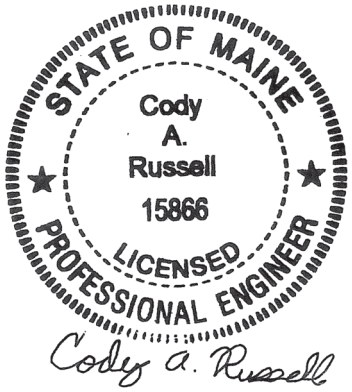
MAINE DEPARTMENT OF TRANSPORTATION
HIGHWAY PROGRAM
GEOTECHNICAL SECTION
AUGUSTA, MAINE

GEOTECHNICAL DESIGN REPORT

For the Rehabilitation of

ROUTE 1
MILBRIDGE-CHERRYFIELD, MAINE

Prepared by:
Yueh-Ti Lee
Assistant Geotechnical Engineer



Reviewed by:
Cody Russell, P.E.
Senior Geotechnical Engineer

Washington County
WIN 20405.00

Soils Report 2024-30
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1.0 INTRODUCTION

The purpose of this Geotechnical Design Report is to present subsurface information and make geotechnical design and construction recommendations for the rehabilitation of an approximately 5.05-mile portion of US Route 1 in Milbridge and Cherryfield, as shown on Sheet 1 – Location Map. The project is needed to improve drainage and the roadway structure. The scope includes full depth reclamation of existing pavement with full depth construction of roadway shoulders for roadway geometric improvements. Geometric improvements include vertical alignment modifications, where sight distances are inadequate for posted roadway speeds. Improvements at the intersection of Route 1 and Route 182 are proposed to simplify lane arrangements by creating a simple T-Intersection. Roadside ditching, cross culverts, driveway culverts and sections of closed drainage are proposed to improve both surface and roadway subbase material drainage. Route 1 is a Highway Corridor Priority 1 road.

2.0 GEOLOGIC SETTING

According to the Reconnaissance Surficial Geology Map of the Cherryfield Quadrangle, Maine, Open File No. 80-2 (1982) published by the Maine Geological Survey (MGS), the surficial soils along the project length consist of Presumpscot Formation. Presumpscot Formation consists of silt, clay, and sand.

According to the MGS map titled Bedrock Geologic Map of Maine (1985) the bedrock along the project consists of undetermined volcanic rocks of the Columbia Falls Formation and Intrusive Devonian granite, gabbro, diorite, and ultramafic rocks.

3.0 SUBSURFACE INVESTIGATION

Subsurface conditions at the site were explored by drilling a total of thirty-five (35) borings and three (3) probes.

Borings HB-MICH-101 through HB-MICH-123 were drilled between January 11, 2016 and January 12, 2016. Borings HB-MICH-201, HB-MICH-203 through HB-MICH-205, HB-MICH 207 through HB-MICH-213, and HB-MICH-215 and probes HB-MICH-202, HB-MICH-206, and HB-MICH-214 were drilled between May 1, 2018 and May 5, 2018. The 100-series explorations were drilled by Northern Test Boring. The 200-series explorations were drilled by the MaineDOT drill crew. The borings were drilled to depths ranging from approximately 3.9 to 26.2 feet below ground surface (bgs) using solid stem auger, cased wash boring, and rock core drilling techniques. The probes were drilled to a depth of approximately 20.0 to 20.5 feet bgs using solid stem auger drilling techniques. Boring and probe locations are shown on Sheets 2 through 43 Boring Location Plans. The boring logs are presented in Appendix A.

Soil samples were obtained off the auger flights in twenty-three (23) 100-series borings. Soil samples were obtained in twelve (12) 200-series borings at standard 5-foot intervals using Standard Penetration Testing (SPT). No soil sampling was done in three (3) 200-series probes and no soil descriptions were recorded.

The MaineDOT calibrated automatic hammer delivers approximately 42 percent more energy during driving than the standard rope and cathead system. All N-values discussed in this report are corrected values (N_{60}) computed by applying an average energy transfer factor of 0.854 to the raw field N-values.

Details and sampling methods used, field data obtained, and soil and groundwater conditions encountered are shown in the Boring Logs in Appendix A. The MaineDOT Geotechnical Team member selected the boring locations, drilling methods, designated type and depth of sampling, reviewed field logs for accuracy and identified field and laboratory testing requirements. A North East Transportation Training and Certification Program (NETTCP) certified subsurface inspector logged the subsurface conditions encountered. The boring and probes were located in the field by taping to site features after completion of the drilling program.

4.0 LABORATORY TESTING

A laboratory testing program was conducted on select soil samples obtained in the test borings to assist in soil classification, evaluation of engineering properties of the soils and geologic assessment of the project site. Laboratory testing consisted of sixty-eight (68) standard grain size analyses and natural water content, twenty-two (22) grain size analyses with hydrometer and natural water content, fourteen (14) Atterberg Limits tests, and one loss on ignition test. The results of the laboratory tests are in Appendix B – Laboratory Test Results. Laboratory test results are also summarized on the boring logs in Appendix A.

5.0 SUBSURFACE CONDITIONS

Subsurface conditions encountered at the test borings and probes generally consisted of pavement and fill soils consisting of gravel, sandy gravel, sand, gravelly sand, silt, sandy silt, clayey silt, and silty clay underlain by layers of native gravel, sandy gravel, silty gravel, sand, silty sand, gravelly sand, silt, sandy silt, clayey silt, and silty clay underlain by bedrock. The boring locations are shown on Sheets 2 through 43 - Boring Location Plans. The boring logs are presented in Appendix A – Boring Logs.

5.1 Pavement and Fill Soils

The subsurface investigations found areas of pavement and roadway fill soils along the project. Where present, the pavement thickness ranged from approximately 4.0 to 7.0 inches. The fill soils consisted of:

- Grey, brown-grey, and brown, damp to wet, gravel, some fine to coarse sand, trace to some silt, occasional cobble.

- Grey and brown, damp to wet, fine to coarse sandy gravel, trace to little silt, occasional cobble.

- Black-brown and brown, damp to wet, fine to coarse sand, little to some gravel, trace to some silt, occasional cobble.

- Grey-brown and brown, damp to wet, gravelly fine to coarse sand, trace to little silt, occasional cobble.

- Grey-brown, brown, and olive, moist to wet, silt, some clay, some fine to coarse sand, trace to some gravel, trace organics, wood.

- Grey-brown, moist, fine to coarse sandy silt, little gravel.

- Olive-brown, moist, stiff, clayey silt, trace fine sand.

- Olive-brown, stiff, silty clay, trace fine sand.

The thickness of the fill ranged from approximately 0.7 to 21.5 feet. SPT N_{60}-values obtained in the granular fill ranged from 9 to 80 blows per foot (bpf) indicating that the granular fill is loose to very dense in consistency. SPT N_{60}-values obtained the in the silt and clay fill ranged from 10 to 17 bpf indicating that the silt and clay fill is stiff to very stiff in consistency.

Water contents from fifty-three (53) samples obtained within the fill range from approximately 0.6% to 50.0%. Grain size analyses conducted on fifty-three (53) samples of the fill resulted in the soil being classified as an A-1-a, A-1-b, A-2-4, A-4, or A-6 under the AASHTO Soil Classification System and a SM, SW-SM, GM, GW-GM or CL under the Unified Classification System.

The following table summarizes the results of Atterberg Limits tests done on two (2) samples of the fill:

Boring No. and Sample No.	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index
HB-MICH-215 2D	23.8	30	18	12	0.48
HB-MICH-215 3D	24.2	30	18	12	0.52

Interpretation of these results indicate that the fill has medium plasticity. The clayey silt in sample 2D from boring HB-MICH-215, and the silty clay in sample 3D from boring HB-MICH-215 are overconsolidated.

5.2 Native Soils

The fill soils are underlain by layers of native soils consisting of gravel, sand, silt and clay.

5.2.1 Native Gravel

The native gravel encountered in the borings consisted of:

- Grey, wet, gravel, some fine to coarse sand, little silt.
- Brown, wet, fine to coarse sandy gravel, little silt.
- Grey-brown, moist, silty gravel, some fine to coarse sand.

The thickness of the native gravel ranged from approximately 2.2 to 6.0 feet. The full depth of the native gravel was not encountered or fully penetrated in all of the explorations. SPT N-values obtained in the native gravel ranged from 7 to 46 bpf indicating that the native gravel is loose to dense in consistency.

Water contents from three (3) samples obtained within the native gravel range from approximately 7.0% to 10.8%. Grain size analyses conducted on three (3) samples of the native gravel resulted in the soil being classified as an A-1-a, or A-4 under the AASHTO Soil Classification System and a GW-GM, or GM under the Unified Classification System.

5.2.2 Native Sand

The native sand encountered in the borings consisted of:

- Grey-brown, grey, and brown, damp to wet, fine to coarse sand, trace to some silt, trace to some gravel, trace to some clay, trace organics.
- Grey-brown, grey, and brown, moist to wet, silty fine to coarse sand, trace to some gravel, trace clay.
- Grey, wet, gravelly fine to coarse sand, little silt.

The thickness of the native sand ranged from approximately 2.0 to 8.5 feet. The full depth of the native sand was not encountered or fully penetrated in all of the explorations. SPT N-values obtained in the native sand ranged from 7 to 108 bpf indicating that the native sand is loose to very dense in consistency.

Water contents from eleven (11) samples obtained within the native sand range from approximately 8.1% to 29.4%. Grain size analyses conducted on eleven (11) samples of the native sand resulted in the soil being classified as an A-1-b, A-2-4, A-3, A-4, or A-6 under the AASHTO Soil Classification System and a SM, SP-SM, SC-SM, or CL under the Unified Classification System.

The following table summarizes the results of Atterberg Limits tests done on two (2) samples of the sand:

Boring No. and Sample No.	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index
HB-MICH-201 6D	28.6	33	19	14	0.69
HB-MICH-205 5D	27.4	38	22	16	0.34

Interpretation of these results indicates that the sand has medium plasticity. The silty sand in sample 6D from boring HB-MICH-201, and the sand in sample 5D from boring HB-MICH-205 are overconsolidated.

5.2.3 Native Silt

The native silt encountered in the borings consisted of:

- Grey-brown, olive-brown, light brown, brown, grey, and olive, moist to wet, silt, trace to some fine to coarse sand, trace to some clay, trace to little gravel, some organics-peat layer, trace organics.
- Grey-brown and grey, wet, clayey silt, trace fine sand, trace gravel, trace organics, wood.
- Brown, wet, fine to medium sandy silt, little clay.

The thickness of the native silt layers ranged from approximately 1.4 to 10.5 feet. The full depth of the native silt was not penetrated in all of the explorations. SPT N-values obtained in the native silt ranged from 1 to 19 bpf indicating that the native silt is very soft to very stiff in consistency.

