STATE OF MAINE
MAINE DEPARTMENT OF TRANSPORTATION
Letter of Transmittal

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Town: Poland

Attached is one (1) copy of Soils Report No. 2012-25, dated: October 25, 2012.

This report is available in TEDOCS as Document # 1236059.

att: 1 of 2012-25

MAINE DEPARTMENT OF TRANSPORTATION
HIGHWAY PROGRAM
GEOTECHNICAL GROUP
AUGUSTA, MAINE

SUBSURFACE INVESTIGATION FOR RECONSTRUCTION OF ROUTE 26, POLAND

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Androscoggin County
PIN 17883.00

Soils Report No. 2012-25

Federal STP-1788(300)
October 25, 2012

Table of Contents

Section		Page No.
1.0	**INTRODUCTION**	1
1.1	Project Overview	1
1.2	Summary of Recommendations	1
2.0	**SITE AND SUBSURFACE CONDITIONS**	2
2.1	General Site Conditions	2
2.2	Mapped Data	2
2.3	Subsurface Investigation	2
2.4	Native Soils	3
2.5	Subsurface Bedrock	3
2.6	Existing Pavement	4
2.7	Groundwater	4
2.8	Organic Soils	4
3.0	**DESIGN RECOMMENDATIONS**	4
3.1	Embankment Fills and Slopes	4
3.2	Cut Slopes	5
3.3	Pavement Design	5
3.4	Groundwater	6
3.5	Frost Action	6
3.6	Construction Considerations	6
4.0	**CLOSURE**	6

Figures:

Figure 1 – Project Location Map
Figures 2 and 3 - Boring Log Sheets

Appendices:

Appendix A **Resource Maps**
Surficial Geology
NRCS Soils Maps
National Wetlands Inventory Map

Appendix B **Plans**
Geoplans
1932 As-Built Typical Sections

Appendix C **Field Exploration Data**
Soils Descriptions Key
Boring Logs
Probe Summary Sheet
Soils Summary Sheet
Summary of bedrock depths

Appendix D **Testing Data**
Lab Testing Summary Sheet
Grain Size Curves
Lab Test Reports

Appendix E **Existing Pavement Data**
FWD Analysis
Pavement Core Photos

1.0 Introduction

1.1 Project Overview

MaineDOT proposes to rehabilitate and widen a portion of Route 26 in the Town of Poland. The project starts at Brown Road and extends 1.07 miles northerly, ending 0.10 miles south of the Mechanic Falls Town Line. This highway was originally built as State Highway "S" in 1932. The project scope includes complete reconstruction to include changes to the horizontal and vertical alignment, construction of paved shoulders and sidewalks, and a closed drainage system for part of the project. The intersection of Tripp Lake Road will be improved as part of this project and a center turn lane will be built from the intersection of Tripp Lake Road to the High School entrance.

Native soils in this area are predominantly loose to medium dense sand with varying amounts of silt. Shallow bedrock may be anticipated under the highway and in sideslopes between approximately Station 106+00 and Station 117+50. A thin layer of organic soils was found in a boring at Station 144+50.

Fills to widen the existing embankment and raise the roadway will be constructed with height of up to 20 feet. Turf Reinforcement Mat will be installed to protect some sensitive slopes.

This report describes existing conditions for this project.

1.2 Summary of Recommendations

- Existing subbase materials do not meet MaineDOT specification for base and subbase materials. These materials shall not be mined and reused as gravel in this project.
- A Resilient Modulus for 4750 psi should be used for pavement design of this project.
- Full width compaction will be required on the fill slopes from Station 113+00 to Station 123+50, Left. The material used in these slopes should meet the minimum requirements of Standard Specification 703.18, Common Borrow.

2.0 Site and Subsurface Conditions

2.1 General Site Conditions

The project begins at the intersection of Route 26 and the Brown Road and extends north for a distance of 1.07 miles, ending 0.1 miles south of the Mechanic Falls town line. This portion of Route 26 serves an area of gently rolling land with primarily residential development in the southern portion and residential and business development and the High School north of Tripp Lake Road. This highway was originally built in 1932 as State Highway S; it was built with 10 foot lanes and 3 foot shoulders. The original plans show a variety of gravel and stone base sections. This highway has been widened and paved many times over the years, but it was never built with appropriate aggregate materials to the full width section. Appendix A includes the plans and 1932 as-built typical sections for this project.

2.2 Mapped Data

The Maine Geologic Survey Surficial Geology map for the Mechanic Falls Quadrangle shows three soil types along this project. From Brown Road extending northwest for approximately 1500 feet the surficial soils are shown as Till. The next soil type indicated is an esker deposit of sand and gravel. The northwesterly portion of the project is shown on the map as Glaciofluvial and glaciomarine deposits of the Little Androscoggin River consisting of sand, gravel and mud with thickness varying for 1 foot to 50 feet.

Natural Resources Conservation Services (NRCS) maps include information on soils for the five feet below the surface; deeper soils are not discussed. Bedrock is shown as shallow in the area north of the Brown Road; deeper bedrock is shown for all other areas of this project. NRCS mapping for this area shows soils to be primarily sand with smaller amounts of silt for most of this project. No areas of high fines are indicated on the NRCS map.

The MGS Map of Bedrock Geology, Poland Quadrangle, shows the bedrock in this area to be primarily granite with heterogenous textures ranging from medium grained granitic to pegmatitic within outcrops.

The National Wetland Inventory (NWI) map of the area shows areas of wetlands adjacent to the highway from approximately Station 142+00 to Station 146+00.

Portions of the Surficial Geology, NRCS and NWI maps of the area are included in Appendix B.

2.3 Subsurface Investigation

The preliminary subsurface investigation for this project was conducted in December of 2007. A single power auger boring and two pavement cores were completed. A Falling Weight Deflectometer (FWD) analysis was conducted as part of the scoping process for this project. The final subsurface investigation was undertaken in December of 2011. Ten borings were done and five pavement cores were taken. All borings were extended to a depth of seven feet or twelve feet unless shallow refusal was encountered. Ground Penetrating Radar (GPR) data was collected by MaineDOT in July 2012 to further refine the depth to bedrock in the areas where shallow bedrock is

anticipated. Laboratory testing was done on existing gravel and subgrade samples from several borings spaced across the length of the project.

2.4 Native Soils

According to geologic mapping by MGS and NRCS, native soils in this area are predominantly sand and silty sand. Our borings confirm this. The soils near the surface are generally medium dense. There was little difference between soils immediately below the pavement surface and soils from lower in the soil profile. Table 1 shows the aggregate thickness and pavement section subgrade encountered in borings for this project:

Table 1 – Subgrade Soils

Station	Offset	HMA	Gravel Thickness	subgrade soils
104+00	9 LT	8"	3.3'	damp, loose SAND, trace silt
108+00	9.5 LT	5"	4.1'	damp, med dense SAND, some gravel, little silt
113+50	6 RT	3"	3.3'	moist, loose SAND, trace silt
		3" macadam		
116+50	12 LT	2"	4.3'	damp, loose SAND, trace silt
121+50	8 LT	5"	1.8'	damp SAND, little gravel, trace silt
		3" macadam		
126+00	11.5 RT	7"	2.4'	moist, med dense SAND, trace gravel, trace silt
132+00	19 LT	7"	3.2'	damp SAND, trace silt
137+50	11 RT	7.5"	1.3'	damp, med dense SAND, trace silt
144+50	16 RT	5.5"	2.5'	wet, loose SAND, little silt, organic layer from 5.5 - 5.67 bgs
155+00	11.5 RT	6"	2'	moist, med dense SAND, trace gravel, trace silt

Boring logs are included in Appendix C. Appendix D includes Lab Testing data.

2.5 Subsurface Bedrock

Shallow bedrock was encountered in many explorations for this project, and additional data was made available from borings drilled for the water main extension in 2010. The bedrock surface was variable. Shallow bedrock was encountered between Station 106+50 and station 117+00 on the Left, approximately 22.5 feet Left of CL, at depths ranging from 2.5-feet to 8-feet below existing ground surface (bgs). On the Right, shallow bedrock was encountered in water district borings from Station 106+50 to 117+50 at depths ranging from 1.5-feet to 8-feet bgs. In both of these areas there were borings that did not encounter bedrock within 10-feet bgs. GPR data collected by Maine DOT from Station 106+00 to Station 113+00, Left, did not show a clear indication of the bedrock surface. Extremely low deflections in the FWD analysis can also be used to help locate shallow bedrock. Low deflections show in the tests at Station 108+00, 116+00 and 156+00. Table 2 shows the depth to bedrock encountered in borings and probes on the Left side. GPR testing on the Left side of the highway did not indicate shallow bedrock between Station 106+00 and 113+00. Areas of shallow bedrock may be found during construction of this project that were not indicated in borings, FWD or GPR testing.

The probe summary sheet and a summary of data from water system borings are included in Appendix C.

2.6 Existing Pavement

The existing pavement is in poor condition. This project was originally designed with 10-foot lanes and 3-foot shoulders. The roadway surface consisted of 3-inches of macadam over 5-inches of crushed stone placed on an 8-inch or 12-inch gravel base or a 6-inch stone base. None of the samples we collected met MDOT requirements for Standard Specification 703.06, Aggregate for Base and Subbase Type D and only the samples from the boring at Station 126+00 met the requirements for Type E gravel. A 2-inch thick layer of old pavement was encountered at a depth of 2-feet bgs at in borings at Station 104+00 and Station 113+50.

The FWD analysis and pavement core photographs are included in Appendix E.

2.7 Groundwater

Groundwater was not encountered in borings for this project, however wet soils were found in a boring at Station 144+50 near an existing culvert. Groundwater depths may vary with the seasons, and seasonal seeps may be encountered during construction in cut sections.

2.8 Organic Soils

A 2-inch thick layer of organic materials was found at a depth of 5.5-feet at Station 144+50. This section is a shallow embankment fill, and it appears that fill was placed on an existing organic layer in the original construction. The NRCS map indicates that Freshwater/Uplands wetlands soils may be found between approximately Station 142+00 and Station 146+00, however no indication is given that these will be organic soils.

3.0 Design Recommendations

The horizontal alignment for this project will be close to the existing alignment. There are changes in the vertical alignment, with a maximum cut of approximately 7-inches at Station 128+50 and maximum fill of 2.5 feet at Station 119+50, the intersection of Tripp Lake Road. Construction of shoulders and ditches will require substantial cuts and fills in side slopes.

3.1 Embankment Fills and Slopes

Many borings encountered loose soils within the surface layer of sandy materials underlying this project. Medium dense sands were found at depths, however loose sands may be anticipated in all areas. Adequate compaction of the embankment fills will be needed to ensure stability of all constructed slopes. Care should be taken to ensure that all toes of slope are stable.

A side slope fill will be required for construction of shoulder and sidewalk from Station 103+50 to Station 105+50 Left, with a maximum depth of approximately 3

feet. Adequate slope stability will be achieved for the design maximum 3h:1v slopes if the toe of slope is well compacted.

The vertical alignment change will require an embankment fill from Station 113+00 to Station 123+50, Left. Existing pavement should be removed to ensure that water is not trapped between the existing pavement section and the new construction, and to provide a layer of uniform materials at pavement section subgrade. Toes of slope in this area should be well compacted. Benching will be required in this area to prevent creation of a slip surface between existing soils and the new construction. The maximum slope length in this area will be greater than 60-feet. Adequate slope stability will be achieved for the design maximum 3h:1v slopes if compaction of each lift is carried to the edge of the slope rather than a 1.5h:1v line from the edge of shoulder as required by Standard Specification Section 203.10. The waste area on these slopes should be limited to the outer 2-feet of the slope. A Special Provision for these changes to compaction and waste area should be included in the Contract documents.

Between Station 131+00 and Station 134+00 Left, construction of a sidewalk requires fills on the Left. The toes of slope were pulled in to avoid reducing the volume of an existing detention pond, and steep fill slopes are required. This fill will begin midway up an existing slope within the pond. A shear key is recommended for this construction and benching of the existing slope is recommended to avoid the creation of a shear plane at the interface between the existing ground and new construction. Turf reinforcing mat is recommended to ensure the stability of this slope.

3.2 Cut Slopes

Soil cut slopes will be required in several places along this project for construction of shoulders and ditches.

From Station 107+50 to 109+00 Right, cuts on the order of 3.5-feet will be required. Probes for the water district found bedrock as shallow as 1.5-feet, in the area of the waterline Right of centerline. Bedrock excavation may be anticipated in this area. Sandy soils in this area can be expected in this area, and no stability problems are anticipated with these 2h:1v cut slopes in soil. If the rock-soil interface is encountered in these cut slopes, turf reinforcing mat may be added to ensure the stability of the finished slopes.

From Station 138+50 to Station 140+50 Right, cuts as deep as 11 feet will be required. Borings in this area encountered medium dense sandy soils. These soils should be stable at the design 2h:1v slopes.

3.3 Pavement Design

A Resilient Modulus of 4750 psi should be used to calculate the pavement structural section for this highway. This was determined from testing by the FWD; the higher values indicating shallow bedrock were removed from the calculation.

3.4 Groundwater

Free groundwater was not detected at shallow depths when this project was drilled in December, 2011. Groundwater seeps are difficult to find during a subsurface investigation, and may be encountered during construction in soil and bedrock cut slopes along this project. If seeps are found, groundwater discharge could lead to slope instability in the excavations. Riprap drains should be constructed if seeps are found during construction. Granular filters are preferred for use under the riprap drains rather than geotextile. Improperly designed geotextile can become clogged, and use of a granular filter will ensure that water is not trapped under a clogged geotextile.

3.5 Frost Action

The Design Freezing Index for Poland is 1300. The freezing index can be used to calculate the depth of frost under the pavement section. Frost depth below a roadway depends on the Freezing index, grain size distribution of the subgrade soils, and the thickness of the pavement section. The design depth of frost in Poland for a 30 inch total pavement section with a granular subgrade is 52 inches. Any lenses of water trapped above these depths will freeze and potentially distort the pavement section.

3.6 Construction Considerations

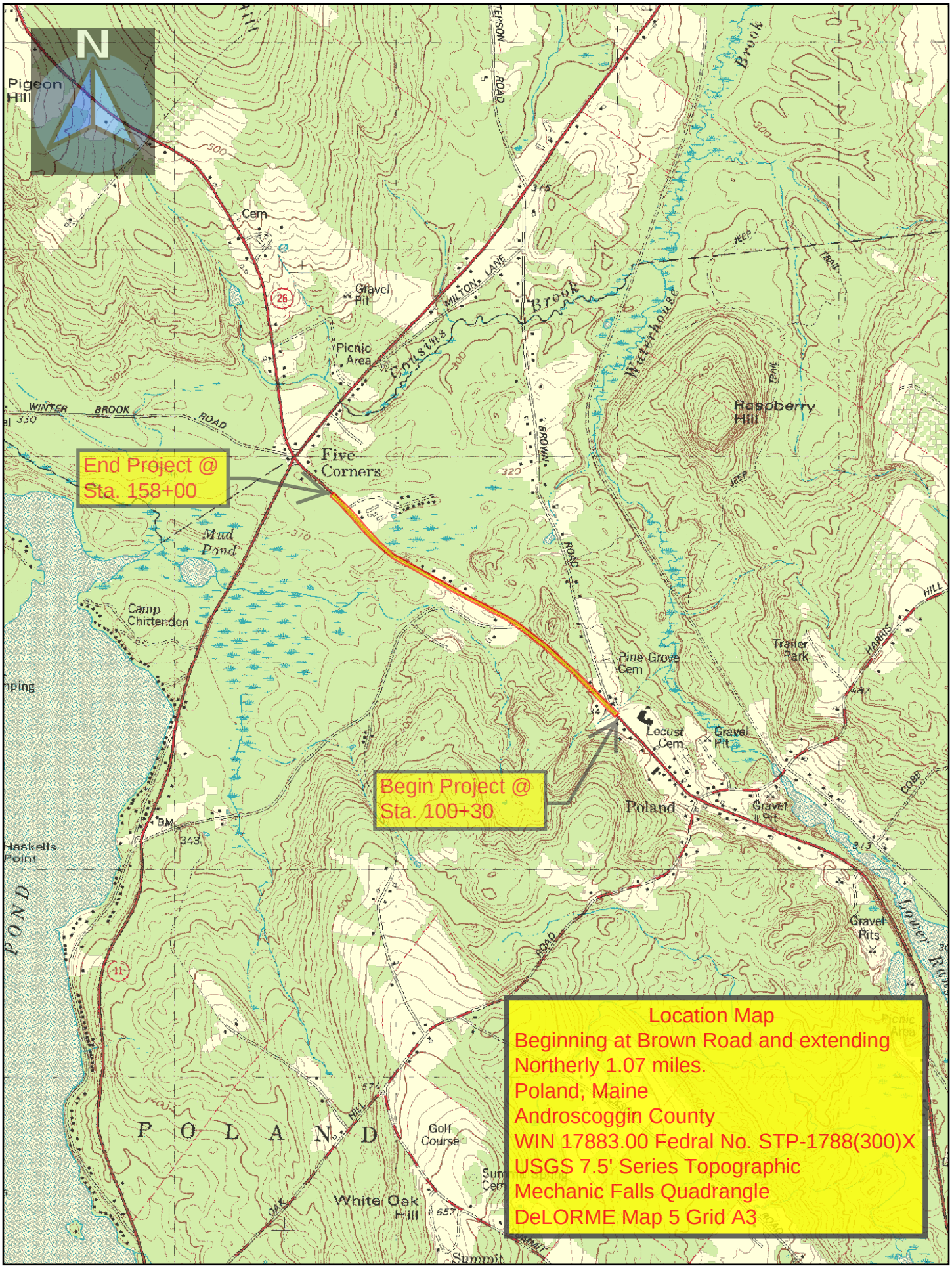
No soft soils were encountered in the subsurface investigation for this project, but loose native sands will need to be well proof-rolled to provide stability for new embankment construction. Benching will be required to widen existing embankments with a slope steeper than 2h:1v.

4.0 Closure

This report has been prepared for the use of the MaineDOT Highway Program for specific application to the proposed reconstruction of a portion of Route 26 in Poland. No other intended use or warranty is implied. 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 recommendation as appropriate to reflect the changes in design. Further, the analyses and recommendations are based in part upon limited soil explorations at discrete locations 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.

Figures

Figure 1



Map Scale 1:24000

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. Road names used on this map may not match official road names.

Filename: ...\MSTA\010_BORING LOGS1.dgn Division: GEOTECH Username: kitty.breskin Date:10/19/2012

Maine Department of Transportation — Soil/Rock Exploration Log — US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26 — Location: Poland, Maine — Boring No.: HB-POL-103 — WIN: 17883.00

Driller:	MaineDOT	Elevation (ft.)	346.4	Auger ID/OD:	5" Dia.
Operator:	Giguere/Giles	Datum:	NAVD88	Sampler:	Standard Split Spoon
Logged By:	B. Wilder	Rig Type:	CME 45C	Hammer Wt./Fall:	140#/30"
Date Start/Finish:	12/5/11-12/5/11	Drilling Method:	Solid Stem Auger	Core Barrel:	N/A
Boring Location:	104+00, 3.0 ft Lt.	Casing ID/OD:	N/A	Water Level*:	None Observed
Hammer Efficiency Factor: 0.84		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 = Insitu Vane Shear Test, PP = Pocket Penetrometer; 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 = Insitu Field Vane Shear Strength (psf); T_v = Pocket Torvane Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Annual Calibration Value; N_{60} = SPT N-uncorrected corrected for hammer efficiency; N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected; $S_{u(lab)}$ = Lab Vane Shear Strength (psf); WC = water content, percent; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0	PC-1		0.00 - 0.67				SSA	345.73	8" PAVEMENT, core taken. (0.67)	
	1D	24/17	1.00 - 3.00	13/19/12/7	31	43			Brown, damp, dense, fine to coarse SAND, some gravel, little silt. Layer of Old Pavement at 2.0 ft bgs. (4.00)	G#239957 A-1-b, SM WC=4.8%
5	2D	24/18	5.00 - 7.00	6/6/3/6	9	13		342.40	Rust, damp, loose, fine to medium SAND, little silt, trace gravel. (8.50)	G#239958 A-2-4, SM WC=13.1%
10	3D	24/20	10.00 - 12.00	4/4/4/4	8	11		337.90	Light brown, moist, loose, fine to medium SAND, trace silt. (12.00)	
15								334.40	Bottom of Exploration at 12.00 feet below ground surface. NO REFUSAL	
20										

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-POL-103

Maine Department of Transportation — Soil/Rock Exploration Log — US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26 — Location: Poland, Maine — Boring No.: HB-POL-102 — WIN: 17883.00

Driller:	MaineDOT	Elevation (ft.)	366.7	Auger ID/OD:	5" Dia.
Operator:	Giguere/Giles	Datum:	NAVD88	Sampler:	Standard Split Spoon
Logged By:	B. Wilder	Rig Type:	CME 45C	Hammer Wt./Fall:	140#/30"
Date Start/Finish:	12/5/11-12/5/11	Drilling Method:	Solid Stem Auger	Core Barrel:	N/A
Boring Location:	108+00, 9.5 ft Lt.	Casing ID/OD:	N/A	Water Level*:	None Observed
Hammer Efficiency Factor: 0.84		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 = Insitu Vane Shear Test, PP = Pocket Penetrometer; 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 = Insitu Field Vane Shear Strength (psf); T_v = Pocket Torvane Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Annual Calibration Value; N_{60} = SPT N-uncorrected corrected for hammer efficiency; N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected; $S_{u(lab)}$ = Lab Vane Shear Strength (psf); WC = water content, percent; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0							SSA	366.28	5" PAVEMENT. (0.42)	
	1D	24/19	1.00 - 3.00	7/8/8/8	16	22			Brown, damp, medium dense, fine to coarse SAND, trace gravel, little silt.	G#239959 A-2-4, SM WC=8.2%
5								362.20	Bottom of Exploration at 4.50 feet below ground surface. (4.50) REFUSAL	
10										
15										
20										

