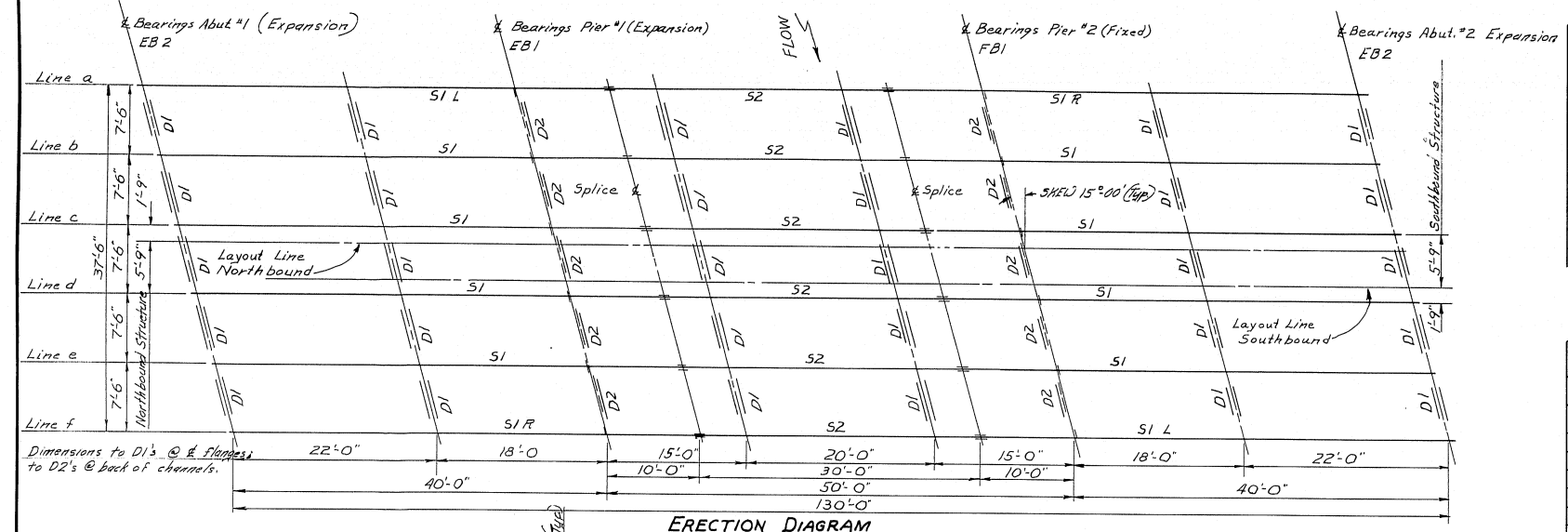
Note: Minimum width of bridge seat 3'-0" based on El. 132.20 (Working Line elev.)

NOTE: Required pier excavation above elev. 113.0 to be paid as Item 204-16, "Structural Earth Excavation, Channel" and below elev. 113.0 as Item 204-1A, "Structural Earth Excavation, Piers". Maximum Footing Pressure 2.5 Tons/sq. ft.

DESIGN - Gentry	BRIDGE NO.
TRACE - W.A.H.	BRIDGE DIVISION
CHECK - F.S.H.	100
STATE HIGHWAY COMMISSION	
BRIDGE DIVISION	
SQUADABSCOOK STREAM BRIDGE	
EAST	
IN THE TOWN OF	
HAMPDEN	
PENOBSCOT COUNTY	
PIER NO. 2 SOUTHBOUND	
SHEET 10 OF 14 AUGUSTA, MAINE MARCH 1961	

M-1536





NORTHBOUND STRUCTURE

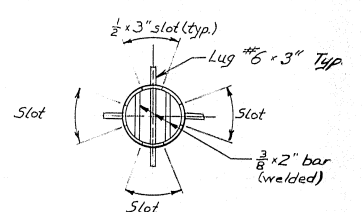
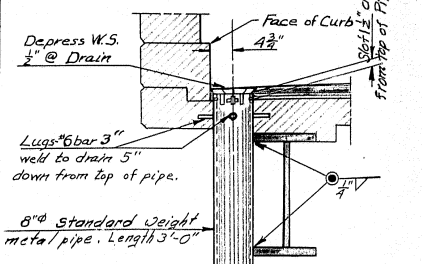
Bottom of Slab Elevations

	Line a	Line b	Line c	Line d	Line e	Line f
# Bearings Abut.	134.40	134.53	134.66	134.59	134.46	134.33
+10	134.41	134.54	134.67	134.60	134.47	134.34
+20	134.42	134.55	134.68	134.61	134.48	134.35
+30	134.41	134.54	134.67	134.60	134.47	134.34
# Bear. Pier	134.40	134.53	134.66	134.59	134.46	134.33
+50	134.41	134.54	134.67	134.60	134.47	134.34
+60	134.42	134.55	134.68	134.61	134.48	134.35
# Span #2	134.42	134.56	134.69	134.62	134.49	134.36