Water contents from fifteen (15) samples obtained within the native silt range from approximately 16.5% to 32.1%. Grain size analyses conducted on fifteen (15) samples of the native silt resulted in the soil being classified as an A-4 or A-6 under the AASHTO Soil Classification System and a ML, or CL under the Unified Classification System.

The ignition loss of the native silt from sample 2D, boring HB-MICH-209 is 10.8% for the organics-peat layer.

The following table summarizes the results of Atterberg Limits tests done on three (3) samples of the silt:

Boring No. and Sample No.	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index
HB-MICH-201 3D	30.4	37	21	16	0.59
HB-MICH-204 4D	25.6	31	21	10	0.46
HB-MICH-205 4D	29.7	31	23	8	0.84

Interpretation of these results indicate that the silt has low to medium plasticity. The silt in sample 4D from boring HB-MICH-205 is normally consolidated, meaning it is currently experiencing its highest stress. The silt in sample 3D from boring HB-MICH-201, and the clayey silt in sample 4D from boring HB-MICH-204 are overconsolidated.

5.2.4 Native Clay

The native clay encountered in the borings consisted of:

- Grey-brown, light brown, dark grey, brown, and grey, moist to wet, silty clay, trace fine to coarse sand, trace gravel, wood.

The thickness of the native clay layers ranged from approximately 1.5 to 8.5 feet. The full depth of the native clay was not penetrated in all of the explorations. SPT N-values obtained in the native clay ranged from 7 to 21 bpf indicating that the native clay is medium stiff to very stiff in consistency.

Water contents from eight (8) samples obtained within the native clay range from approximately 22.8% to 31.3%. Grain size analyses conducted on eight (8) samples of the native clay resulted in the soil being classified as an A-4, or A-6 under the AASHTO Soil Classification System and a CL-ML, or CL under the Unified Classification System.

The following table summarizes the results of Atterberg Limits tests done on seven (7) samples of the clay:

Boring No. and Sample No.	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index
HB-MICH-201 2D	30.3	26	21	5	1.86
HB-MICH-201 4D	30.8	34	21	13	0.75
HB-MICH-201 5D	30.2	35	23	12	0.60
HB-MICH-203 3D	22.8	30	20	10	0.28
HB-MICH-203 4D	27.8	36	21	15	0.45
HB-MICH-204 5D	26.6	32	18	14	0.61
HB-MICH-210 5D	32.7	39	21	18	0.65

Interpretation of these results indicate that the clay has slight to medium plasticity. The silty clay in sample 2D from boring HB-MICH-201 is on the verge of being a viscous liquid if disturbed. Overburden pressure and interparticle cementation is providing stability to keep the soil in its current state, but the slightest disturbance causing remolding could convert the soil into a viscous fluid. The silty clay in sample 3D from boring HB-MICH-203 is some to heavily overconsolidated. The silty clay in samples 4D and 5D from boring HB-MICH-201, sample 4D from HB-MICH-203, sample 5D from HB-MICH-204, and sample 5D from HB-MICH-210 are overconsolidated.

5.3 Bedrock and Refusal Surfaces

Refusal surfaces were encountered at varying depths along the project. Refusal of the drilling tools varied from a depth of approximately 3.9 feet to 21.2 feet bgs. The table below summarizes the refusal surfaces encountered.

Boring No.	Station	Offset (feet)	Approximate Depth to Top of Refusal Surface (feet)	Approximate Elevation of Top of Refusal Surface (feet)	RQD (%)[1]
HB-MICH-110	192+67	7.0 Left	3.9	32.4	NA
HB-MICH-212	246+70	9.5 Right	21.2	18.5	37
HB-MICH-213	247+00	9.0 Left	17.7	21.9	60
HB-MICH-215	352+15	8.0 Left	19.9	44.6	78

[1] RQD = Rock Quality Designation

A 5-foot bedrock core was drilled in three (3) of the borings where refusal was encountered. The exact nature of the refusal surface was not determined in the remaining explorations.

The bedrock consists of undetermined volcanic rocks of the Columbia Falls Formation and Intrusive Devonian granite, gabbro, diorite, and ultramafic rocks. The Rock Quality Designation (RQD) of the bedrock was determined to range from 37% to 78%, correlating to a Rock Quality of Poor to Good. The approximate elevations of the top of bedrock or the refusal surface encountered at the boring and probe locations are presented in Appendix A – Boring Logs.

5.4 Groundwater

Groundwater was recorded at depths ranging from approximately 1.1 feet to 14.5 feet bgs in six (6) 100-series borings and eight (8) 200-series borings. The water levels observed are indicated on the boring logs in Appendix A. Groundwater levels can be expected to fluctuate subject to seasonal variations, local soil conditions, topography, precipitation, and construction activity.

6.0 GEOTECHNICAL RECOMMENDATIONS

The following sections discuss the geotechnical-related design features of this project. Areas of geotechnical concern include the large culverts at approximate Stations 118+44, 144+01, and 200+61, the Milbridge Road Bridge box culvert at approximate Station 352+00, and the proposed oversteepened slopes from approximate Stations 209+50 to 210+50, 225+00 to 225+50, and 246+50 to 247+00.

6.1 Large Culvert at approximate Station 118+44

6.1.1 General Information

The existing structure at approximate Station 118+18 is a 24-inch diameter, approximately 67-foot long corrugated metal pipe (CMP) culvert. The proposed replacement structure is a 72-inch diameter, 88-foot long reinforced concrete pipe (RCP) culvert on an approximately 18-degree skew to the roadway centerline with an inlet elevation of approximately 35.78 feet and an outlet elevation of approximately 33.46 feet.

One (1) boring (HB-MICH-201) and (1) probe (HB-MICH-202) were drilled near the proposed structure. The boring and probe locations and the interpretive subsurface profile are shown on Sheets 44 – Boring Location Plan & Interpretive Subsurface Profile. The boring logs are also provided in Appendix A – Boring Logs.

Boring HB-MICH-201 was drilled to a depth of approximately 24.0 feet bgs without encountering a refusal surface. The subsurface conditions encountered in the boring consisted of fill consisting of sand underlain by silty clay and silt underlain by silty sand. One (1) SPT N_{60}-value obtained in the fill was 28 bpf indicating that the fill is medium dense in consistency. Four (4) SPT N_{60}-values obtained in the silty clay and silt ranged from 7 to 14 bpf indicating that the silty clay and silt is medium stiff to stiff in consistency. One (1) SPT N_{60}-value obtained in the silty sand was 13 bpf indicating that the silty sand is medium dense in consistency. Probe HB-MICH-202 was drilled to a depth of approximately 20.5 feet bgs without encountering a refusal surface.

6.1.2 Design and Construction

The proposed RCP culvert shall be constructed in accordance with MaineDOT Standard Specification Section 603 and the Contract Plans. To facilitate fish passage, Habitat Connectivity Design elements will be used inside the proposed RCP culvert as shown on the Special Details sheet in the Contract Plans.

The proposed RCP culvert can be bedded on a 1-foot thick layer of Granular Borrow, Material for Underwater Backfill (MaineDOT Item 203.25, Granular Borrow). The bedding material should be placed in lifts of 6 to 8 inches loose measure and compacted to at least 95 percent of the AASHTO T-180 maximum dry density. The exposed subgrade shall be free of ponded water so that bedding material placement and compaction can be completed in the dry. The soils at the bedding elevation shall be excavated using a smooth-edged backhoe bucket to limit disturbance. Any disturbed soils at the bedding elevation resulting from excavation activities shall be removed by hand prior to placement of the bedding material. All subgrade surfaces should be protected from construction traffic in order to limit disturbance. Groundwater and surface water levels shall be depressed sufficiently to allow work in the dry.

The full nature of the culvert bearing surface will not become evident until the culvert excavation is made. The bottom elevation of the excavation shall take into account the wall thickness of the RCP culvert and the required 1-foot layer of bedding material. Any loose or soft soils in the excavations shall be removed and replaced with Granular Borrow Material for Underwater Backfill (MaineDOT 703.19) or Crushed Stone ¾-Inch (MaineDOT 703.13). Any cobbles or boulders encountered in excess of 6 inches shall be removed and replaced with compacted Granular Borrow Material for Underwater Backfill or Crushed Stone ¾-Inch.

The soil envelope and backfill shall consist of Granular Borrow (703.19) with a maximum particle size of 4 inches. The granular borrow backfill material shall be placed in lifts of 6 to 8 inches loose measure and compacted to the manufacturer's specifications or, in the absence of manufacturer's specifications, the bedding and backfill soil shall be compacted to at least 92 percent of the AASHTO T-180 maximum dry density.

6.2 Large Culvert at approximate Station 144+01

6.2.1 General Information

The existing structure at approximate Station 144+00 is a 24-inch diameter, approximately 73-foot long CMP culvert. The proposed replacement structure is a 60-inch diameter, 128-foot long RCP culvert on an approximately 16-degree skew to the roadway centerline with an inlet elevation of approximately 30.45 feet and an outlet elevation of approximately 27.20 feet.

Two (2) borings (HB-MICH-203 and HB-MICH-204) were drilled near the proposed structure. The boring locations and the interpretive subsurface profile are shown on Sheets 45 – Boring Location Plan & Interpretive Subsurface Profile. The boring logs are also provided in Appendix A – Boring Logs.

Boring HB-MICH-203 was drilled to a depth of approximately 22.0 feet bgs without encountering a refusal surface, and Boring HB-MICH-204 was drilled to a refusal surface of approximately 26.1 feet bgs. The subsurface conditions encountered in the borings consisted of fill consisting of gravelly sand and sand underlain by silt, clayey silt, and silty clay underlain by sand. Four (4) SPT N_{60}-values obtained in the fill ranged from 14 bpf to 48 bpf indicating that the fill is medium dense to dense in consistency. Five (5) SPT N_{60}-values obtained in the silt, clayey silt, and silty clay ranged from 10 to 19 bpf indicating that the silt, clayey silt, and silty clay is stiff to very stiff in consistency. One (1) SPT N_{60}-value obtained in the sand was 33 bpf indicating that the sand is dense in consistency.

6.2.2 Design and Construction

The proposed RCP culvert shall be constructed in accordance with MaineDOT Standard Specification Section 603 and the Contract Plans. To facilitate fish passage, Habitat Connectivity Design elements will be used inside the proposed RCP culvert as shown on the Special Details sheet in the Contract Plans.

The proposed RCP culvert can be bedded on a 1-foot thick layer of Granular Borrow, Material for Underwater Backfill (MaineDOT Item 203.25, Granular Borrow). The bedding material should be placed in lifts of 6 to 8 inches loose measure and compacted to at least 95 percent of the AASHTO T-180 maximum dry density. The exposed subgrade shall be free of ponded water so that bedding material placement and compaction can be completed in the dry. The soils at the bedding elevation shall be excavated using a smooth-edged backhoe bucket to limit disturbance. Any disturbed soils at the bedding elevation resulting from excavation activities shall be removed by hand prior to placement of the bedding material. All subgrade surfaces should be protected from construction traffic in order to limit disturbance. Groundwater and surface water levels shall be depressed sufficiently to allow work in the dry.