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-POL-102

Maine Department of Transportation — Soil/Rock Exploration Log — US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26 — Location: Poland, Maine — Boring No.: HB-POL-104 — WIN: 17883.00

Driller:	MaineDOT	Elevation (ft.)	362.4	Auger ID/OD:	5" Dia.
Operator:	Giguere/Giles	Datum:	NAVD88	Sampler:	Standard Split Spoon
Logged By:	B. Wilder	Rig Type:	CME 45C	Hammer Wt./Fall:	140#/30"
Date Start/Finish:	12/5/11-12/5/11	Drilling Method:	Solid Stem Auger	Core Barrel:	N/A
Boring Location:	113+50, 6.0 ft Rt.	Casing ID/OD:	N/A	Water Level*:	None Observed
Hammer Efficiency Factor: 0.84		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 = Insitu Vane Shear Test, PP = Pocket Penetrometer; 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 = Insitu Field Vane Shear Strength (psf); T_v = Pocket Torvane Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Annual Calibration Value; N_{60} = SPT N-uncorrected corrected for hammer efficiency; N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected; $S_{u(lab)}$ = Lab Vane Shear Strength (psf); WC = water content, percent; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0	PC-2		0.00 - 0.50				SSA	362.15	3" PAVEMENT, core taken. (0.25)	
								361.90	3" MCADAM, core taken. (0.50)	
	1D	24/16	1.00 - 3.00	16/25/16/8	41	57			Brown, damp, dense, fine to coarse SAND, some gravel, some silt. Layer of Old Pavement at 2.0 ft bgs.	G#239960 A-2-4, SM WC=6.8%
5	2D	24/18	5.00 - 7.00	2/3/3/5	6	8		358.60	Rust, moist, loose, fine to medium SAND, trace gravel, trace silt. (3.80)	G#239961 A-3, SP-SM WC=10.9%
10	3D	24/18	10.00 - 12.00	8/5/6/5	11	15		354.40	Light brown, saturated, medium dense, fine to medium sandy SILT. (8.00)	G#239962 A-4, ML WC=24.5%
15								350.40	Bottom of Exploration at 12.00 feet below ground surface. NO REFUSAL (12.00)	
20										

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-POL-104

Maine Department of Transportation — Soil/Rock Exploration Log — US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26 — Location: Poland, Maine — Boring No.: HB-POL-101 — WIN: 17883.00

Driller:	MaineDOT	Elevation (ft.)	352.5	Auger ID/OD:	5" Dia.
Operator:	Giguere/Giles	Datum:	NAVD88	Sampler:	Standard Split Spoon
Logged By:	B. Wilder	Rig Type:	CME 45C	Hammer Wt./Fall:	140#/30"
Date Start/Finish:	12/5/11-12/5/11	Drilling Method:	Solid Stem Auger	Core Barrel:	N/A
Boring Location:	116+50, 12.0 ft Lt.	Casing ID/OD:	N/A	Water Level*:	None Observed
Hammer Efficiency Factor: 0.84		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 = Insitu Vane Shear Test, PP = Pocket Penetrometer; 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 = Insitu Field Vane Shear Strength (psf); T_v = Pocket Torvane Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Annual Calibration Value; N_{60} = SPT N-uncorrected corrected for hammer efficiency; N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected; $S_{u(lab)}$ = Lab Vane Shear Strength (psf); WC = water content, percent; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0							SSA	352.33	2" PAVEMENT. (0.17)	
	1D	24/14	1.00 - 3.00	4/5/5/6	10	14			Brown, damp, loose, fine to coarse SAND, little gravel, little silt.	G#239956 A-1-b, SM WC=5.7%
5	2D	24/18	5.00 - 7.00	1/2/3/3	5	7		348.00	Light brown, damp, loose, fine to medium SAND, trace gravel, trace silt. (4.50)	G#244130 A-3, SP-SM WC=5.3%
10	3D	24/19	10.00 - 12.00	10/18/9/15	27	38		344.50	Brown, damp, medium dense, fine to sandy GRAVEL, little silt. (8.00)	G#244131 A-1-b, GW WC=5.9%
15	4D	20.4/18	15.00 - 16.70	22/32/31/60(12.4)	63	88			Similar to above.	
20								335.80	Bottom of Exploration at 16.70 feet below ground surface. SPOON REFUSAL (16.70)	
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-POL-101

Maine Department of Transportation — Soil/Rock Exploration Log — US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26 — Location: Poland, Maine — Boring No.: HB-POL-110 — WIN: 17883.00

Driller:	MaineDOT	Elevation (ft.)	337.8	Auger ID/OD:	5" Dia.
Operator:	Giguere/Giles	Datum:	NAVD88	Sampler:	N/A
Logged By:	B. Wilder	Rig Type:	CME 45C	Hammer Wt./Fall:	N/A
Date Start/Finish:	12/6/11-12/6/11	Drilling Method:	Solid Stem Auger	Core Barrel:	N/A
Boring Location:	121+50, 8.0 ft Lt.	Casing ID/OD:	N/A	Water Level*:	None Observed
Hammer Efficiency Factor:		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 = Insitu Vane Shear Test, PP = Pocket Penetrometer; 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 = Insitu Field Vane Shear Strength (psf); T_v = Pocket Torvane Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Annual Calibration Value; N_{60} = SPT N-uncorrected corrected for hammer efficiency; N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected; $S_{u(lab)}$ = Lab Vane Shear Strength (psf); WC = water content, percent; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0	PC-4		0.00 - 0.67				SSA	337.15	5" PAVEMENT, core taken. (0.42)	
	S2		0.67 - 2.50					337.15	3" MCADAM, core taken. (0.67)	
									Brown, moist, fine to coarse SAND, little gravel, little silt.	G#239969 A-2-4, SM WC=6.9%
	S3		2.50 - 6.50					335.30	Light brown, damp, fine to coarse SAND, little gravel, trace silt. (2.50)	
5								331.30	Bottom of Exploration at 6.50 feet below ground surface. NO REFUSAL (6.50)	
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-POL-110

Maine Department of Transportation — Soil/Rock Exploration Log — US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26 — Location: Poland, Maine — Boring No.: HB-POL-105 — WIN: 17883.00

Driller:	MaineDOT	Elevation (ft.)	337.6	Auger ID/OD:	5" Dia.
Operator:	Giguere/Giles	Datum:	NAVD88	Sampler:	Standard Split Spoon
Logged By:	B. Wilder	Rig Type:	CME 45C	Hammer Wt./Fall:	N/A
Date Start/Finish:	12/6/11-12/6/11	Drilling Method:	Solid Stem Auger	Core Barrel:	N/A
Boring Location:	126+00, 11.5 ft Rt.	Casing ID/OD:	N/A	Water Level*:	None Observed
Hammer Efficiency Factor: 0.84		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 = Insitu Vane Shear Test, PP = Pocket Penetrometer; 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 = Insitu Field Vane Shear Strength (psf); T_v = Pocket Torvane Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Annual Calibration Value; N_{60} = SPT N-uncorrected corrected for hammer efficiency; N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected; $S_{u(lab)}$ = Lab Vane Shear Strength (psf); WC = water content, percent; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0							SSA	337.05	7" PAVEMENT. (0.58)	
	1D	24/18	1.00 - 3.00	7/5/5/7	10	14			Brown, moist, loose, fine to coarse SAND, some gravel, little silt.	G#239963 A-1-b, SP-SM WC=8.0%
5								334.60	Light brown, damp, medium dense, fine to coarse SAND, trace gravel, trace silt. (3.00)	
	2D	24/20	5.00 - 7.00	4/6/6/6	12	17				G#239964 A-1-b, SP WC=3.2%
10								330.60	Bottom of Exploration at 7.00 feet below ground surface. NO REFUSAL (7.00)	
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-POL-105

Maine Department of Transportation — Soil/Rock Exploration Log — US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26 — Location: Poland, Maine — Boring No.: HB-POL-109 — WIN: 17883.00

Driller:	MaineDOT	Elevation (ft.)	327.4	Auger ID/OD:	5" Dia.
Operator:	Giguere/Giles	Datum:	NAVD88	Sampler:	N/A
Logged By:	B. Wilder	Rig Type:	CME 45C	Hammer Wt./Fall:	N/A
Date Start/Finish:	12/6/11-12/6/11	Drilling Method:	Solid Stem Auger	Core Barrel:	N/A
Boring Location:	132+00, 19.0 ft Lt.	Casing ID/OD:	N/A	Water Level*:	None Observed
Hammer Efficiency Factor:		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 = Insitu Vane Shear Test, PP = Pocket Penetrometer; 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 = Insitu Field Vane Shear Strength (psf); T_v = Pocket Torvane Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Annual Calibration Value; N_{60} = SPT N-uncorrected corrected for hammer efficiency; N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected; $S_{u(lab)}$ = Lab Vane Shear Strength (psf); WC = water content, percent; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0	S1		0.58 - 3.80				SSA	326.82	7" PAVEMENT. (0.58)	
									Brown, damp, fine to coarse SAND, little gravel, trace silt.	
								323.60	Light brown, damp, fine to coarse SAND, trace silt. (3.80)	
5								320.90	Bottom of Exploration at 6.50 feet below ground surface. NO REFUSAL (6.50)	
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-POL-109

Maine Department of Transportation — Soil/Rock Exploration Log — US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26 — Location: Poland, Maine — Boring No.: HB-POL-106 — WIN: 17883.00

Driller:	MaineDOT	Elevation (ft.)	331.0	Auger ID/OD:	5" Dia.
Operator:	Giguere/Giles	Datum:	NAVD88	Sampler:	Standard Split Spoon
Logged By:	B. Wilder	Rig Type:	CME 45C	Hammer Wt./Fall:	140#/30"
Date Start/Finish:	12/6/11-12/6/11	Drilling Method:	Solid Stem Auger	Core Barrel:	N/A
Boring Location:	133+50, 11.0 ft Rt.	Casing ID/OD:	N/A	Water Level*:	None Observed
Hammer Efficiency Factor: 0.84		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 = Insitu Vane Shear Test, PP = Pocket Penetrometer; 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 = Insitu Field Vane Shear Strength (psf); T_v = Pocket Torvane Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Annual Calibration Value; N_{60} = SPT N-uncorrected corrected for hammer efficiency; N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected; $S_{u(lab)}$ = Lab Vane Shear Strength (psf); WC = water content, percent; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0	PC-3		0.00 - 0.63				SSA	330.38	7.5" PAVEMENT, core taken. (0.63)	
	1D/A	24/18	1.00 - 3.00	9/7/4/4	11	15			1D (1.0-2.0 ft) Brown, damp, medium dense, fine to coarse SAND, some gravel, trace silt. (2.00)	G#239965 A-2-4, SM WC=10.5%
5								329.00	1D/A (2.0-3.0 ft) Rust, damp, medium dense, fine to medium SAND, trace silt. (4.00)	
	2D	24/20	5.00 - 7.00	5/6/9/10	15	21		327.00	Light brown, damp, medium dense, fine to medium SAND, trace silt. (7.00)	G#239966 A-2-4, SP-SM WC=5.5%
10								324.00	Bottom of Exploration at 7.00 feet below ground surface. NO REFUSAL	
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-POL-106

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED	K.BRESKIN	OCT 2012
CHECKED-REVIEWED	T.WHITE	
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

POLAND
ROUTE 26 / MAINE STREET

BORING LOGS

SHEET NUMBER
2
OF 3

Filename: ...\msta\011_BORING LOGS2.dgn Division: GEOTECH Username: kitty.breskin Date:10/19/2012

Maine Department of Transportation
Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-107
WIN: 17883.00

Driller:	MaineDOT	Elevation (ft.)	316.5	Auger ID/OD:	5" Dia.
Operator:	Giguere/Giles	Datum:	NAVD88	Sampler:	Standard Split Spoon
Logged By:	B. Wilder	Rig Type:	CME 45C	Hammer Wt./Fall:	140#/30"
Date Start/Finish:	12/6/11-12/6/11	Drilling Method:	Solid Stem Auger	Core Barrel:	N/A
Boring Location:	144+50, 16.0 ft Rt.	Casing ID/OD:	N/A	Water Level*:	None Observed
Hammer Efficiency Factor: 0.84		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 = Insitu Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Insitu 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 = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
Nuncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows / 6 in. Shear Strength (psf) N-value (bpf)	Nuncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0	PC-4		0.00 - 0.46				SSA	316.04	5.5" PAVEMENT, core taken. (0.46)	
	1D	24/17	1.00 - 3.00	4/5/7/7	12	17		313.50	Brown, wet, medium dense, fine to coarse SAND, some gravel, little silt. (3.00)	GM239968 A-2-4, SP-SM WC=26.7%
5	2D	24/18	5.00 - 7.00	WOH/3/5/5	8	11		311.00	Brown, wet, loose, fine to coarse SAND, little silt. (5.50)	
								310.83	1" organic layer from 5.5-5.67 ft bgs. (6.67)	
								309.50	Bottom of Exploration at 7.00 feet below ground surface. NO REFUSAL (7.00)	
10										
15										
20										
25										

Remarks:

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

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Page 1 of 1
Boring No.: HB-POL-107

Maine Department of Transportation
Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-108
WIN: 17883.00

Driller:	MaineDOT	Elevation (ft.)	321.5	Auger ID/OD:	5" Dia.
Operator:	Giguere/Giles	Datum:	NAVD88	Sampler:	Standard Split Spoon
Logged By:	B. Wilder	Rig Type:	CME 45C	Hammer Wt./Fall:	140#/30"
Date Start/Finish:	12/6/11-12/6/11	Drilling Method:	Solid Stem Auger	Core Barrel:	N/A
Boring Location:	155+00, 11.5 ft Rt.	Casing ID/OD:	N/A	Water Level*:	None Observed
Hammer Efficiency Factor: 0.84		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 = Insitu Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Insitu 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 = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
Nuncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows / 6 in. Shear Strength (psf) N-value (bpf)	Nuncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0							SSA	321.00	6" PAVEMENT. (0.50)	
	1D	24/19	1.00 - 3.00	4/9/6/8	15	21		319.00	Brown, damp, medium dense, fine to coarse SAND, some gravel, trace silt, old pavement. (2.50)	GM239968 A-2-4, SM WC=8.7%
5	2D	24/20	5.00 - 7.00	6/6/5/7	11	15		314.50	Light brown, moist, medium dense, fine to coarse SAND, trace gravel, trace silt. (7.00)	
									Bottom of Exploration at 7.00 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-POL-108

State of Maine - Department of Transportation
Power Auger Probe Summary Sheet

Town(s): Poland **Work Number: 17883.00**

Station (Feet)	Offset (Feet)	Weathered Rock (Feet)	Refusal (Feet)	No Refusal (Feet)	Water Depth (Ft.)	Comments / Date 12/5/2011
115+00	12.5 Lt.		5.6			
115+25	12.0 Lt.		4.5			
115+50	12.0 Lt.		7.4			
115+75	12.5 Lt.		7.1			
116+00	12.0 Lt.		9.3			
116+25	12.0 Lt.			10.0		
116+75	12.54 Lt.		8.2			
117+00	11.5 Lt.		8.6			
139+50	12.0 Rt.			10.0		

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

		BY	DATE
PROJ. MANAGER			
DESIGN-DETAILED	K.BRESKIN	T.WHITE	OCT 2012
CHECKED-REVIEWED			
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

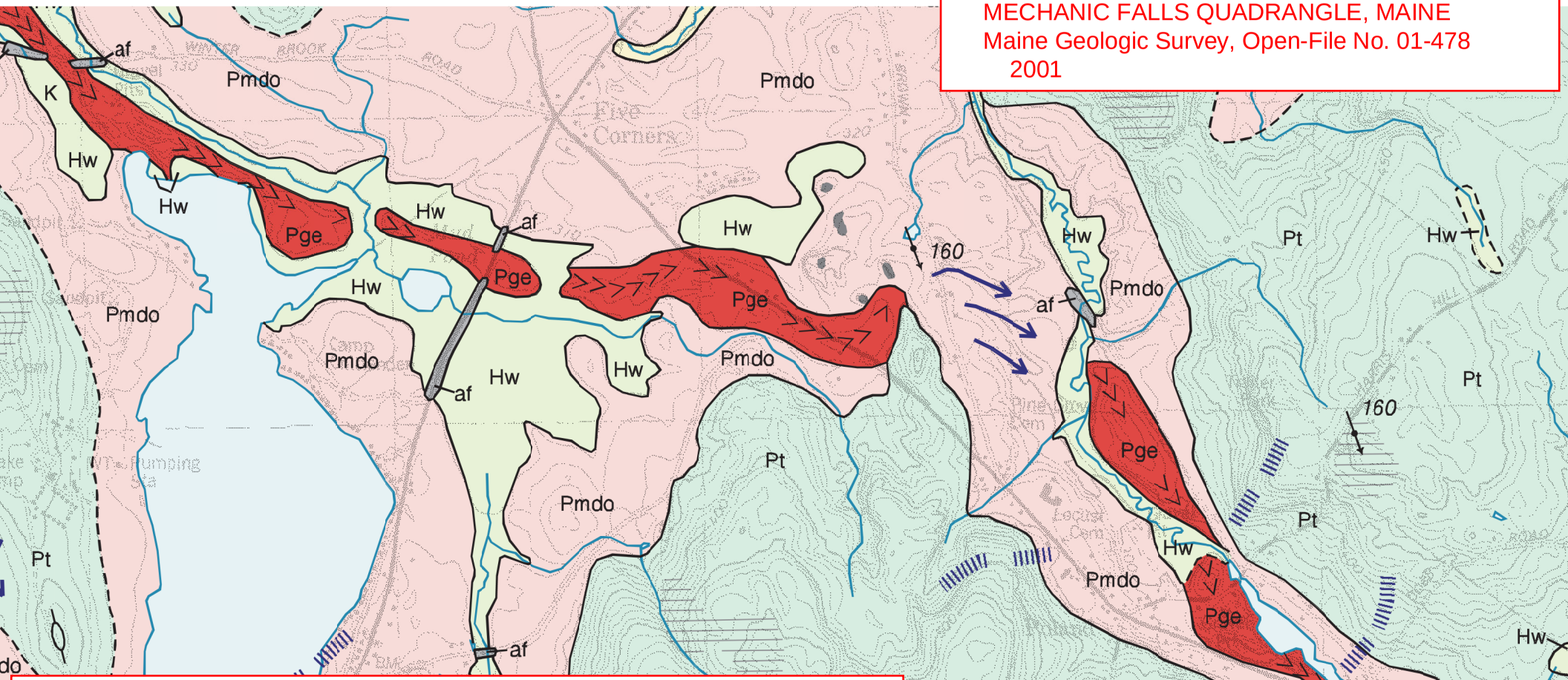
POLAND
ROUTE 26 / MAINE STREET

BORING LOGS

SHEET NUMBER
3
OF 3

Appendix A
Resource Maps
Surficial Geology Map
NRCS Soils Maps
National Wetland Inventory Map

SURFICIAL GEOLOGY
A portion of the
MECHANIC FALLS QUADRANGLE, MAINE
Maine Geologic Survey, Open-File No. 01-478
2001



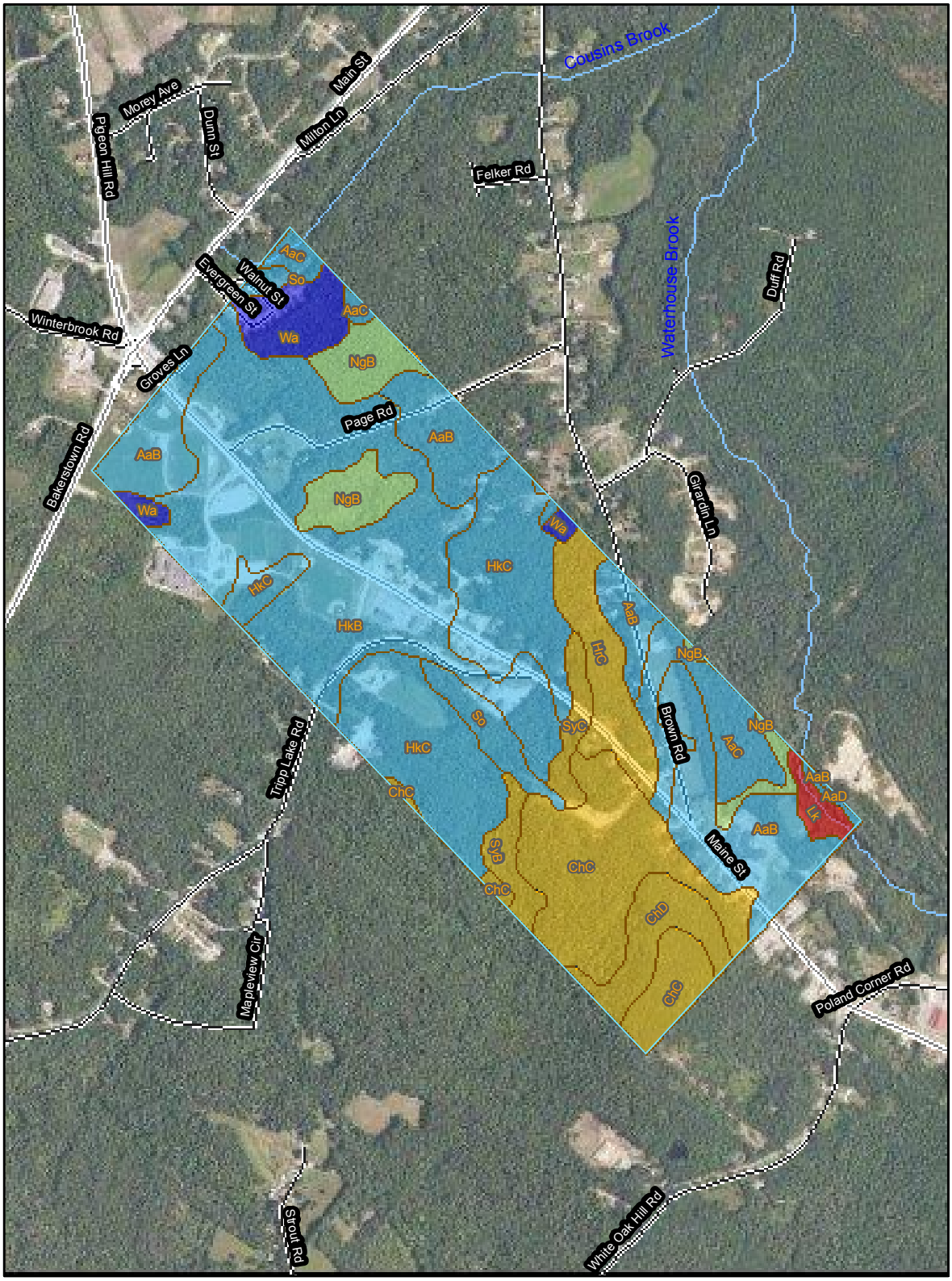
KEY

Pt: Till (Pleistocene) - Light- to dark gray, nonsorted to poorly sorted mixture of clay, silt, sand, pebbles, cobbles and boulders. A predominantly sandy diamicton containing some gravel. Generally underlies most other deposits. Thickness varies and is generally is less than 20 ft but is probably more than 100 ft under many drumlins and streamlined hills. Many streamlined hills in this area are bedrock cored.