SOUTHBOUND STRUCTURE

Bottom of Slab Elevations

	Line a	Line b	Line c	Line d	Line e	Line f
# Bearings Abut.	134.33	134.46	134.59	134.66	134.53	134.40
+10	134.34	134.47	134.60	134.67	134.54	134.41
+20	134.35	134.48	134.61	134.68	134.55	134.42
+30	134.34	134.47	134.60	134.67	134.54	134.41
# Bear. Pier	134.33	134.46	134.59	134.66	134.53	134.40
+50	134.34	134.47	134.60	134.67	134.54	134.41
+60	134.35	134.48	134.61	134.68	134.55	134.42
# Span #2	134.36	134.49	134.62	134.69	134.56	134.43



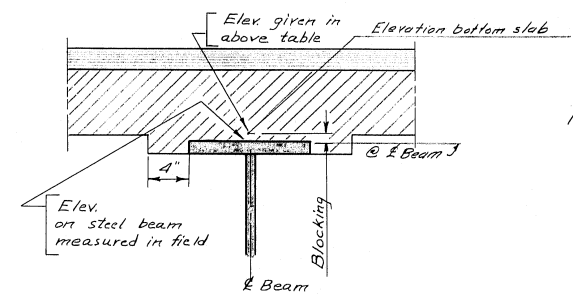
NOTE: See sheet No. #13 for location of drains.

24 Drains required

NOTES: Drains to be paid for under Items 702-103, 702-104 and 702-105.

1/2" x 3" slots in drain pipe must be cleaned of concrete & membrane water proofing.

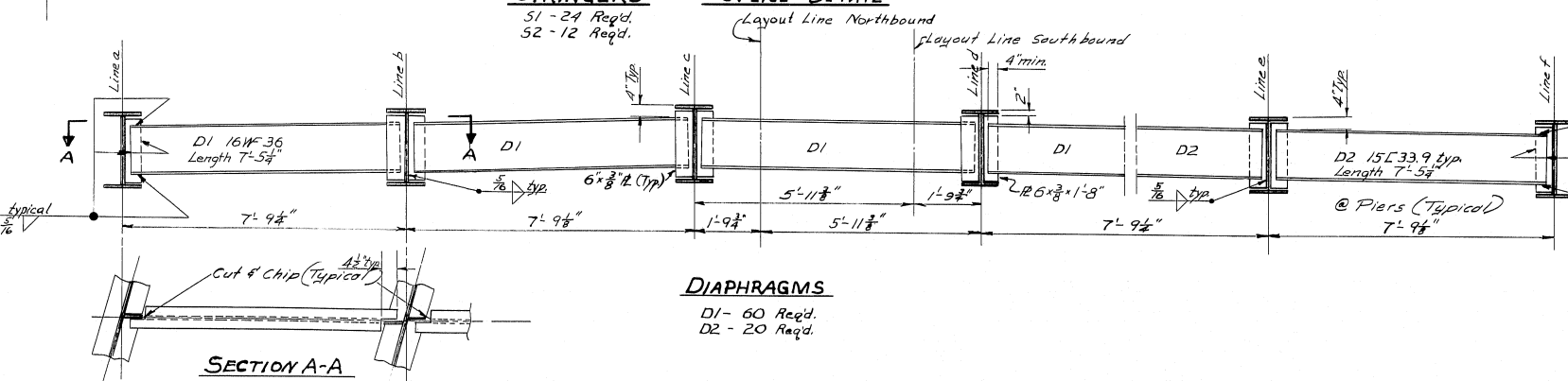
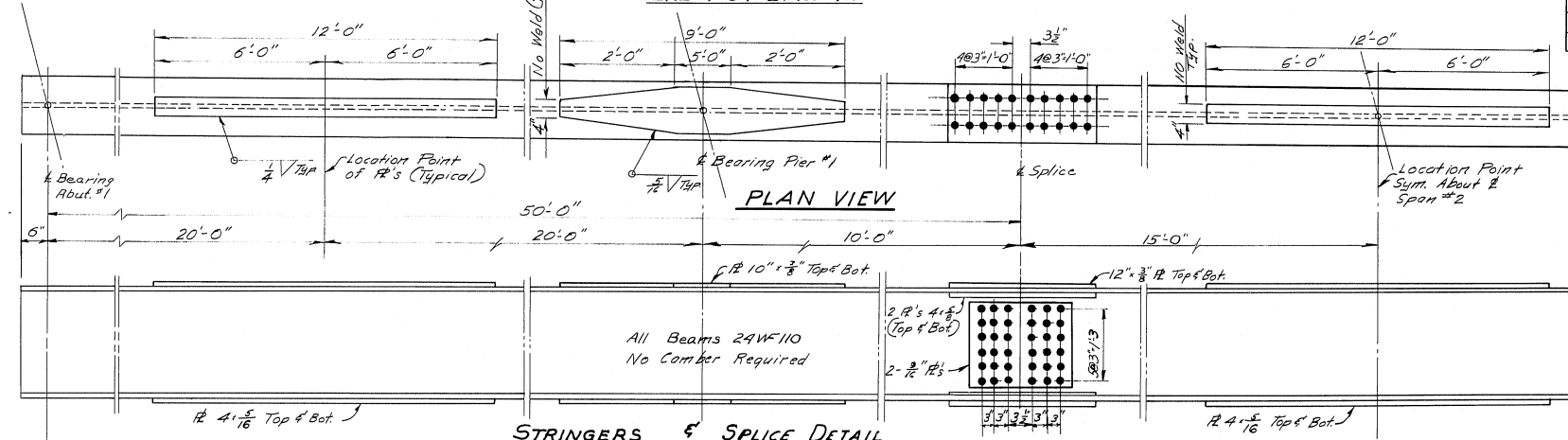
Note: In order to compensate for the dead load deflection and any irregularities in the rolling of the steel, elevations will be taken at the above points after the erection of the steel but before any forms have been constructed. These elevations will be subtracted from elevations given in the tables and the results will be the blocking. See blocking detail.