The full nature of the culvert bearing surface will not become evident until the culvert excavation is made. The bottom elevation of the excavation shall take into account the wall thickness of the RCP culvert and the required 1-foot layer of bedding material. Any loose or soft soils in the excavations shall be removed and replaced with Granular Borrow Material for Underwater Backfill (MaineDOT

703.19) or Crushed Stone ¾-Inch (MaineDOT 703.13). Any cobbles or boulders encountered in excess of 6 inches shall be removed and replaced with compacted Granular Borrow Material for Underwater Backfill or Crushed Stone ¾-Inch.

The soil envelope and backfill shall consist of Granular Borrow (703.19) with a maximum particle size of 4 inches. The granular borrow backfill material shall be placed in lifts of 6 to 8 inches loose measure and compacted to the manufacturer's specifications or, in the absence of manufacturer's specifications, the bedding and backfill soil shall be compacted to at least 92 percent of the AASHTO T-180 maximum dry density.

6.3 Large Culvert at approximate Station 200+61

6.3.1 General Information

The existing structure at approximate Station 200+61 is a 24-inch diameter, approximately 90-foot long CMP culvert. The proposed replacement structure is a 96-inch diameter, 120-foot long RCP culvert on an approximately 4-degree skew to the roadway centerline with an inlet elevation of approximately 14.19 feet and an outlet elevation of approximately 12.62 feet.

One (1) boring (HB-MICH-205) and (1) probe (HB-MICH-206) were drilled on opposite, diagonal corners of the proposed structure. The boring locations and the interpretive subsurface profile are shown on Sheet 46 – Boring Location Plan & Interpretive Subsurface Profile. The boring logs are also provided in Appendix A – Boring Logs.

Boring HB-MICH-205 was drilled to a depth of approximately 24.0 feet bgs without encountering a refusal surface. The subsurface conditions encountered in the boring consisted of fill consisting of sand and silt underlain by clayey silt underlain by sand underlain by silty clay. Two (2) SPT N_{60}-values obtained in the sand fill were 21 bpf and 41 bpf indicating that the sand fill is medium dense to dense in consistency. One (1) SPT N_{60}-value obtained in the silt fill was 17 bpf indicating that the silt fill is very stiff in consistency. One (1) SPT N_{60}-value obtained in the clayey silt was 11 bpf indicating that the clayey silt is stiff in consistency. One (1) SPT N_{60}-value obtained in the sand was 11 bpf indicating that the sand is medium dense in consistency. One (1) SPT N_{60}-value obtained in the silty clay was 21 bpf indicating that the clay is very stiff in consistency. Probe HB-MICH-206 was drilled to a depth of approximately 20.0 feet bgs without encountering a refusal surface.

6.3.2 Design and Construction

The proposed RCP culvert shall be constructed in accordance with MaineDOT Standard Specification Section 603 and the Contract Plans. To facilitate fish passage, Habitat Connectivity Design elements will be used inside the proposed RCP culvert as shown on the Special Details sheet in the Contract Plans.

The proposed RCP culvert can be bedded on a 1-foot thick layer of Granular Borrow, Material for Underwater Backfill (MaineDOT Item 203.25, Granular Borrow). The bedding material should be placed in lifts of 6 to 8 inches loose measure and compacted to at least 95 percent of the AASHTO T-180 maximum dry density. The exposed subgrade shall be free of ponded water so that bedding

material placement and compaction can be completed in the dry. The soils at the bedding elevation shall be excavated using a smooth-edged backhoe bucket to limit disturbance. Any disturbed soils at the bedding elevation resulting from excavation activities shall be removed by hand prior to placement of the bedding material. All subgrade surfaces should be protected from construction traffic in order to limit disturbance. Groundwater and surface water levels shall be depressed sufficiently to allow work in the dry.

The full nature of the culvert bearing surface will not become evident until the culvert excavation is made. The bottom elevation of the excavation shall take into account the wall thickness of the RCP culvert and the required 1-foot layer of bedding material. Any loose or soft soils in the excavations shall be removed and replaced with Granular Borrow Material for Underwater Backfill (MaineDOT 703.19) or Crushed Stone ¾-Inch (MaineDOT 703.13). Any cobbles or boulders encountered in excess of 6 inches shall be removed and replaced with compacted Granular Borrow Material for Underwater Backfill or Crushed Stone ¾-Inch.

The soil envelope and backfill shall consist of Granular Borrow (703.19) with a maximum particle size of 4 inches. The granular borrow backfill material shall be placed in lifts of 6 to 8 inches loose measure and compacted to the manufacturer's specifications or, in the absence of manufacturer's specifications, the bedding and backfill soil shall be compacted to at least 92 percent of the AASHTO T-180 maximum dry density.

6.4 Milbridge Road Bridge (Bridge #6697) at approximate Station 352+00

6.4.1 General Information

The existing structure at approximate Station 352+04 is a 4.5-foot span, 5-foot rise, approximately 91-foot long elliptical CMP culvert. The proposed replacement structure is a 13-foot span, 8-foot rise, 136-foot long precast concrete box culvert on an approximately 10-degree skew to the roadway centerline with an inlet elevation of approximately 45.59 feet and an outlet elevation of approximately 43.83 feet.

One (1) probe (HB-MICH-214) and (1) boring (HB-MICH-215) were drilled in the roadway on opposite, diagonal corners of the proposed structure. The boring locations and the interpretive subsurface profile are shown on Sheet 47 – Boring Location Plan & Interpretive Subsurface Profile. The boring logs are also provided in Appendix A – Boring Logs.

Probe HB-MICH-214 was drilled to a depth of approximately 20.0 feet bgs without encountering a refusal surface. Boring HB-MICH-215 was drilled to a depth of approximately 19.9 feet bgs where a refusal surface was encountered and then advanced to a depth of 24.9 feet bgs using rock core drilling techniques. The subsurface conditions encountered in the boring consisted of fill consisting of sand, clayey silt, and silty clay underlain by silt underlain by bedrock. One (1) SPT N_{60}-value obtained in the sand fill was 40 bpf indicating that the sand fill is dense in consistency. Two (2) SPT N_{60}-values obtained in the clayey silt and silty clay fill ranged from 10 bpf to 14 bpf indicating that the clayey silt and silty clay fill are stiff in consistency. One (1) SPT N_{60}-value obtained in the silt was 13 bpf indicating that the silt is stiff in consistency. RQD of the bedrock was determined to 78%, correlating to a Rock Quality of Good.

6.4.2 Design and Construction

The proposed precast concrete box culvert shall be constructed in accordance with MaineDOT Standard Specification Section 534 and the Contract Plans. To facilitate fish passage, Habitat Connectivity Design elements will be used inside the proposed precast concrete box culvert as shown on the Special Details sheet in the Contract Plans.

The proposed precast concrete box culvert can be bedded on a 1-foot thick layer of Granular Borrow, Material for Underwater Backfill (MaineDOT Item 203.25, Granular Borrow). The bedding material should be placed in lifts of 6 to 8 inches loose measure and compacted to at least 95 percent of the AASHTO T-180 maximum dry density. The exposed subgrade shall be free of ponded water so that bedding material placement and compaction can be completed in the dry. The soils at the bedding elevation shall be excavated using a smooth-edged backhoe bucket to limit disturbance. Any disturbed soils at the bedding elevation resulting from excavation activities shall be removed by hand prior to placement of the bedding material. All subgrade surfaces should be protected from construction traffic in order to limit disturbance. Groundwater and surface water levels shall be depressed sufficiently to allow work in the dry.

The full nature of the culvert bearing surface will not become evident until the culvert excavation is made. The bottom elevation of the excavation shall take into account the wall thickness of the precast concrete box culvert and the required 1-foot layer of bedding material. Any loose or soft soils (peat or organic materials) in the excavations shall be removed and replaced with Granular Borrow Material for Underwater Backfill (MaineDOT 703.19) or Crushed Stone ¾-Inch (MaineDOT 703.13). Any cobbles or boulders encountered in excess of 6 inches shall be removed and replaced with compacted Granular Borrow Material for Underwater Backfill or Crushed Stone ¾-Inch.

The soil envelope and backfill shall consist of Granular Borrow (703.19) with a maximum particle size of 4 inches. The granular borrow backfill material shall be placed in lifts of 6 to 8 inches loose measure and compacted to the manufacturer's specifications or, in the absence of manufacturer's specifications, the bedding and backfill soil shall be compacted to at least 92 percent of the AASHTO T-180 maximum dry density.

6.4.3 Bearing Resistance

The factored bearing resistances for the precast concrete box culvert bearing on compacted granular bedding material placed on native soils at the service and strength limit states are presented in the table below. Supporting calculations in accordance with AASHTO LRFD Bridge Design Specifications 9th Edition 2020 (LRFD) are provided in Appendix C – Calculations.

Limit State	Resistance Factor φ_b	AASHTO LRFD Reference	Factored Bearing Resistance (ksf)
Service	1.0	Article 10.5.5.1	3.0
Strength	0.45	Table 10.5.5.2.2-1	9.0

6.4.4 Modulus of Subgrade Reaction

A modulus of subgrade reaction (k_s) equal to 20 pounds per cubic inch shall be used for the structural design of the box culvert's base slab. Calculations are included in Appendix C – Calculations.

6.5 Scour and Riprap

Both the inlet and outlet of the proposed RCP culverts and precast concrete box culvert shall be armored with riprap conforming to MaineDOT Standard Specification Section 703.26 Plain and Hand Laid Riprap. Riprap slopes shall not be steeper than 2H:1V. The riprap on the slopes shall be underlain by a 1-foot layer of protective aggregate cushion conforming to MaineDOT Standard Specification 703.19 Granular Borrow Material for Underwater Backfill that is underlain by a non-woven Class 1 erosion control geotextile that meets the requirements for MaineDOT Standard Specification 722.03.

6.6 Seismic Design Considerations

In conformance with LRFD Article 3.10.1, seismic analysis is not required for buried structures, except where they cross active faults. There are no known active faults in Maine; therefore, seismic analysis is not required.

6.7 Oversteepened Slopes from Stations 209+50 to 210+50, 225+00 to 225+00, and 246+50 to 247+00

Oversteepened slopes are proposed from approximate Stations 209+50 to 210+50 left and right, 225+00 to 225+50 right, and 246+50 to 247+00 left and right. Cross sections along the oversteepened slopes were analyzed to evaluate the proposed slope stability. The cross sections were chosen to represent critical slope locations along the oversteepened slopes. Geostudio Slope/W software was used to evaluate the slopes. The stability analyses were based on subsurface conditions encountered in the borings drilled in the roadway shoulder at the crest of the existing slopes. In accordance with AASHTO LRFD Bridge Design Specifications 9th Edition 2020 (LRFD) Article 11.6.3.7 evaluation of earth slopes where geotechnical parameters are well defined shall achieve a factor of safety of 1.3 (equivalent to a resistance factor of 0.75).

