

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

GEOTECHNICAL DATA REPORT

For the Reconstruction of:
**U.S. ROUTE 2
DYER BROOK, MAINE**

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Aroostook County
WIN 19231.00

Soils Report 2018-15
Federal No. STP-1923(100)

April 6, 2018

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1.0 INTRODUCTION

The purpose of this data report is to document subsurface information collected and make geotechnical design and construction recommendations for the reconstruction of an approximately 1.54-mile portion of U.S. Route 2 in Dyer Brook. The project is needed to improve roadway base and pavement structure, vertical alignment, and drainage. This report presents the results of a limited geotechnical investigation performed along the project site and the results of a limited laboratory testing program conducted on soils recovered during the geotechnical investigation. U.S. Route 2 is a Highway Corridor Priority 4 road.

2.0 GEOLOGIC SETTING

The project begins approximately 2.3 miles north of Pond Road and extends northerly approximately 1.54 miles to Keith Brook Road as shown on Sheet 1 – Location Map.

According to the Maine Geologic Survey (MGS) map titled Reconnaissance Surficial Geology of the Smyrna Mills Quadrangle, Maine Open-File No. 86-57 (1986) the surficial soils along the project consist of till. These soils typically consist of a heterogenous mixture of sand, silt, clay and stones.

According to the map titled Bedrock Geologic Map of Maine (1985) published by the MGS, the bedrock in the vicinity of the site consists of interbedded pelite and sandstone of the Smyrna Mills Formation.

3.0 SUBSURFACE INVESTIGATION

Subsurface conditions along the project were explored by drilling a total of seventeen (17) test borings and seventy-eight (78) probes and digging four (4) shallow test pits. The 100-series borings were drilled on June 11, 2012. The 200-series borings and the probes were drilled between November 18 and 19, 2015. All of the borings and probes were drilled by the MaineDOT drill crew using a trailer mounted drill rig and solid stem auger techniques. The boring depths ranged from approximately 2.3 to 9.4 feet below ground surface (bgs). The probe depths ranged from approximately 2.8 to 10.0 feet bgs. Seven (7) of the borings and many of the probes encountered a shallow refusal surface. The exact nature of the refusal surface was not determined in the explorations. The test pits were excavated to obtain large bucket samples of the existing subbase soils for testing. No logs were kept for the test pits. Boring, probe, and test pit locations are shown on the Sheets 2 through 13 Boring Location Plans. Boring Logs and the Probe Summary Sheets are presented in Appendix A.

Soil samples were obtained from the auger flights in several of the borings and from the test pits. No soil samples were obtained in the probes. Details and sampling methods used, field data obtained, and soil conditions encountered are presented in the boring logs provided in Appendix A – Boring Logs.

A Northeast Transportation Training and Certification Program (NETTCP) Certified Subsurface Inspector logged the subsurface conditions encountered in the borings. The MaineDOT

Geotechnical Team member selected the boring locations, drilling methods, designated type and depth of sampling, reviewed field logs for accuracy and identified laboratory testing requirements. The borings, probes, and test pits were located in the field by taping to site features after completion of the drilling program.

4.0 LABORATORY TESTING

A laboratory testing program was conducted on select soil samples obtained in the borings and test pits to assist in soil classification. Laboratory testing consisted of twenty-four (24) standard grain size analyses with natural water content. The results of the laboratory tests are in Appendix B - Laboratory Test Results. Laboratory test results for the samples obtained in the borings are also summarized on the boring logs in Appendix A.

5.0 SUBSURFACE CONDITIONS

Subsurface conditions encountered at the borings and test pits were generally gravelly sand, sand, sandy gravel, silty sand, sandy silt, and silt. The boring locations are shown on Sheets 2 through 13 – Boring Location Plans. The boring logs are in Appendix A – Boring Logs.

5.1 Fill - Sand, Gravelly Sand, and Sandy Gravel

The subsurface investigation found layers of fill consisting of sand, gravelly sand, and sandy gravel under the roadway pavement. The sand fill consisted of light to dark brown and black-brown, damp to moist, fine to coarse sand, little to some gravel, trace to some silt, occasional cobbles. The gravelly sand fill consisted of brown, damp, gravelly fine to coarse sand, trace to little silt, occasional cobbles. The sandy gravel fill consisted of brown, damp, fine to coarse sandy gravel, trace to little silt, occasional cobbles. The thickness of the fill layers ranged from approximately 0.8 feet to greater than 4.5 feet. Grain size analyses conducted on eighteen (18) samples of the fill resulted in the soil being classified as an A-1-a, A-1-b, or A-2-4 under the AASHTO Soil Classification System and an SW-SM, SM, GM, or GW-GM under the Unified Classification System. The measured natural water contents of the fill samples tested ranged from approximately 1 to 11 percent.

5.2 Native Silty Sand, Sandy Silt, and Silt

In some areas, the fill is underlain by layers of native silty sand, sandy silt, and silt. The silty sand consisted of light brown, damp, silty fine to coarse sand, little gravel. The sandy silt consisted of light brown, wet, fine to coarse sandy silt, little gravel. The silt consisted of brown and light brown, damp, silt, some sand, trace to some gravel. The full thickness of the native soils was not penetrated in the borings. Grain size analyses conducted on six (6) samples of the native silty sand, sandy silt, and silt resulted in the soil being classified as an A-4 under the AASHTO Soil Classification System and an SM or CL under the Unified Classification System. The measured natural water contents of the samples tested ranged from approximately 7 to 24 percent.

6.0 GEOTECHNICAL RECOMMENDATIONS

Shallow refusals are an area of geotechnical concern on this project.

6.1 Shallow Refusals

Based on the results of the borings and probes, rock removal will be necessary near the following stations where a shallow refusal surface was encountered:

Stations	Range of Approximate Depths to Refusal (feet bgs)
54+50 to 66+00	2.3 to 4.7
75+00 to 77+00	2.3 to 5.0

Rock excavation for the proposed drainage system will be necessary near these stations. Additional shallow rock may be encountered during construction of the drainage system at other locations. No rock cores were taken along the project and the actual nature of the refusal surface was not determined. The nature, slope and degree of fracturing in the rock surface will not be evident until the excavations are made and rock is exposed.

It should be anticipated that if shallow rock is encountered during excavation work, removal will be necessary. Machinery capable of removing intact rock, such as heavy duty backhoes with rock ripping teeth, hydraulic thumbs or pneumatic rock breaking equipment, should be anticipated for this work. There is also a possibility that rock excavation will require blasting. Construction activities should not be permitted to disturb the rock mass or to create any rock falls or any open fissures.

Blasting should be conducted in accordance with MaineDOT Standard Specification Sections 105.2.7 and 203. The Contractor is required to conduct pre-blast surveys as well as blast vibration monitoring at any nearby structures in accordance with industry standards at the time of the blast. Pre-blast surveys shall be provided to the Resident prior to blasting at the site. Strict measures should be implemented to control flyrock. The method of flyrock control shall be subject to approval by the Department. Such approval will not relieve the Contractor from adequately protecting adjacent property and work areas.

7.0 CLOSURE

This Geotechnical Data Report has been prepared for the use of the MaineDOT Highway Program for specific application to the proposed reconstruction of U.S. Route 2 in Dyer Brook, Maine in accordance with generally accepted geotechnical and foundation engineering practices. No other intended use or warranty is expressed or implied.

MaineDOT conducted a limited number of soil explorations at discrete locations along the project and a limited number of laboratory tests. MaineDOT shall not be responsible for the Bidder's or

Contractor's interpretations, estimates, or conclusions derived from the geotechnical information. Data provided may not be representative of the subsurface conditions between boring locations.

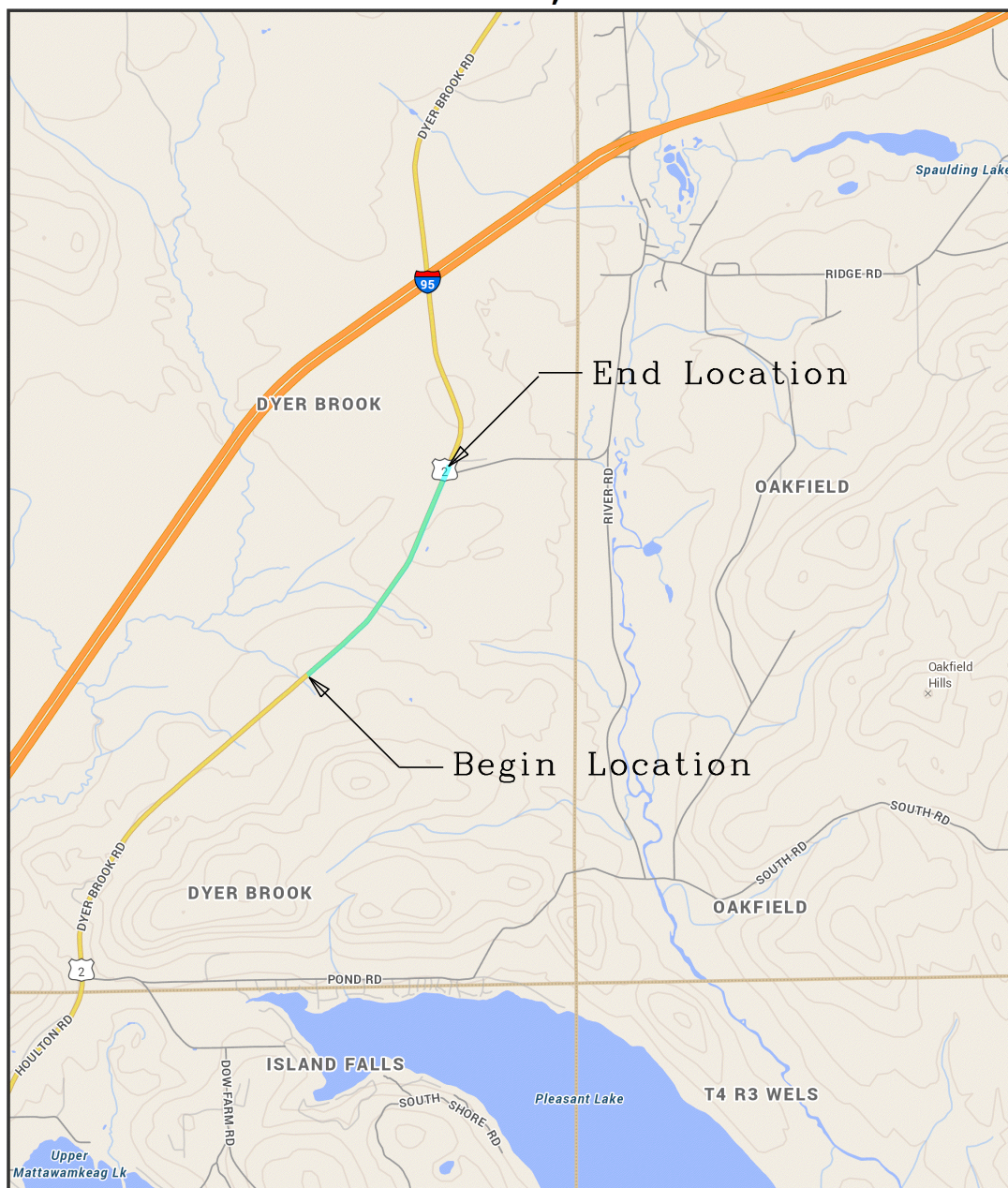
In the event that any changes in the nature, design, or location of the proposed project are planned, this report should be reviewed by a geotechnical engineer to assess the appropriateness of the conclusions and recommendations and to modify the recommendations as appropriate to reflect the changes in design. These analyses and recommendations are based in part upon a limited subsurface investigation at discrete exploratory locations completed at the site. If variations from the conditions encountered during the investigation appear evident during construction, it may also become necessary to re-evaluate the recommendations made in this report.

It is recommended that a geotechnical engineer be provided the opportunity for a review of the design and specifications in order that the earthwork and foundation recommendations and construction considerations presented in this report are properly interpreted and implemented in the design and specifications.