Pge: Esker deposits (Pleistocene) - Sand and gravel deposited by glacial meltwater flowing in tunnels within of beneath the ice. As much as 130 ft thick. Chevrons indicate direction of stream flow.

Pmdo - Glaciofluvial and glaciomarine deposits of the Little Androscogging River valley (Pleistocene) - Sand, silt, gravel and mud. Consists of delta deposits graded to the contemporary sea. In places, overlain by unmapped thin dune deposts. Thickness varies: 1 to 50 ft.

70° 25' 14"
70° 23' 26"
44° 4' 59"
44° 5' 0"



44° 3' 15"
44° 3' 16"
70° 25' 11"
70° 23' 24"

Map Scale: 1:15,300 if printed on A size (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 500 1,000 2,000 3,000

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Soil Ratings

<= 21.2

> 21.2 AND <= 65.9

> 65.9 AND <= 74.2

> 74.2 AND <= 87.4

> 87.4 AND <= 91.2

Not rated or not available

Political Features

Cities

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:15,300 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Androscoggin and Sagadahoc Counties, Maine
Survey Area Data: Version 13, Jul 27, 2009

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Percent Sand

Percent Sand— Summary by Map Unit — Androscoggin and Sagadahoc Counties, Maine (ME606)				
Map unit symbol	**Map unit name**	**Rating (percent)**	**Acres in AOI**	**Percent of AOI**
AaB	Adams loamy sand, 0 to 8 percent slopes	87.4	63.4	15.7%
AaC	Adams loamy sand, 8 to 15 percent slopes	87.4	21.5	5.3%
AaD	Adams loamy sand, 15 to 30 percent slopes	87.4	1.0	0.2%
ChC	Charlton very stony fine sandy loam, 8 to 15 percent sl opes	62.3	50.6	12.5%
ChD	Charlton very stony fine sandy loam, 15 to 25 percent s lopes	62.3	13.4	3.3%
HkB	Hinckley gravelly sandy loam, 0 to 8 percent slopes	86.2	109.8	27.2%
HkC	Hinckley gravelly sandy loam, 8 to 15 percent slopes	86.2	66.4	16.4%
HrC	Hollis fine sandy loam, 8 to 15 percent slopes	60.0	17.7	4.4%
Lk	Limerick silt loam	21.2	3.9	1.0%
NgB	Ninigret fine sandy loam, 0 to 8 percent slopes	74.2	21.2	5.2%
So	Scarboro fine sandy loam	87.1	9.3	2.3%
SyB	Sutton very stony loam, 0 to 8 percent slopes	65.9	5.8	1.4%
SyC	Sutton very stony loam, 8 to 15 percent slopes	65.9	5.7	1.4%
Wa	Walpole fine sandy loam	91.2	14.6	3.6%
Totals for Area of Interest			**404.3**	**100.0%**

Description

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In the database, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Layer Options: Depth Range

Top Depth: 0

Bottom Depth: 800

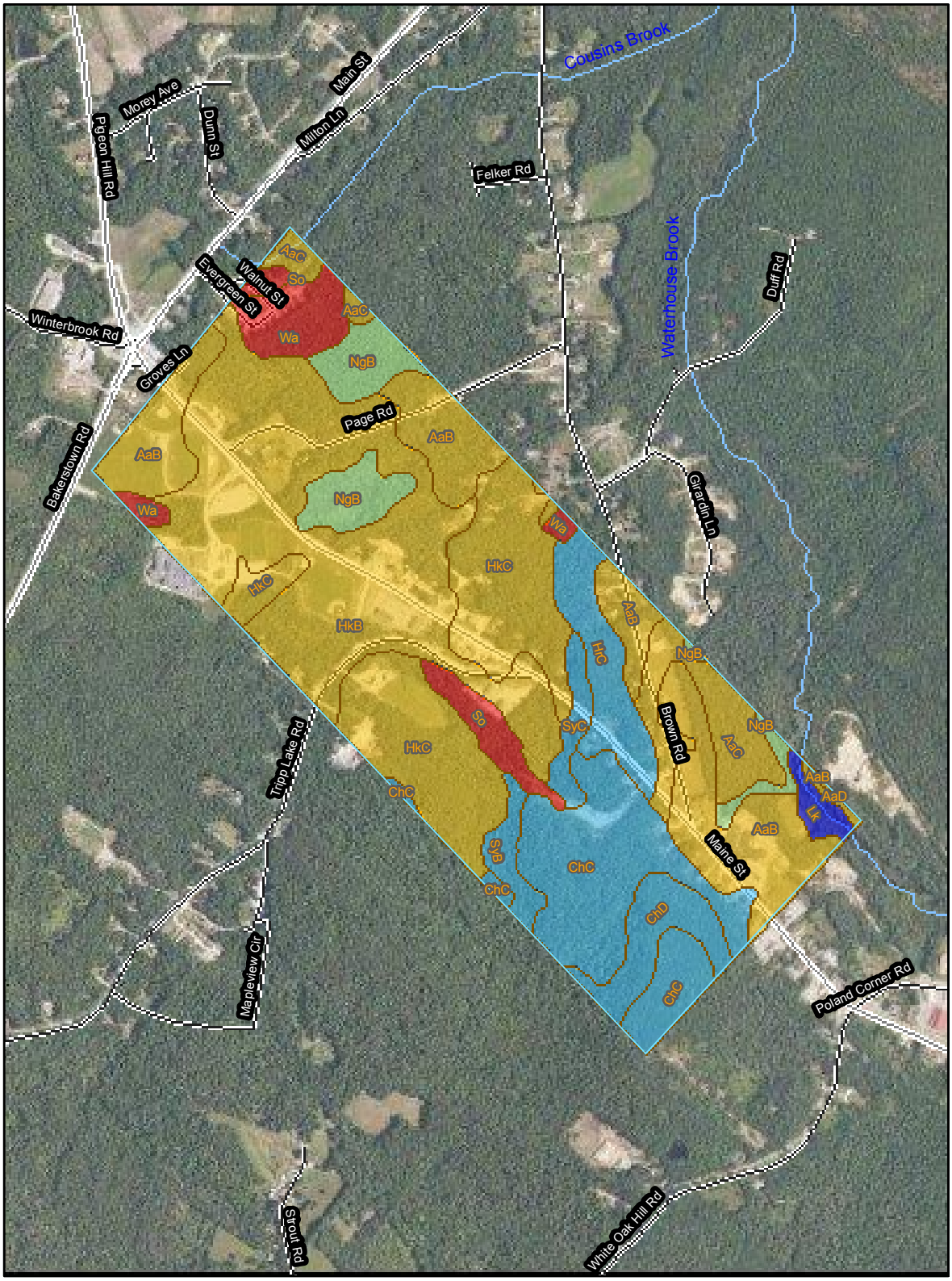
Units of Measure: Centimeters

70° 25' 14"

70° 23' 26"

44° 4' 59"

44° 5' 0"



44° 3' 15"

44° 3' 16"

70° 25' 11"

70° 23' 24"

Map Scale: 1:15,300 if printed on A size (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 500 1,000 2,000 3,000

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Soil Ratings

<= 8.7

> 8.7 AND <= 11.9

> 11.9 AND <= 21.3

> 21.3 AND <= 34

> 34 AND <= 68.8

Not rated or not available

Political Features

Cities

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:15,300 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Androscoggin and Sagadahoc Counties, Maine
Survey Area Data: Version 13, Jul 27, 2009

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Percent Silt

Percent Silt— Summary by Map Unit — Androscoggin and Sagadahoc Counties, Maine (ME606)				
Map unit symbol	**Map unit name**	**Rating (percent)**	**Acres in AOI**	**Percent of AOI**
AaB	Adams loamy sand, 0 to 8 percent slopes	10.1	63.4	15.7%
AaC	Adams loamy sand, 8 to 15 percent slopes	10.1	21.5	5.3%
AaD	Adams loamy sand, 15 to 30 percent slopes	10.1	1.0	0.2%
ChC	Charlton very stony fine sandy loam, 8 to 15 percent sl opes	31.8	50.6	12.5%
ChD	Charlton very stony fine sandy loam, 15 to 25 percent s lopes	31.8	13.4	3.3%
HkB	Hinckley gravelly sandy loam, 0 to 8 percent slopes	11.9	109.8	27.2%
HkC	Hinckley gravelly sandy loam, 8 to 15 percent slopes	11.9	66.4	16.4%
HrC	Hollis fine sandy loam, 8 to 15 percent slopes	34.0	17.7	4.4%
Lk	Limerick silt loam	68.8	3.9	1.0%
NgB	Ninigret fine sandy loam, 0 to 8 percent slopes	21.3	21.2	5.2%
So	Scarboro fine sandy loam	8.7	9.3	2.3%
SyB	Sutton very stony loam, 0 to 8 percent slopes	27.5	5.8	1.4%
SyC	Sutton very stony loam, 8 to 15 percent slopes	27.5	5.7	1.4%
Wa	Walpole fine sandy loam	6.9	14.6	3.6%
Totals for Area of Interest			**404.3**	**100.0%**

Description

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In the database, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Layer Options: Depth Range

Top Depth: 0

Bottom Depth: 800

Units of Measure: Centimeters

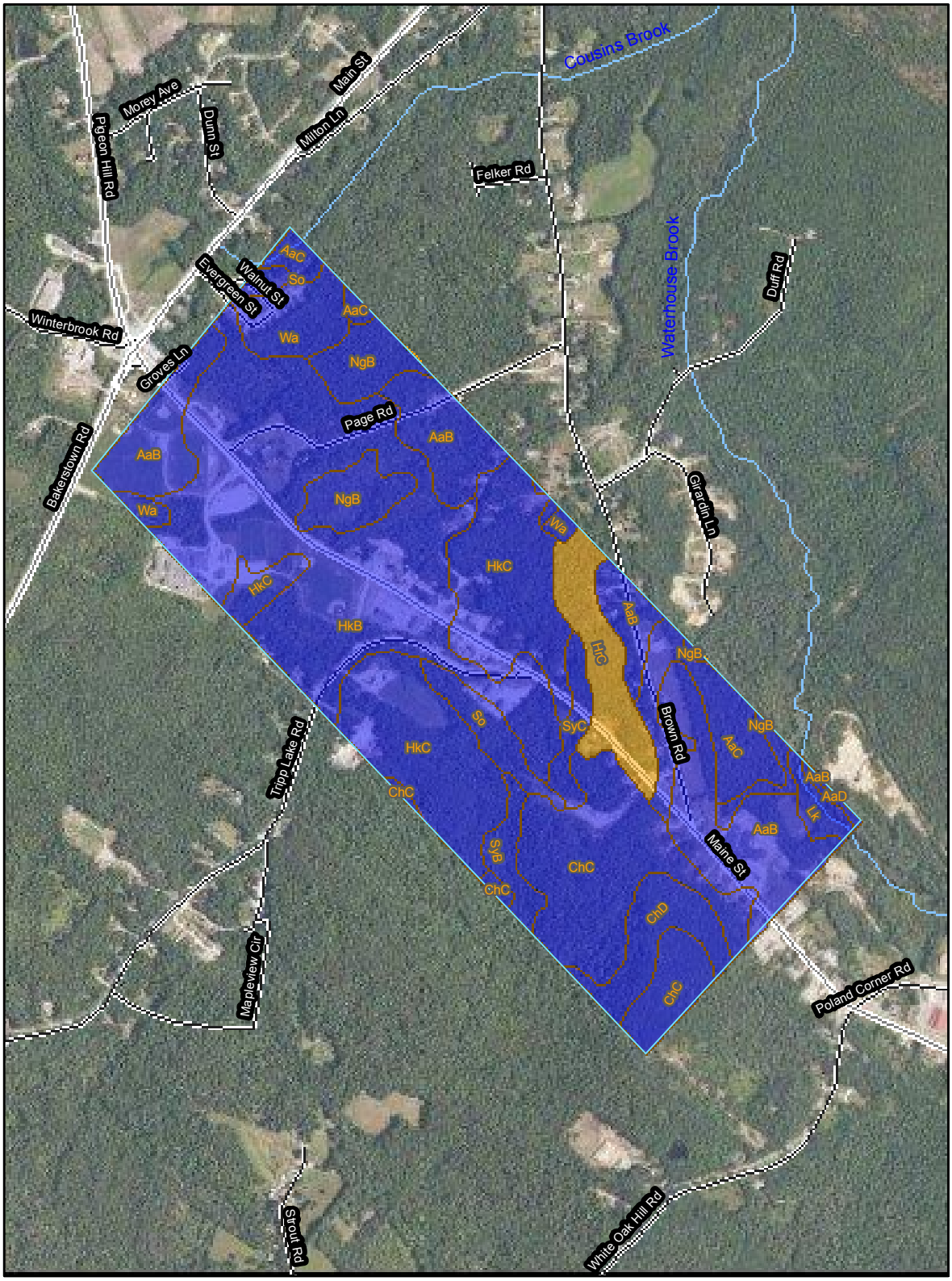
Depth to a Selected Soil Restrictive Layer: Lithic bedrock—Androscoggin and Sagadahoc Counties, Maine
(Poland, Route 26)

70° 25' 14"

70° 23' 26"

44° 4' 59"

44° 5' 0"



44° 3' 15"

44° 3' 16"

70° 25' 11"

70° 23' 24"

Map Scale: 1:15,300 if printed on A size (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 500 1,000 2,000 3,000

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Soil Ratings

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Political Features

Cities

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:15,300 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 19N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Androscoggin and Sagadahoc Counties, Maine
Survey Area Data: Version 13, Jul 27, 2009

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Depth to a Selected Soil Restrictive Layer: Lithic bedrock

Depth to a Selected Soil Restrictive Layer: Lithic bedrock— Summary by Map Unit — Androscoggin and Sagadahoc Counties, Maine (ME606)				
Map unit symbol	**Map unit name**	**Rating (centimeters)**	**Acres in AOI**	**Percent of AOI**
AaB	Adams loamy sand, 0 to 8 percent slopes	>200	63.4	15.7%
AaC	Adams loamy sand, 8 to 15 percent slopes	>200	21.5	5.3%
AaD	Adams loamy sand, 15 to 30 percent slopes	>200	1.0	0.2%
ChC	Charlton very stony fine sandy loam, 8 to 15 percent sl opes	>200	50.6	12.5%
ChD	Charlton very stony fine sandy loam, 15 to 25 percent s lopes	>200	13.4	3.3%
HkB	Hinckley gravelly sandy loam, 0 to 8 percent slopes	>200	109.8	27.2%
HkC	Hinckley gravelly sandy loam, 8 to 15 percent slopes	>200	66.4	16.4%
HrC	Hollis fine sandy loam, 8 to 15 percent slopes	46	17.7	4.4%
Lk	Limerick silt loam	>200	3.9	1.0%
NgB	Ninigret fine sandy loam, 0 to 8 percent slopes	>200	21.2	5.2%
So	Scarboro fine sandy loam	>200	9.3	2.3%
SyB	Sutton very stony loam, 0 to 8 percent slopes	>200	5.8	1.4%
SyC	Sutton very stony loam, 8 to 15 percent slopes	>200	5.7	1.4%
Wa	Walpole fine sandy loam	>200	14.6	3.6%
Totals for Area of Interest			**404.3**	**100.0%**

Description

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

This theme presents the depth to the user selected type of restrictive layer as described in for each map unit. If no restrictive layer is described in a map unit, it is represented by the "> 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Restriction Kind: Lithic bedrock

Aggregation Method: Dominant Component

Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower

Interpret Nulls as Zero: No

U.S. Fish and Wildlife Service

National Wetlands Inventory

NWI Wetland, PIN 17883

May 18, 2012

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

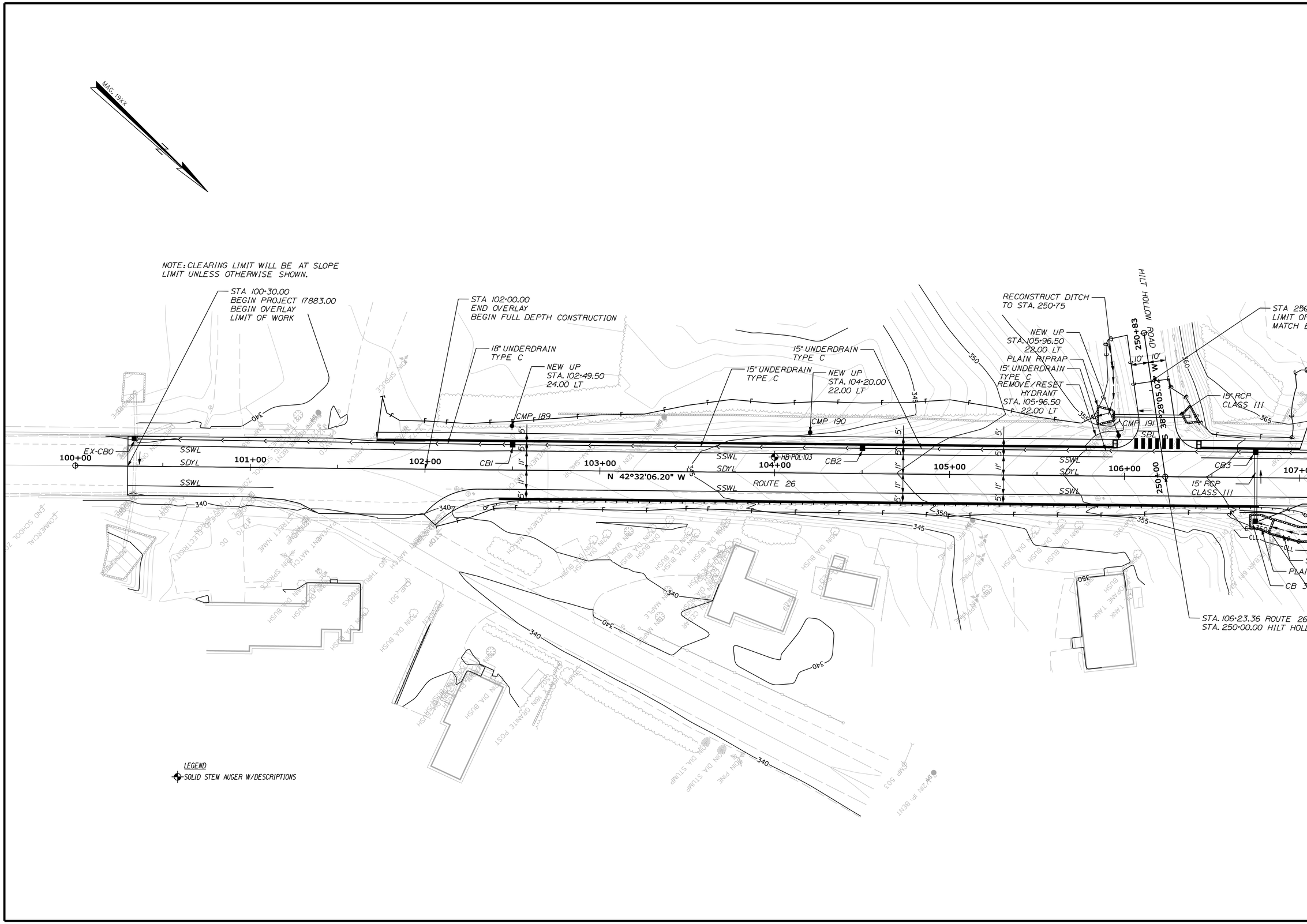
Status

- Digital
- Scan
- Non-Digital
- No Data

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

Appendix B
Plans
Geoplans
1932 As-built Typical Section



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED	K.BRESKIN	MAR 2012
CHECKED-REVIEWED		
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