All of the proposed slopes will be constructed using 1.5H:1V riprap slopes, with the exception of Station 246+50 to 270+00 right, which will be constructed using 1.6H:1V riprap slopes.

The results of these analyses are presented in the following table:

Station	Proposed Slope Angle	Proposed Slope Factor of Safety with 3 feet of Plain Riprap
209+50 Right	1.5H:1V	1.316
210+00 Right	1.5H:1V	1.333

210+19.82 Right	1.5H:1V	1.367
210+19.82 Left	1.5H:1V	1.355
210+50 Left	1.5H:1V	1.295
225+00 Left	1.5H:1V	1.375
225+03 Left	1.5H:1V	1.334
225+50 Left	1.5H:1V	1.366
246+82.34 Left	1.5H:1V	1.302
246+82.34 Right	1.6H:1V	1.401

Based on these analyses, all of the proposed slopes shall be armored with 3 feet of riprap conforming to MaineDOT Standard Specification Section 703.26 Plain Riprap and Hand Laid Riprap underlain by a 1-foot layer of protective aggregate cushion conforming to MaineDOT Standard Specification 703.19 Granular Borrow Material for Underwater Backfill that is underlain by a non-woven Class 1 erosion control geotextile that meets the requirements for MaineDOT Standard Specification 722.03. Appendix D – Slope Stability Analyses presents the final slope configuration results from these slope stability analyses.

6.8 Settlement

No settlement issues are anticipated for either the roadway or the proposed RCP culverts and precast concrete box culvert. The installation of the proposed RCP culverts and precast concrete box culvert will result in a net unloading of the site soils at the proposed structure location. Placement of fill soils at the location of the existing structure to be removed and in areas where the proposed roadway grade is higher than existing grades are not anticipated to exceed the past loading condition of the site soils.

6.9 Bedrock Removal

Refusal of the drilling tools was encountered in multiple borings along the project (see Section 5.3). Bedrock removal is anticipated for drainage and subgrade installation near these locations. Additional shallow bedrock should be expected during construction at other locations.

The approximate invert of the proposed precast concrete box culvert ranges from an elevation of 45.59 feet at the inlet to 43.83 feet at the outlet. Constructing the culvert at this elevation may require removal of bedrock. The need for and depth of weathered bedrock removal will vary over the length of the precast concrete box culvert. The bottom elevation of the excavation shall take into account the wall thickness of the culvert bottom and the required 1-foot layer of bedding material. The borings indicate that the Rock Quality of the bedrock is poor to good with an RQD of approximately 37 to 78 percent.

The bedrock surface shall be prepared in accordance with MaineDOT standard practices. The nature, slope, and degree of fracturing in the bedrock bearing surfaces will not be evident until the excavation from the precast concrete box culvert is made. Construction activities should not be permitted to create any open fissures in the bedrock to remain. Any irregularities in the existing

bedrock surface or irregularities created during the excavation process should be backfilled with crushed stone to the bottom of the required bedding material.

The Contractor shall remove any overburden soil and bedrock that can be removed using ordinary excavation equipment to expose the proposed bearing surface at the required elevation. The cleanliness and condition of the bedrock surface should be confirmed and accepted by the Resident prior to placing the structural bedding material. If soil is encountered at bedding material subgrade it shall be proof-rolled using multiple passes of a static roller to achieve a firm and stable surface for construction. Any cobbles, boulders, or loose bedrock encountered in excess of 6 inches shall be removed and replaced with compacted Granular Borrow Material for Underwater Backfill or Crushed Stone ¾-Inch.

Blasting shall be conducted in accordance with MaineDOT Standard Specifications Sections 105.2.7 and 203. The Contractor is required to conduct pre- and post-blast surveys, as well as blast vibrations monitoring at nearby structures in accordance with industry standards at the time of the blast.

It is anticipated that there will be seepage of water from fractures and joints exposed in the bedrock surface. Water should be controlled by pumping from sumps. The Contractor should maintain the excavation so that all work is completed in the dry.

6.10 Additional Construction Considerations

Construction of the RCP culverts and precast concrete box culvert will require soil excavation. Earth support systems will be required if laying back slopes is not feasible. Regardless of the method of excavation, all excavations and earth support systems shall meet all applicable OSHA regulations.

If organic silt or peat is encountered in the project excavations, the materials should be over excavated to be completely removed and replaced with Granular Borrow, Material for Underwater Backfill or Crushed Stone, ¾-Inch.

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

7.0 CLOSURE

This report has been prepared for the use of the MaineDOT Highway Program for specific application to the proposed rehabilitation of U.S. Route 1 in Milbridge-Cherryfield, Maine in accordance with generally accepted geotechnical and foundation engineering practices. No other intended use or warranty is expressed or implied.

In the event that any changes in the nature, design, or location of the proposed project are planned, this report should be reviewed by a geotechnical engineer to assess the appropriateness of the conclusions and recommendations and to modify the recommendations as appropriate to reflect the

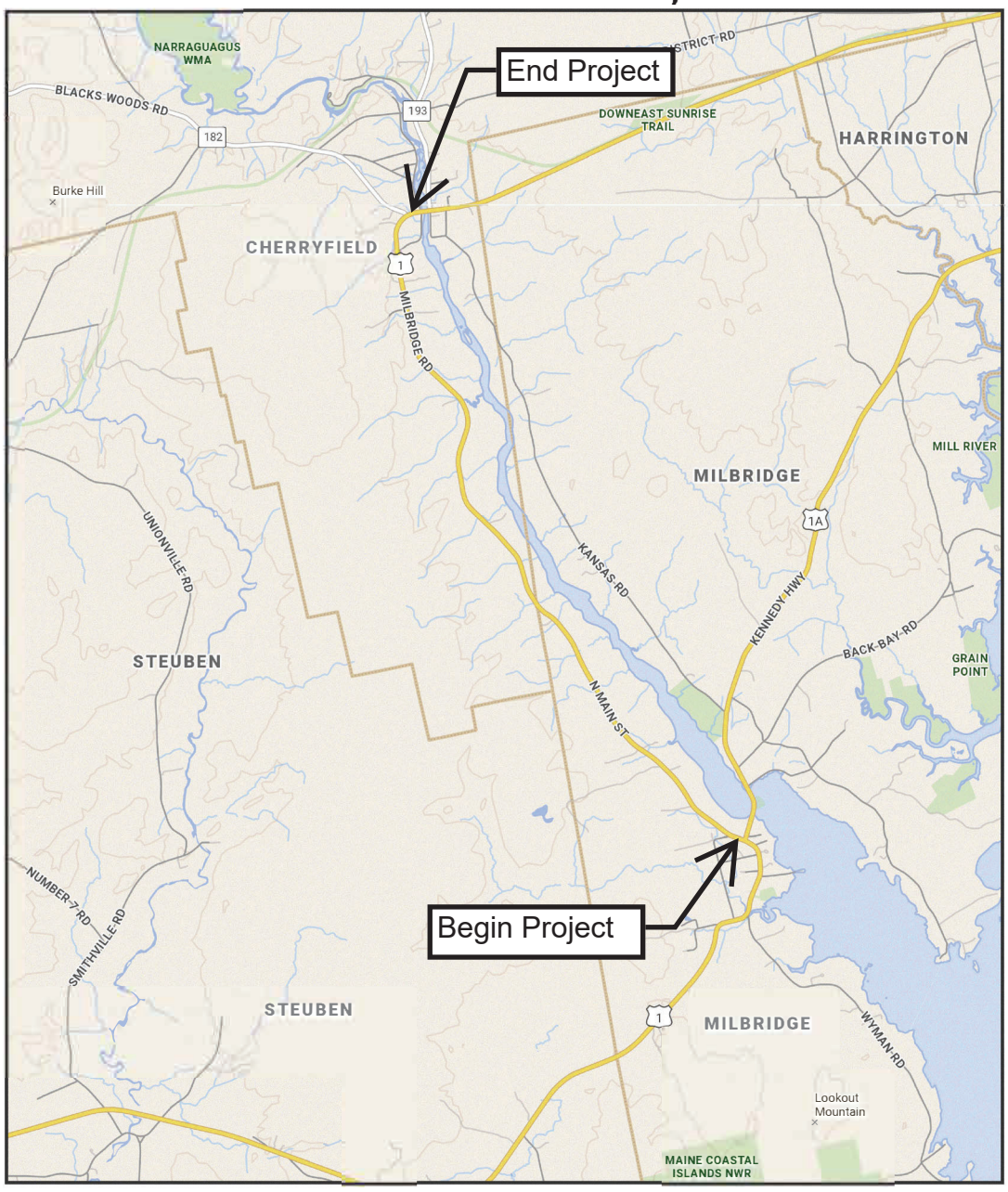
changes in design. These analyses and recommendations are based in part upon a limited subsurface investigation at discrete exploratory locations completed at the site. If variations from the conditions encountered during the investigation appear evident during construction, it may also become necessary to re-evaluate the recommendations made in this report.