Sheets



DYER BROOK, MAINE



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

1 Miles
1 inch = 1.08 miles

Date: 3/30/2018
Time: 6:56:12 AM

SHEET NUMBER

1

OF 13

DYER BROOK
U.S. ROUTE 2

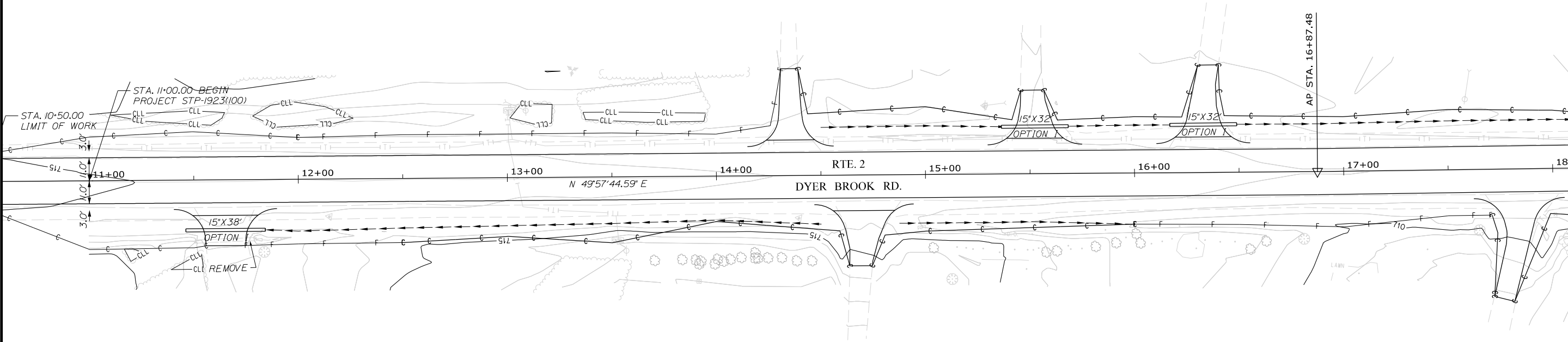
LOCATION MAP

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1923(100)

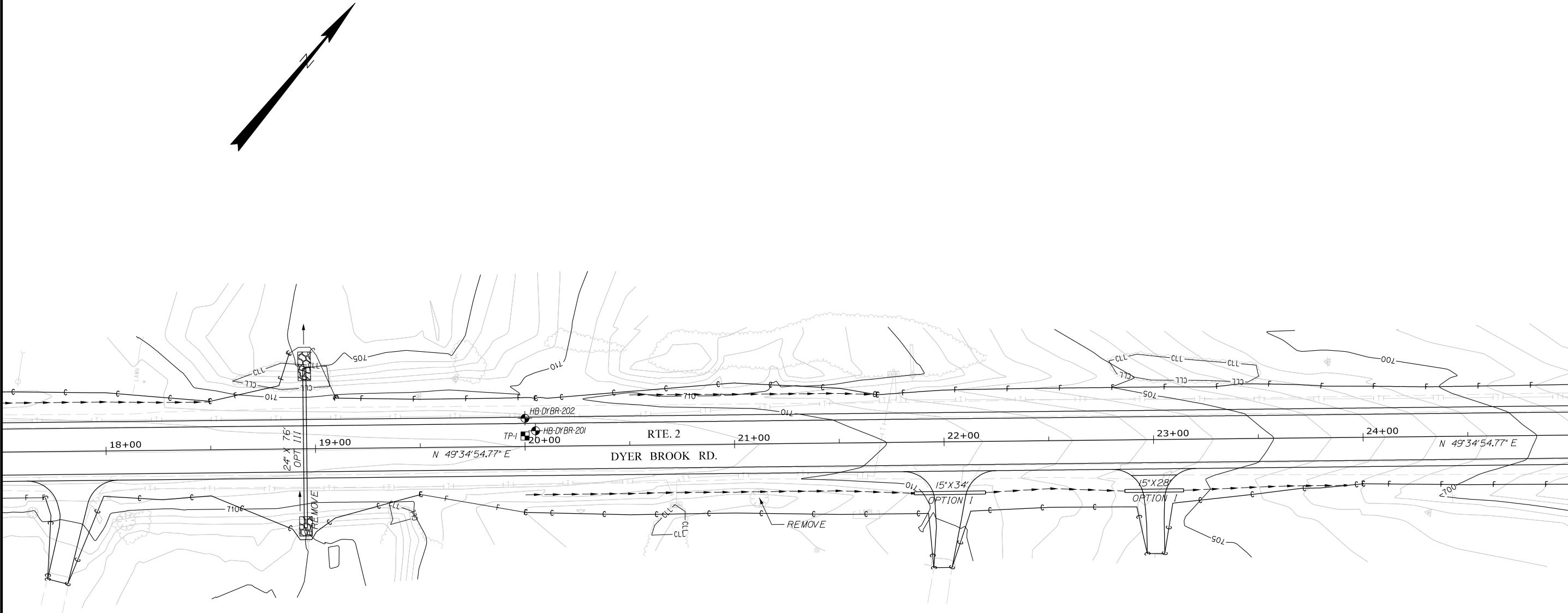
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19231.00

HIGHWAY PLANS

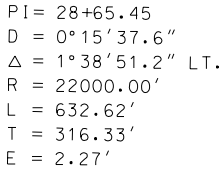


- LEGEND**
- SOLID STEM AUGER W/DESCRIPTIONS
 - POWER AUGER PROBE
 - TEST PIT
- KEY**
- R = Refusal of augers (actual nature of refusal surface unknown)
 - NR = No Refusal surface encountered
 - W = Weathered Rock, top of

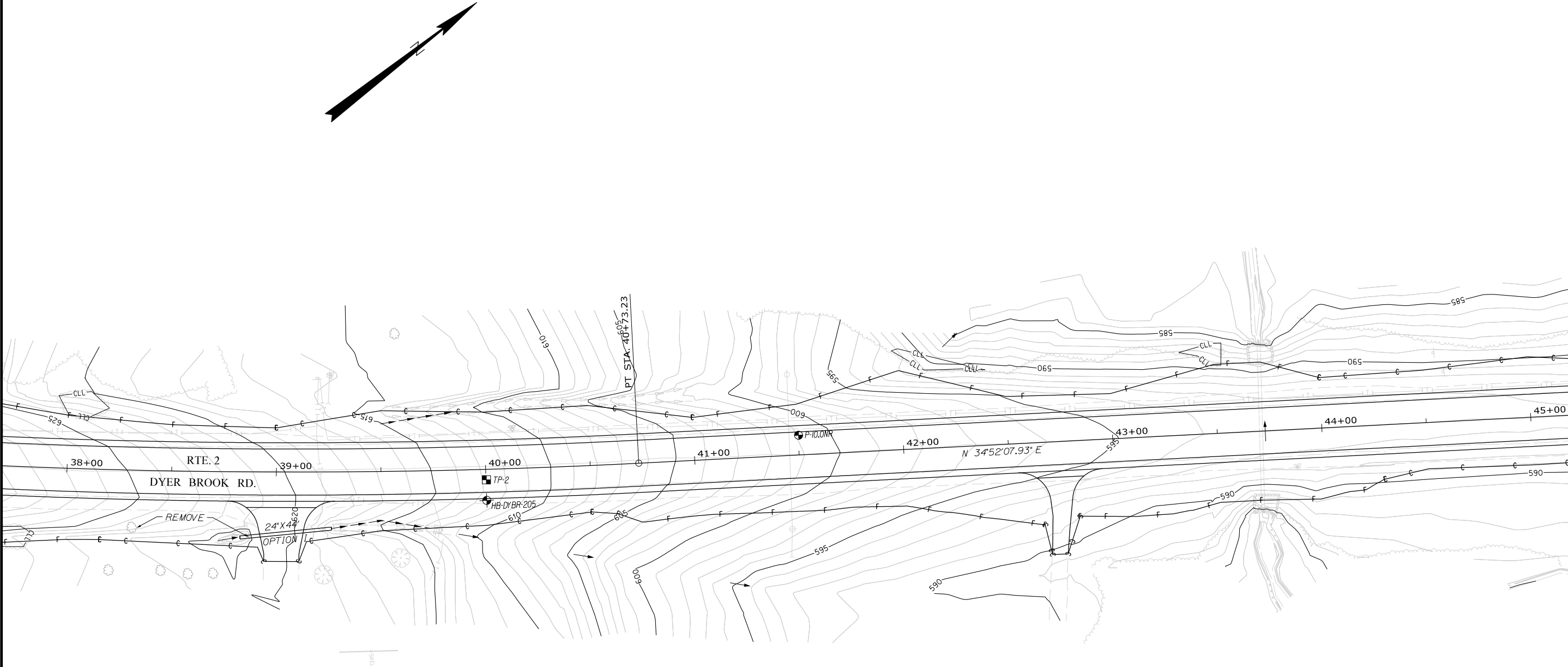
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WIN		P.E. NUMBER	
019231.00		DATE	
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DYEY BROOK		PROJ. MANAGER	BY
US ROUTE 2		C. SULLOWAY	C. SULLOWAY
BORING LOCATION PLANS		CHECKED-REVIEWED	DATE
SHEET NUMBER		C. RUSSELL	MAR 2018
2		DESIGN-DETAILED	T. WHITE
OF 13		REVISIONS 1	
		REVISIONS 2	
		REVISIONS 3	
		REVISIONS 4	



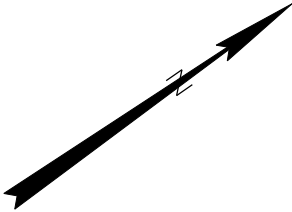
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	P.E. NUMBER			
	DATE			
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	CHECKED-REVIEWED	C. Sullivan	DATE	MAR 2018
	DESIGN-DETAILED	C. Russell	DATE	MAR 2018
	REVISIONS 1			
	REVISIONS 2			
SHEET NUMBER	REVISIONS 3			
	REVISIONS 4			
FIELD CHANGES				
3				
OF 13				
WIN 019231.00 HIGHWAY PLANS				