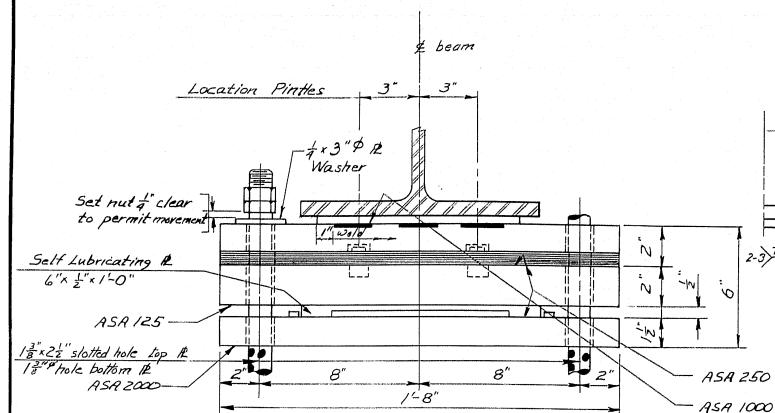


BLOCKING DETAIL

Blocking over # bearings for all beams is 1" to top of WF beam to bottom of slab.

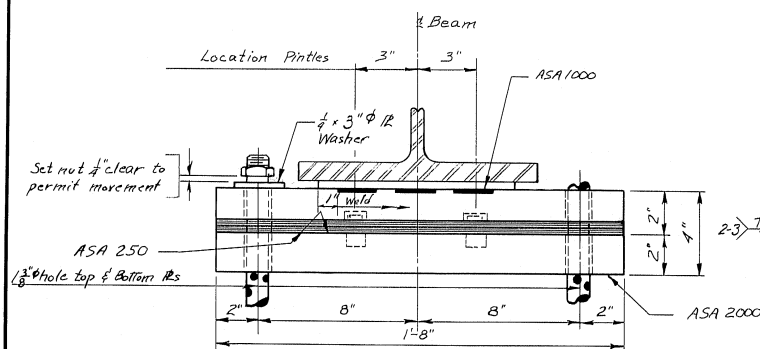
Blocking & Drains H.L.D.