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

Sheets

Date: 9/23/2024
Division: GEOTECH
Username: Terry.White

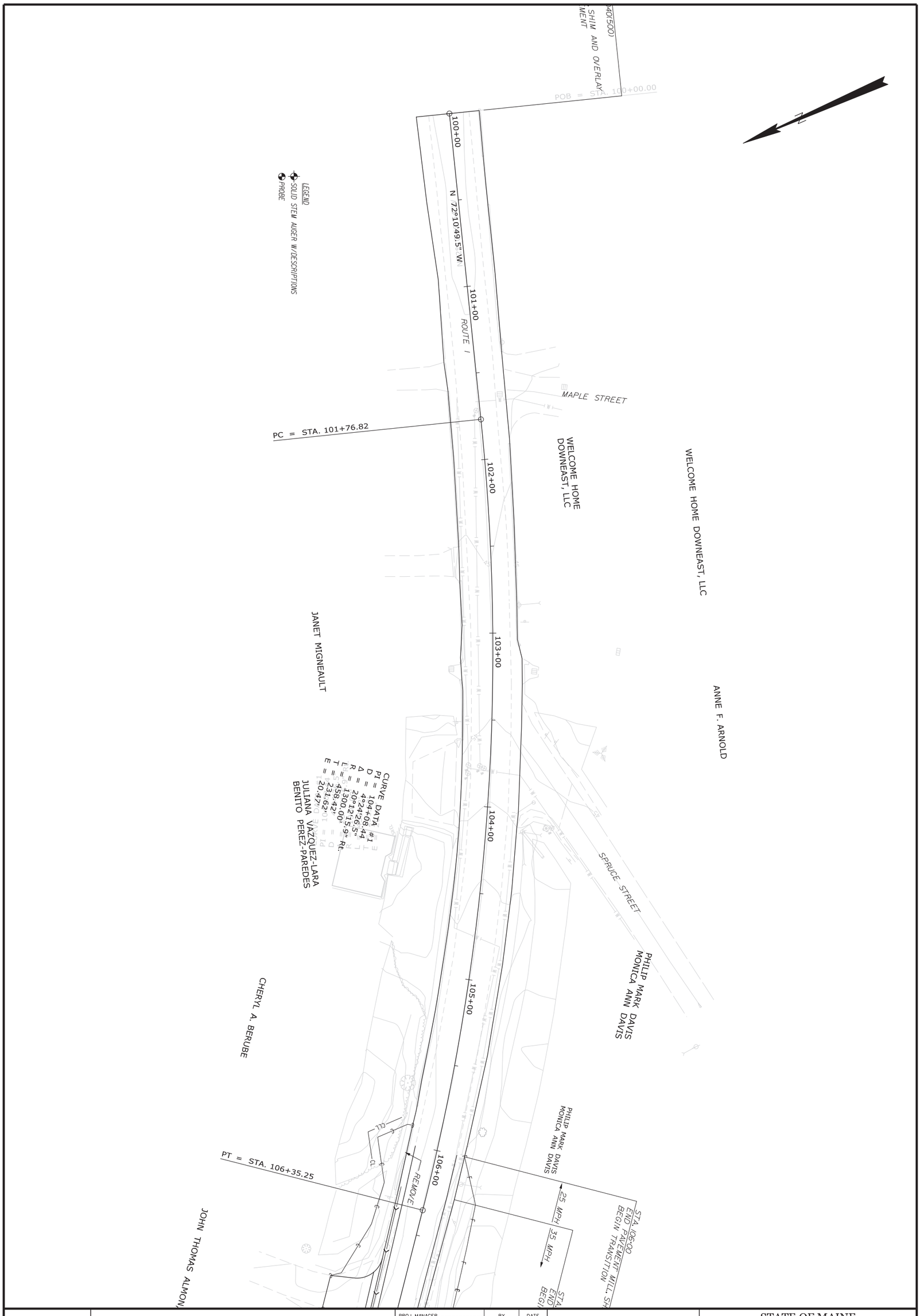
MILBRIDGE-CHERRYFIELD, MAINE



1 Miles
1 inch = 1.14 miles

Date: 9/23/2024
Time: 7:57:06 AM

SHEET NUMBER 1 OF 47	MILBRIDGE-CHERRYFIELD ROUTES 1 & 182 LOCATION MAP	STATE OF MAINE DEPARTMENT OF TRANSPORTATION STP-2040(500) WIN 20405.00 HIGHWAY PLANS



PROJ. MANAGER		BY	DATE
DESIGN-DETAILED			
CHECKED-REVIEWED			
DESIGN2-DETAILED2	Y-T.LEE	T.WHITE	NOV 2024
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER 2 OF 47

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00 HIGHWAY PLANS

STA. 106+00
END PAVEMENT MILL, SHIM AND OVERLAY
BEGIN TRANSITION

STA. 106+25
END TRANSITION
BEGIN REHABILITATION

25 MPH 35 MPH

PT = STA. 106+35.25

JOHN THOMAS ALMON, III

PHILIP MARK DAVIS
MONICA ANN DAVIS

DAVID W. PINKHAM
RHONDA J. PINKHAM,

PC = STA. 109+22.41

PHILIP MARK DAVIS
MONICA ANN DAVIS

CURVE DATA #2
PI = 111+55.22
D = 0°34'22.6"
Δ = 2°40'02.3" Lt.
R = 10000.00'
L = 465.53'
T = 232.81'
E = 2.71'

KYLE STANLEY

VIKING, INC.

POTENTIAL CELLAR DRAIN LOCATION

REMOVE AND RESET SIGN

POTENTIAL CELLAR DRAIN LOCATION

REMOVE

4'
11'
107+00

18" OPTION III

108+00
N 51°58'33.7" W

REMOVE

6" UD "B"

109+00

ROUTE 1

110+00

6" UD "B"

REMOVE STONE WALL PRIOR TO RIPRAP OUTLET END PROTECTION

AVOID IMPACTS TO CONCRETE PATH

REMOVE

MAINTAIN STONE WALL ALONG FLOW CHANNEL

4'
11'
111+00

112+00

113+00

4'
5'
6" UD "B"

REMOVE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED		NOV 2024
DESIGN2-DETAILED2	Y-T.LEE	T.WHITE
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

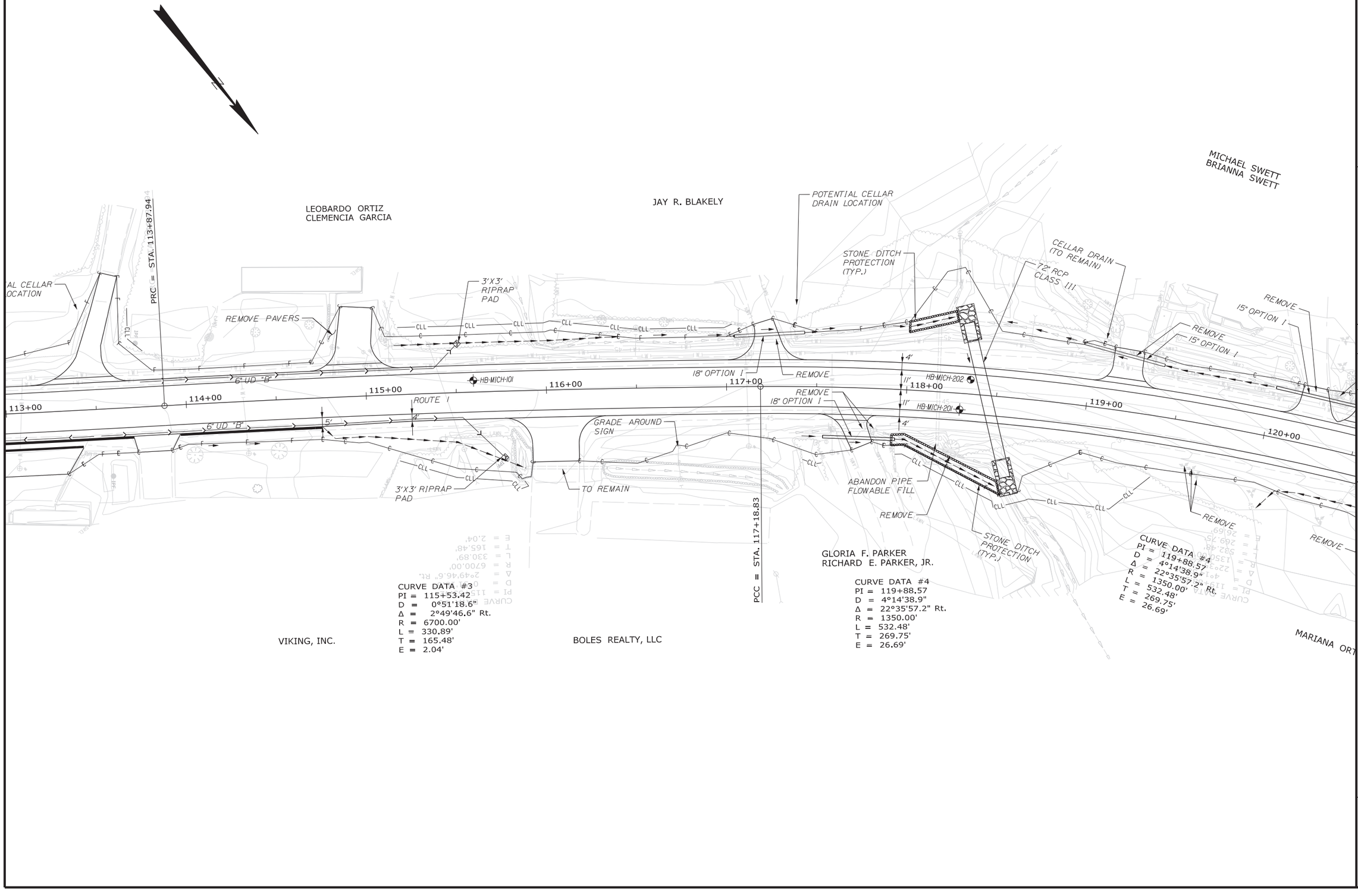
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

3

OF 47



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

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HIGHWAY PLANS

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SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

4

OF 47

KENDRA R. BONNETT

PATRICIA A. PORTRIE
ALICIA A. MCNALLY

JOSHUA A. GAY
VIRGINIA M. GAY

CURVE DATA #5
PI = 125+72.63
D = 0°57'17.7"
Δ = 6°07'51.2" Lt.
R = 6000.00'
L = 642.03'
T = 321.32'
E = 8.60'

PATRICIA A. PORTRIE
ALICIA A. MCNALLY

PHILIP G. SCHUYLER
DEBRA B. SCHUYLER

QUIETUDE WAY

REMOVE FENCE

CONTRACTOR TO USE CAUTION WHILE WORKING IN AREA OF LEACH FIELD AND AVOID IMPACTS

CONNECT CELLAR DRAIN

REMOVE

3'X3' RIPRAP PAD

CBI

TEST PIT

MAINTAIN CELLAR DRAIN

15" OPTION I

6" UD "B"

24" OPTION III

CLL

ROUTE 1

120+00 121+00 122+00 123+00 124+00 125+00 126+00 127+00

4' 5' 5' 4' 4' 11' 11' 4'

MARIANA ORTIZ

PRC = STA. 122+51.31

JOSE G. ORTIZ
GUSTAVO ORTIZ

SUSI BETH PAREDES VAZQUEZ
JOSE ANGEL PAREDES MANRIQUEZ

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	DATE	BY
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED	NOV 2024	T.WHITE
DESIGN2-DETAILED2		Y-T.LEE
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