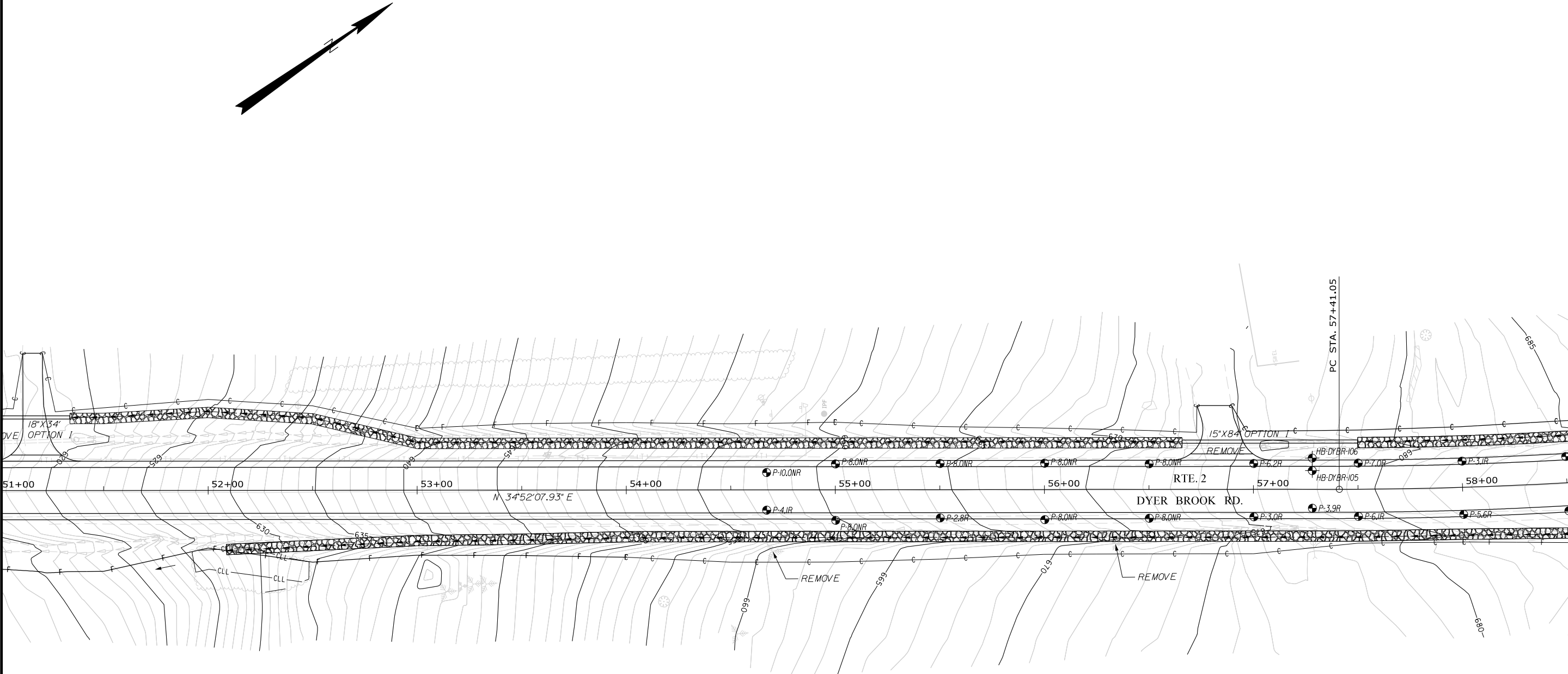
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		BORING LOCATION PLANS	CHECKED-REVIEWED	C. SULLOWAY	C. SULLOWAY	MAR 2018	SIGNATURE	
	DESIGN2-DETAILED2		C. RUSSELL	T. WHITE	MAR 2018	P.E. NUMBER		
	DESIGN3-DETAILED3		REVISIONS 1					
		REVISIONS 2						



STATE OF MAINE DEPARTMENT OF TRANSPORTATION	SIGNATURE			
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BORING LOCATION PLANS				DATE
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OF 13				DATE



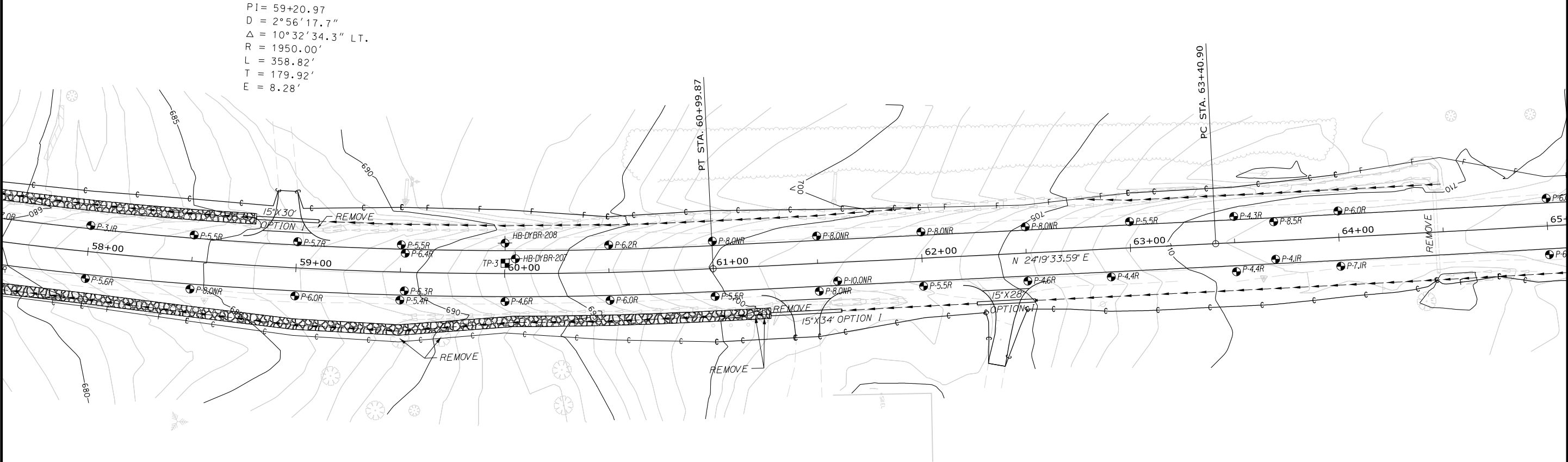
OF 13	SHEET NUMBER	DYER BROOK US ROUTE 2	PROJ. MANAGER	R. MOULTON	BY	DATE	STATE OF MAINE DEPARTMENT OF TRANSPORTATION
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		DESIGN2-DETAILED2	C. RUSSELL	T. WHITE	MAR 2018	SIGNATURE	
		DESIGN3-DETAILED3				P.E. NUMBER	
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		REVISIONS 2					
BORING LOCATION PLANS							
	REVISIONS 3						
	REVISIONS 4					DATE	
	FIELD CHANGES						
						WIN 019231.00 HIGHWAY PLANS	



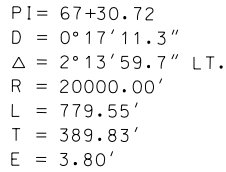
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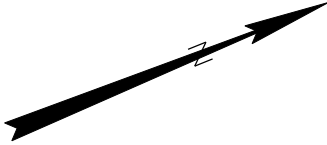
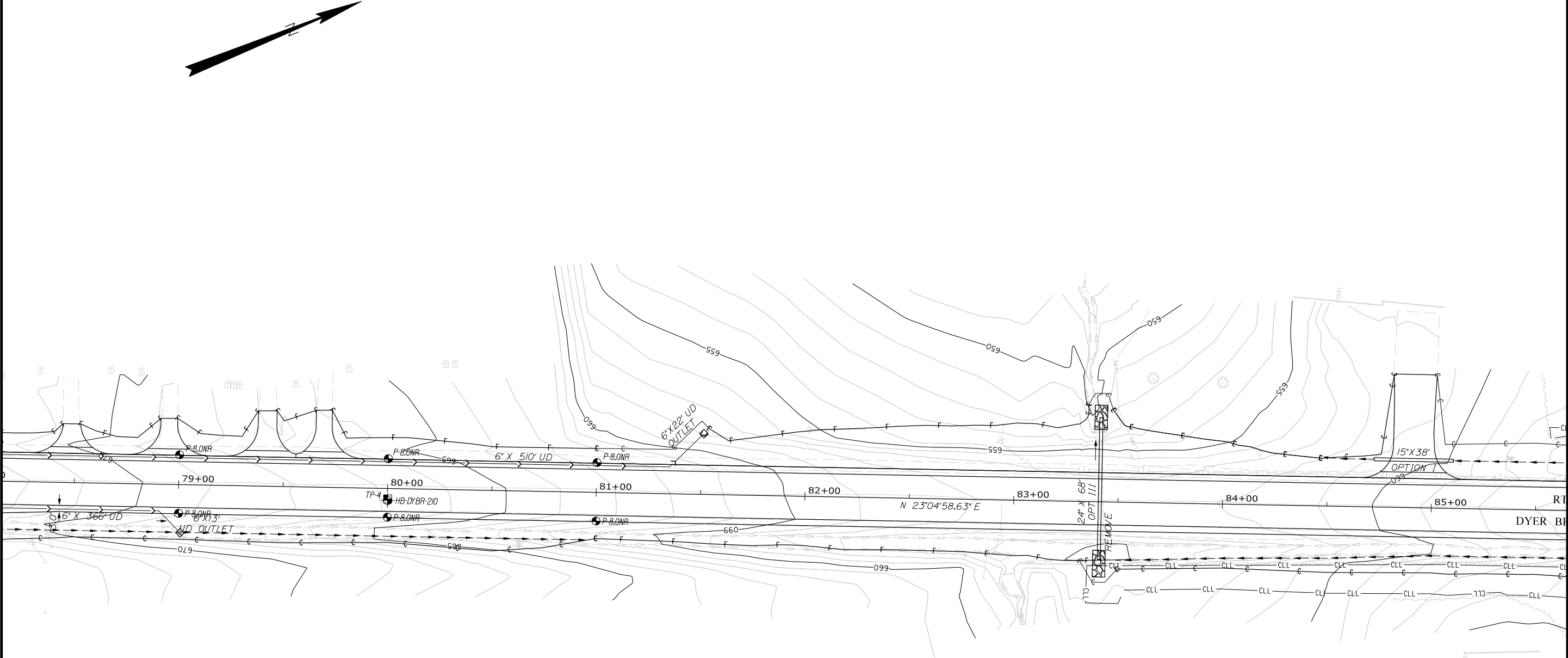
DYER BROOK US ROUTE 2 BORING LOCATION PLANS	PROJ. MANAGER	R. MOUTON	BY	C. SULLOWAY	DATE	MAR 2018
	CHECKED-DETAILED	C. SULLOWAY	C. RUSSELL	T. WHITE	SIGNATURE	
	DESIGN-DETAILED	C. RUSSELL	T. WHITE	P.E. NUMBER		
	REVISIONS 1				DATE	
	REVISIONS 2				DATE	
REVISIONS 3				DATE		
REVISIONS 4				DATE		
FIELD CHANGES				DATE		

SHEET NUMBER	8
OF 13	



DYER BROOK US ROUTE 2		STATE OF MAINE DEPARTMENT OF TRANSPORTATION			
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OF 13					

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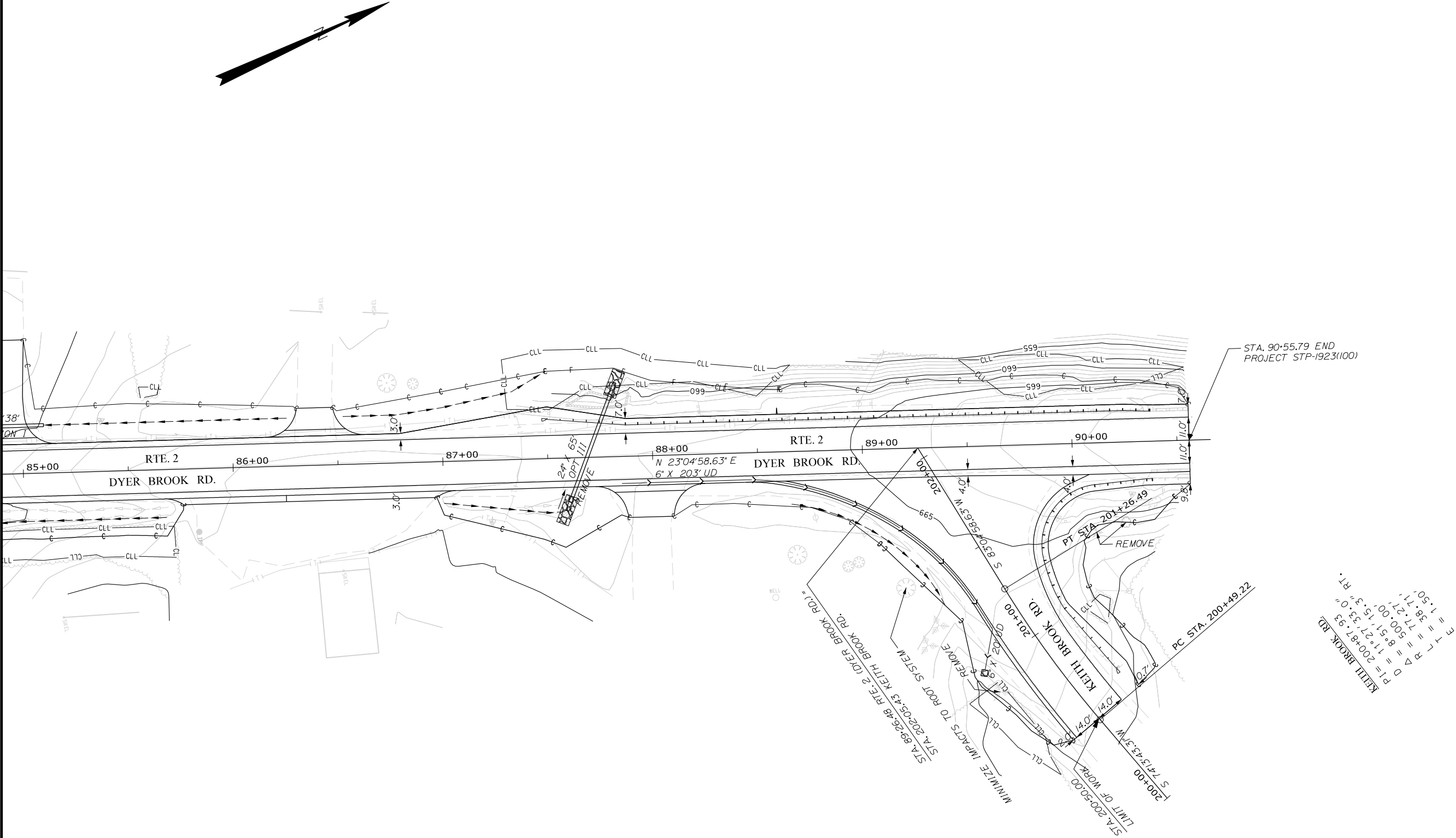