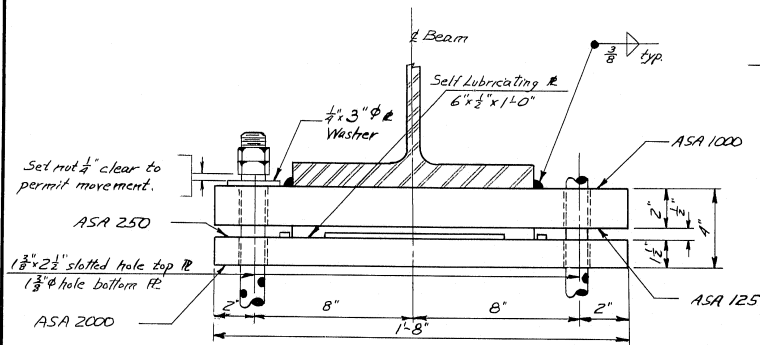
EXPANSION BEARING EB1

12 Required



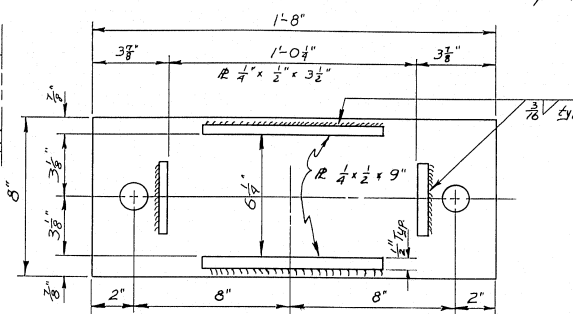
FIXED BEARING FB1

12 Required

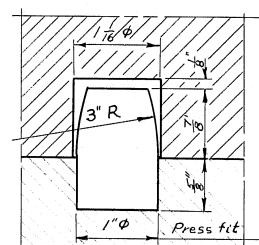


EXPANSION BEARING EB2

24 Required



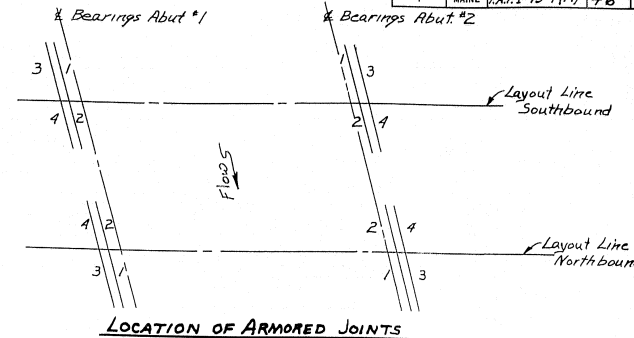
MASONRY PLATE FOR EB1 & EB2



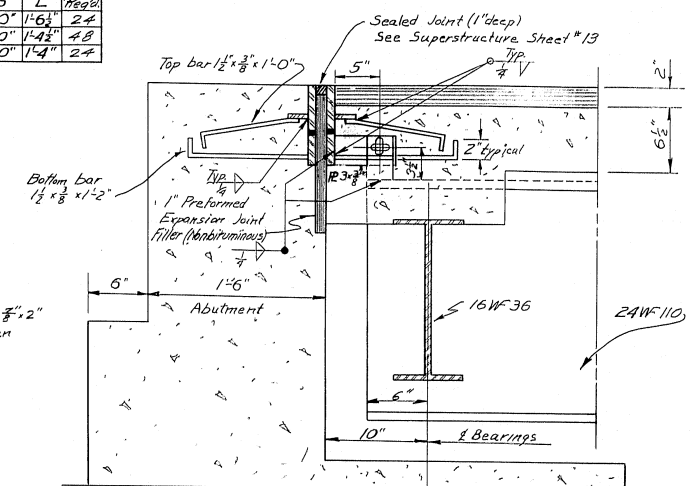
PINTLE DETAIL

NOTE: 3/8 inch adjustment R's with 5/8 inch 2 inch slotted holes. Weld together when joint is positioned.

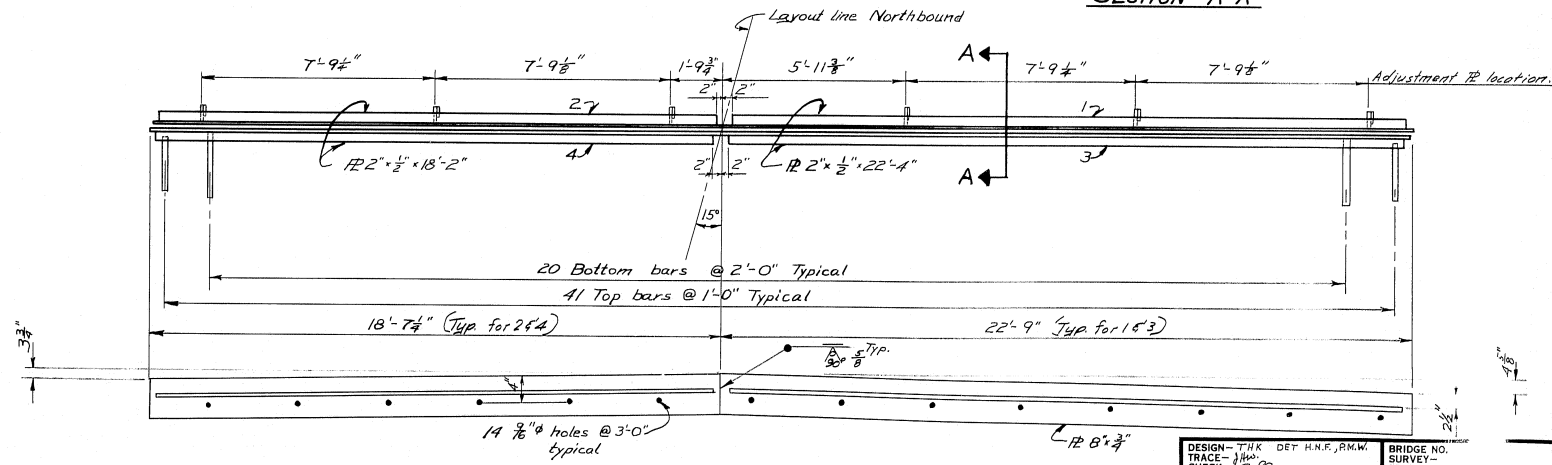
ANCHOR	BOLTS						
Bearing	P	T	P-T	S	L	Reqd.	
EB1	8 1/2"	2 1/2"	6"	10"	1 1/2"	2 1/2"	
EB2	6 1/2"	2 1/2"	4"	10"	1 1/2"	4 1/2"	
FB1	6"	2"	4"	10"	1 1/2"	2 1/2"	