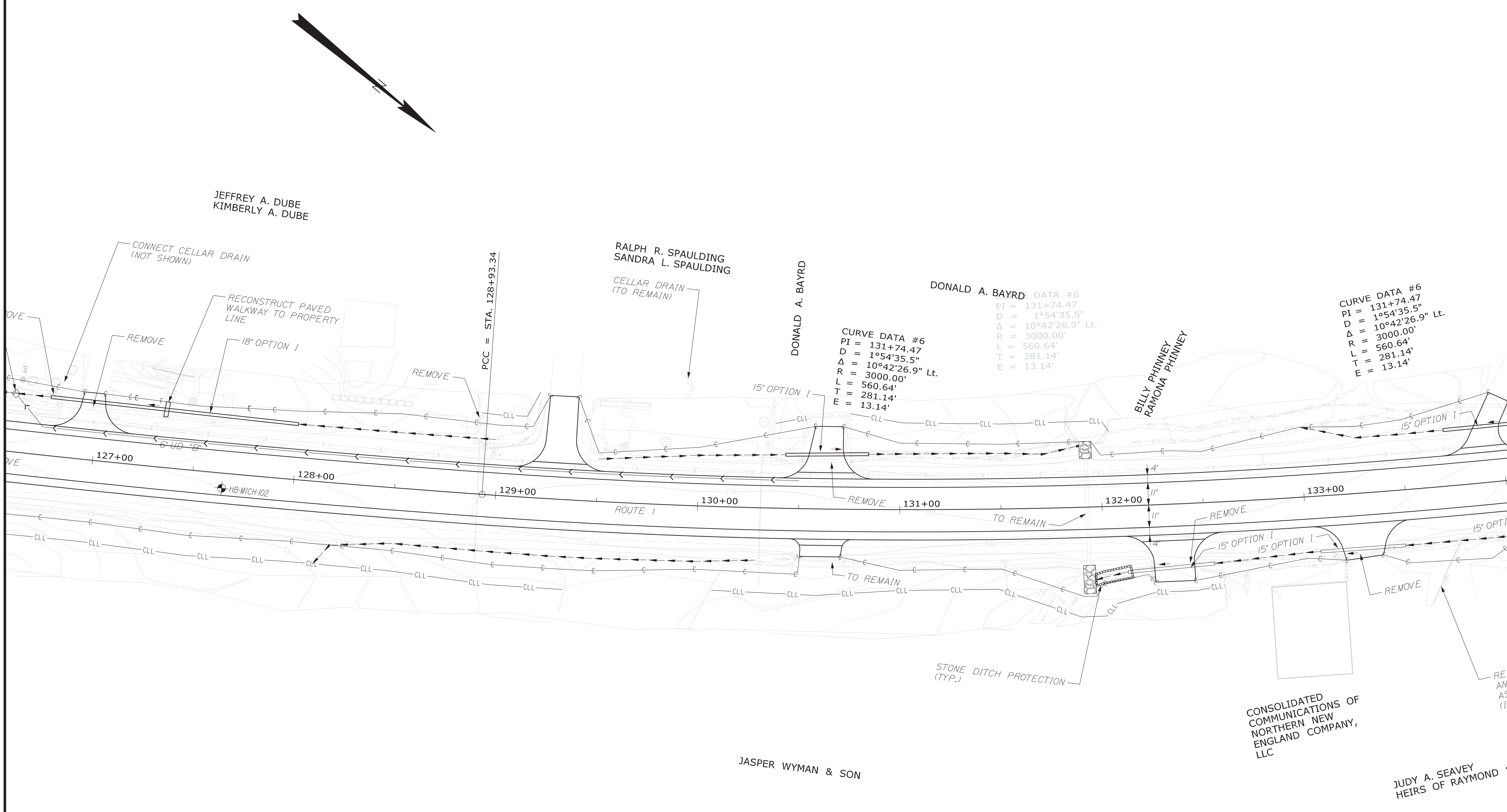
BORING LOCATION PLAN

SHEET NUMBER

5

OF 47

Filename: ...\00\GEOTECH\MSTA\005_BLP4.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024



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STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED	Y-T.LEE	
DESIGN2-DETAILED2	T.WHITE	NOV 2024
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

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P.E. NUMBER

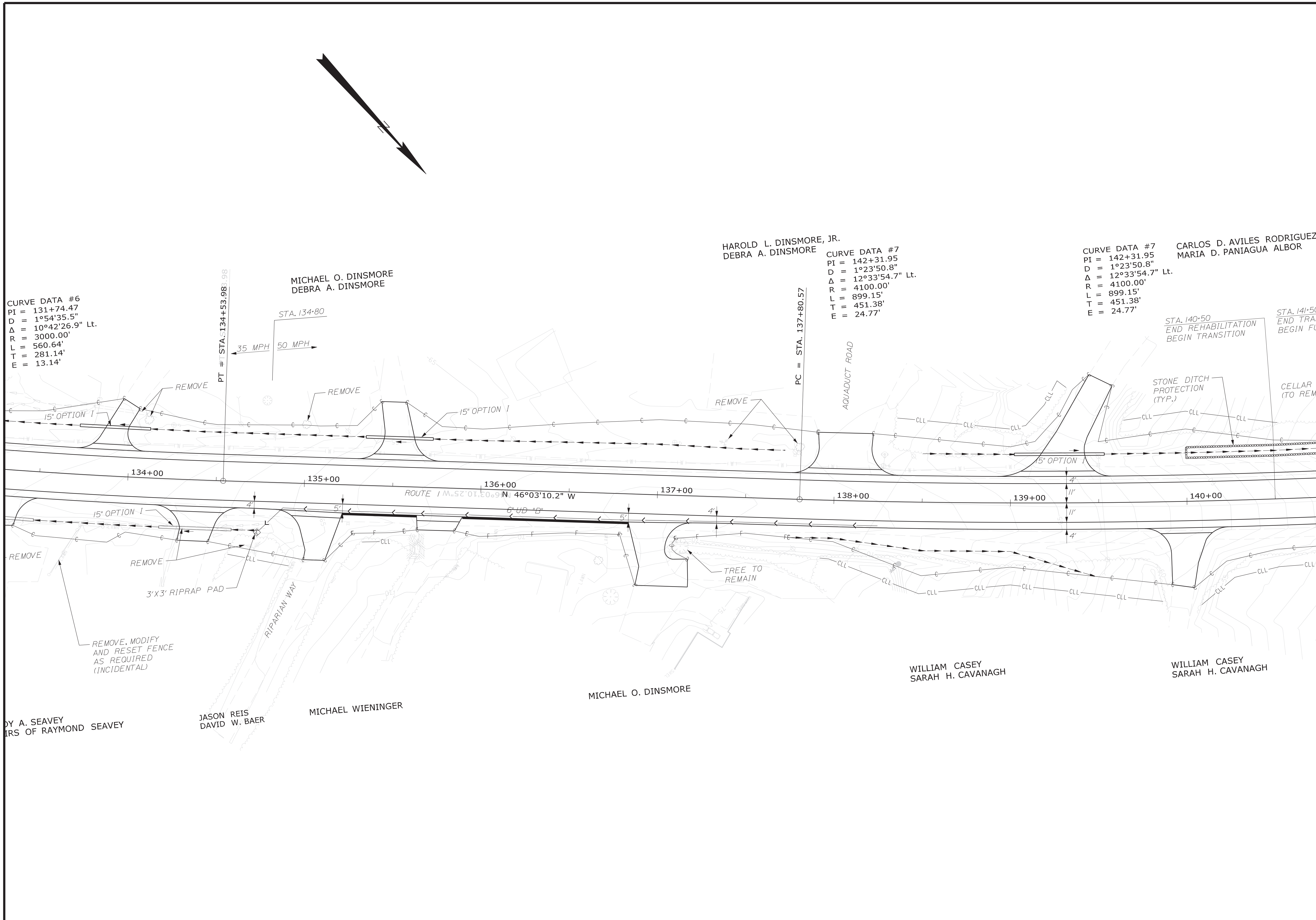
DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER
6
OF 47

Date:11/4/2024 Username: Yueh-Ti.Lee Division: GEOTECH Filename: ...\00\GEOTECH\MSTA\007_BLP6.dgn



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

PROJ. MANAGER	BY	DATE
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CHECKED-REVIEWED	T.WHITE	NOV 2024
DESIGN2-DETAILED2	Y-T.LEE	
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER
7
OF 47

CARLOS D. AVILES RODRIGUEZ
MARIA D. PANIAGUA ALBOR

#7
95
8"
.7" Lt.

CARLOS D. AVILES RODRIGUEZ
MARIA D. PANIAGUA ALBOR

REGINA RITTENHOUSE

HERON J. AREY
MEGAN A. AREY

CURVE DATA #7
PI = 142+31.95
D = 1°23'50.8"
Δ = 12°33'54.7" Lt.
R = 4100.00'
L = 899.15'
T = 451.38'
E = 24.77'

CURVE DATA #7
PI = 142+31.95
D = 1°23'50.8"
Δ = 12°33'54.7" Lt.
R = 4100.00'
L = 899.15'
T = 451.38'
E = 24.77'

PRC = STA. 146+79.71

STA. 140+50
END REHABILITATION
BEGIN TRANSITION

STA. 141+50
END TRANSITION
BEGIN FULL DEPTH RECONSTRUCTION

STONE DITCH PROTECTION (TYP.)

CELLAR DRAIN (TO REMAIN)

18" OPTION I

HB-MICH-104

HB-MICH-103

HB-MICH-204

HB-MICH-203

60" RCP CLASS III

ROUTE 1

REMOVE

15" OPTION I

GRADE AROUND TREE

TRIM TREES TO 10' ABOVE GROUND (INCIDENTAL TO CLEARING ITEM)

CHRISTY L. NORTON

NASH LANE

140+00
141+00
142+00
143+00
144+00
145+00
146+00
147+00

WILLIAM CASEY
SARAH H. CAVANAGH

JOSEPH M. SARGENT

MARK A. NASH
RAYMOND OAKES

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE	SIGNATURE
PROJ. MANAGER	-----	-----	-----
DESIGN-DETAILED	-----	-----	-----
CHECKED-REVIEWED	-----	-----	-----
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024	-----
DESIGN3-DETAILED3	T.WHITE	-----	P.E. NUMBER
REVISIONS 1	-----	-----	-----
REVISIONS 2	-----	-----	-----
REVISIONS 3	-----	-----	DATE
REVISIONS 4	-----	-----	-----
FIELD CHANGES	-----	-----	-----