POLAND
ROUTE 26 / MAINE STREET

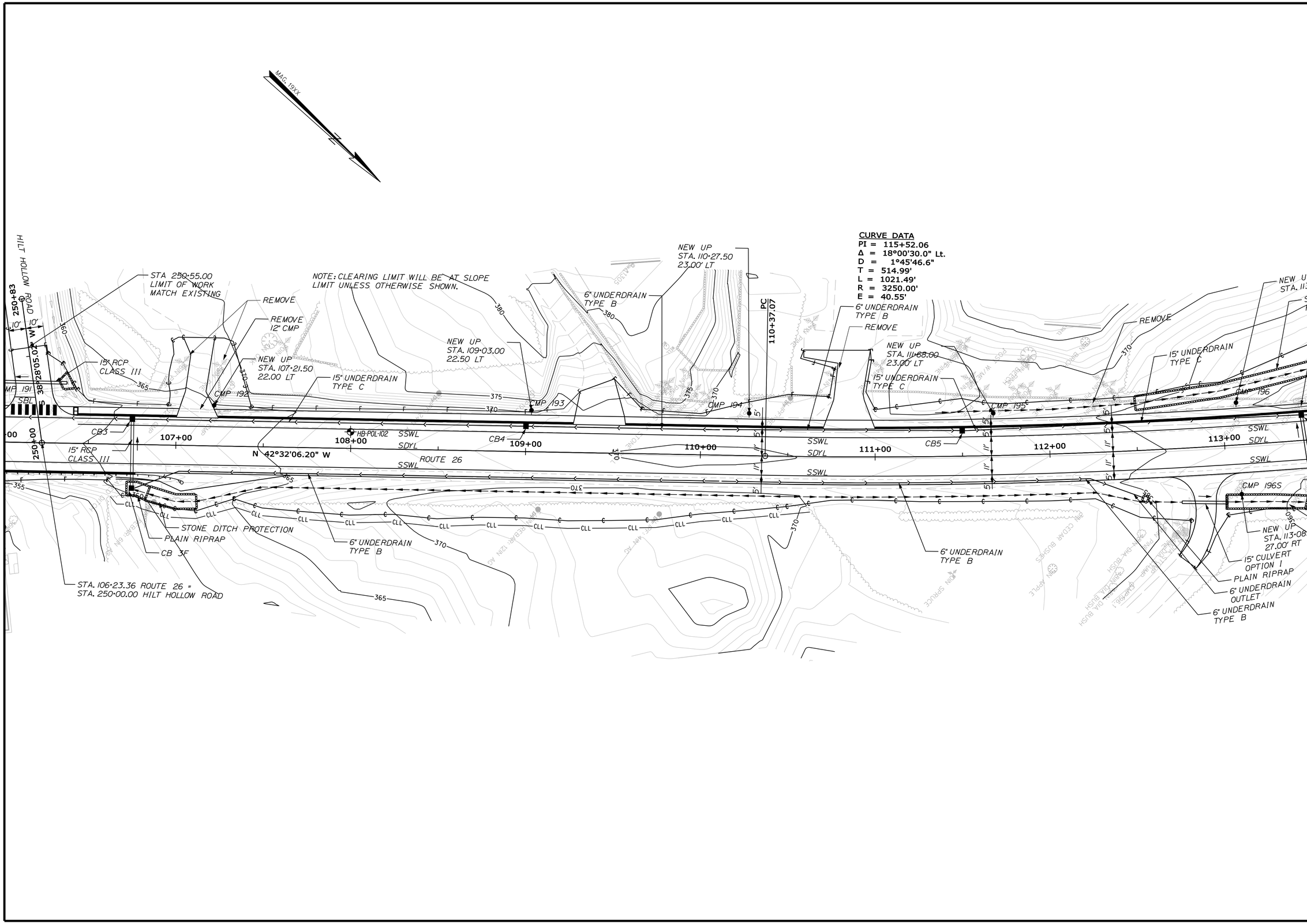
GEOPLANS

SHEET NUMBER

1

OF 9

Filename: ...\GEOTECH\MSTA\001_Geoplan1.dgn Division: GEOTECH Username: kitty.breskin Date:10/24/2012



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED	K.BRESKIN	MAR 2012
CHECKED-REVIEWED		
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

POLAND
ROUTE 26 / MAINE STREET

GEOPLANS

SHEET NUMBER
2
OF 9

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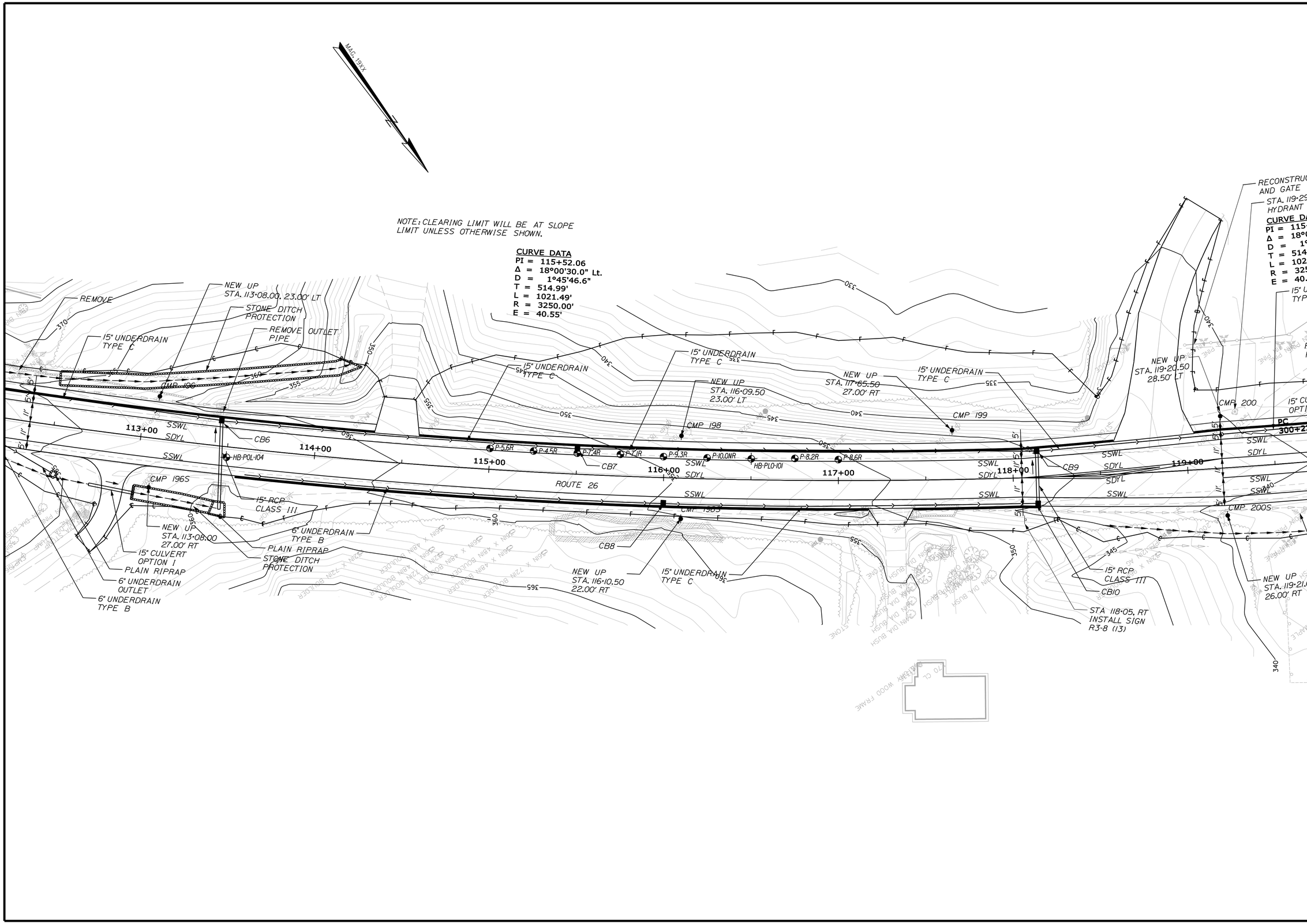

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED	K.BRESKIN	MAR 2012
CHECKED-REVIEWED		
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

POLAND
ROUTE 26 / MAINE STREET

GEOPLANS

SHEET NUMBER

3

OF 9

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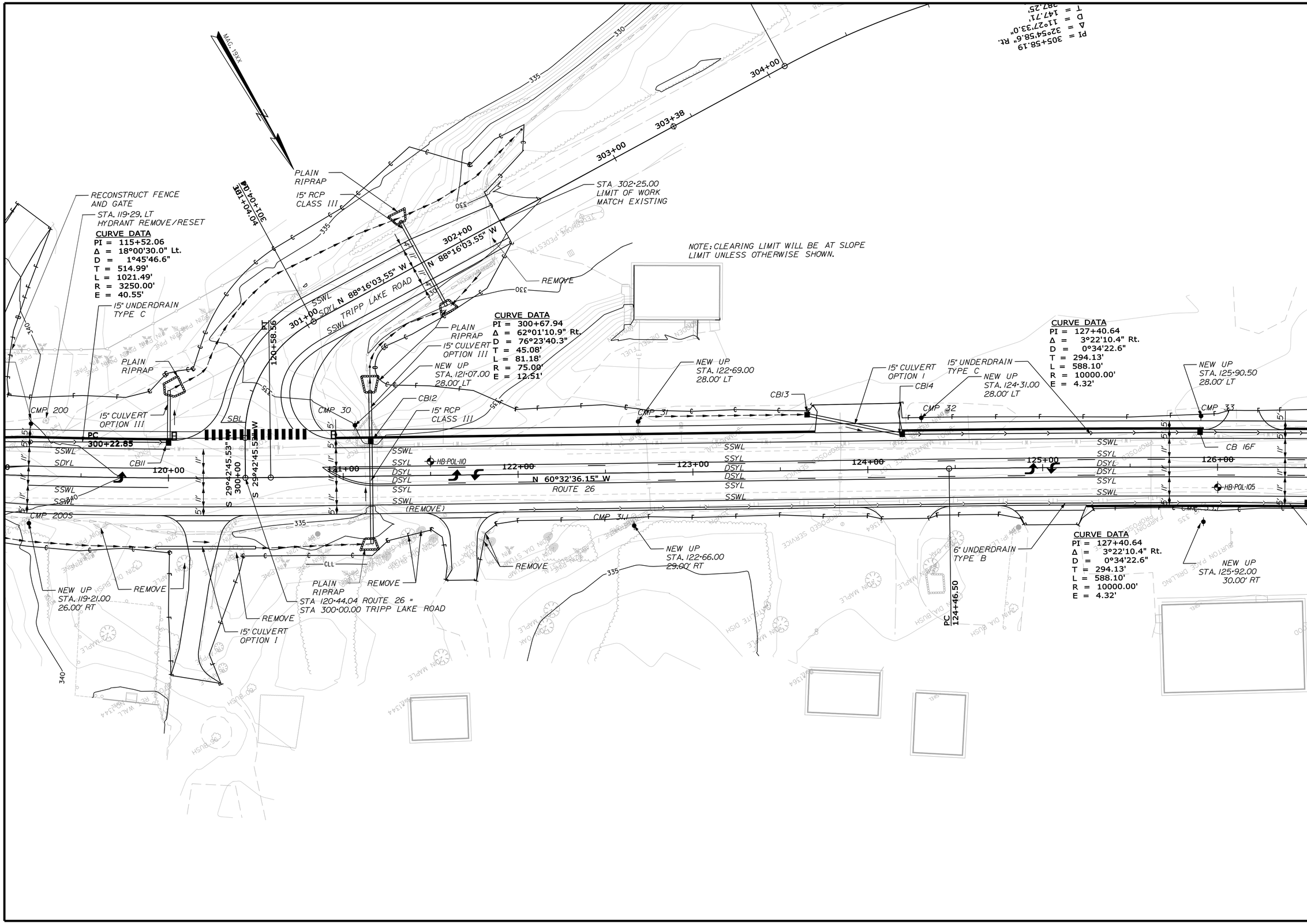

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED	K.BRESKIN	MAR 2012
CHECKED-REVIEWED	T. WHITE	
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

POLAND
ROUTE 26 / MAINE STREET

GEOPLANS

SHEET NUMBER

4

OF 9

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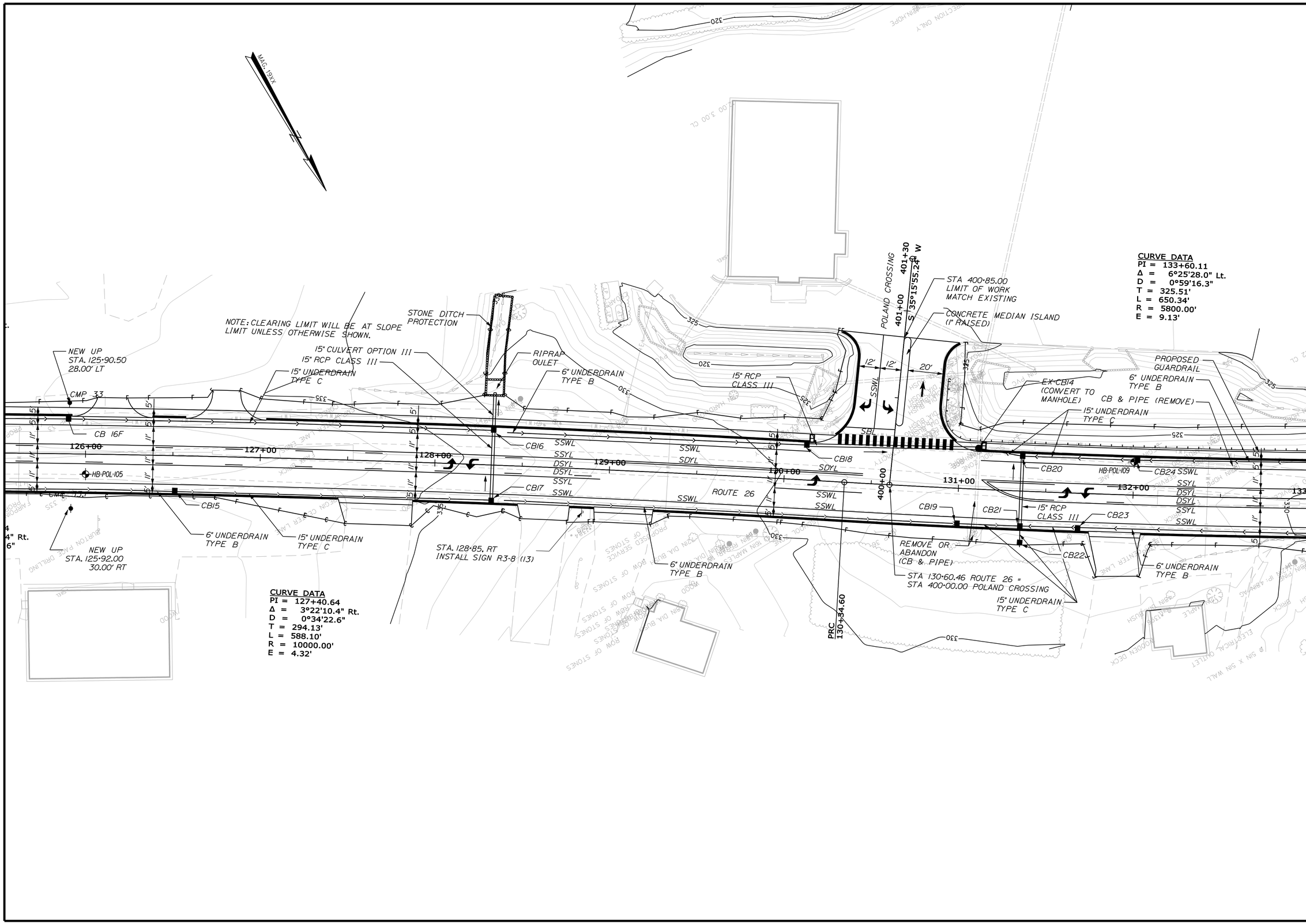

CURVE DATA
PI = 133+60.11
Δ = 6°25'28.0" Lt.
D = 0°59'16.3"
T = 325.51'
L = 650.34'
R = 5800.00'
E = 9.13'

CURVE DATA
PI = 127+40.64
Δ = 3°22'10.4" Rt.
D = 0°34'22.6"
T = 294.13'
L = 588.10'
R = 10000.00'
E = 4.32'

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED	K.BRESKIN	MAR 2012
CHECKED-REVIEWED	T.WHITE	
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

POLAND
ROUTE 26 / MAINE STREET

GEOPLANS

SHEET NUMBER
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OF 9

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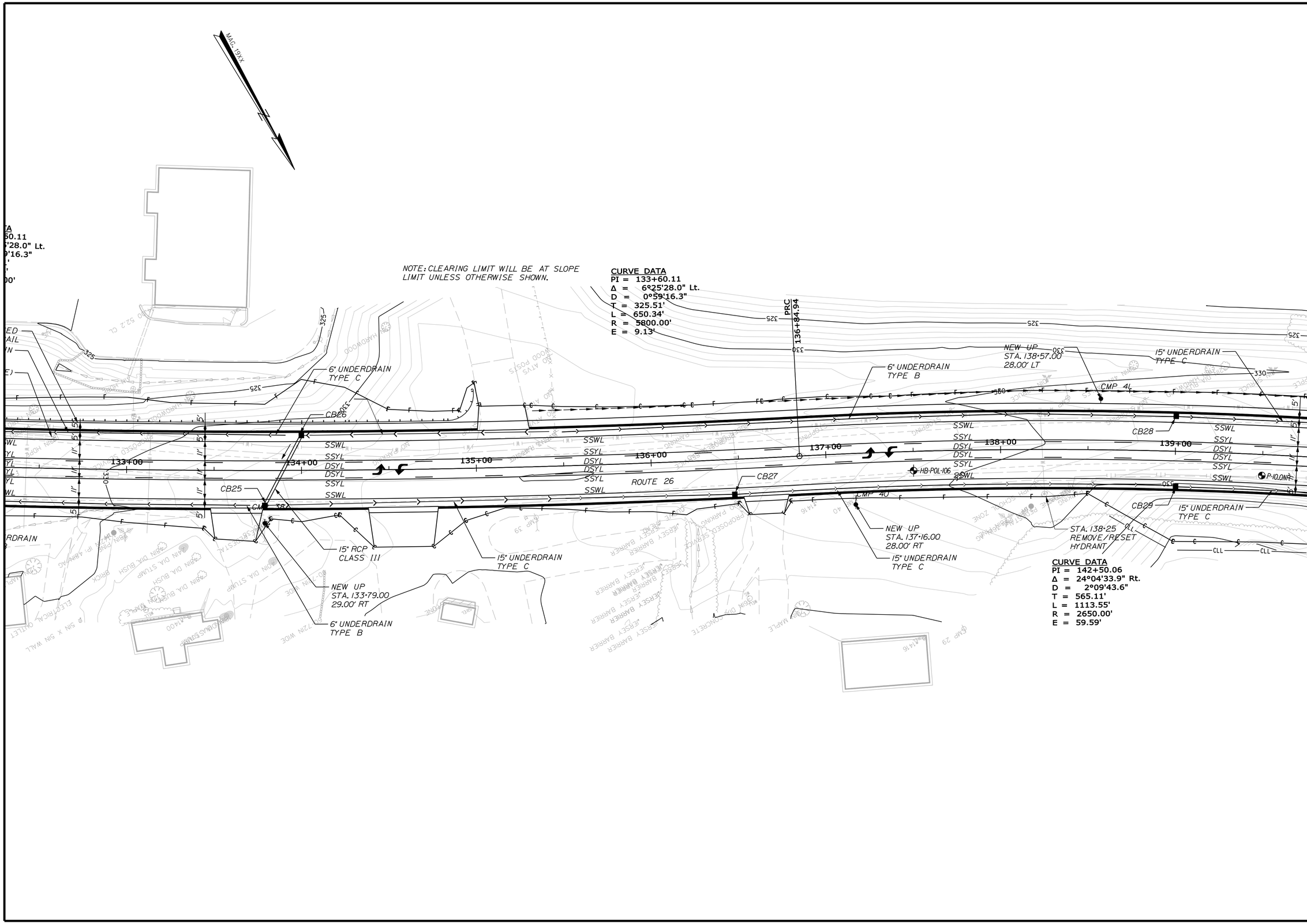

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED	K.BRESKIN	MAR 2012
CHECKED-REVIEWED		
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