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		DATE		
STP-1923(100)				
WIN				
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HIGHWAY PLANS				

DYER BROOK

US ROUTE 2

BORING LOCATION PLANS



PROJ. MANAGER	R. Moulton	BY	DATE
CHECKED-DETAILED	C. SULLOWAY	C. SULLOWAY	MAR 2018
DESIGN-DETAILED	C. RUSSELL	T. WHITE	MAR 2018
DESIGN-DETAILED			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

Appendix A

Boring Logs
and
Probe Summary Sheets

UNIFIED SOIL CLASSIFICATION SYSTEM					MODIFIED BURMISTER SYSTEM															
MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES																
COARSE-GRAINED SOILS (more than half of material is larger than No. 200 sieve size)	GRAVELS (more than half of coarse fraction is larger than No. 4 sieve size)	CLEAN GRAVELS	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.	<u>Descriptive Term</u>		<u>Portion of Total (%)</u>													
		(little or no fines)	GP	Poorly-graded gravels, gravel sand mixtures, little or no fines.	trace	0 - 10														
					little	11 - 20														
					some	21 - 35														
					adjective (e.g. sandy, clayey)	36 - 50														
	SANDS (more than half of coarse fraction is smaller than No. 4 sieve size)	GRAVEL WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.	TERMS DESCRIBING DENSITY/CONSISTENCY															
		GC	Clayey gravels, gravel-sand-clay mixtures.																	
		CLEAN SANDS	SW	Well-graded sands, gravelly sands, little or no fines	<u>Density of Cohesionless Soils</u>		<u>Standard Penetration Resistance N-Value (blows per foot)</u>													
		(little or no fines)	SP	Poorly-graded sands, gravelly sand, little or no fines.	Very loose	0 - 4														
					Loose	5 - 10														
FINE-GRAINED SOILS (more than half of material is smaller than No. 200 sieve size)	SILTS AND CLAYS (liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity.	Medium Dense	11 - 30														
					Dense	31 - 50														
					Very Dense	> 50														
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Approximate Undrained Shear Strength (psf)															
			OL	Organic silts and organic silty clays of low plasticity.																
	SILTS AND CLAYS (liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	<u>Consistency of Cohesive soils</u>		<u>SPT N-Value (blows per foot)</u>													
			CH	Inorganic clays of high plasticity, fat clays.	Very Soft	WOH, WOR, WOP, <2	0 - 250													
					Soft	2 - 4	250 - 500													
					Medium Stiff	5 - 8	500 - 1000													
					Stiff	9 - 15	1000 - 2000													
HIGHLY ORGANIC SOILS				Very Stiff	16 - 30	2000 - 4000														
				Hard	>30	over 4000														
Desired Soil Observations (in this order, if applicable): Color (Munsell color chart) Moisture (dry, damp, moist, wet) Density/Consistency (from above right hand side) Texture (fine, medium, coarse, etc.) Name (sand, silty sand, clay, etc., including portions - trace, little, etc.) Gradation (well-graded, poorly-graded, uniform, etc.) Plasticity (non-plastic, slightly plastic, moderately plastic, highly plastic) Structure (layering, fractures, cracks, etc.) Bonding (well, moderately, loosely, etc.,) Cementation (weak, moderate, or strong) Geologic Origin (till, marine clay, alluvium, etc.) Groundwater level					Rock Quality Designation (RQD): RQD (%) = $\frac{\text{sum of the lengths of intact pieces of core} * > 4 \text{ inches}}{\text{length of core advance}}$ *Minimum NQ rock core (1.88 in. OD of core) Correlation of RQD to Rock Mass Quality <table><tr><th>Rock Mass Quality</th><th>RQD (%)</th></tr><tr><td>Very Poor</td><td>≤25</td></tr><tr><td>Poor</td><td>26 - 50</td></tr><tr><td>Fair</td><td>51 - 75</td></tr><tr><td>Good</td><td>76 - 90</td></tr><tr><td>Excellent</td><td>91 - 100</td></tr></table> Desired Rock Observations (in this order, if applicable): Color (Munsell color chart) Texture (aphanitic, fine-grained, etc.) Rock Type (granite, schist, sandstone, etc.) Hardness (very hard, hard, mod. hard, etc.) Weathering (fresh, very slight, slight, moderate, mod. severe, severe, etc.) Geologic discontinuities/jointing: -dip (horiz - 0-5 deg., low angle - 5-35 deg., mod. dipping - 35-55 deg., steep - 55-85 deg., vertical - 85-90 deg.) -spacing (very close - <2 inch, close - 2-12 inch, mod. close - 1-3 feet, wide - 3-10 feet, very wide >10 feet) -tightness (tight, open, or healed) -infilling (grain size, color, etc.) Formation (Waterville, Ellsworth, Cape Elizabeth, etc.) RQD and correlation to rock mass quality (very poor, poor, etc.) ref: ASTM D6032 and AASHTO Standard Specification for Highway Bridges, 17th Ed. Table 4.4.8.1.2A Recovery (inch/inch and percentage) Rock Core Rate (X.X ft - Y.Y ft (min:sec))				Rock Mass Quality	RQD (%)	Very Poor	≤25	Poor	26 - 50	Fair	51 - 75	Good	76 - 90	Excellent	91 - 100
Rock Mass Quality	RQD (%)																			
Very Poor	≤25																			
Poor	26 - 50																			
Fair	51 - 75																			
Good	76 - 90																			
Excellent	91 - 100																			
Maine Department of Transportation Geotechnical Section Key to Soil and Rock Descriptions and Terms Field Identification Information					Sample Container Labeling Requirements: WIN Blow Counts Bridge Name / Town Sample Recovery Boring Number Date Sample Number Personnel Initials Sample Depth															

Maine Department of Transportation <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				Project: A 0.83 mile portion of Route 2 Location: Dyer Brook, Maine				Boring No.: HB-DYBR-101 WIN: 19231.00																																																																																																																			
Drilling Contractor: MaineDOT				Elevation (ft.): 674.6				Auger ID/OD: 5" Dia.																																																																																																																			
Operator: Giguere/Giles/Daggett				Datum: NAVD88				Sampler: Off Flights																																																																																																																			
Logged By: B. Wilder				Rig Type: CME 45C				Hammer Wt./Fall: N/A																																																																																																																			
Date Start/Finish: 6/11/12-6/11/12				Drilling Method: Solid Stem Auger				Core Barrel: N/A																																																																																																																			
Boring Location: 77+25, 9.0 ft Lt.				Casing ID/OD: N/A				Water Level*: None Observed																																																																																																																			
Definitions: D = Spilt Spoon Sample S = Sample off Auger Flights B = Bucket Sample off Auger Flights MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MV = Unsuccessful Field Vane Shear Test Attempt V = Field Vane Shear Test, PP= Pocket Penetrometer MU = Unsuccessful Thin Wall Tube Sample 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 1 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-value = Raw Field SPT N-value T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent ≈ = Similar or Equal too LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test																																																																																																																											
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Maine Department of Transportation <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				Project: A 0.83 mile portion of Route 2 Location: Dyer Brook, Maine				Boring No.: HB-DYBR-102 WIN: 19231.00			
Drilling Contractor: MaineDOT				Elevation (ft.): 674.3				Auger ID/OD: 5" Dia.			
Operator: Giguere/Giles/Daggett				Datum: NAVD88				Sampler: Off Flights			
Logged By: B. Wilder				Rig Type: CME 45C				Hammer Wt./Fall: N/A			
Date Start/Finish: 6/11/12-6/11/12				Drilling Method: Solid Stem Auger				Core Barrel: N/A			
Boring Location: 77+25, 15.0 ft Lt. Shoulder				Casing ID/OD: N/A				Water Level*: None Observed			
Definitions: D = Spilt Spoon Sample S = Sample off Auger Flights B = Bucket Sample off Auger Flights MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MV = Unsuccessful Field Vane Shear Test Attempt V = Field Vane Shear Test, PP= Pocket Penetrometer MU = Unsuccessful Thin Wall Tube Sample 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 1 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-value = Raw Field SPT N-value T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent ≈ = Similar or Equal too LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test											
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5							669.3	Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL	5.0		
10											
15											
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Stratification lines represent approximate boundaries between soil types; transitions may be gradual.								Page 1 of 1			
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Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS						Project: A 0.83 mile portion of Route 2		Boring No.: HB-DYBR-103																																																																																																																																																																																																																																																																																																																																																																																
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Maine Department of Transportation <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				Project: A 0.83 mile portion of Route 2 Location: Dyer Brook, Maine				Boring No.: HB-DYBR-104 WIN: 19231.00			
Drilling Contractor: MaineDOT				Elevation (ft.) 712.5				Auger ID/OD: 5" Dia.			
Operator: Giguere/Giles/Daggett				Datum: NAVD88				Sampler: Off Flights			
Logged By: B. Wilder				Rig Type: CME 45C				Hammer Wt./Fall: N/A			
Date Start/Finish: 6/11/12-6/11/12				Drilling Method: Solid Stem Auger				Core Barrel: N/A			
Boring Location: 67+25, 15.0 ft Rt.				Casing ID/OD: N/A				Water Level*: None Observed			
Definitions: D = Spilt Spoon Sample S = Sample off Auger Flights B = Bucket Sample off Auger Flights MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MV = Unsuccessful Field Vane Shear Test Attempt V = Field Vane Shear Test, PP= Pocket Penetrometer MU = Unsuccessful Thin Wall Tube Sample 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 1 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-value = Raw Field SPT N-value T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent ≈ = Similar or Equal too LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test											
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Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS				Project: A 0.83 mile portion of Route 2 Location: Dyer Brook, Maine				Boring No.: HB-DYBR-105 WIN: 19231.00																																																																																																																																																																																																																																																																																																													
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Boring Location: 57+28, 9.0 ft Lt.				Casing ID/OD: N/A				Water Level*: None Observed																																																																																																																																																																																																																																																																																																													
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Maine Department of Transportation <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				Project: A 0.83 mile portion of Route 2 Location: Dyer Brook, Maine				Boring No.: HB-DYBR-106 WIN: 19231.00			
Drilling Contractor: MaineDOT				Elevation (ft.): 677.3				Auger ID/OD: 5" Dia.			
Operator: Giguere/Giles/Daggett				Datum: NAVD88				Sampler: Off Flights			
Logged By: B. Wilder				Rig Type: CME 45C				Hammer Wt./Fall: N/A			
Date Start/Finish: 6/11/12-6/11/12				Drilling Method: Solid Stem Auger				Core Barrel: N/A			
Boring Location: 57+28, 15.0 ft Lt.				Casing ID/OD: N/A				Water Level*: None Observed			
Definitions: D = Spilt Spoon Sample S = Sample off Auger Flights B = Bucket Sample off Auger Flights MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MV = Unsuccessful Field Vane Shear Test Attempt V = Field Vane Shear Test, PP= Pocket Penetrometer MU = Unsuccessful Thin Wall Tube Sample 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 1 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-value = Raw Field SPT N-value T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent ≈ = Similar or Equal too LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test											
Depth (ft.)	Sample Information							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-value	Casing Blows	Elevation (ft.)				
0						SSA	676.5	Black, damp, fine to coarse SAND, little gravel, trace silt.	0.8'		
								Light brown, wet, Silty fine to coarse SAND, trace gravel.			
							673.0		4.3'		
5								Bottom of Exploration at 4.3 feet below ground surface. REFUSAL			
25											
Remarks: Stationing determined by DMI estimate.											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.								Page 1 of 1			
* 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.: HB-DYBR-106			