LOCATION OF ARMORED JOINTS



SECTION A-A

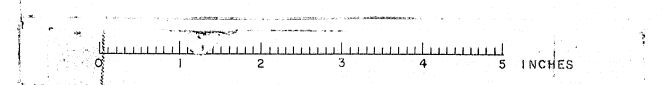


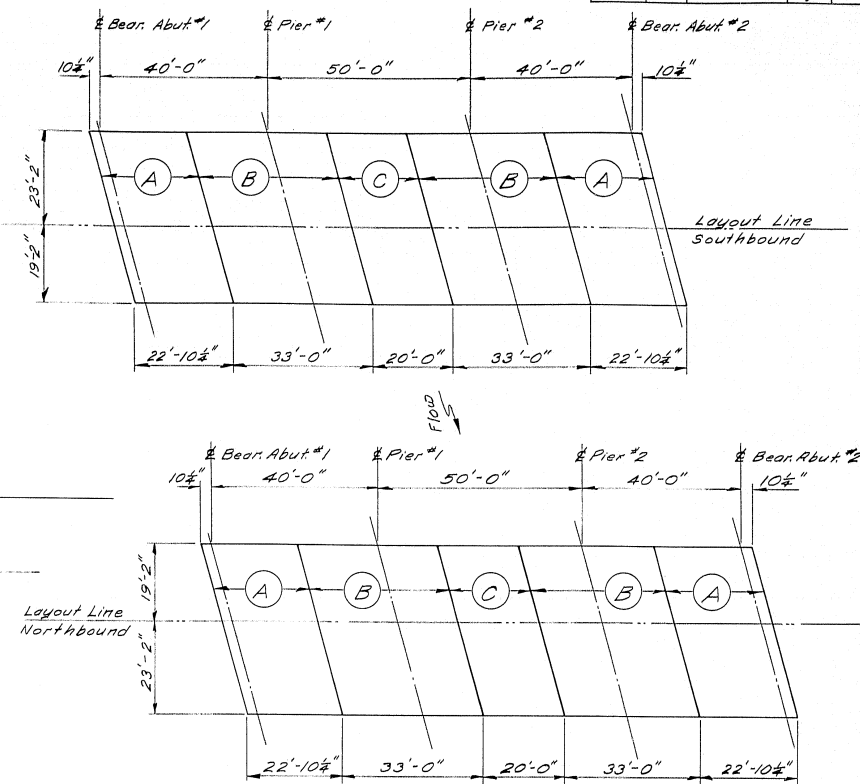
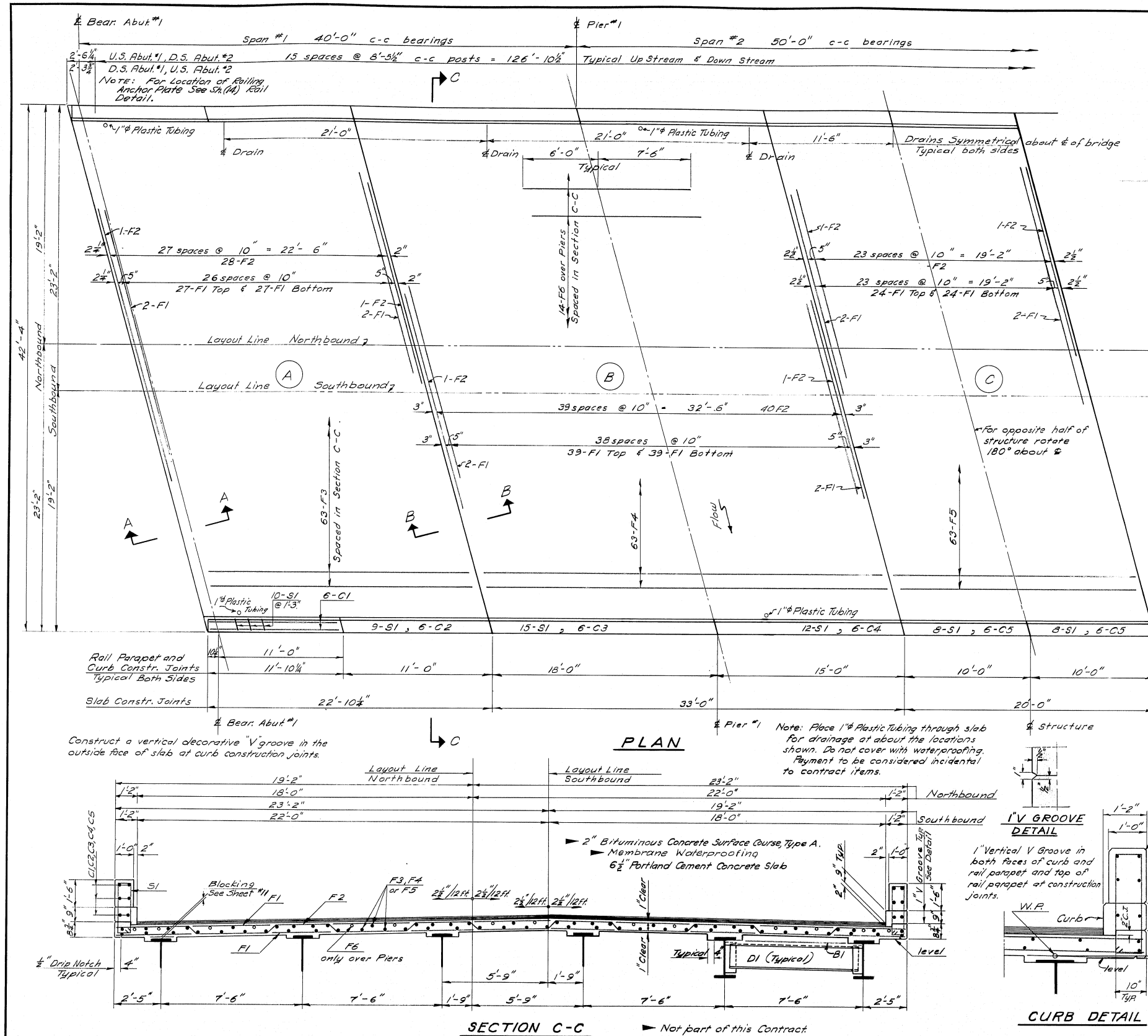
ARMORED JOINT