POLAND
ROUTE 26 / MAINE STREET

GEOPLANS

SHEET NUMBER

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OF 9

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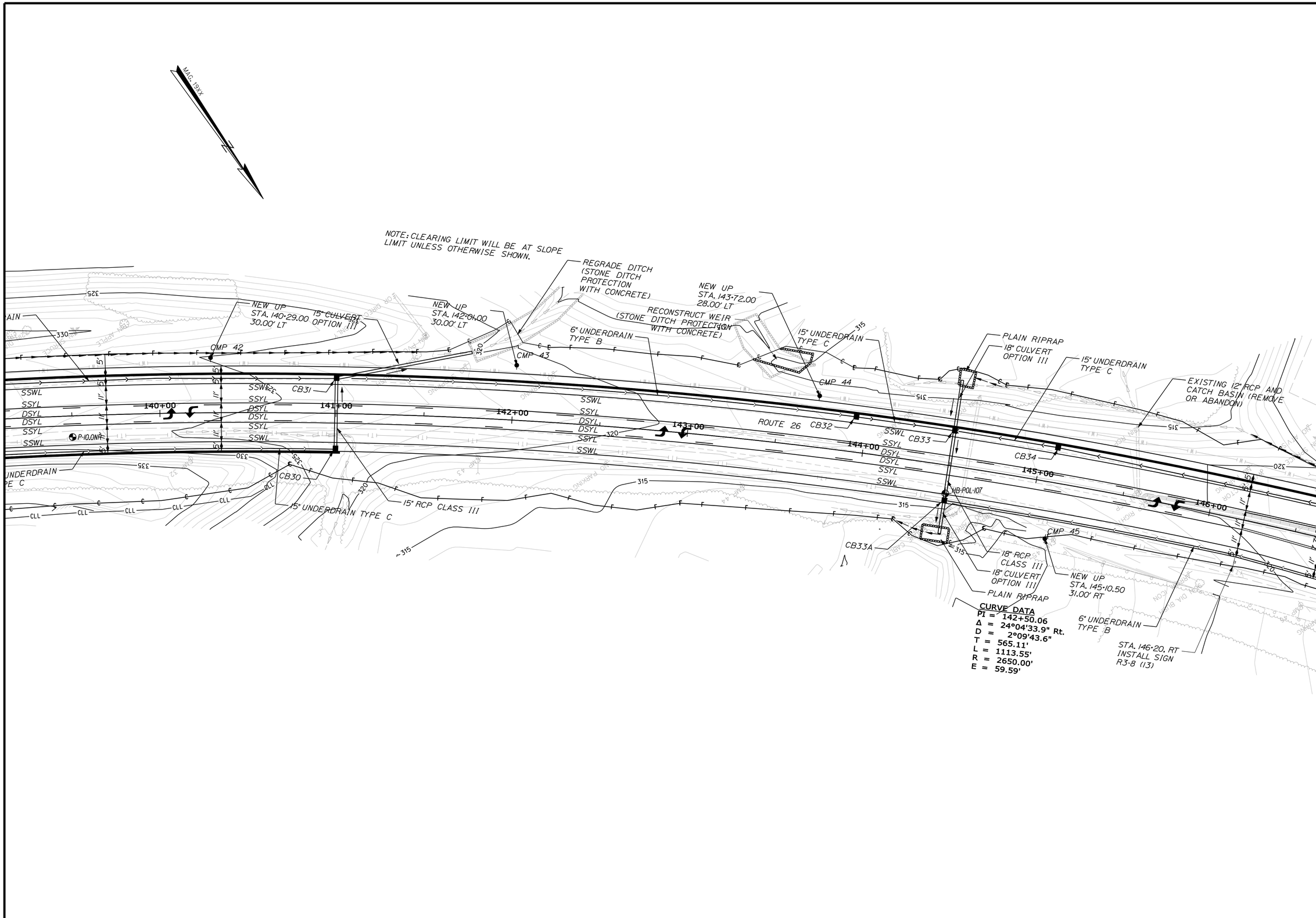

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

		BY	DATE
PROJ. MANAGER			
DESIGN-DETAILED	K.BRESKIN	T.WHITE	MAR 2012
CHECKED-REVIEWED			
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

POLAND
ROUTE 26 / MAINE STREET

GEOPLANS

SHEET NUMBER

7

OF 9

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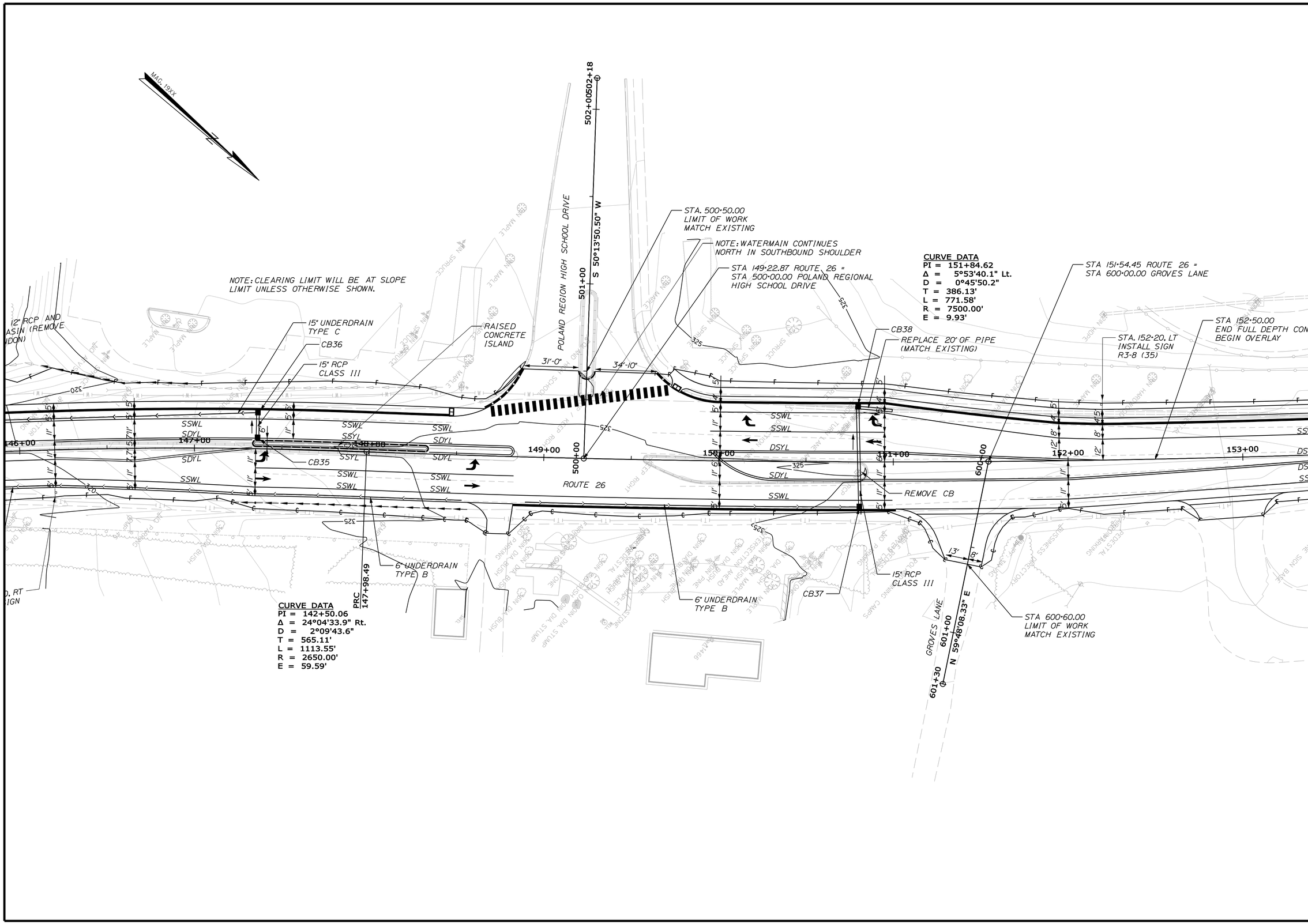


STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

PROJ. MANAGER	BY	DATE	SIGNATURE
DESIGN-DETAILED	K.BRESKIN	MAR 2012	
CHECKED-REVIEWED			P.E. NUMBER
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			DATE
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

POLAND
ROUTE 26 / MAINE STREET

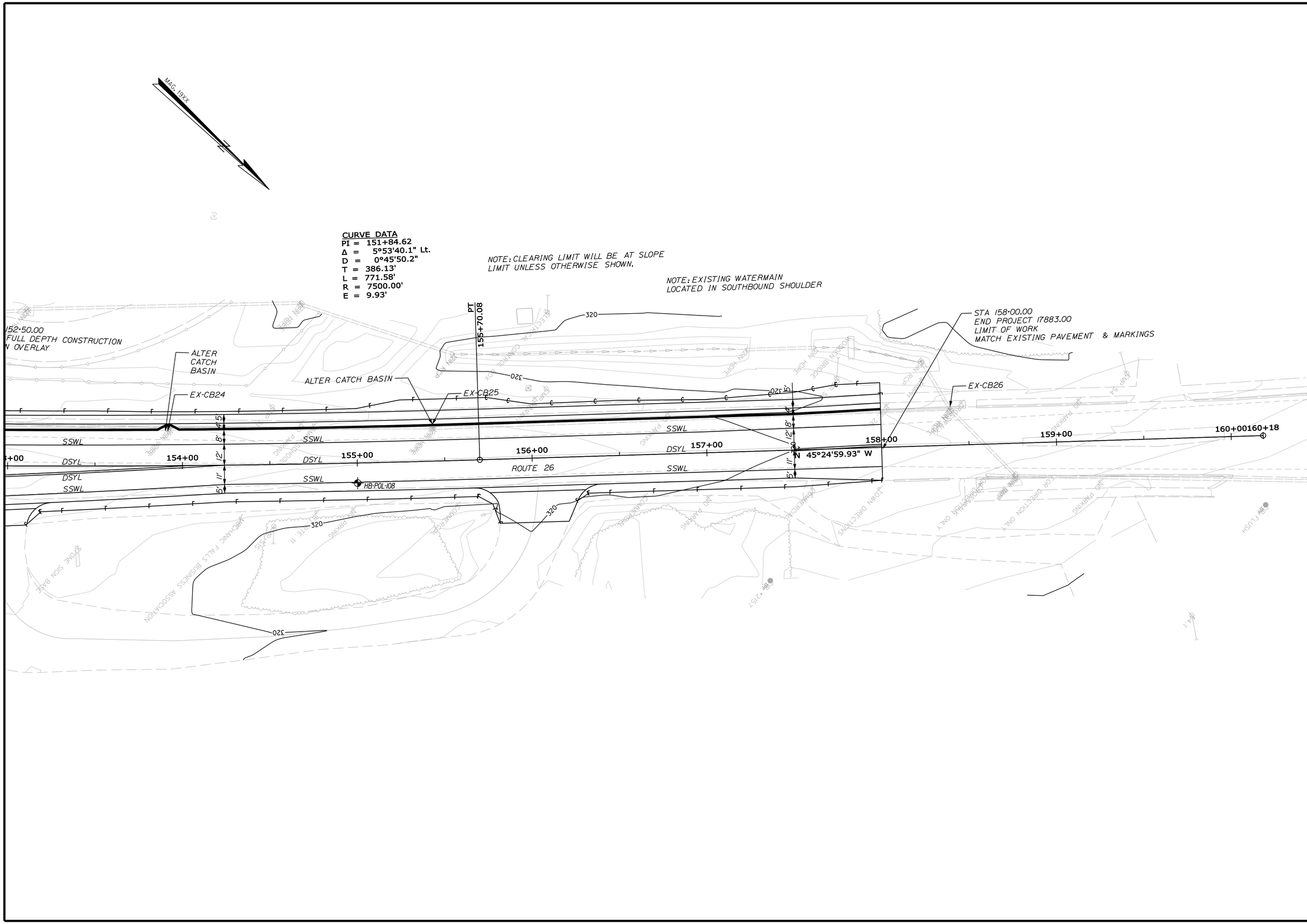
GEOPLANS

SHEET NUMBER

8

OF 9

Filename: ...\geotech\msta\008_Geoplan8.dgn Division: GEOTECH Username: kitty.breskin Date:10/24/2012



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-1788(300)X

PIN
WIN 17883.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED	K.BRESKIN	MAR 2012
CHECKED-REVIEWED		
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

POLAND
ROUTE 26 / MAINE STREET

GEOPLANS

SHEET NUMBER

9

OF 9

Filename: ...\geotech\msta\009_Geoplan9.dgn Division: GEOTECH Username: kitty.breskin Date:10/24/2012

Fed. Road Dist. No.	State	Fed. Aid Proj. No.	Fiscal Year	Sheet No.	Total Sheets
	Maine	80-E		1	65

STATE OF MAINE
STATE HIGHWAY COMMISSION

PLAN AND PROFILE
STATE HIGHWAY "5"
POLAND
ANDROSCOGGIN COUNTY
FEDERAL AID PROJECT NO. 80-E

RT 26

TOTAL LENGTH 7.205 MILES

SCALES:
- PLAN 1 IN. = 50 FT.
- PROFILE HOR. 1 IN. = 50 FT. / VER. 1 IN. = 5 FT.
- CROSS SECTIONS 1 IN. = 5 FT.

CONVENTIONAL SIGNS

State or National Line	Survey Line
County Line	Culvert
Town Line	Drop Inlet
Unfenced Property	Trolley Pole
Fence	Power Pole
Right of Way Line	Tel. Pole
Traveled Way	Marsh
Railroad	Trees
Retaining Wall	Stone Wall

INDEX OF SHEETS

Sheet No. 1	Title Page	Sta. 0+00 to 260+46 & 45+57 & 125+76 & 178+22.7
Sheet No. 2	Typical Sections	
Sheet No. 3 to 29	Plan and Profile	Sta. 0+00 to 260+46 & 45+57 & 125+76 & 178+22.7
Sheet No. 30 to 65	Cross-Sections	Sta. 0+00 to 260+46 & 45+57 & 125+76 & 178+22.7
Sheet No.	Bridges	Sta.
Sheet No.	Special Details	

3" Macadam Surface
7"-5" Crushed Stone Base
12" Gravel Base. Variable Gravel Base.

TYPICAL SECTION

Note:-
All work contemplated under this contract to be covered by and in conformity with the specifications revised January 1932, except as modified by this plan.

LOCATION PLAN
Approx. Scale 1 inch - 1 mile
Traced from U.S.G.S. Topo Map of Maine, Gray, Poland, & Norway quadrangles

APPROVED:
MAINE STATE HIGHWAY COMMISSION
CHAIRMAN
CHIEF ENGINEER.

APPROVED:
U. S. BUREAU OF PUBLIC ROADS
[redacted]
DISTRICT ENGINEER
[redacted]
CHIEF ENGINEER
[redacted]
DIRECTOR

AA 09

STANDARD SECTIONS
BITUMINOUS MACADAM SURFACE

Note:- Sta. 0+0 to 205+50 Shoulders to be built of Selected Earth Excavation

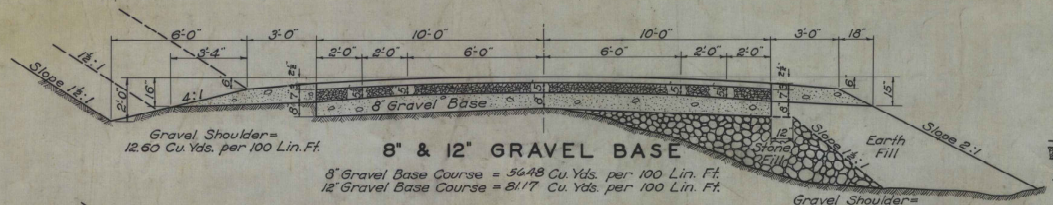
Gravel Shoulder = 14.20 Cu. Yds. per 100 Lin. Ft.

CRUSHED STONE & VARIABLE GRAVEL BASE

For all sections; location and depth of ditch to depend on local conditions.

3" Macadam Surface Course = 18.52 Cu. Yds. per 100 Lin. Ft.
Crushed Stone Base Course = 32.21 Cu. Yds. per 100 Lin. Ft.

Gravel Shoulder = 10.30 Cu. Yds. per 100 Lin. Ft.



Gravel Shoulder = 12.60 Cu. Yds. per 100 Lin. Ft.

8" & 12" GRAVEL BASE

8" Gravel Base Course = 56.48 Cu. Yds. per 100 Lin. Ft.
12" Gravel Base Course = 84.77 Cu. Yds. per 100 Lin. Ft.

Gravel Shoulder = 10.30 Cu. Yds. per 100 Lin. Ft.

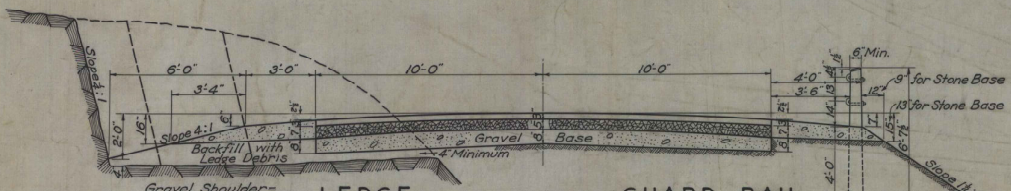
Gravel Shoulder = 6.56 Cu. Yds. per 100 Lin. Ft.

STONE BASE

5" Crushed Stone Base Course = 30.86 Cu. Yds. per 100 Lin. Ft.
6" Stone Base Course = 49.38 Cu. Yds. per 100 Lin. Ft.
4" Gravel Sub-Base = 27.78 Cu. Yds. per 100 Lin. Ft.

Gravel Shoulder = 7.75 Cu. Yds. per 100 Lin. Ft.

Note:- Gravel Base, Sub-Base and Gravel Shoulders to be paid for as Gravel Borrow.



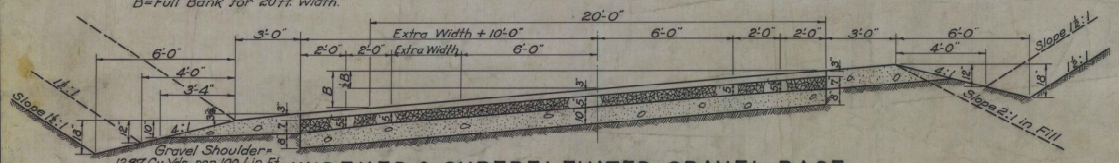
Gravel Shoulder = 12.60 Cu. Yds. per 100 Lin. Ft.

LEDGE

GUARD RAIL

Gravel Shoulder
with Gravel Base = 11.34 Cu. Yds. per 100 Lin. Ft.
with Stone Base = 10.51 Cu. Yds. per 100 Lin. Ft.

"B" = Full Bank for 20 ft. width.



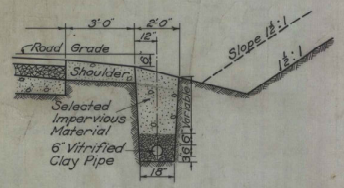
Gravel Shoulder = 12.57 Cu. Yds. per 100 Lin. Ft.

WIDENED & SUPERELEVATED GRAVEL BASE

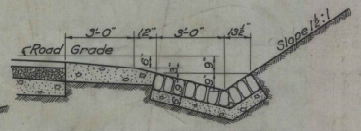
Note: All dimensions for ditch on superelevated section, are given from edge of Shoulder.

Curves of 2° or more to be superelevated.
"B" equals (Degree of Curve x 2), with a minimum of 6" superelevation.
Maximum superelevation equals 1" per foot width of pavement.
All curves to have full superelevation at approximately 50 ft. onto the curve from P.C. & P.T. with a runoff of 150 ft. unless otherwise specified.
Curves of 8° or more to be widened according to the formula $\frac{D}{10}+2$, where "D" equals Degree of Curve.

For unwidened Superelevated Curves:
8" Gravel Base Course = 60.08 Cu. Yds. per 100 Lin. Ft.
12" Gravel Base Course = 84.77 Cu. Yds. per 100 Lin. Ft.
4" Gravel Sub-Base = 24.69 Cu. Yds. per 100 Lin. Ft.

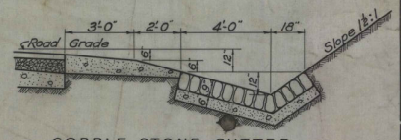


TILE UNDERDRAIN



COBBLE STONE GUTTER

Area = ½ sq. yds. Per lin. Ft.

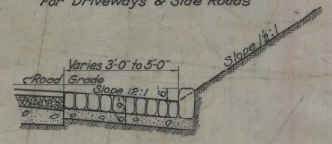


COBBLE STONE GUTTER

Area = 2/9 sq. yds. Per lin. Ft.

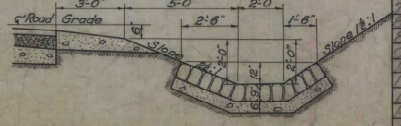
COBBLE STONE GUTTER

For Driveways & Side Roads



COBBLE STONE GUTTER

And Curb



COBBLE STONE GUTTER

Special Section Sta. to Sta.