Maine Department of Transportation <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				Project: A 0.83 mile portion of Route 2 Location: Dyer Brook, Maine		Boring No.: HB-DYBR-107 WIN: 19231.00			
Drilling Contractor: MaineDOT			Elevation (ft.) 495.4		Auger ID/OD: 5" Dia.				
Operator: Giguere/Giles/Daggett			Datum: NAVD88		Sampler: Off Flights				
Logged By: B. Wilder			Rig Type: CME 45C		Hammer Wt./Fall: N/A				
Date Start/Finish: 6/11/12-6/11/12			Drilling Method: Solid Stem Auger		Core Barrel: N/A				
Boring Location: 47+25, 8.5 ft Lt.			Casing ID/OD: N/A		Water Level*: None Observed				
Definitions: D = Spilt Spoon Sample S = Sample off Auger Flights B = Bucket Sample off Auger Flights MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MV = Unsuccessful Field Vane Shear Test Attempt V = Field Vane Shear Test, PP= Pocket Penetrometer MU = Unsuccessful Thin Wall Tube Sample 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 1 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-value = Raw Field SPT N-value T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent ≈ = Similar or Equal too LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test									
Depth (ft.)	Sample Information							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-value	Casing Blows	Elevation (ft.)		
0	S7		0.25 - 5.00			SSA	495.2	3" PAVEMENT. Light brown, damp, fine to coarse SAND, some gravel, some silt, (Fill Area).	G#267800 A-1-b, SM WC=4.5%
5							490.4		
10								Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL	
25									
Remarks: Stationing determined by DMI estimate.									
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.								Page 1 of 1	
* 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.: HB-DYBR-107	

Maine Department of Transportation

Soil/Rock Exploration Log

US CUSTOMARY UNITS

Project: A 0.83 mile portion of Route 2

Location: Dyer Brook, Maine

Boring No.: HB-DYBR-201

WIN: 19231.00

Drilling Contractor: MaineDOT

Operator: Daggett

Logged By: B. Wilder

Date Start/Finish: 11/18/2015-11/18/2015

Boring Location: 20+05, 6.5 ft Lt.

Elevation (ft.) 711.5

Datum: NAVD88

Rig Type: CME 45C

Drilling Method: Solid Stem Auger

Casing ID/OD: N/A

Auger ID/OD: 10" Dia.

Sampler: Off Flights

Hammer Wt./Fall: N/A

Core Barrel: N/A

Water Level*: None Observed

Definitions: D = Spilt Spoon Sample
S = Sample off Auger Flights
B = Bucket Sample off Auger Flights
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MV = Unsuccessful Field Vane Shear Test Attempt
V = Field Vane Shear Test, PP= Pocket Penetrometer

MU = Unsuccessful Thin Wall Tube Sample 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 1 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-value = Raw Field SPT N-value
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent ≈ = Similar or Equal too

LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information							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-value	Casing Blows	Elevation (ft.)		
0	B1		0.58 - 4.50			SSA	710.9	7" PAVEMENT. Brown, damp, Gravelly fine to coarse SAND, little silt, occasional cobble.	G#301069 A-1-a, SW-SM WC=0.8%
5							707.0	Bottom of Exploration at 4.5 feet below ground surface. NO REFUSAL	
10									
15									
20									
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 1

Boring No.: HB-DYBR-201

Maine Department of Transportation <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				Project: A 0.83 mile portion of Route 2 Location: Dyer Brook, Maine				Boring No.: HB-DYBR-202 WIN: 19231.00			
Drilling Contractor: MaineDOT				Elevation (ft.): 711.2				Auger ID/OD: 10" Dia.			
Operator: Daggett				Datum: NAVD88				Sampler: Off Flights			
Logged By: B. Wilder				Rig Type: CME 45C				Hammer Wt./Fall: N/A			
Date Start/Finish: 11/18/2015-11/18/2015				Drilling Method: Solid Stem Auger				Core Barrel: N/A			
Boring Location: 20+00, 12.5 ft Lt. Shoulder				Casing ID/OD: N/A				Water Level*: None Observed			
Definitions: D = Spilt Spoon Sample S = Sample off Auger Flights B = Bucket Sample off Auger Flights MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MV = Unsuccessful Field Vane Shear Test Attempt V = Field Vane Shear Test, PP= Pocket Penetrometer MU = Unsuccessful Thin Wall Tube Sample 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 1 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-value = Raw Field SPT N-value T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent ≈ = Similar or Equal too LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test											
Depth (ft.)	Sample Information								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-value	Casing Blows	Elevation (ft.)	Graphic Log			
0	B2		0.00 - 4.50			SSA			Brown, damp, Gravelly fine to coarse SAND, little silt, occasional cobble.	G#301068 A-1-b, SM WC=1.6%	
5							706.7				
									Bottom of Exploration at 4.5 feet below ground surface. NO REFUSAL		
10											
15											
20											
25											
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 1 of 1	
* 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.: HB-DYBR-202	

[illegible]

Maine Department of Transportation <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				Project: A 0.83 mile portion of Route 2 Location: Dyer Brook, Maine		Boring No.: HB-DYBR-204 WIN: 19231.00				
Drilling Contractor: MaineDOT			Elevation (ft.): 675.2		Auger ID/OD: 10" Dia.					
Operator: Daggett			Datum: NAVD88		Sampler: Off Flights					
Logged By: B. Wilder			Rig Type: CME 45C		Hammer Wt./Fall: N/A					
Date Start/Finish: 11/18/2015-11/18/2015			Drilling Method: Solid Stem Auger		Core Barrel: N/A					
Boring Location: 30+05, 5.0 ft Rt.			Casing ID/OD: N/A		Water Level*: None Observed					
Definitions: D = Spilt Spoon Sample S = Sample off Auger Flights B = Bucket Sample off Auger Flights MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MV = Unsuccessful Field Vane Shear Test Attempt V = Field Vane Shear Test, PP= Pocket Penetrometer MU = Unsuccessful Thin Wall Tube Sample 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 1 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-value = Raw Field SPT N-value T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent ≈ = Similar or Equal too LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test										
Depth (ft.)	Sample Information							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-value	Casing Blows	Elevation (ft.)			
0	B4		0.58 - 4.50			SSA	674.6	7" PAVEMENT. Brown, moist, Gravelly fine to coarse SAND, little silt, occasional cobble, (Fill Area).	G#301073 A-1-a, SM WC=2.9%	
5							670.7			
10								Bottom of Exploration at 4.5 feet below ground surface. NO REFUSAL, outcrop in Lt. Shoulder.		
15										
20										
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 1				
						Boring No.: HB-DYBR-204				

[illegible]

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS						Project: A 0.83 mile portion of Route 2				Boring No.: HB-DYBR-206			
						Location: Dyer Brook, Maine				WIN: 19231.00			
Drilling Contractor: MaineDOT						Elevation (ft.): 608.4				Auger ID/OD: 10" Dia.			
Operator: Daggett						Datum: NAVD88				Sampler: Off Flights			
Logged By: B. Wilder						Rig Type: CME 45C				Hammer Wt./Fall: N/A			
Date Start/Finish: 11/18/2015-11/18/2015						Drilling Method: Solid Stem Auger				Core Barrel: N/A			
Boring Location: 50+00, 7.5 ft Rt.						Casing ID/OD: N/A				Water Level*: None Observed			
Definitions: D = Split Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person S = Sample off Auger Flights R = Rock Core Sample S _u = Peak/Remolded Field Vane Undrained Shear Strength (psf) B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S _{u(lab)} = Lab Vane Undrained Shear Strength (psf) LL = Liquid Limit MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q _p = Unconfined Compressive Strength (ksf) PL = Plastic Limit U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value PI = Plasticity Index MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T _v = Pocket Torvane Shear Strength (psf) G = Grain Size Analysis V = Field Vane Shear Test PP= Pocket Penetrometer WOR/C = Weight of Rods or Casing WC = Water Content, percent ≈ = Similar or Equal too C = Consolidation Test													
Depth (ft.) Sample No. Pen./Rec. (in.) Sample Depth (ft.) Blows (6 in.) Shear Strength (psf) or RQD (%) N-value Casing Blows Elevation (ft.) Graphic Log Visual Description and Remarks Laboratory Testing Results/ AASHTO and Unified Class.													
0	B6		0.67 - 3.00			SSA	607.7		8" PAVEMENT. Brown, damp, fine to coarse SANDY GRAVEL, trace silt, occasional cobble. Brown, moist, fine to coarse SAND, some silt, little gravel. Bottom of Exploration at 4.5 feet below ground surface. NO REFUSAL	G#301071 A-1-a, GW-GM WC=0.7% G#301074 A-2-4, SM WC=11.2%			
	S1		3.00 - 4.50				603.9						
5													
10													
20													
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 1

Boring No.: HB-DYBR-206

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS						Project: A 0.83 mile portion of Route 2 Location: Dyer Brook, Maine							Boring No.: HB-DYBR-207 WIN: 19231.00				
Drilling Contractor: MaineDOT						Elevation (ft.) 693.2							Auger ID/OD: 10" Dia.				
Operator: Daggett						Datum: NAVD88							Sampler: Off Flights				
Logged By: B. Wilder						Rig Type: CME 45C							Hammer Wt./Fall: N/A				
Date Start/Finish: 11/18/2015-11/18/2015						Drilling Method: Solid Stem Auger							Core Barrel: N/A				
Boring Location: 60+05, 7.0 ft Lt.						Casing ID/OD: N/A							Water Level*: None Observed				
Definitions: D = Split Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person S = Sample off Auger Flights R = Rock Core Sample S_p = Peak/Remolded Field Vane Undrained Shear Strength (psf) B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf) LL = Liquid Limit MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf) PL = Plastic Limit U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value PI = Plasticity Index MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf) G = Grain Size Analysis V = Field Vane Shear Test PP= Pocket Penetrometer WOR/C = Weight of Rods or Casing WC = Water Content, percent ≡ Similar or Equal too C = Consolidation Test																	
	Depth (ft.)	Sample Information									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-value	Casing Blows	Elevation (ft.)	Graphic Log								
	0	B7		0.83 - 2.30			SSA	692.4	[Pattern]	10" PAVEMENT. Brown, damp, fine to coarse Sandy GRAVEL, little silt, occasional cobble.	-0.8	G#301070 A-1-b, GM WC=2.2%					
								690.9	[Pattern]	Bottom of Exploration at 2.3 feet below ground surface. REFUSAL	-2.3						
	5																
	10																
	20																
	25																
Remarks:																	
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.																	
Page 1 of 1																	
Boring No.: HB-DYBR-207																	