NOTE: For Southbound layout see "Location of Armored Joints"

DESIGN - T.H.K.	DET. H.N.F., R.M.W.	BRIDGE NO.	
TRACE - J.H.W.		SURVEY	
CHECK - J.H.W.		PLOT -	
STATE HIGHWAY COMMISSION BRIDGE DIVISION			
SQUADABSCOOK STREAM BRIDGE EAST IN THE TOWN OF HAMPDEN PENOBSCOT COUNTY STRUCTURAL STEEL DETAILS			
SHEET 12 OF 14 AUGUSTA, MAINE MARCH 1961			

M-1538

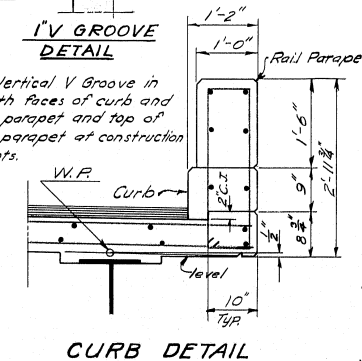
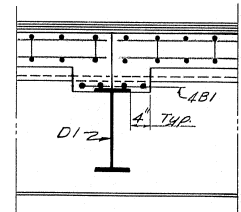
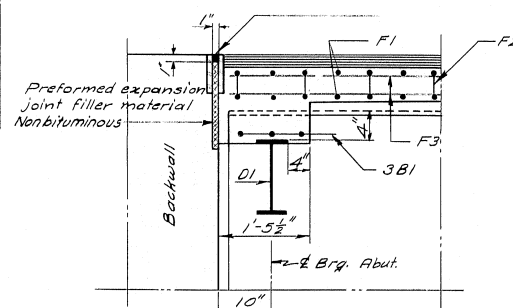




LAYOUT PLAN

Concrete Placing Sequence in Superstructure Slab:
 In each structure; Panels A & C to be placed before Panels B.

Sealed Joint. This area to be sealed with rubberized joint sealer.



NOTE:
 Concrete for curbs shall not be placed until concrete in superstructure slab has been in place for a minimum period of seven days. During the seven day period formwork may be placed but hand equipment only shall be allowed on the slab.
 Curb steel shall be in place before slab concrete is placed.
 Break bond of Vertical Construction Joints in curbs and rail curbs only with a suitable grade of asphaltic paint.