ESTIMATED QUANTITIES

Item	Quantity	Unit	Description	Remarks
11	10.2	Acres	Clearing and Grubbing	
12A	35,800	Cu. Yds.	Earth Excavation	
12B	1,800	Cu. Yds.	Rock Excavation	
12C	75	Each	Trees Removed	
13	1,300	Cu. Yds.	Excavation for Structures	
16	3,140	Cu. Yds.	Stone Fill	
17A	6,300	Cu. Yds.	Common Borrow	
17B	36,000	Cu. Yds.	Gravel Borrow	
24	3,675	Cu. Yds.	Stone Base Course	
26	12,283	Cu. Yds.	Crushed Stone Base Course	
31A	7,046	Cu. Yds.	Bituminous Macadam Surface Course	
31B	211,364	Gals.	Emulsified Asphalt	
37A	47	Cu. Yds.	Class "A" Concrete	
37B	235	Cu. Yds.	Class "B" Concrete	
38	6,650	Lbs.	Steel Reinforcement for Conc. Structs.	
40	20	Cu. Yds.	Cement Rubble Masonry	
42A	652	Lin. Ft.	Laying 12" Corr. Metal Pipe	
42B	60	Lin. Ft.	" 15" " " "	
42C	248	Lin. Ft.	" 18" " " "	
44B	340	Lin. Ft.	Laying 15" Concrete Pipe	
44C	816	Lin. Ft.	" 18" " "	
44D	116	Lin. Ft.	" 24" " "	
44E	40	Lin. Ft.	" 30" " "	
45C	148	Lin. Ft.	Laying 12" Vitrified Clay Pipe	
45D	148	Lin. Ft.	" 15" " " "	
45E	366	Lin. Ft.	" 18" " " "	
45G	170	Lin. Ft.	" 24" " " "	
46B	9	Each	Catch Basins	
48	350	Cu. Yds.	Hand-Laid Riprap	
49	825	Lin. Ft.	Tile Underdrain	
50	1,745	Sq. Yds.	Cobble Stone Gutter	
52A	10,000	Lin. Ft.	Wire Cable Guard Rail	
52B	62	Each	Anchorages for Wire Cable Guard Rail	

CULVERT DATA

Sta.	Kind	Size	Length	Remarks
3+53	R.C.P.	15"	36'	2 Headwalls
18+04	Conc. Box	2'X2'	18'	Extension of old Culv.
37+50	R.C.P.	15"	32'	2 Headwalls
41+60	R.C.P.	18"	36'	" " "
49+20	R.C.P.	15"	44'	" " "
62+34	Conc. Box	2'X2'	25'	
72+41	R.C.P.	15"	32'	2 Headwalls
76+92	R.C.P.	18"	32'	Dr. Right and Left
79+12	R.C.P.	18"	32'	" " " "
81+84	R.C.P.	24"	44'	1 Headwall on Left
85+66	Conc. Box	4'X2'	31'	
95+38	R.C.P.	18"	32'	2 Headwalls
150+92	R.C.P.	15"	40'	" " "
160+15	R.C.P.	30"	40'	" " "
181+39	R.C.P.	18"	44'	" " "
200+17	R.C.P.	18"	40'	" " "
202+35	R.C.P.	15"	40'	Headwall on Rt. & Headwall on Lt.
215+60	R.C.P.	18"	36'	" " " " " " "
220+61	R.C.P.	15"	36'	" " " " " " "
225+0	R.C.P.	18"	36'	" " " " " " "
226+78	R.C.P.	18"	40'	" " " " " " "
229+50	R.C.P.	18"	40'	" " " " " " "
235+50	R.C.P.	18"	36'	" " " " " " "
236+50	Conc. Box	3'X2'	34'	
257+91	R.C.P.	18"	36'	2 Headwalls
259+78	R.C.P.	15"	36'	" " "
264+75	R.C.P.	24"	36'	" " "
270+26	R.C.P.	18"	36	" " "
272+80	R.C.P.	18"	40'	" " "
275+08	R.C.P.	15"	36'	" " "
281+65	R.C.P.	15"	44'	" " "
289+24	R.C.P.	18"	36'	" " "
293+75	R.C.P.	18"	40'	Headwall on Rt. & Headwall on Lt.
305+40	R.C.P.	18"	40'	2 Headwalls
327+30	R.C.P.	18"	36'	" " "
328+66	R.C.P.	18"	40'	" " "
429+55	R.C.P.	18"	36'	" " "
441+78	R.C.P.	24"	36'	" " "
449+52	R.C.P.	18"	36'	" " "
467+00	Conc. Box	Extension old Culv. 7' Lt. & 5' Rt. 4'x4'		
468+50	Conc. Box	"	"	" 8' Rt. 6'x5'
495+0	Conc. Box	5'x5'	40'	

FOR CORR. METAL PIPE SEE Pg. 65, PLANS

Appendix C
Field Exploration Data

Soils Descriptions Key
Boring Logs
Probe Summary Sheet
Soils Summary Sheet
Summary of Bedrock Depths

UNIFIED SOIL CLASSIFICATION SYSTEM

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

Desired Soil Observations: (in this order)

Color (Munsell color chart)
Moisture (dry, damp, moist, wet, saturated)
Density/Consistency (from above right hand side)
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., if applicable)
Cementation (weak, moderate, or strong, if applicable, ASTM D 2488)
Geologic Origin (till, marine clay, alluvium, etc.)
Unified Soil Classification Designation
Groundwater level

TERMS DESCRIBING DENSITY/CONSISTENCY

Coarse-grained soils (more than half of material is larger than No. 200 sieve): Includes (1) clean gravels; (2) silty or clayey gravels; and (3) silty, clayey or gravelly sands. Consistency is rated according to standard penetration resistance.

Modified Burmister System

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

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

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

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

Rock Quality Designation (RQD):

$$RQD = \frac{\text{sum of the lengths of intact pieces of core* > 100 mm}}{\text{length of core advance}}$$

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

Correlation of RQD to Rock Mass Quality

Rock Mass Quality	RQD
Very Poor	<25%
Poor	26% - 50%
Fair	51% - 75%
Good	76% - 90%
Excellent	91% - 100%

Desired Rock Observations: (in this order)

Color (Munsell color chart)
Texture (aphanitic, fine-grained, etc.)
Lithology (igneous, sedimentary, metamorphic, 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, low angle - 5-35, mod. dipping - 35-55, steep - 55-85, vertical - 85-90)
- -spacing (very close - <5 cm, close - 5-30 cm, mod. close 30-100 cm, wide - 1-3 m, very wide >3 m)
- -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: AASHTO Standard Specification for Highway Bridges 17th Ed. Table 4.4.8.1.2A
Recovery

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

Sample Container Labeling Requirements:

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

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-101
PIN: 17883.00

Driller:	MaineDOT	**Elevation (ft.)**	352.5	**Auger ID/OD:**	5" Dia.
Operator:	Giguere/Giles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	12/5/11-12/5/11	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	116+50, 12.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:	0.84	**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 = Insitu Vane Shear Test
MV = Unsuccessful Insitu 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 = weight of rods
WO1P = Weight of one person
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Analysis
C = Consolidation Test

Sample Information

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	352.33	2" PAVEMENT. 0.17	
	1D	24/14	1.00 - 3.00	4/5/5/6	10	14			Brown, damp, loose, fine to coarse SAND, little gravel, little silt.	G#239956 A-1-b, SM WC=5.7%
								348.00	4.50	
5	2D	24/18	5.00 - 7.00	1/2/3/3	5	7			Light brown, damp, loose, fine to medium SAND, trace gravel, trace silt.	G#244130 A-3, SP-SM WC=5.3%
								344.50	8.00	
10	3D	24/19	10.00 - 12.00	10/18/9/15	27	38			Brown, damp, medium dense,fine to sandy GRAVEL, little silt.	G#244131 A-1-b, GM WC=5.9%
15	4D	20.4/18	15.00 - 16.70	22/32/31/60(2.4)	63	88			Similar to above.	
								335.80	16.70	
									Bottom of Exploration at 16.70 feet below ground surface. SPOON REFUSAL	
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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-102
PIN: 17883.00

Driller:	MaineDOT	**Elevation (ft.)**	366.7	**Auger ID/OD:**	5" Dia.
Operator:	Giguere/Giles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	12/5/11-12/5/11	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	108+00, 9.5 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:	0.84	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample attempt
V = Insitu Vane Shear Test
MV = Unsuccessful Insitu 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 = weight of rods
WO1P = Weight of one person
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	366.28		5" PAVEMENT. 0.42	
	1D	24/19	1.00 - 3.00	7/8/8/8	16	22				Brown, damp, medium dense, fine to coarse SAND, trace gravel, little silt.	G#239959 A-2-4, SM WC=8.2%
								362.20		4.50	
5										**Bottom of Exploration at 4.50 feet below ground surface.** 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.

Boring No.: HB-POL-102

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-103
PIN: 17883.00

Driller:	MaineDOT	**Elevation (ft.)**	346.4	**Auger ID/OD:**	5" Dia.
Operator:	Giguere/Giles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	12/5/11-12/5/11	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	104+00, 9.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:	0.84	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample attempt
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MV = Unsuccessful Insitu Vane Shear Test attempt
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SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = weight of 140lb. hammer
WOR = weight of rods
WO1P = Weight of one person
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	PC-1		0.00 - 0.67				SSA	345.73	8" PAVEMENT, core taken. (0.67)	
	1D	24/17	1.00 - 3.00	13/19/12/7	31	43			Brown, damp, dense, fine to coarse SAND, some gravel, little silt. Layer of Old Pavement at 2.0 ft bgs.	G#239957 A-1-b, SM WC=4.8%
								342.40	(4.00)	
5	2D	24/18	5.00 - 7.00	6/6/3/6	9	13			Rust, damp, loose, fine to medium SAND, little silt, trace gravel.	G#239958 A-2-4, SM WC=13.1%
								337.90	(8.50)	
10	3D	24/20	10.00 - 12.00	4/4/4/4	8	11			Light brown, moist, loose, fine to medium SAND, trace silt.	
								334.40	(12.00)	
15									**Bottom of Exploration at 12.00 feet below ground surface.** NO REFUSAL	
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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-104
PIN: 17883.00

Driller:	MaineDOT	**Elevation (ft.)**	362.4	**Auger ID/OD:**	5" Dia.
Operator:	Giguere/Giles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	12/5/11-12/5/11	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	113+50, 6.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:	0.84	**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 = Insitu Vane Shear Test
MV = Unsuccessful Insitu 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 = weight of rods
WO1P = Weight of one person
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Analysis
C = Consolidation Test

Sample Information

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	PC-2		0.00 - 0.50				SSA	362.15	3" PAVEMENT, core taken. 0.25	
	1D	24/16	1.00 - 3.00	16/25/16/8	41	57		361.90	3" MCADAM, core taken. 0.50	G#239960 A-2-4, SM WC=6.8%
									Brown, damp, dense, fine to coarse SAND, some gravel, some silt. Layer of Old Pavement at 2.0 ft bgs.	
								358.60	3.80	
5	2D	24/18	5.00 - 7.00	2/3/3/5	6	8			Rust, moist, loose, fine to medium SAND, trace gravel, trace silt.	G#239961 A-3, SP-SM WC=10.9%
								354.40	8.00	
10	3D	24/18	10.00 - 12.00	8/5/6/5	11	15			Light brown, saturated, medium dense, fine to medium sandy SILT.	G#239962 A-4, ML WC=24.5%
								350.40	12.00	
15									**Bottom of Exploration at 12.00 feet below ground surface.** NO REFUSAL	
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.

Boring No.: HB-POL-104

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-105
PIN: 17883.00

Driller:	MaineDOT	**Elevation (ft.)**	337.6	**Auger ID/OD:**	5" Dia.
Operator:	Giguere/Giles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	12/6/11-12/6/11	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	126+00, 11.5 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:	0.84	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample attempt
V = Insitu Vane Shear Test
MV = Unsuccessful Insitu 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 = weight of rods
WO1P = Weight of one person
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	337.02	7" PAVEMENT. 0.58	
	1D	24/18	1.00 - 3.00	7/5/5/7	10	14			Brown, moist, loose, fine to coarse SAND, some gravel, little silt.	G#239963 A-1-b, SP-SM WC=8.0%
								334.60	3.00	
5	2D	24/20	5.00 - 7.00	4/6/6/6	12	17			Light brown, damp, medium dense, fine to coarse SAND, trace gravel, trace silt.	G#239964 A-1-b, SP WC=3.2%
								330.60	7.00	
10									**Bottom of Exploration at 7.00 feet below ground surface.** NO REFUSAL	
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.

Boring No.: HB-POL-105

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-106
PIN: 17883.00

Driller:	MaineDOT	**Elevation (ft.)**	331.0	**Auger ID/OD:**	5" Dia.
Operator:	Giguere/Giles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	12/6/11-12/6/11	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	137+50, 11.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:	0.84	**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 = Insitu Vane Shear Test
MV = Unsuccessful Insitu 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 = weight of rods
WO1P = Weight of one person
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Sample Information

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	PC-3		0.00 - 0.63				SSA	330.38	7½" PAVEMENT, core taken. 0.63	
	1D/A	24/18	1.00 - 3.00	9/7/4/4	11	15		329.00	1D (1.0-2.0 ft) Brown, damp, medium dense, fine to coarse SAND, some gravel, trace silt. 2.00	G#239965 A-2-4, SM WC=10.5%
									1D/A (2.0-3.0 ft) Rust, damp, medium dense, fine to medium SAND, trace silt.	
								327.00	4.00	
5	2D	24/20	5.00 - 7.00	5/6/9/10	15	21			Light brown, damp, medium dense, fine to medium SAND, trace silt.	G#239966 A-2-4, SP-SM WC=5.5%
								324.00	7.00	
10									**Bottom of Exploration at 7.00 feet below ground surface.** NO REFUSAL	
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.

Boring No.: HB-POL-106

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-107
PIN: 17883.00

Driller:	MaineDOT	**Elevation (ft.)**	316.5	**Auger ID/OD:**	5" Dia.
Operator:	Giguere/Giles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	12/6/11-12/6/11	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	144+50, 16.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:	0.84	**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 = Insitu Vane Shear Test
MV = Unsuccessful Insitu 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 = weight of rods
WO1P = Weight of one person
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Sample Information

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	PC-4		0.00 - 0.46				SSA	316.04	5½" PAVEMENT, core taken. 0.46	
	1D	24/17	1.00 - 3.00	4/5/7/7	12	17			Brown, wet, medium dense, fine to coarse SAND, some gravel, little silt.	G#239967 A-2-4, SP-SM WC=26.7%
								313.50	3.00	
5	2D	24/18	5.00 - 7.00	WOH/3/5/5	8	11		311.00	Brown, wet, loose, fine to coarse SAND, little silt. 5.50	
								310.83	2" organic layer from 5.5-5.67 ft bgs. 5.67	
								309.50	7.00	
10									**Bottom of Exploration at 7.00 feet below ground surface.** NO REFUSAL	
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.

Boring No.: HB-POL-107

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-108
PIN: 17883.00

Driller:	MaineDOT	**Elevation (ft.)**	321.5	**Auger ID/OD:**	5" Dia.
Operator:	Giguere/Giles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	12/6/11-12/6/11	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	155+00, 11.5 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:	0.84	**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 = Insitu Vane Shear Test
MV = Unsuccessful Insitu 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 = weight of rods
WO1P = Weight of one person
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Sample Information

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	321.00	6" PAVEMENT. 0.50	
	1D	24/19	1.00 - 3.00	4/9/6/8	15	21			Brown, damp, medium dense, fine to coarse SAND, some gravel, trace silt, old pavement.	G#239968 A-2-4, SM WC=8.7%
								319.00	2.50	
5	2D	24/20	5.00 - 7.00	6/6/5/7	11	15			Light brown, moist, medium dense, fine to coarse SAND, trace gravel, trace silt.	
								314.50	7.00	
10									**Bottom of Exploration at 7.00 feet below ground surface.** NO REFUSAL	
15										
20										
25										

Remarks:

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

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-109
PIN: 17883.00

Driller:	MaineDOT	**Elevation (ft.)**	327.4	**Auger ID/OD:**	5" Dia.
Operator:	Giguere/Giles	**Datum:**	NAVD88	**Sampler:**	N/A
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/6/11-12/6/11	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	132+00, 19.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☐		

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MV = Unsuccessful Insitu 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 = weight of rods
WO1P = Weight of one person
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S1		0.58 - 3.80				SSA	326.82		7" PAVEMENT.	
										0.58 Brown, damp, fine to coarse SAND, little gravel, trace silt.	
								323.60		3.80 Light brown, damp, fine to coarse SAND, trace silt.	
5								320.90		6.50 **Bottom of Exploration at 6.50 feet below ground surface.** NO REFUSAL	
10											
15											
20											
25											

Remarks:

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Boring No.: HB-POL-109

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: A 1.07 mile portion of Route 26
Location: Poland, Maine

Boring No.: HB-POL-110
PIN: 17883.00

Driller:	MaineDOT	**Elevation (ft.)**	337.8	**Auger ID/OD:**	5" Dia.
Operator:	Giguere/Giles	**Datum:**	NAVD88	**Sampler:**	N/A
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	12/6/11-12/6/11	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	121+50, 8.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☐		

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V = Insitu Vane Shear Test
MV = Unsuccessful Insitu 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 = weight of rods
WO1P = Weight of one person
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw field SPT N-value
Hammer Efficiency Factor = Annual Calibration Value
N_{60} = SPT N-uncorrected corrected for hammer efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	PC-5		0.00 - 0.67				SSA	337.38		5" PAVEMENT, core taken. 0.42	
	S2		0.67 - 2.50					337.13		3" MCADAM, core taken. 0.67	G#239969 A-2-4, SM WC=6.9%
										Brown, moist, fine to coarse SAND, little gravel, little silt.	
	S3		2.50 - 6.50					335.30		2.50 Light brown, damp, fine to coarse SAND, little gravel, trace silt.	
5											
								331.30		6.50 **Bottom of Exploration at 6.50 feet below ground surface.** NO REFUSAL	
10											
15											
20											
25											

Remarks:

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

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State of Maine - Department of Transportation

Power Auger Probe Summary Sheet

Town(s): Poland

Work Number: 17883.00

Station (Feet)	Offset (Feet)	Weathered Rock (Feet)	Refusal (Feet)	No Refusal (Feet)	Water Depth (Ft.)	Comments / Date 12/5/2011
115+00	12.5 Lt.		5.6			
115+25	12.0 Lt.		4.5			
115+50	12.0 Lt.		7.4			
115+75	12.5 Lt.		7.1			
116+00	12.0 Lt.		9.3			
116+25	12.0 Lt.			10.0		
116+75	12.54 Lt.		8.2			
117+00	11.5 Lt.		8.6			
139+50	12.0 Rt.			10.0		

MaineDOT Drill Crew
Logged By: B. Wilder
Drill Rig: CME 45C

5" Solid Stem Auger

Soils Summary Sheet

Poland PIN 17883.00

Boring no.	Station	Offset	depth	HMA	gravel thickness	subgrade soils
HB-POL- 103	104+00	9 LT	12 NR	8"	3.3'	damp, loose SAND, trace silt
HB-POL- 102	108+00	9.5 LT	4.5R	5"	4.1'	damp, med dense SAND, some gravel, little silt
HB-POL- 104	113+50	6 RT	12 NR	3"+3" macadam	3.3'	moist, loose SAND, trace silt
HB-POL- 101	116+50	12 LT	16.7 R	2"	4.3'	damp, loose SAND, trace silt
HB-POL- 110	121+50	8 LT	6.5 NR	5"+3" macadam	1.8'	damp SAND, little gravel, trace silt
HB-POL- 105	126+00	11.5 RT	7 NR	7"	2.4'	moist, med dense SAND, trace gravel, trace silt
HB-POL- 109	132+00	19 LT	6.5 NR	7"	3.2'	damp SAND, trace silt
HB-POL- 106	137+50	11 RT	7 NR	7.5"	1.3'	damp, med dense SAND, trace silt
HB-POL- 107	144+50	16 RT	7 NR	5.5"	2.5'	wet, loose SAND, little silt, organic layer from 5.5 - 5.67 bgs
HB-POL- 108	155+00	11.5 RT	7 NR	6"	2'	moist, med dense SAND, trace gravel, trace silt

Poland PIN 17883.00
All refusals
Include probes from Pine Tree Engineering for Water System.

Station	Offset Lt	Refusal	Offset Rt	Refusal	NR
10250			22.5		10
10350			22.5		10
10400	9	12			
10450			22.5		10
10550			22.5		10
10600			22.5		10
10650			22.5	4	
10675			22.5	7	
10700			22.5	5	
10725			22.5	7	
10750			22.5	5	
10775			22.5	3.5	
10800	9.5	4.5	22.5	1.5	
10825			22.5	3	
10850			22.5	3	
10875			22.5	3	
10900			22.5	2	
10925			22.5	2.5	
10950			22.5	3	
10975			22.5	3.5	
11000			22.5	5	
11025			22.5	8	
11050			22.5	5	
11075			22.5		10
11100			22.5		10
11125			22.5	2.5	
11150			22.5	2	
11200			22.5	5	
11250			22.5	8	
11300			22.5	5	
11350			6		12
11400			22.5		10
11450			22.5	5	
11500	12.5	5.6	22.5		10
11525	12	4.5			
11550	12	7.4	22.5	6	
11575	12.5	7.1			
11600	12	9.3	22.5	7	
11625	12				10
11650	12	16.7	22.5	5	
11675	12.5	8.2			
11700	11.5	8.6	22.5	5.5	
11900			22.5		10
12150	8	6.5			
12600			11.5		7
13200	19	6.5			
13750			11		7
13950			12		10
14450			16		7
15500			11.5		7

Appendix D
Lab Test Data
Lab Testing Summary Sheet
Grain Size Curves
Lab Test Reports

State of Maine - Department of Transportation

Laboratory Testing Summary Sheet

Town(s): Poland Work Number: 17883.00

Boring & Sample Identification Number	Station (Feet)	Offset (Feet)	Depth (Feet)	Reference Number	G.S.D.C. Sheet	W.C. %	L.L.	P.I.	Classification		
									Unified	AASHTO	Frost
HB-POL-101, 1D	116+50	12.0 Lt.	1.0-3.0	239956	1	5.7			SM	A-1-b	II
HB-POL-101, 2D	116+50	12.0 Lt.	5.0-7.0	244130	1	5.3			SP-SM	A-3	0
HB-POL-101, 3D	116+50	12.0 Lt.	10.0-12.0	244131	1	5.9			GM	A-1-b	II
HB-POL-102, 1D	108+00	9.5 Lt.	1.0-3.0	239959	1	8.2			SM	A-2-4	II
HB-POL-103, 1D	104+00	9.0 Lt.	1.0-3.0	239957	1	4.8			SM	A-1-b	II
HB-POL-103, 2D	104+00	9.0 Lt.	5.0-7.0	239958	1	13.1			SM	A-2-4	II
HB-POL-104, 1D	113+50	6.0 Rt.	1.0-3.0	239960	2	6.8			SM	A-2-4	II
HB-POL-104, 2D	113+50	6.0 Rt.	5.0-7.0	239961	2	10.9			SP-SM	A-3	0
HB-POL-104, 3D	113+50	6.0 Rt.	10.0-12.0	239962	2	24.5			ML	A-4	IV
HB-POL-105, 1D	126+00	11.5 Rt.	1.0-3.0	239963	2	8.0			SP-SM	A-1-b	0
HB-POL-105, 2D	126+00	11.5 Rt.	5.0-7.0	239964	2	3.2			SP	A-1-b	0
HB-POL-106, 1D	137+50	11.0 Rt.	1.0-2.0	239965	3	10.5			SM	A-2-4	II
HB-POL-106, 2D	137+50	11.0 Rt.	5.0-7.0	239966	3	5.5			SP-SM	A-2-4	II
HB-POL-107, 1D	144+50	16.0 Rt.	1.0-3.0	239967	3	26.7			SP-SM	A-2-4	0
HB-POL-108, 1D	155+00	11.5 Rt.	1.0-3.0	239968	3	8.7			SM	A-2-4	II
HB-POL-110, S2	121+50	8.0 Lt.	0.67-2.5	239969	3	6.9			SM	A-2-4	II

Borings are not in Station order.