Maine Department of Transportation <u>Soil/Rock Exploration Log</u> <u>US CUSTOMARY UNITS</u>				Project: A 0.83 mile portion of Route 2 Location: Dyer Brook, Maine		Boring No.: HB-DYBR-208 WIN: 19231.00			
Drilling Contractor: MaineDOT			Elevation (ft.): 692.0		Auger ID/OD: 10" Dia.				
Operator: Daggett			Datum: NAVD88		Sampler: Off Flights				
Logged By: B. Wilder			Rig Type: CME 45C		Hammer Wt./Fall: N/A				
Date Start/Finish: 11/18/2015-11/18/2015			Drilling Method: Solid Stem Auger		Core Barrel: N/A				
Boring Location: 60+00, 14.5 ft Lt.			Casing ID/OD: N/A		Water Level*: None Observed				
Definitions: D = Spilt Spoon Sample S = Sample off Auger Flights B = Bucket Sample off Auger Flights MD = Unsuccessful Split Spoon Sample Attempt U = Thin Wall Tube Sample MV = Unsuccessful Field Vane Shear Test Attempt V = Field Vane Shear Test, PP= Pocket Penetrometer MU = Unsuccessful Thin Wall Tube Sample 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 1 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-value = Raw Field SPT N-value T_v = Pocket Torvane Shear Strength (psf) WC = Water Content, percent ≈ = Similar or Equal too LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test									
Depth (ft.)	Sample Information							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-value	Casing Blows	Elevation (ft.)		
0	B8		0.00 - 2.80			SSA	689.2	Brown, damp, fine to coarse Sandy GRAVEL, little silt, occasional cobble.	G#301064 A-1-a, GM WC=1.0%
								Bottom of Exploration at 2.8 feet below ground surface. REFUSAL	
5									
10									
15									
20									
25									
Remarks:									
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.								Page 1 of 1	
* 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.: HB-DYBR-208	

Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS								Project: A 0.83 mile portion of Route 2						Boring No.: HB-DYBR-209							
								Location: Dyer Brook, Maine						WIN: 19231.00							
Drilling Contractor: MaineDOT								Elevation (ft.) 705.9						Auger ID/OD: 10" Dia.							
Operator: Daggett								Datum: NAVD88						Sampler: Off Flights							
Logged By: B. Wilder								Rig Type: CME 45C						Hammer Wt./Fall: N/A							
Date Start/Finish: 11/18/2015-11/18/2015								Drilling Method: Solid Stem Auger						Core Barrel: N/A							
Boring Location: 70+00, 7.5 ft Rt.								Casing ID/OD: N/A						Water Level*: None Observed							
Definitions: D = Spilt Spoon SampleMU = Unsuccessful Thin Wall Tube Sample AttemptWOIP = Weight of 1 PersonS = Sample off Auger FlightsR = Rock Core SampleSu = Peak/Remolded Field Vane Undrained Shear Strength (psf)B = Bucket Sample off Auger FlightsSSA = Solid Stem AugerSu(lab) = Lab Vane Undrained Shear Strength (psf)MD = Unsuccessful Split Spoon Sample AttemptHSA = Hollow Stem Augerqp = Unconfined Compressive Strength (ksf)U = Thin Wall Tube SampleRC = Roller ConeN-value = Raw Field SPT N-valueMV = Unsuccessful Field Vane Shear Test AttemptWOH = Weight of 140lb. HammerTv = Pocket Torvane Shear Strength (psf)V = Field Vane Shear TestPP= Pocket PenetrometerWOR/C = Weight of Rods or CasingWC = Water Content, percent ≈ = Similar or Equal tooLL = Liquid LimitPL = Plastic LimitPI = Plasticity IndexG = Grain Size AnalysisC = Consolidation Test																					
Sample Information																					
Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks							Laboratory Testing Results/ AASHTO and Unified Class.					
0	B9		0.42 - 1.60			SSA	705.5		5" PAVEMENT.	-0.4	G#301065										
	S2		1.60 - 4.50				704.3		Black-brown, moist, fine to coarse SAND, some gravel, little silt, occasional cobble.	-1.6	A-1-b, SM										
									Light brown, moist, SILT, some sand, trace gravel.		G#301075										
											A-4, CL										
5							701.4		Bottom of Exploration at 4.5 feet below ground surface. NO REFUSAL							WC=23.5%					
10																					
15																					
20																					
25																					
Remarks:																					
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.																					
Page 1 of 1																					
Boring No.: HB-DYBR-209																					

Maine Department of Transportation

Soil/Rock Exploration Log

US CUSTOMARY UNITS

Project: A 0.83 mile portion of Route 2

Location: Dyer Brook, Maine

Boring No.: HB-DYBR-210

WIN: 19231.00

Drilling Contractor: MaineDOT

Operator: Daggett

Logged By: B. Wilder

Date Start/Finish: 11/18/2015-11/18/2015

Boring Location: 80+00, 6.0 ft Rt.

Elevation (ft.) 666.9

Datum: NAVD88

Rig Type: CME 45C

Drilling Method: Solid Stem Auger

Casing ID/OD: N/A

Auger ID/OD: 10" Dia.

Sampler: Off Flights

Hammer Wt./Fall: N/A

Core Barrel: N/A

Water Level*: None Observed

Definitions: D = Spilt Spoon Sample
S = Sample off Auger Flights
B = Bucket Sample off Auger Flights
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MV = Unsuccessful Field Vane Shear Test Attempt
V = Field Vane Shear Test, PP= Pocket Penetrometer

MU = Unsuccessful Thin Wall Tube Sample 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 1 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-value = Raw Field SPT N-value
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent ≈ = Similar or Equal too

LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information							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-value	Casing Blows	Elevation (ft.)		
0	B10		0.58 - 1.90			SSA	666.3	7" PAVEMENT.	
	S3		1.90 - 4.50				665.0	Black-brown, moist, fine to coarse SAND, some gravel, little silt, occasional cobble.	G#301066 A-1-b, SW-SM WC=1.3%
								Light brown, damp, Silty fine to coarse SAND, little gravel.	G#302035 A-4, SM WC=11.1%
5							662.4	Bottom of Exploration at 4.5 feet below ground surface. NO REFUSAL	
10									
15									
20									
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 1

Boring No.: HB-DYBR-210

State of Maine - Department of Transportation

Power Auger Probe Summary Sheet

Town(s): Dyer Brook

Work Number: 19231.00

Station (Feet)	Offset (Feet)	Weathered Rock (Feet)	Refusal (Feet)	No Refusal (Feet)	Water Depth (Ft.)	Comments / Date
41+50	9.0 Lt.			10.0		
50+17	9.0 Rt.			10.0		with cobbles
50+17	9.0 Lt.			10.0		with cobbles
54+67	9.0 Rt.		4.1			
54+67	9.0 Lt.			10.0		
57+28	9.0 Rt.		3.9			
59+52	9.0 Rt.		6.3			
59+52	9.0 Lt.		6.4			
61+59	9.0 Rt.			10.0		
63+69	9.0 Rt.		4.1			
63+69	9.0 Lt.		8.5			
65+85	9.0 Rt.		9.4			
65+85	9.0 Lt.		5.8			
70+40	9.0 Rt.			10.0		
70+40	9.0 Lt.			10.0		
Above Boring Stationing determined by DMI estimate.						
						11/18-19/2015
55+00	13.0 Lt.			8.0		
55+00	14.0 Rt.			8.0		
55+50	13.0 Lt.			8.0		
55+50	13.0 Rt.		2.8			
56+00	13.0 Lt.			8.0		
56+00	14.0 Rt.			8.0		
56+50	12.5 Lt.			8.0		
56+50	13.5 Rt.			8.0		
57+00	12.5 Lt.		6.2			
57+00	13.0 Rt.		3.0			
57+50	12.5 Lt.		7.0			
57+50	13.0 Rt.		6.1			
58+00	12.5 Lt.		3.1			
58+00	13.0 Rt.		5.6			
58+50	12.5 Lt.		5.5			
58+50	13.5 Rt.			8.0		
59+00	12.5 Lt.		5.7			
59+00	13.5 Rt.		6.0			
59+50	13.0 Lt.		5.5			
59+50	13.5 Rt.		5.4			
60+00	13.5 Rt.		4.6			
60+50	13.0 Lt.		6.2			
60+50	13.5 Rt.		6.0			
61+00	13.0 Lt.			8.0		
61+00	13.5 Rt.		5.5			
61+50	13.0 Lt.			8.0		
61+50	13.5 Rt.			8.0		
62+00	12.5 Lt.			8.0		
62+00	13.5 Rt.		5.5			

Work Number: 19231.00

[illegible]

Appendix B

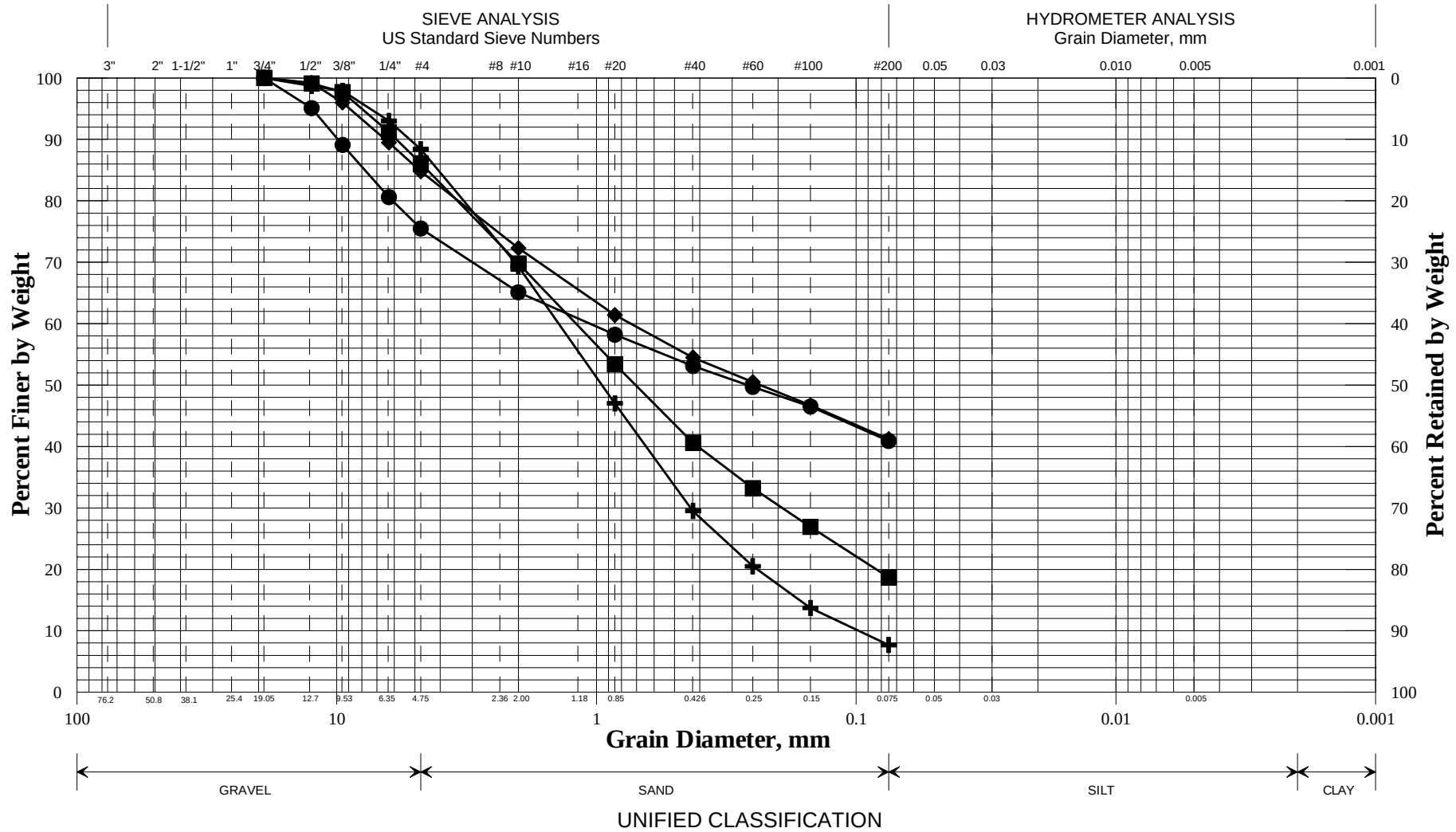
Laboratory Test Results

Work Number: 19231.00

Classification of these soil samples is in accordance with AASHTO Classification System M-145-40. This classification is followed by the "Frost Susceptibility Rating" from zero (non-frost susceptible) to Class IV (highly frost susceptible). The "Frost Susceptibility Rating" is based upon the MDOT and Corps of Engineers Classification Systems.