DESIGN - T.H.R.
 TRACE - R.L.S.
 CHECK - H.L.O.

BRIDGE NO. SURVEY - PLOT -

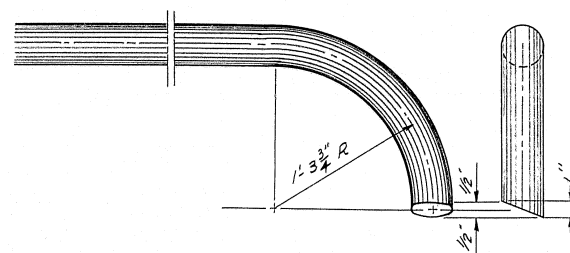
STATE HIGHWAY COMMISSION
 BRIDGE DIVISION

SQUADABSCOOK STREAM BRIDGE EAST

IN THE TOWN OF
HAMPDEN
PENOBSCOT COUNTY
 SUPERSTRUCTURE DETAILS

SHEET 13 OF 14 AUGUSTA, MAINE MARCH 1961

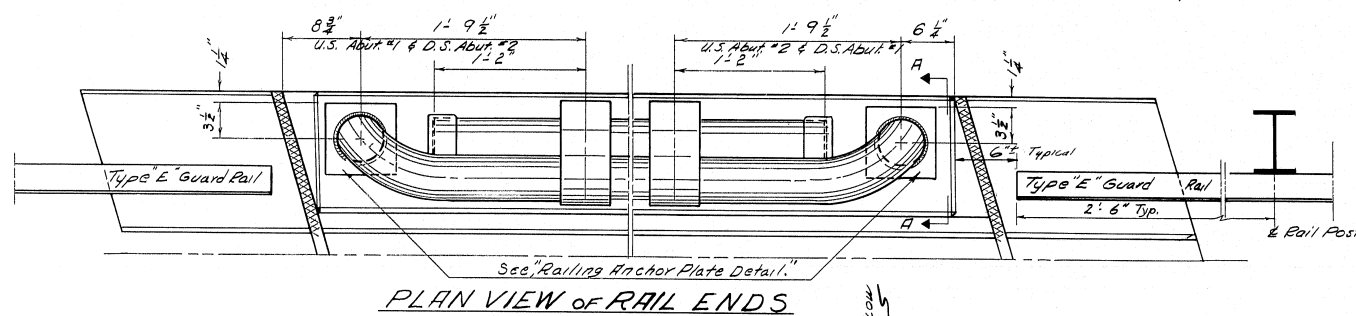
M-1539



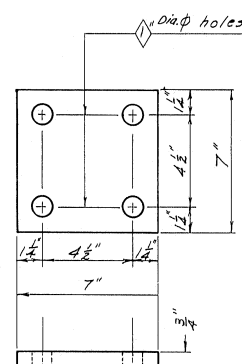
SIDE VIEW

DETAIL OF END TUBE

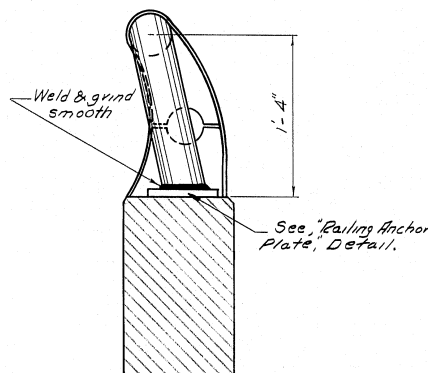
Note: Bent portion of Aluminum tube to be paid for under Item 806-7, "Aluminum Rail."



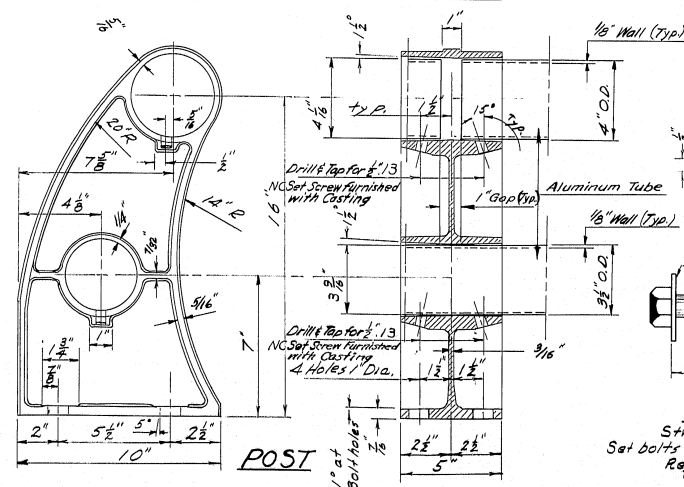
PLAN VIEW OF RAIL ENDS



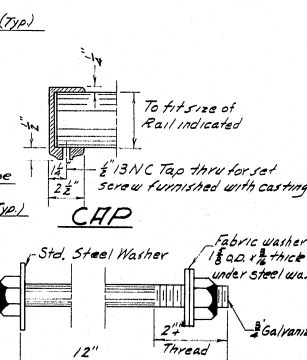
RAILING ANCHOR PLATE (ALUMINUM)