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 MaineDOT and Corps of Engineers Classification Systems.

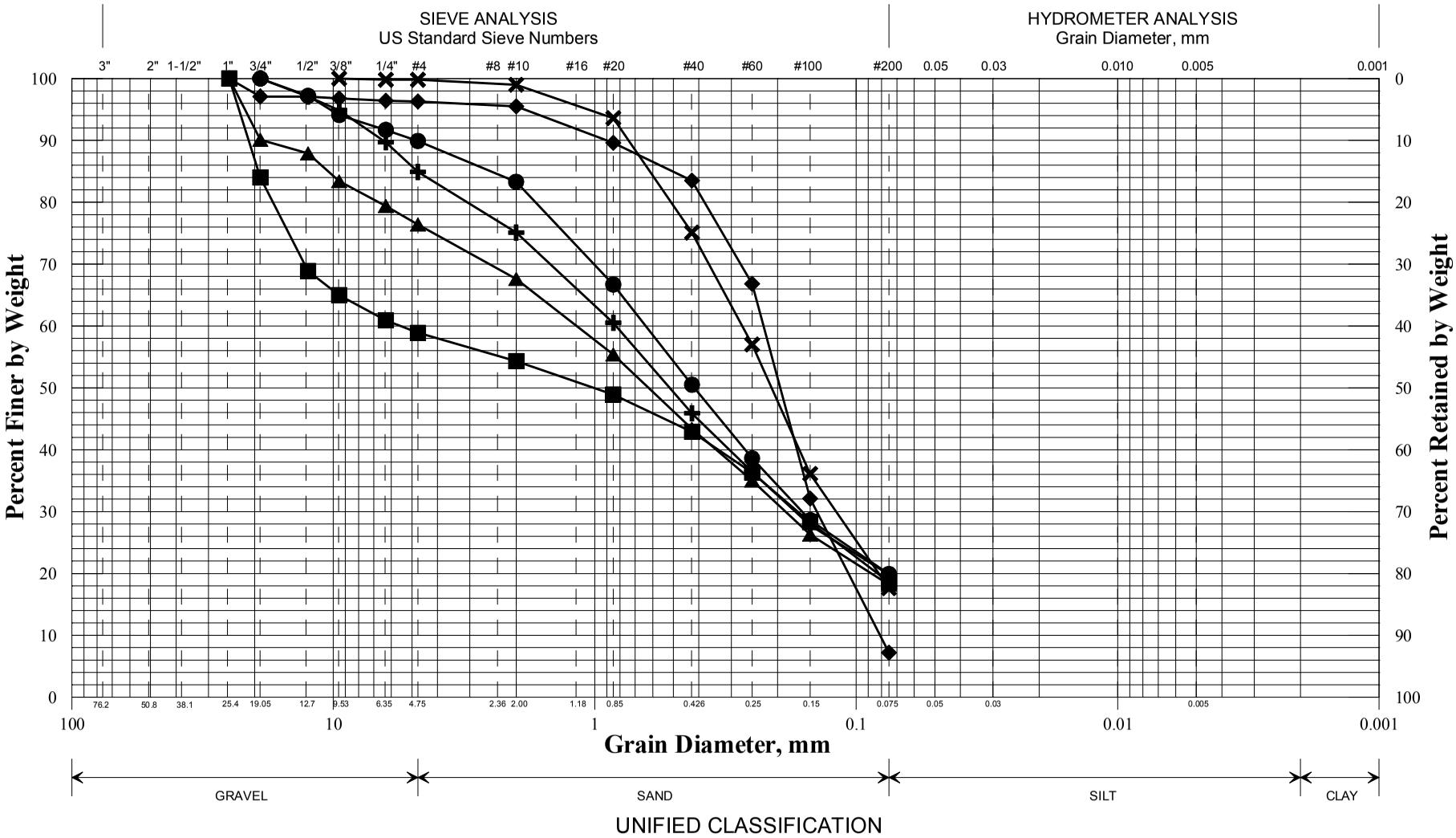
GSDC = Grain Size Distribution Curve as determined by AASHTO T 88-93 (1996) and/or ASTM D 422-63 (Reapproved 1998)

WC = water content as determined by AASHTO T 265-93 and/or ASTM D 2216-98

LL = Liquid limit as determined by AASHTO T 89-96 and/or ASTM D 4318-98 NP = Non Plastic

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

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

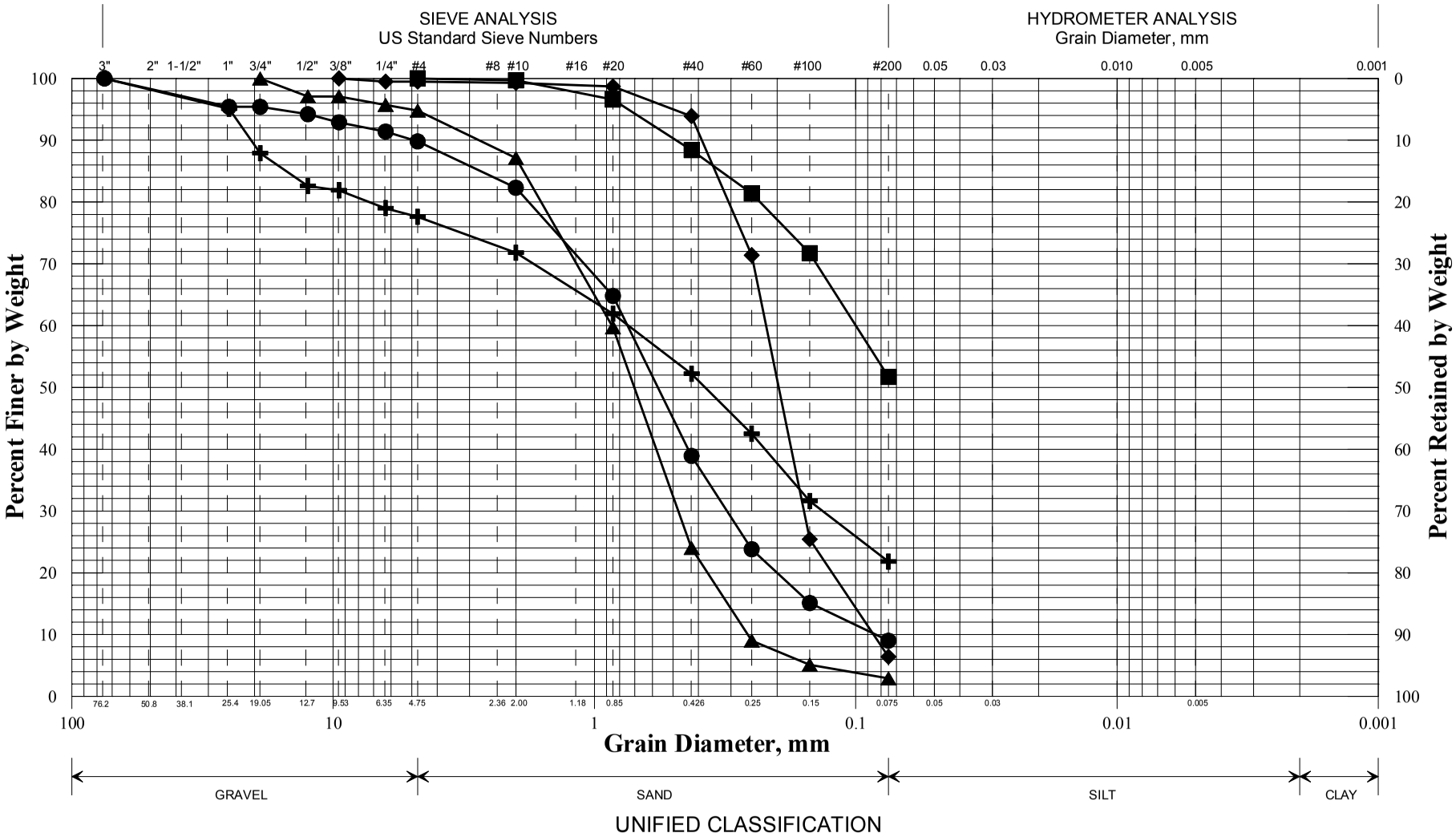


UNIFIED CLASSIFICATION

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-POL-101/1D	116+50	12.0 LT	1.0-3.0	SAND, little silt, little gravel.	5.7			
◆	HB-POL-101/2D	116+50	12.0 LT	5.0-7.0	SAND, trace silt, trace gravel.	5.3			
■	HB-POL-101/3D	116+50	12.0 LT	10.0-12.0	Sandy GRAVEL, little silt.	5.9			
●	HB-POL-102/1D	108+00	9.5 LT	1.0-3.0	SAND, little silt, trace gravel.	8.2			
▲	HB-POL-103/1D	104+00	9.0 LT	1.0-3.0	SAND, some gravel, little silt.	4.8			
✕	HB-POL-103/2D	104+00	9.0 LT	5.0-7.0	SAND, little silt, trace gravel.	13.1			

WIN
017883.00
Town
Poland
Reported by/Date
WHITE, TERRY A 4/13/2012

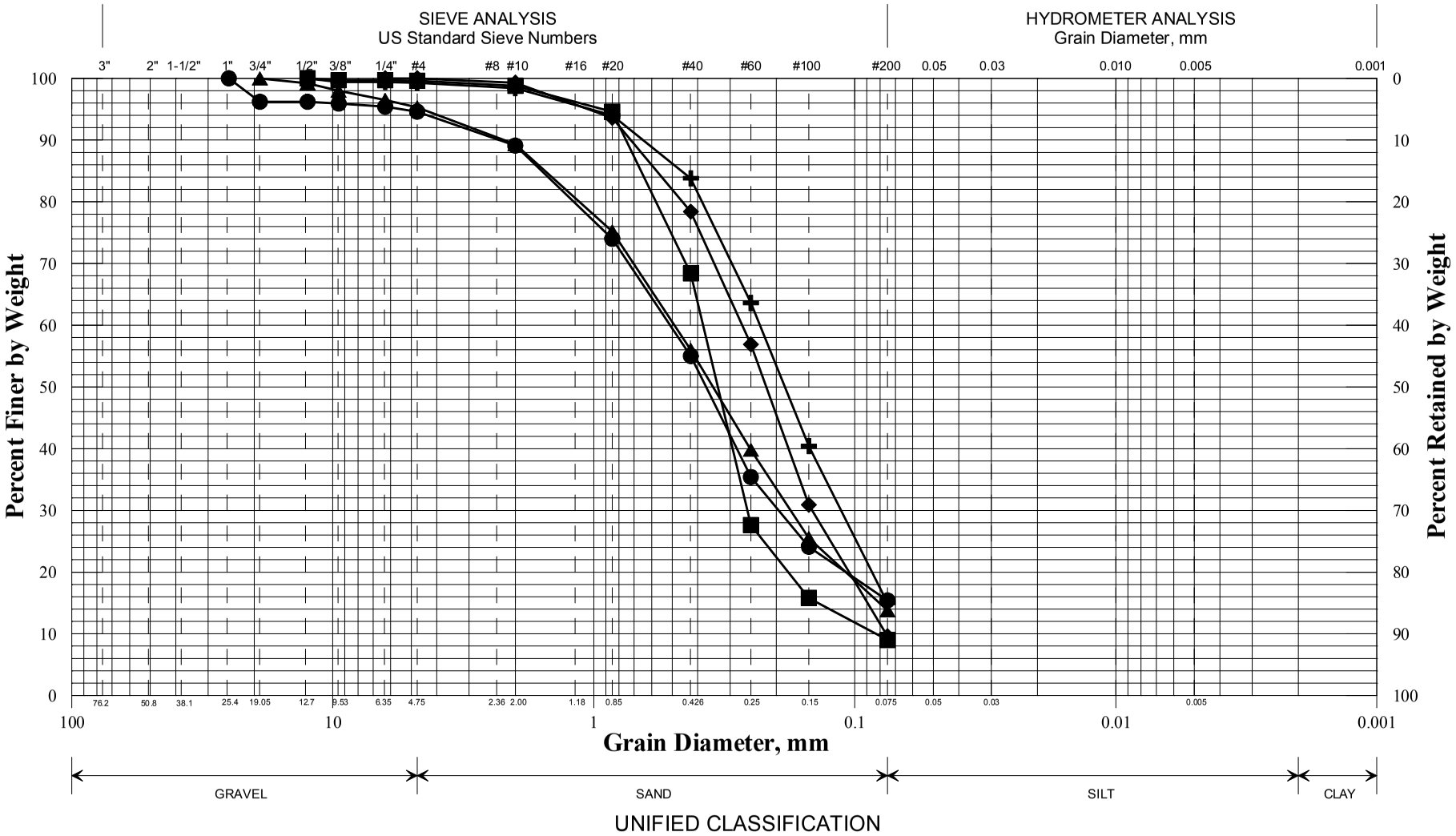
State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-POL-104/1D	113+50	6.0 RT	1.0-3.0	SAND, some gravel, some silt.	6.8			
◆	HB-POL-104/2D	113+50	6.0 RT	5.0-7.0	SAND, trace silt, trace gravel.	10.9			
■	HB-POL-104/3D	113+50	6.0 RT	10.0-12.0	Sandy SILT.	24.5			
●	HB-POL-105/1D	126+00	11.5 RT	1.0-3.0	SAND, trace gravel, trace silt.	8.0			
▲	HB-POL-105/2D	126+00	11.5 RT	5.0-7.0	SAND, trace gravel, trace silt.	3.2			
✕									

WIN
017883.00
Town
Poland
Reported by/Date
WHITE, TERRY A 4/13/2012

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-POL-106/1D	137+50	11.0 RT	1.0-2.0	SAND, little silt, trace gravel.	10.5			
◆	HB-POL-106/2D	137+50	11.0 RT	5.0-7.0	SAND, trace silt.	5.5			
■	HB-POL-107/1D	144+50	16.0 RT	1.0-3.0	SAND, trace silt, trace gravel.	26.7			
●	HB-POL-108/1D	155+00	11.5 RT	1.0-3.0	SAND, little silt, trace gravel.	8.7			
▲	HB-POL-110/S2	121+50	8.0 LT	0.7-2.5	SAND, little silt, trace gravel.	6.9			
✕									

WIN
017883.00
Town
Poland
Reported by/Date
WHITE, TERRY A 4/13/2012

Maine DOT, Materials Testing & Exploration, 219 Hogan Road, Bangor, Maine 04401

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239956	HB-POL-101/1D	GEOTECHNICAL (DISTURBED)	12/5/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **116+50** Offset, ft: **12.0 LT** Dbfg, ft: **1.0-3.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	100.0
½ in. [12.5 mm]	97.1
⅜ in. [9.5 mm]	94.9
¼ in. [6.3 mm]	89.7
No. 4 [4.75 mm]	84.9
No. 10 [2.00 mm]	75.1
No. 20 [0.850 mm]	60.5
No. 40 [0.425 mm]	45.9
No. 60 [0.250 mm]	36.4
No. 100 [0.150 mm]	27.8
No. 200 [0.075 mm]	19.8

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

5.7

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/3/2012**

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Maine DOT, Materials Testing & Exploration, 219 Hogan Road, Bangor, Maine 04401

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
244130	HB-POL-101/2D	GEOTECHNICAL (DISTURBED)	12/5/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **116+50** Offset, ft: **12.0 LT** Dbfg, ft: **5.0-7.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	97.1
½ in. [12.5 mm]	97.1
⅜ in. [9.5 mm]	96.8
¼ in. [6.3 mm]	96.4
No. 4 [4.75 mm]	96.3
No. 10 [2.00 mm]	95.5
No. 20 [0.850 mm]	89.6
No. 40 [0.425 mm]	83.5
No. 60 [0.250 mm]	66.8
No. 100 [0.150 mm]	32.1
No. 200 [0.075 mm]	7.2

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

5.3

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

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Maine DOT, Materials Testing & Exploration, 219 Hogan Road, Bangor, Maine 04401

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
244131	HB-POL-101/3D	GEOTECHNICAL (DISTURBED)	12/5/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **116+50** Offset, ft: **12.0 LT** Dbfg, ft: **10.0-12.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	84.0
½ in. [12.5 mm]	68.9
⅜ in. [9.5 mm]	65.0
¼ in. [6.3 mm]	60.9
No. 4 [4.75 mm]	58.9
No. 10 [2.00 mm]	54.3
No. 20 [0.850 mm]	48.9
No. 40 [0.425 mm]	42.9
No. 60 [0.250 mm]	36.3
No. 100 [0.150 mm]	28.3
No. 200 [0.075 mm]	18.6

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

5.9

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/3/2012**

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Maine DOT, Materials Testing & Exploration, 219 Hogan Road, Bangor, Maine 04401

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239959	HB-POL-102/1D	GEOTECHNICAL (DISTURBED)	12/5/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **108+00** Offset, ft: **9.5** **LT** Dbfg, ft: **1.0-3.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	**100.0**
½ in. [12.5 mm]	**97.2**
⅜ in. [9.5 mm]	**94.1**
¼ in. [6.3 mm]	**91.7**
No. 4 [4.75 mm]	**89.9**
No. 10 [2.00 mm]	**83.3**
No. 20 [0.850 mm]	**66.7**
No. 40 [0.425 mm]	**50.5**
No. 60 [0.250 mm]	**38.6**
No. 100 [0.150 mm]	**28.6**
No. 200 [0.075 mm]	**19.9**

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

8.2

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

Paper Copy: Lab File; Project File; Geotech File

Maine DOT, Materials Testing & Exploration, 219 Hogan Road, Bangor, Maine 04401

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239957	HB-POL-103/1D	GEOTECHNICAL (DISTURBED)	12/5/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **104+00** Offset, ft: **9.0** **LT** Dbfg, ft: **1.0-3.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	90.1
½ in. [12.5 mm]	87.9
⅜ in. [9.5 mm]	83.4
¼ in. [6.3 mm]	79.4
No. 4 [4.75 mm]	76.4
No. 10 [2.00 mm]	67.6
No. 20 [0.850 mm]	55.4
No. 40 [0.425 mm]	43.4
No. 60 [0.250 mm]	35.0
No. 100 [0.150 mm]	26.3
No. 200 [0.075 mm]	18.2

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %
4.8

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/3/2012**

Paper Copy: Lab File; Project File; Geotech File

Maine DOT, Materials Testing & Exploration, 219 Hogan Road, Bangor, Maine 04401

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239958	HB-POL-103/2D	GEOTECHNICAL (DISTURBED)	12/5/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **104+00** Offset, ft: **9.0** **LT** Dbfg, ft: **5.0-7.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	
⅜ in. [9.5 mm]	**100.0**
¼ in. [6.3 mm]	**99.8**
No. 4 [4.75 mm]	**99.8**
No. 10 [2.00 mm]	**99.0**
No. 20 [0.850 mm]	**93.6**
No. 40 [0.425 mm]	**75.1**
No. 60 [0.250 mm]	**57.0**
No. 100 [0.150 mm]	**36.1**
No. 200 [0.075 mm]	**17.6**

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

13.1

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

Paper Copy: Lab File; Project File; Geotech File

Maine DOT, Materials Testing & Exploration, 219 Hogan Road, Bangor, Maine 04401

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239960	**HB-POL-104/1D**	**GEOTECHNICAL (DISTURBED)**	**12/5/2011**	**3/16/2012**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **113+50** Offset, ft: **6.0** **RT** Dbfg, ft: **1.0-3.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	**100.0**
1 in. [25.0 mm]	**95.1**
¾ in. [19.0 mm]	**87.9**
½ in. [12.5 mm]	**82.6**
⅜ in. [9.5 mm]	**81.9**
¼ in. [6.3 mm]	**79.0**
No. 4 [4.75 mm]	**77.6**
No. 10 [2.00 mm]	**71.8**
No. 20 [0.850 mm]	**61.9**
No. 40 [0.425 mm]	**52.2**
No. 60 [0.250 mm]	**42.5**
No. 100 [0.150 mm]	**31.6**
No. 200 [0.075 mm]	**21.8**

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

6.8

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/3/2012**

Paper Copy: Lab File; Project File; Geotech File

Maine DOT, Materials Testing & Exploration, 219 Hogan Road, Bangor, Maine 04401

GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239961	HB-POL-104/2D	GEOTECHNICAL (DISTURBED)	12/5/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **113+50** Offset, ft: **6.0** **RT** Dbfg, ft: **5.0-7.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	
⅜ in. [9.5 mm]	**100.0**
¼ in. [6.3 mm]	**99.5**
No. 4 [4.75 mm]	**99.5**
No. 10 [2.00 mm]	**99.3**
No. 20 [0.850 mm]	**98.7**
No. 40 [0.425 mm]	**93.9**
No. 60 [0.250 mm]	**71.4**
No. 100 [0.150 mm]	**25.4**
No. 200 [0.075 mm]	**6.4**

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %
10.9

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239962	HB-POL-104/3D	GEOTECHNICAL (DISTURBED)	12/5/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **113+50** Offset, ft: **6.0** **RT** Dbfg, ft: **10.0-12.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	
⅜ in. [9.5 mm]	
¼ in. [6.3 mm]	
No. 4 [4.75 mm]	**100.0**
No. 10 [2.00 mm]	**99.7**
No. 20 [0.850 mm]	**96.6**
No. 40 [0.425 mm]	**88.4**
No. 60 [0.250 mm]	**81.4**
No. 100 [0.150 mm]	**71.7**
No. 200 [0.075 mm]	**51.7**