PI = Plasticity Index as determined by AASHTO 90-96 and/or ASTM D4318-98

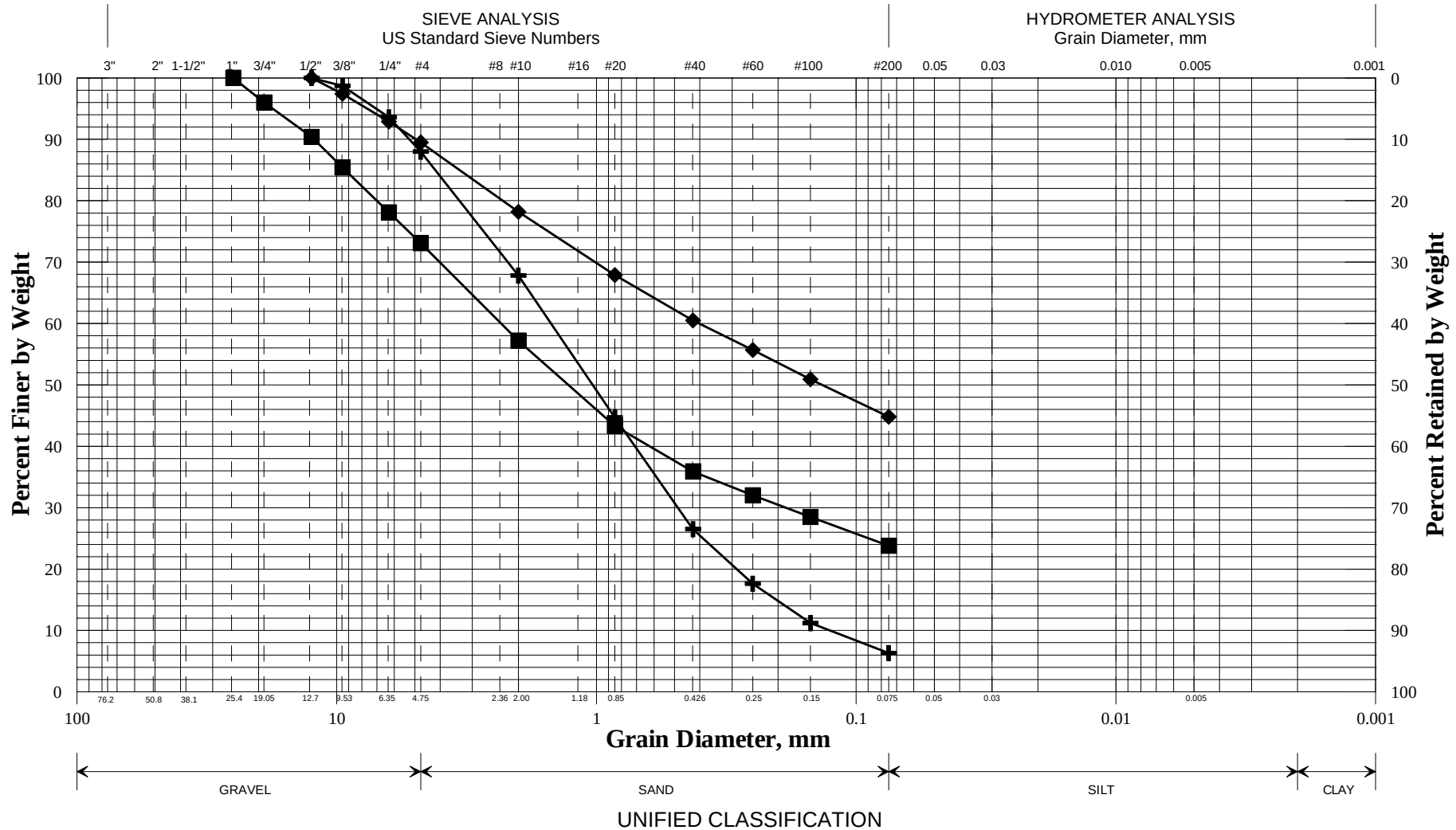
State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	HB-DYBR-101 S1	77+25	9.0 LT	0.25-1.2	SAND, little gravel, trace silt.	4.0			
◆	HB-DYBR-101 S2	77+25	9.0 LT	1.2-5.0	Silty SAND, little gravel.	10.1			
■	HB-DYBR-103 S3	67+25	9.0 RT	0.33-1.3	SAND, little silt, little gravel.	5.3			
●	HB-DYBR-103 S4	67+25	9.0 RT	1.3-9.4	SILT, some sand, some gravel.	10.6			
▲									
×									

WIN	
019231.00	
Town	
DYER BROOK	
Reported by/Date	
WHITE, TERRY A	11/14/2012

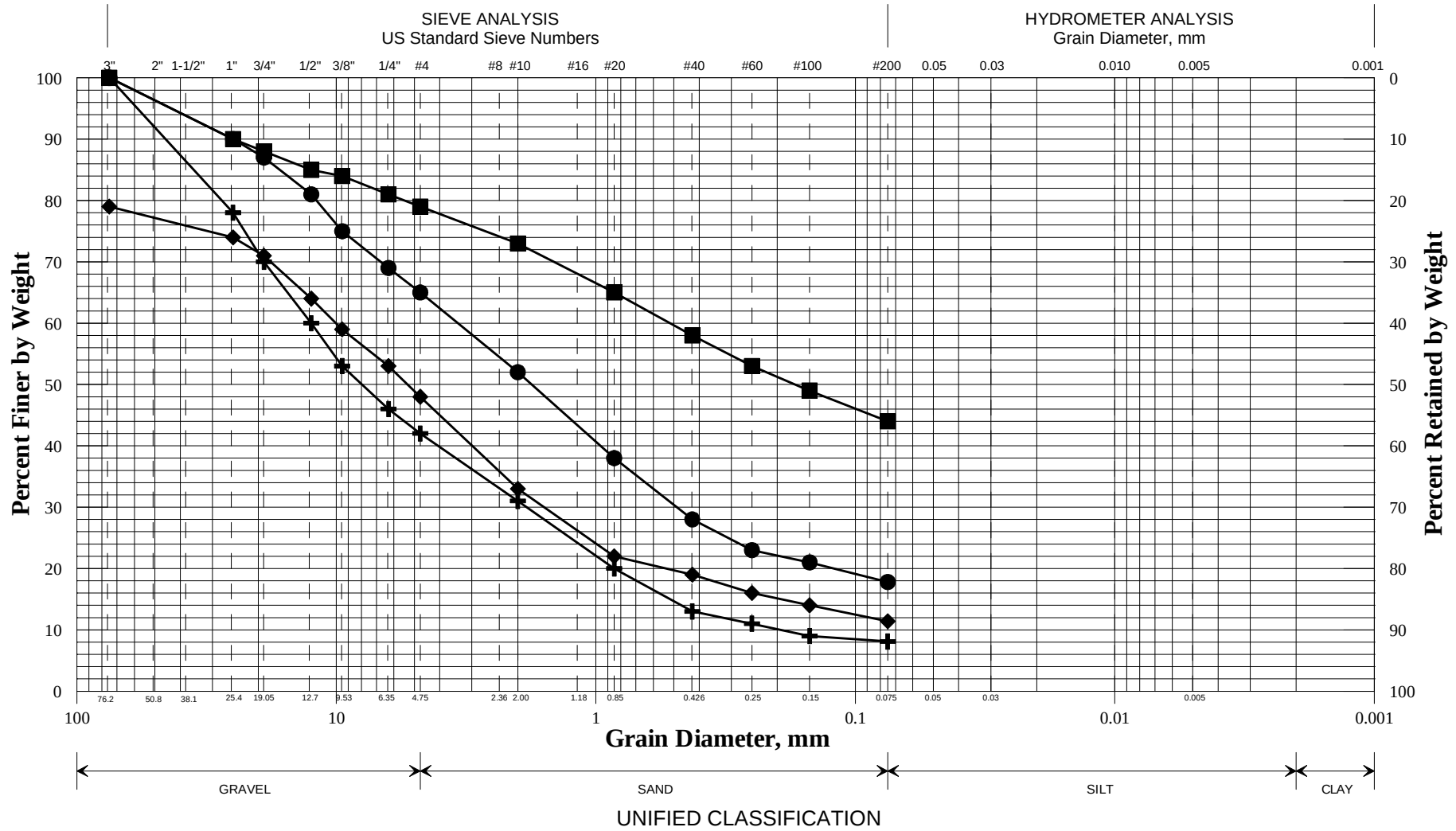
State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	HB-DYBR-105 S5	57+28	9.0 LT	0.33-1.3	SAND, little gravel, trace silt.	2.6			
◆	HB-DYBR-105 S6	57+28	9.0 LT	1.3-7.4	Sandy SILT, little gravel.	10.9			
■	HB-DYBR-107 S7	47+25	8.5 LT	0.25-5.0	SAND, some gravel, some silt.	4.5			
●									
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WIN	
019231.00	
Town	
DYER BROOK	
Reported by/Date	
WHITE, TERRY A	11/14/2012

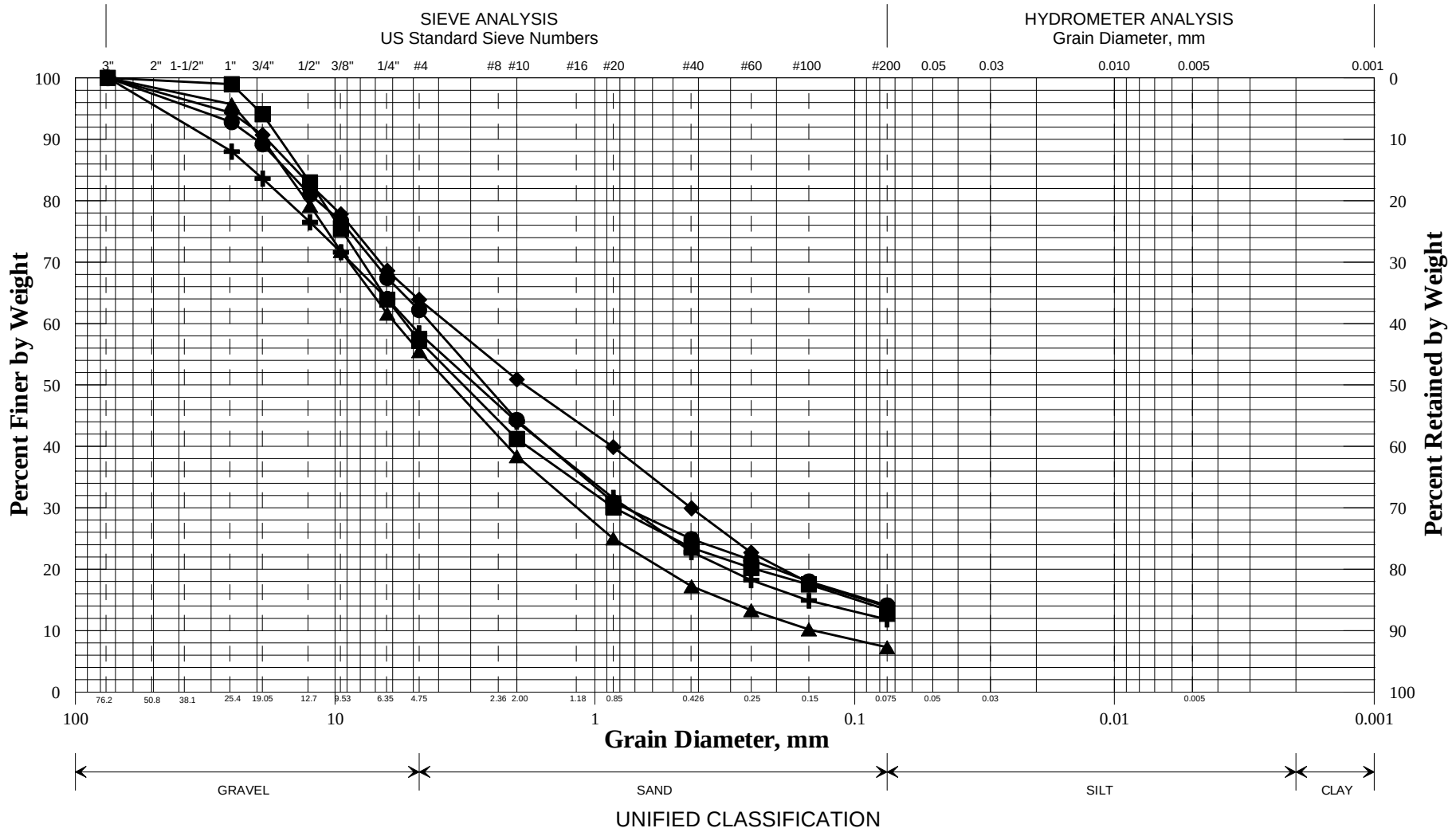
State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	TEST PIT 1	20+00	5.0 LT	1	GRAVEL, some sand, trace silt.	1.3			
◆	TEST PIT 2	40+00	5.0 RT	1	Sandy GRAVEL, little silt.	2.5			
■	TEST PIT 3	60+00	5.0 LT	1	SILT, some sand, some gravel.	7.2			
●	TEST PIT 4	80+00	5.0 RT	1	SAND, some gravel, little silt.	4.1			
▲									
×									