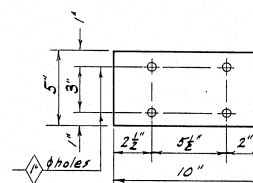
SECTION A-A



POST

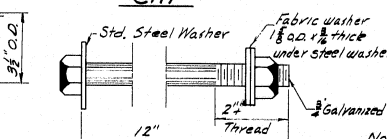


CAF



SHIM

Aluminum Alloy Shims $5\frac{1}{2} \times 0-10'$
to be used and cut as necessary.
Furnish in the amount of 50% of
number of rail posts.



ANCHOR BOLTS

ANCHOR BOLTS
Structural Steel Galvanized.
Set bolts with 2" projecting out of concrete
Reqd: 4 each rail post
4 each anchor Plate

Note: To the extent possible Aluminium pipe shall be continuous for two panels with joints staggered. One set screw to be tight, all others to bear, for each length of pipe.

Rail details shall be submitted to the Engineer for approval.

REINFORCING STEEL N.B. & S.B.

F2

Dimensions to § of bars.

S1

MARK	SIZE	NO.	LENGTH	LOCATION
BENT BARS				
F2	# 5	320	44'-9"	All Panels
S1	4	432	6'-10"	Curb ~ All Panels ~
STRAIGHT BARS				
F1	# 5	624	43'-6"	All Panels
F3	5	252	22'-6"	Panel "A"
F4	5	252	32'-8"	Panel "B"
F5	5	126	19'-8"	Panel "C"
F6	5	56	13'-6"	Panel "B" ~ Over Pier ~
C1	4	48	11'-6"	Panel "A" ~ Curbs ~
C2	4	48	10'-8"	do
C3	4	48	17'-8"	Panel "B" ~ Curbs ~
C4	4	48	14'-8"	do
C5	4	48	9'-8"	Panel "C" ~ Curbs ~
B1	5	260	5'-9"	@ Const. Joints & End Diaphragms

ABUTMENTS, APPROACH SLABS, & PIERS

REINFORCING STEEL N.B. & S.B.

A13

A14

All dimensions to c/c of bars.

MARK	SIZE	NO.	LENGTH	LOCATION
------	------	-----	--------	----------

BENT BARS

A13	*3	72	13'-1"	Bridge Seat Pedestals
A14	5	112	2'-6"	Backwall - Approach Slab -

STRAIGHT BARS

A1	*6	336	5'-6"	Footings
A2	6	16	5'-4"	Footings
A3	6	32	4'-0"	Footings
A4	6	32	2'-8"	Footings
A5	6	104	26'-9"	Footings
A6	5	408	3'-6"	Footings - Backwall
A7	5	376	5'-4"	Backwall & Wings
A8	5	32	4'-3"	Wings
A9	4	56	25'-9"	Backwall & Wings
A10	4	24	21'-3"	Backwall
A11	4	24	6'-6"	Wings
A12	6	168	4'-0"	Footings - Bridge Seat

APPROACH SLAB

A51	*6	128	18'-10"	Approach Slab
A52	6	128	17'-9"	
A53	6	128	16'-9"	
A54	6	128	15'-7"	
A55	6	128	14'-7"	
A56	4	160	21'-6"	
A57	4	48	12'-0"	Approach Slab

PIERS

P1	*6	178	4'-0"	All Piers
P2	6	46	17'-0"	Pier #2, Southbound
P3	5	120	23'-0"	All Piers
P4	5	89	2'-8"	All Piers
P5	*6	132	12'-6"	Pier #1 S.B.; Piers #1 & 2 N.B.

Note: All steel to be Intermediate Grade.

DESIGN - T.H.K. TRACE - H.N.F. CHECK - H.L.D.	BRIDGE NO. SURVEY - PLOT -
---	----------------------------------

STATE HIGHWAY COMMISSION
BRIDGE DIVISION

SOUADABSCOOK STREAM BRIDGE
EAST

IN THE TOWN OF
HAMPDEN
PENOBSCOT COUNTY

REINFORCING STEEL & RAIL DETAILS

SHEET 14 of 14 AUGUSTA, MAINE MARCH 1961

SHEET 17 OF 17 AUGUSTA, MAINE MARCH 1961

MAINE MARCH 1961