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %
24.5

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239963	HB-POL-105/1D	GEOTECHNICAL (DISTURBED)	12/6/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **126+00** Offset, ft: **11.5 RT** Dbfg, ft: **1.0-3.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	95.4
¾ in. [19.0 mm]	95.4
½ in. [12.5 mm]	94.2
⅜ in. [9.5 mm]	92.9
¼ in. [6.3 mm]	91.4
No. 4 [4.75 mm]	89.8
No. 10 [2.00 mm]	82.3
No. 20 [0.850 mm]	64.8
No. 40 [0.425 mm]	38.9
No. 60 [0.250 mm]	23.8
No. 100 [0.150 mm]	15.1
No. 200 [0.075 mm]	9.0

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %
8.0

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/3/2012**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239964	**HB-POL-105/2D**	**GEOTECHNICAL (DISTURBED)**	**12/6/2011**	**3/16/2012**

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **126+00** Offset, ft: **11.5 RT** Dbfg, ft: **5.0-7.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	**100.0**
½ in. [12.5 mm]	**97.1**
⅜ in. [9.5 mm]	**97.1**
¼ in. [6.3 mm]	**95.7**
No. 4 [4.75 mm]	**94.8**
No. 10 [2.00 mm]	**87.1**
No. 20 [0.850 mm]	**59.7**
No. 40 [0.425 mm]	**24.0**
No. 60 [0.250 mm]	**9.0**
No. 100 [0.150 mm]	**5.1**
No. 200 [0.075 mm]	**2.9**

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

3.2

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239965	HB-POL-106/1D	GEOTECHNICAL (DISTURBED)	12/6/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **137+50** Offset, ft: **11.0 RT** Dbfg, ft: **1.0-2.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	**100.0**
⅜ in. [9.5 mm]	**99.4**
¼ in. [6.3 mm]	**99.4**
No. 4 [4.75 mm]	**99.3**
No. 10 [2.00 mm]	**98.4**
No. 20 [0.850 mm]	**94.0**
No. 40 [0.425 mm]	**83.8**
No. 60 [0.250 mm]	**63.6**
No. 100 [0.150 mm]	**40.4**
No. 200 [0.075 mm]	**15.0**

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

10.5

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239966	HB-POL-106/2D	GEOTECHNICAL (DISTURBED)	12/6/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **137+50** Offset, ft: **11.0 RT** Dbfg, ft: **5.0-7.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	
⅜ in. [9.5 mm]	
¼ in. [6.3 mm]	100.0
No. 4 [4.75 mm]	100.0
No. 10 [2.00 mm]	99.3
No. 20 [0.850 mm]	93.6
No. 40 [0.425 mm]	78.4
No. 60 [0.250 mm]	56.9
No. 100 [0.150 mm]	30.9
No. 200 [0.075 mm]	9.6

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

5.5

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239967	HB-POL-107/1D	GEOTECHNICAL (DISTURBED)	12/6/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **144+50** Offset, ft: **16.0 RT** Dbfg, ft: **1.0-3.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	**100.0**
⅜ in. [9.5 mm]	**99.7**
¼ in. [6.3 mm]	**99.7**
No. 4 [4.75 mm]	**99.6**
No. 10 [2.00 mm]	**98.8**
No. 20 [0.850 mm]	**94.6**
No. 40 [0.425 mm]	**68.4**
No. 60 [0.250 mm]	**27.6**
No. 100 [0.150 mm]	**15.8**
No. 200 [0.075 mm]	**9.0**

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

26.7

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239968	HB-POL-108/1D	GEOTECHNICAL (DISTURBED)	12/6/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **155+00** Offset, ft: **11.5 RT** Dbfg, ft: **1.0-3.0**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	96.2
½ in. [12.5 mm]	96.2
⅜ in. [9.5 mm]	95.9
¼ in. [6.3 mm]	95.4
No. 4 [4.75 mm]	94.6
No. 10 [2.00 mm]	89.1
No. 20 [0.850 mm]	74.0
No. 40 [0.425 mm]	55.0
No. 60 [0.250 mm]	35.4
No. 100 [0.150 mm]	24.1
No. 200 [0.075 mm]	15.4

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

8.7

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

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GEOTECHNICAL TEST REPORT
Central Laboratory

SAMPLE INFORMATION

Reference No.	Boring No./Sample No.	Sample Description	Sampled	Received
239969	HB-POL-110/S2	GEOTECHNICAL (DISTURBED)	12/6/2011	3/16/2012

Sample Type: **GEOTECHNICAL** Location: **ROADWAY** Station: **121+50** Offset, ft: **8.0** **LT** Dbfg, ft: **0.7-2.5**

WIN/Town **017883.00 - POLAND** Sampler: **WILDER, BRUCE H**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	100.0
½ in. [12.5 mm]	99.2
⅜ in. [9.5 mm]	98.0
¼ in. [6.3 mm]	96.5
No. 4 [4.75 mm]	95.3
No. 10 [2.00 mm]	89.3
No. 20 [0.850 mm]	75.2
No. 40 [0.425 mm]	56.0
No. 60 [0.250 mm]	39.8
No. 100 [0.150 mm]	25.5
No. 200 [0.075 mm]	13.8

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, psi			
Wet Density, lbs/ft³			
Dry Density, lbs/ft³			
Specimen Thickness, in			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, lbs/ft³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows (T 89), %
Plastic Limit (T 90), %
Plasticity Index (T 90), %
Specific Gravity, Corrected to 20°C (T 100)

Loss on Ignition (T 267)

Loss, %	H2O, %

Water Content (T 265), %

6.9

Vane Shear Test on Shelby Tubes (Maine DOT)

Depth taken in tube, ft	3 In.		6 In.		Water Content, %	Description of Material Sampled at the Various Tube Depths
	U. Shear tons/ft²	Remold tons/ft²	U. Shear tons/ft²	Remold tons/ft²		

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN** Date Reported: **4/2/2012**

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Appendix E
Existing Pavement Data

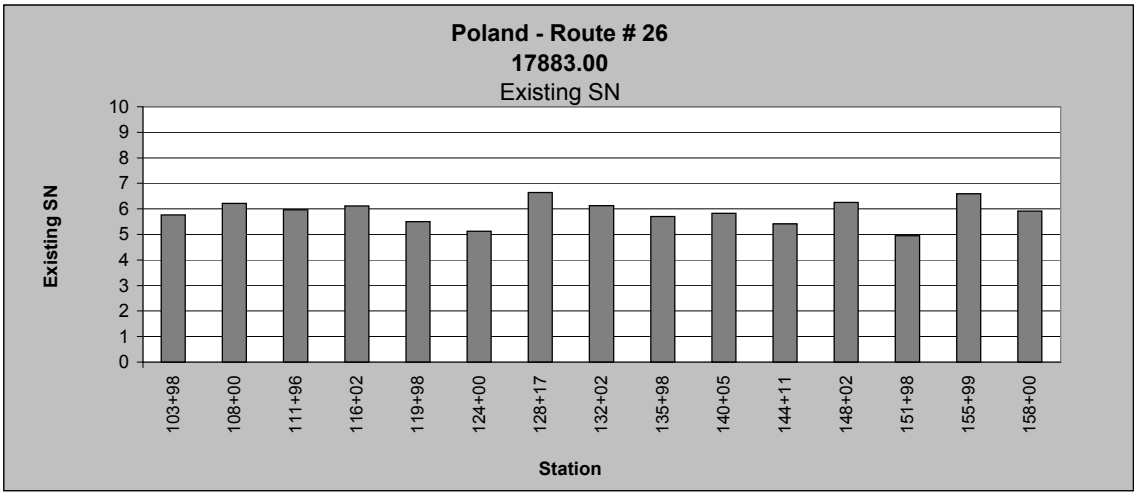
FWD analysis

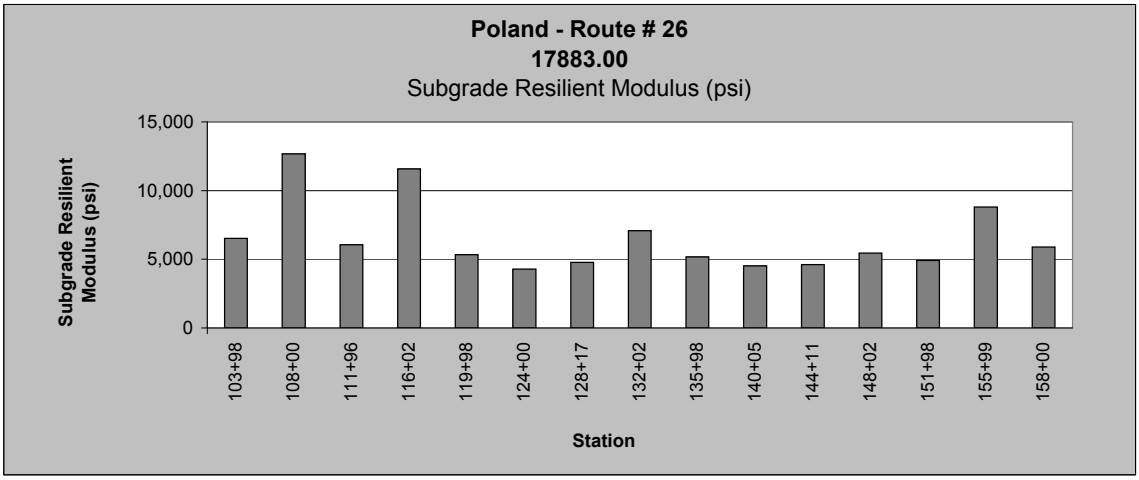
Pavement Core Photos

Poland - Route #26
17883.00

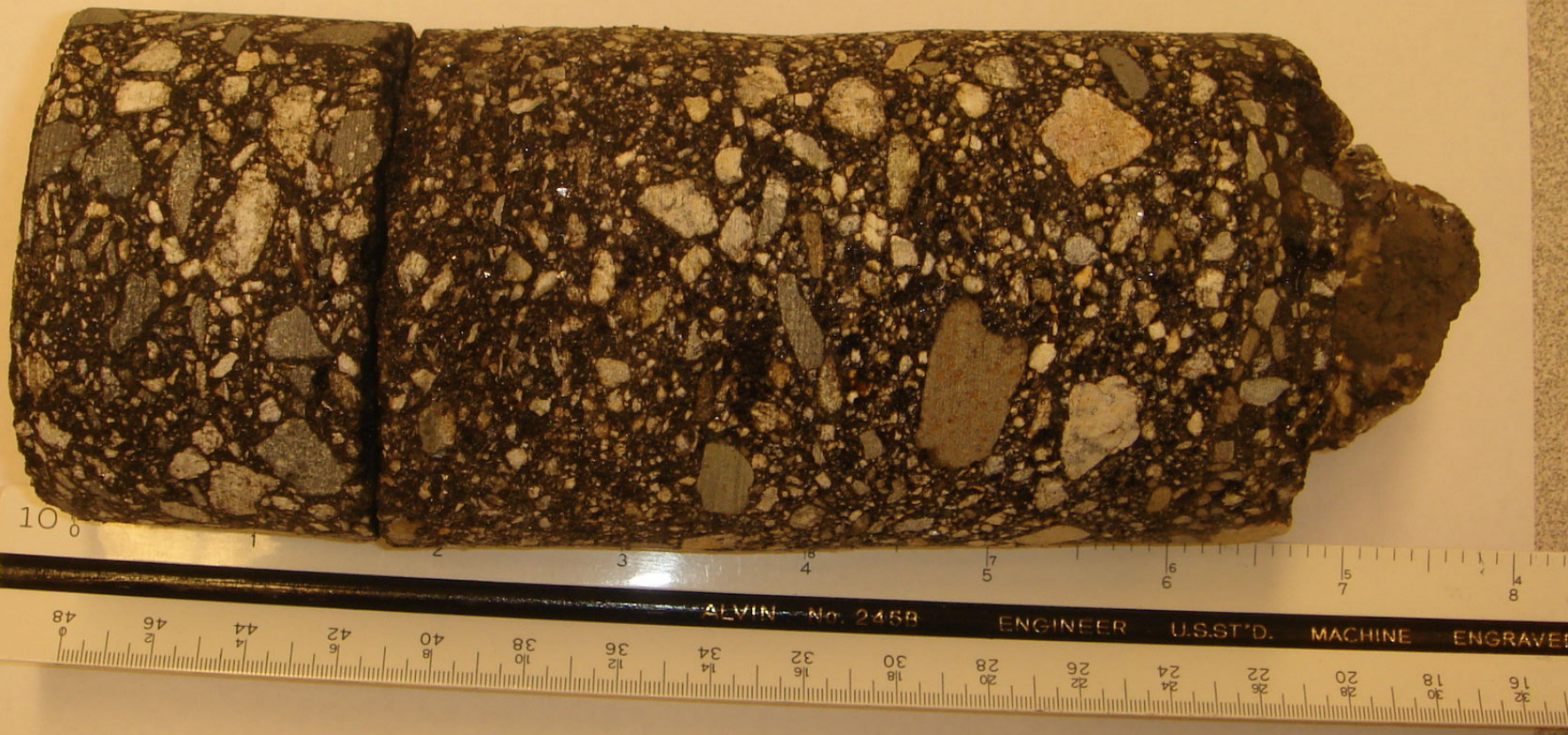
December 14, 2007

Station	Existing Structural Number (in.)	Pavement Modulus (psi)	Subgrade Resilient Modulus (psi)	Pavement Depth (in)	* Combined Pavement/Gravel Depth Used for Calculation (in)
103+98	5.76	77,576	6,527	6.6	30
108+00	6.22	97,629	12,660	6.6	30
111+96	5.97	86,567	6,045	6.6	30
116+02	6.11	92,598	11,575	6.6	30
119+98	5.5	67,624	5,344	6.6	30
124+00	5.13	54,790	4,294	6	30
128+17	6.64	118,853	4,783	6	30
132+02	6.13	93,452	7,070	6	30
135+98	5.7	75,085	5,168	6	30
140+05	5.83	80,434	4,529	6	30
144+11	5.41	64,248	4,613	6	30
148+02	6.25	99,329	5,459	6	30
151+98	4.95	49,329	4,905	7.2	30
155+99	6.59	116,153	8,811	7.2	30
158+00	5.92	84,530	5,893	7.2	30





Sta 104+00 9 LT



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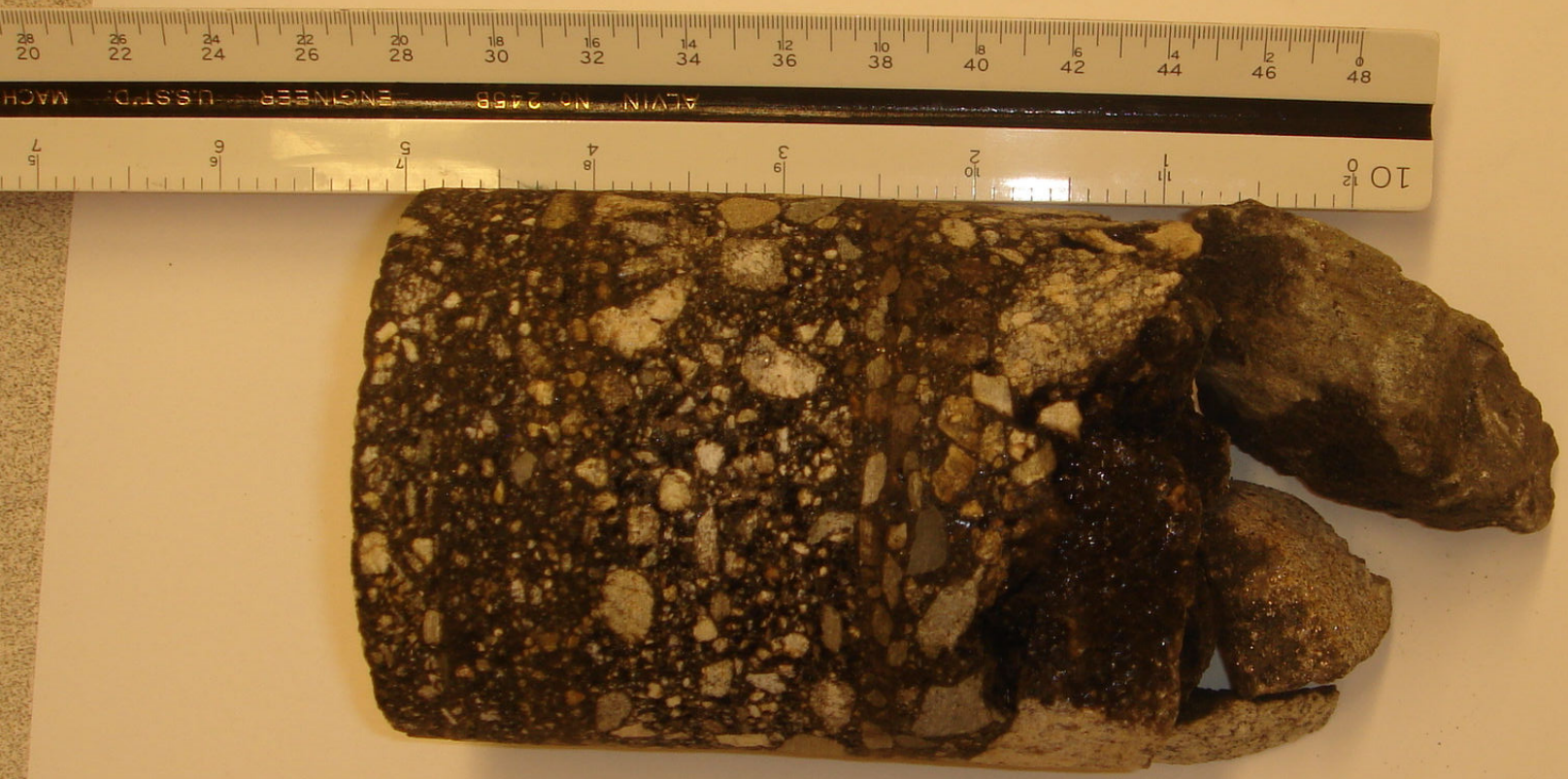
Sta 113+50 G'RT



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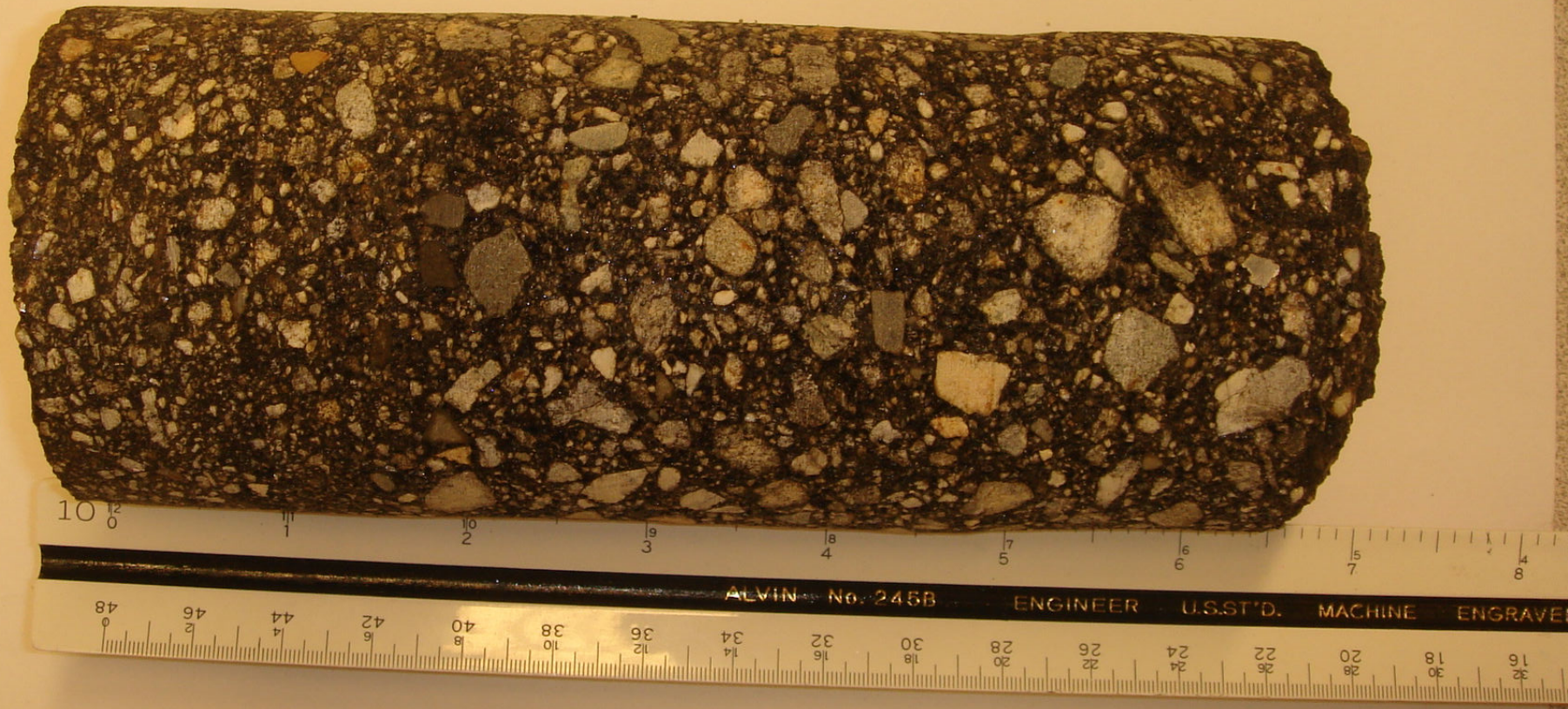
Sta 1214 50 BLT

17883.00

Sta 137+50 11 Rt



17883.00

Sta 144+50 10 Rt
ALVIN No. 2456 ENGINEER U.S.ST'D. MACHINE ENGRAVED