WIN	
019231.00	
Town	
Dyer Brook	
Reported by/Date	
WHITE, TERRY A	11/19/2015

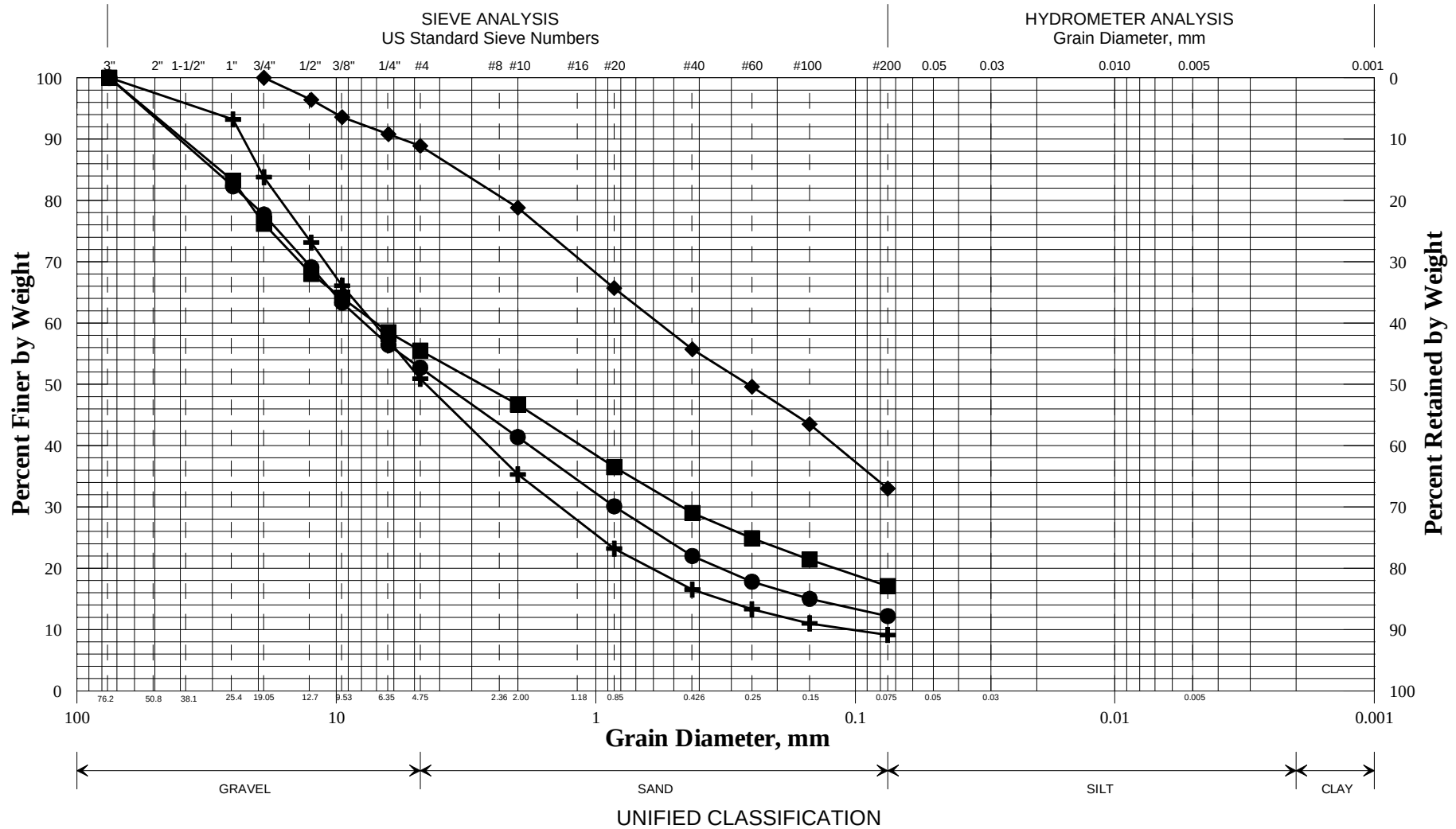
State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	HB-DYBR-201/B1	20+05	6.5 LT	0.58-4.5	Gravelly SAND, little silt.	0.8			
◆	HB-DYBR-202/B2	20+00	12.5 LT	0.0-4.5	Gravelly SAND, little silt.	1.6			
■	HB-DYBR-203/B3	30+00	8.0 RT	0.75-3.3	Gravelly SAND, little silt.	1.9			
●	HB-DYBR-204/B4	40+05	5.0 RT	0.58-4.5	Gravelly SAND, little silt.	2.9			
▲	HB-DYBR-205/B5	40+00	15.5 RT	0.0-3.4	Gravelly SAND, trace silt.	3.0			
×									

WIN	
019231.00	
Town	
Dyer Brook	
Reported by/Date	
WHITE, TERRY A	12/15/2015

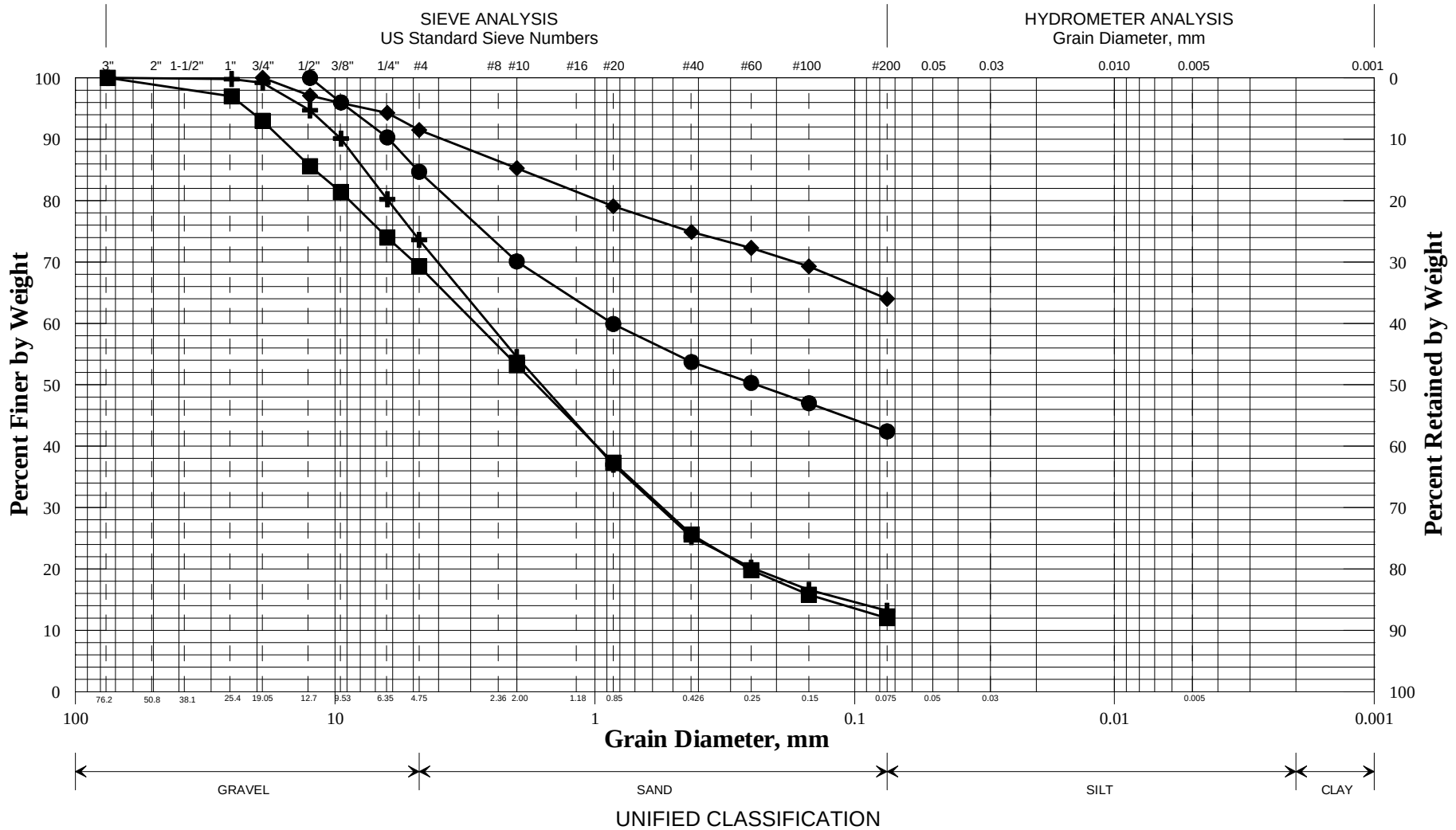
State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	HB-DYBR-206/B6	50+00	7.5 RT	0.67-3.0	Sandy GRAVEL, trace silt.	0.7			
♦	HB-DYBR-206/S1	50+00	7.5 LT	3.0-4.5	SAND, some silt, little gravel.	11.2			
■	HB-DTBR-207/B7	60+05	7.0 LT	0.83-2.3	Sandy GRAVEL, little silt.	2.2			
●	HB-DYBR-208/B8	60+00	14.5 LT	0.0-2.8	Sandy GRAVEL, little silt.	1.0			
▲									
×									

WIN	
019231.00	
Town	
Dyer Brook	
Reported by/Date	
WHITE, TERRY A	12/15/2015

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
+	HB-DYBR-209/B9	70+00	7.5 RT	0.42-1.6	SAND, some gravel, little silt.	2.3			
◆	HB-DYBR-209/S2	70+00	7.5 RT	1.6-4.5	SILT, some sand, trace gravel.	23.5			
■	HB-DYBR-210/B10	80+00	6.0 RT	0.58-1.9	SAND, some gravel, little silt.	1.3			
●	HB-DYBR-210/S3	80+00	6.0 RT	1.9-4.5	Silty SAND, little gravel.	11.1			
▲									
×									

WIN	
019231.00	
Town	
Dyer Brook	
Reported by/Date	
WHITE, TERRY A	12/15/2015