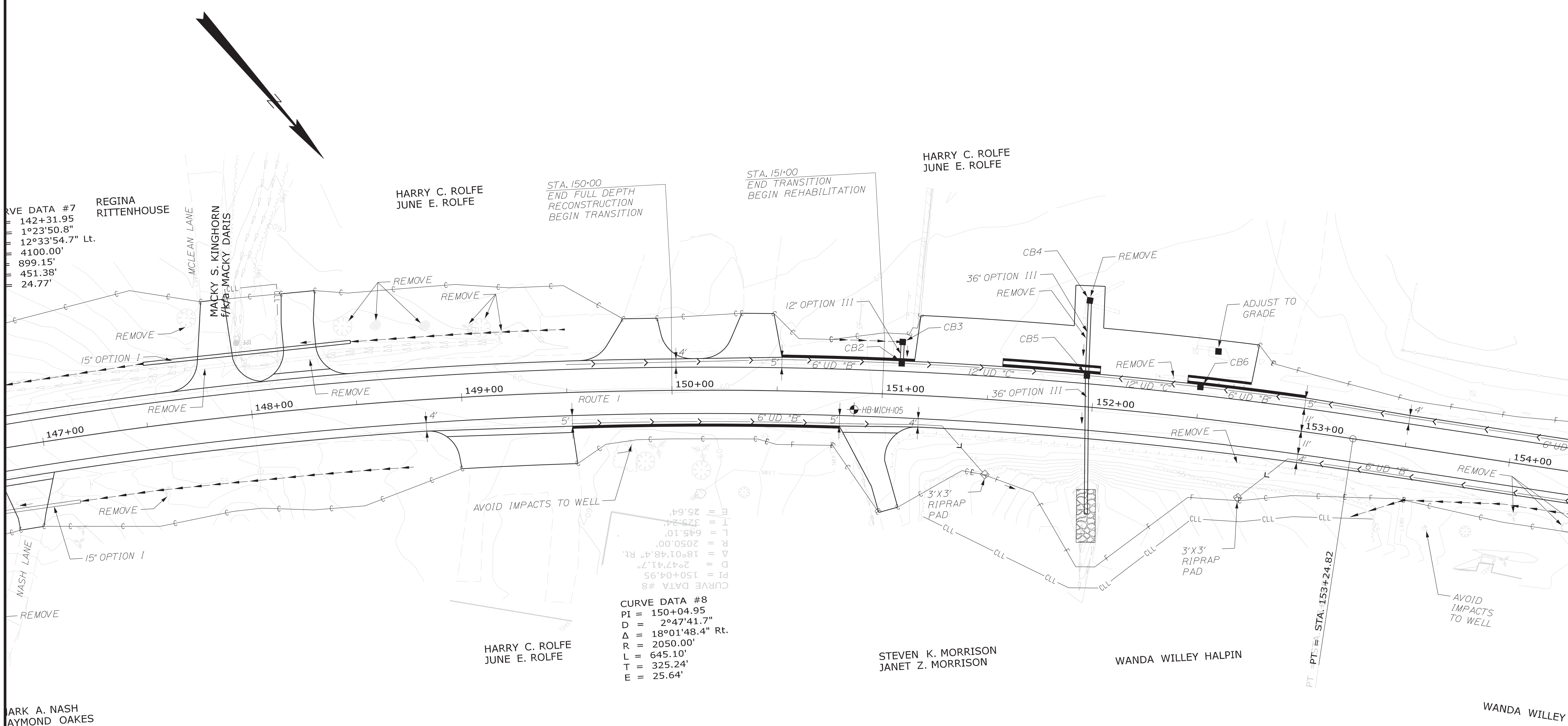
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

8

OF 47



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED	T.WHITE	NOV 2024
DESIGN2-DETAILED2	Y-T.LEE	
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER
9
OF 47

Filename: ...\OO\GEOTECH\MSTA\009_BLP8.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024

CORY A. ROLFE

JOSHUA R. COMPTON
MURIEL J. COMPTON

POTENTIAL CELLAR DRAIN LOCATION

3'X3' RIPRAP PAD

POTENTIAL CELLAR DRAIN LOCATION

6" UD "B"

18" OPTION III

154+00

155+00

156+00
N 40°35'16.6" W

157+00

158+00

159+00

160+00

ROUTE 1

REMOVE

15" OPTION I

CONNECT CELLAR DRAINS (2)
(NOT SHOWN)

CLL

STONE DITCH PROTECTION (TYP.)

AVOID IMPACTS TO WELL

PT = STA. 153+24.02

PC = STA. 158+46.09

CURVE DATA #9
PI = 161+54.98
D = 2°29'28.0"
Δ = 15°17'53.4" Rt.
R = 2300.00'
L = 614.11'
T = 308.89'
E = 20.65'

WANDA WILLEY HALPIN

KAREN S. SCHEVENIEUS
f/k/a KAREN S. OPENSHAW

KAREN S. SCHEVENIEUS
f/k/a KAREN S. OPENSHAW

CASSANDRA L. OPENSHAW

CASSANDRA L. OPENS

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	-----	-----
DESIGN-DETAILED	-----	-----
CHECKED-REVIEWED	-----	-----
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	-----	-----
REVISIONS 1	-----	-----
REVISIONS 2	-----	-----
REVISIONS 3	-----	-----
REVISIONS 4	-----	-----
FIELD CHANGES	-----	-----

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

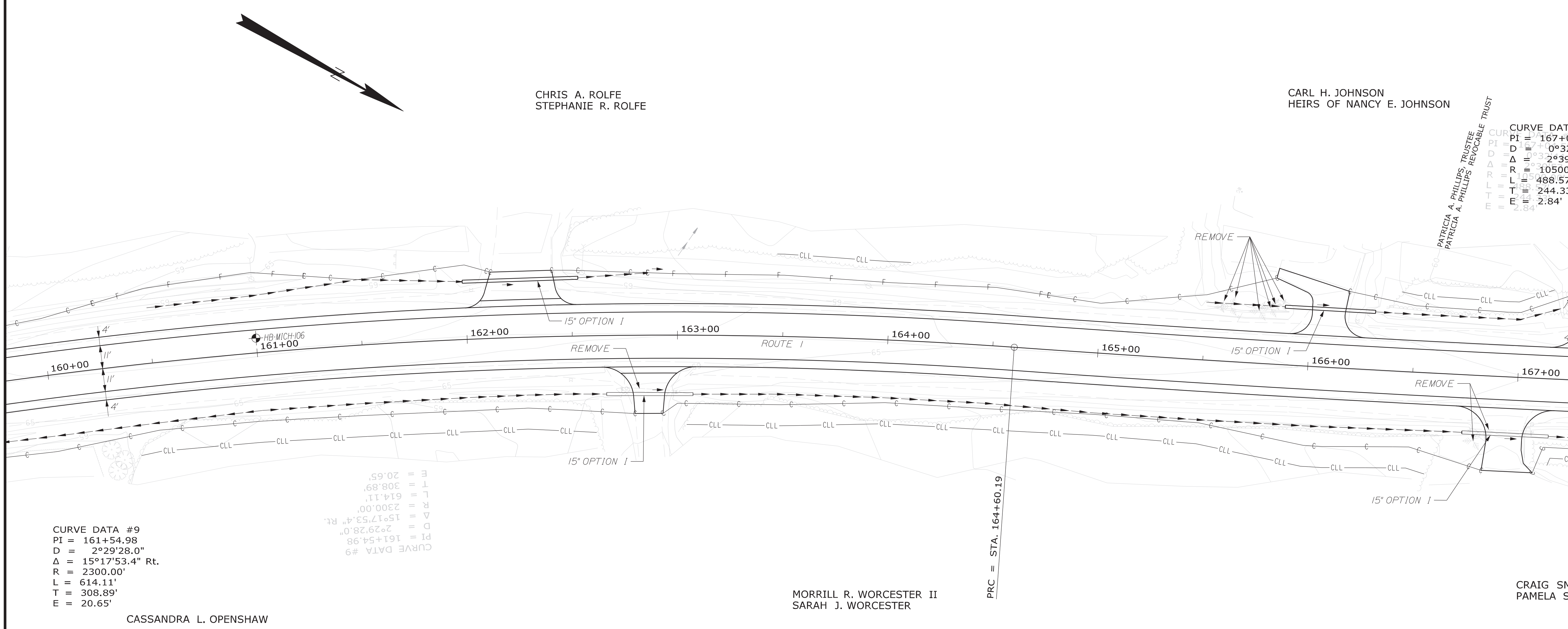
BORING LOCATION PLAN

SHEET NUMBER

10

OF 47

Filename: ...\00\GEOTECH\MSTA\011_BLP10.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00

HIGHWAY PLANS

	SIGNATURE	P.E. NUMBER	DATE
PROJ. MANAGER			
DESIGN-DETAILED			
CHECKED-REVIEWED	T.WHITE		
DESIGN2-DETAILED2	Y-T.LEE		NOV 2024
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

11

OF 47

JOHNSON

PATRICIA A. PHILLIPS, TRUSTEE
PATRICIA A. PHILLIPS REVOCABLE TRUST

CURVE DATA #10
PI = 167+04.52
D = 0°32'44.4"
Δ = 2°39'57.6" Lt.
R = 10500.00'
L = 488.57'
T = 244.33'
E = 2.84'

HEATHER L. DORR

PATRICIA A. PHILLIPS, TRUSTEE
PATRICIA A. PHILLIPS REVOCABLE TRUST

PCC = STA. 169+48.76

KENNETH G. HALLGREN

CURVE DATA
PI = 173+8
D = 0°22
Δ = 3°18'
R = 15000.0
L = 864.30
T = 432.27'
E = 6.23'

STA. 171+00
END REHABILITATION
BEGIN TRANSITION

STA. 172+00
END TRANSITION
BEGIN FULL DEPTH
RECONSTRUCTION

15" OPTION I
REMOVE
TO REMAIN
ROUTE 1
HB-MICH107
HB-MICH108
AVOID
IMPACTS
TO WELL
CLL
4'
11'
167+00
168+00
169+00
170+00
171+00
172+00
173+00

CRAIG SMITH
PAMELA SMITH

MADONNA EVANGELISTA

JOHN J. REESE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	-----	-----
DESIGN-DETAILED	-----	-----
CHECKED-REVIEWED	-----	NOV 2024
DESIGN2-DETAILED2	Y-TLEE	T.WHITE
DESIGN3-DETAILED3	-----	-----
REVISIONS 1	-----	-----
REVISIONS 2	-----	-----
REVISIONS 3	-----	-----
REVISIONS 4	-----	-----
FIELD CHANGES	-----	-----

SIGNATURE

P.E. NUMBER

DATE

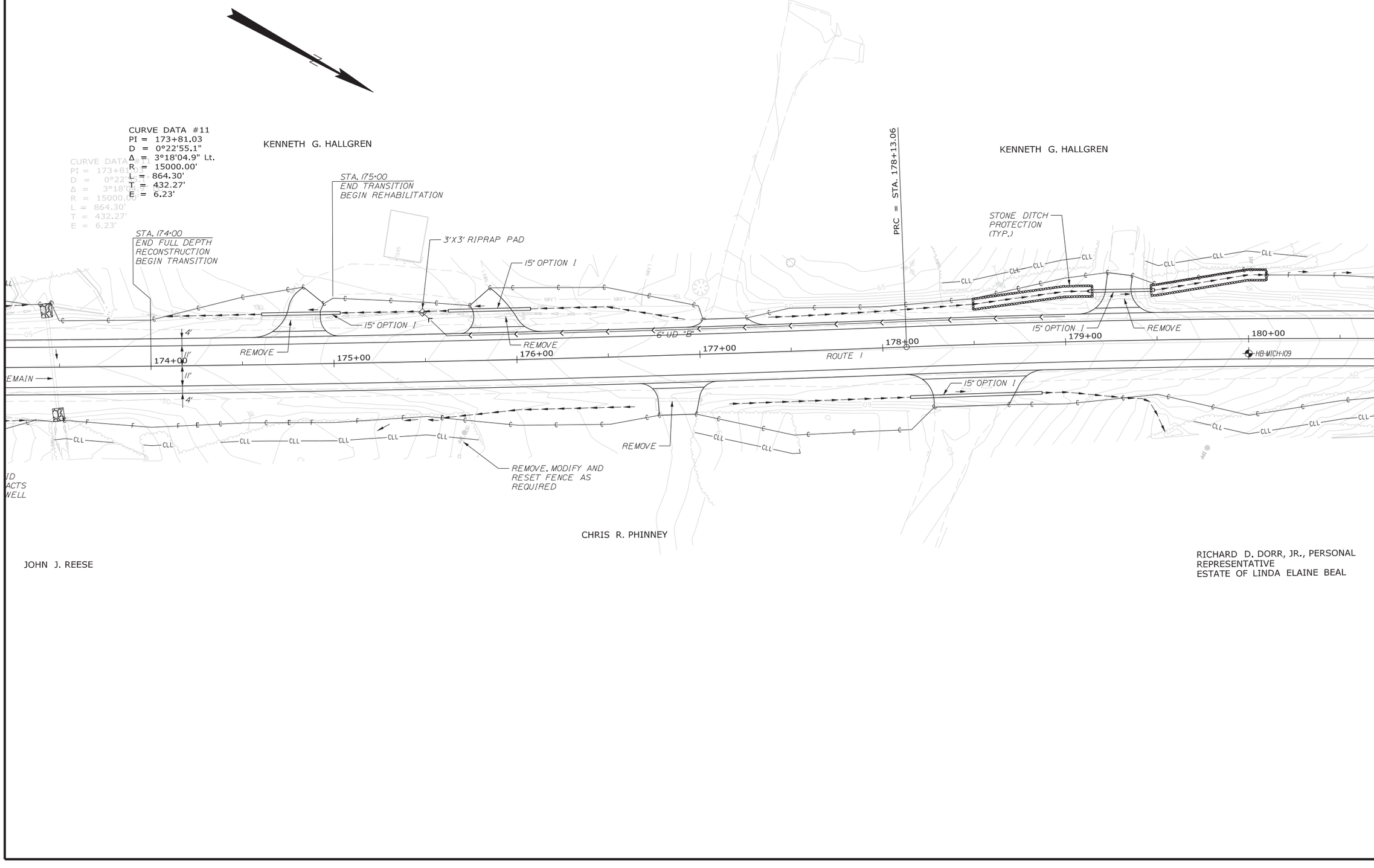
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

12

OF 47



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE	SIGNATURE
PROJ. MANAGER	-----	-----	-----
DESIGN-DETAILED	-----	-----	-----
CHECKED-REVIEWED	-----	-----	-----
DESIGN2-DETAILED	Y-T.LEE	T.WHITE	NOV 2024
DESIGN3-DETAILED	-----	-----	-----
REVISIONS 1	-----	-----	P.E. NUMBER
REVISIONS 2	-----	-----	-----
REVISIONS 3	-----	-----	DATE
REVISIONS 4	-----	-----	-----
FIELD CHANGES	-----	-----	-----

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

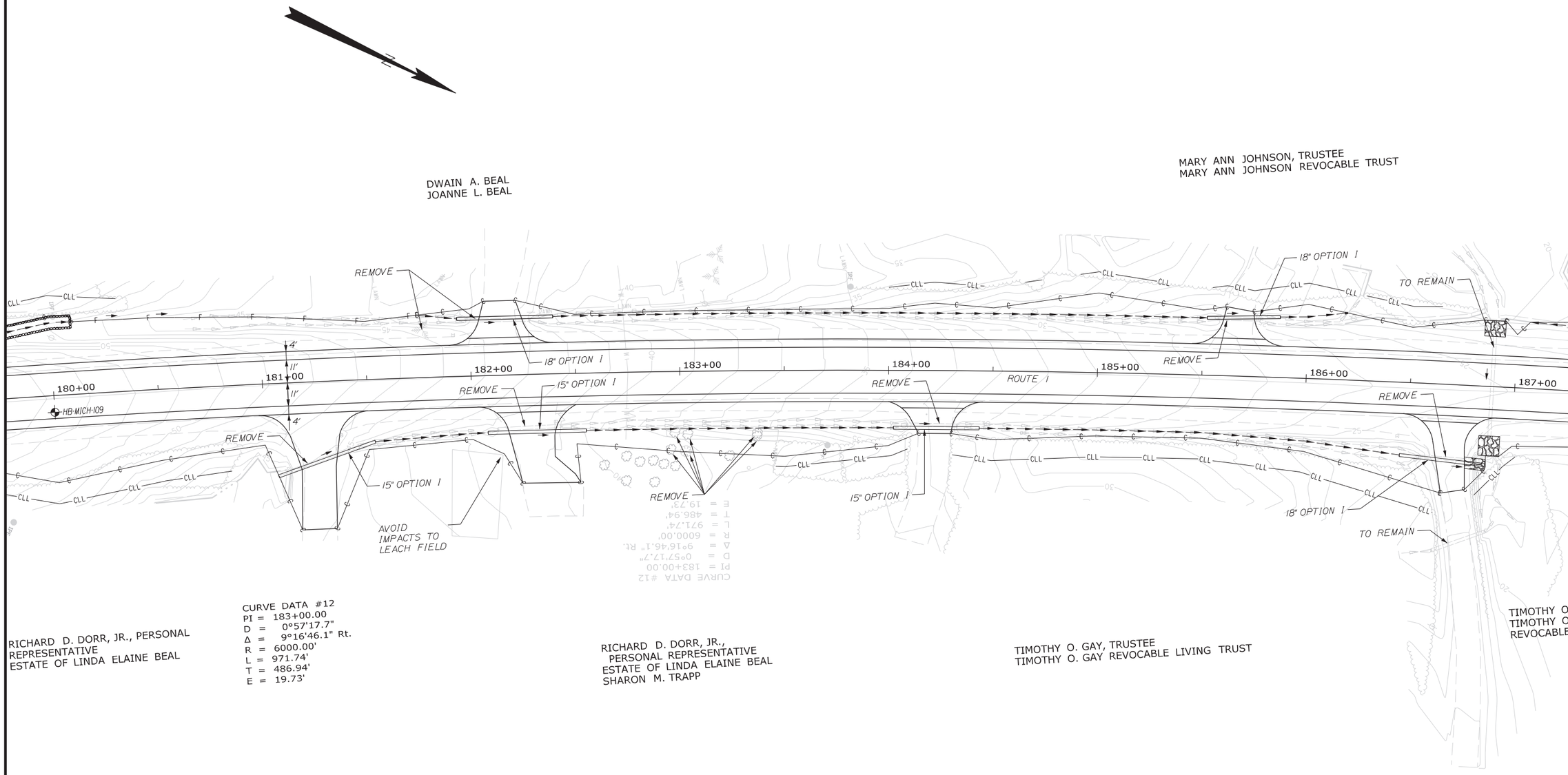
BORING LOCATION PLAN

SHEET NUMBER

13

OF 47

Filename: ...\00\GEOTECH\MSTA\013_BLP12.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	-----	---
DESIGN-DETAILED	-----	---
CHECKED-REVIEWED	-----	---
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	T.WHITE	NOV 2024
REVISIONS 1	-----	-----
REVISIONS 2	-----	-----
REVISIONS 3	-----	-----
REVISIONS 4	-----	-----
FIELD CHANGES	-----	-----

SIGNATURE

P.E. NUMBER

DATE

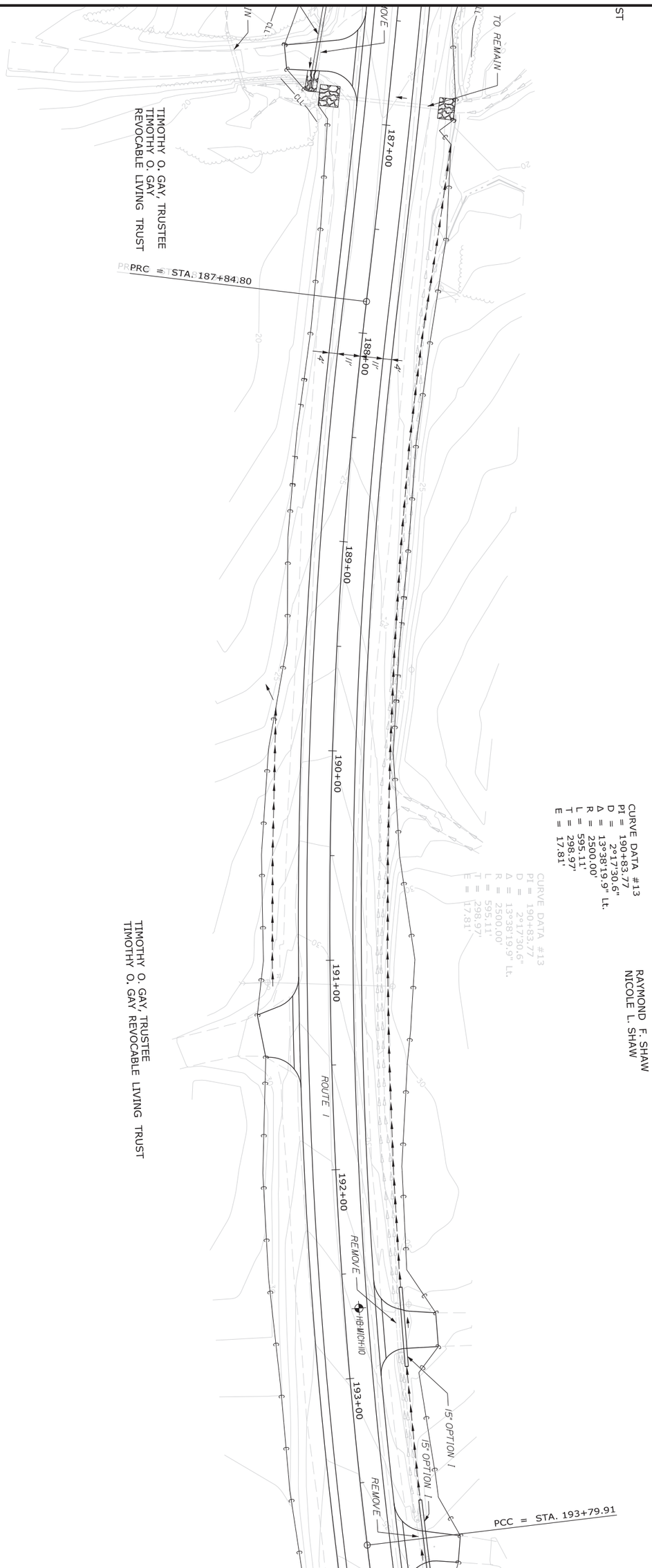
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

14

OF 47



MILBRIDGE-CHERRYFIELD ROUTES 1 & 182	PROJ. MANAGER	BY	DATE
BORING LOCATION PLAN	DESIGN-DETAILED		
	CHECKED-REVIEWED		
	DESIGN2-DETAILED2	Y-T.LEE	T.WHITE NOV 2024
	DESIGN3-DETAILED3		
	REVISIONS 1		
	REVISIONS 2		
	REVISIONS 3		
	REVISIONS 4		
	FIELD CHANGES		

SIGNATURE

P.E. NUMBER

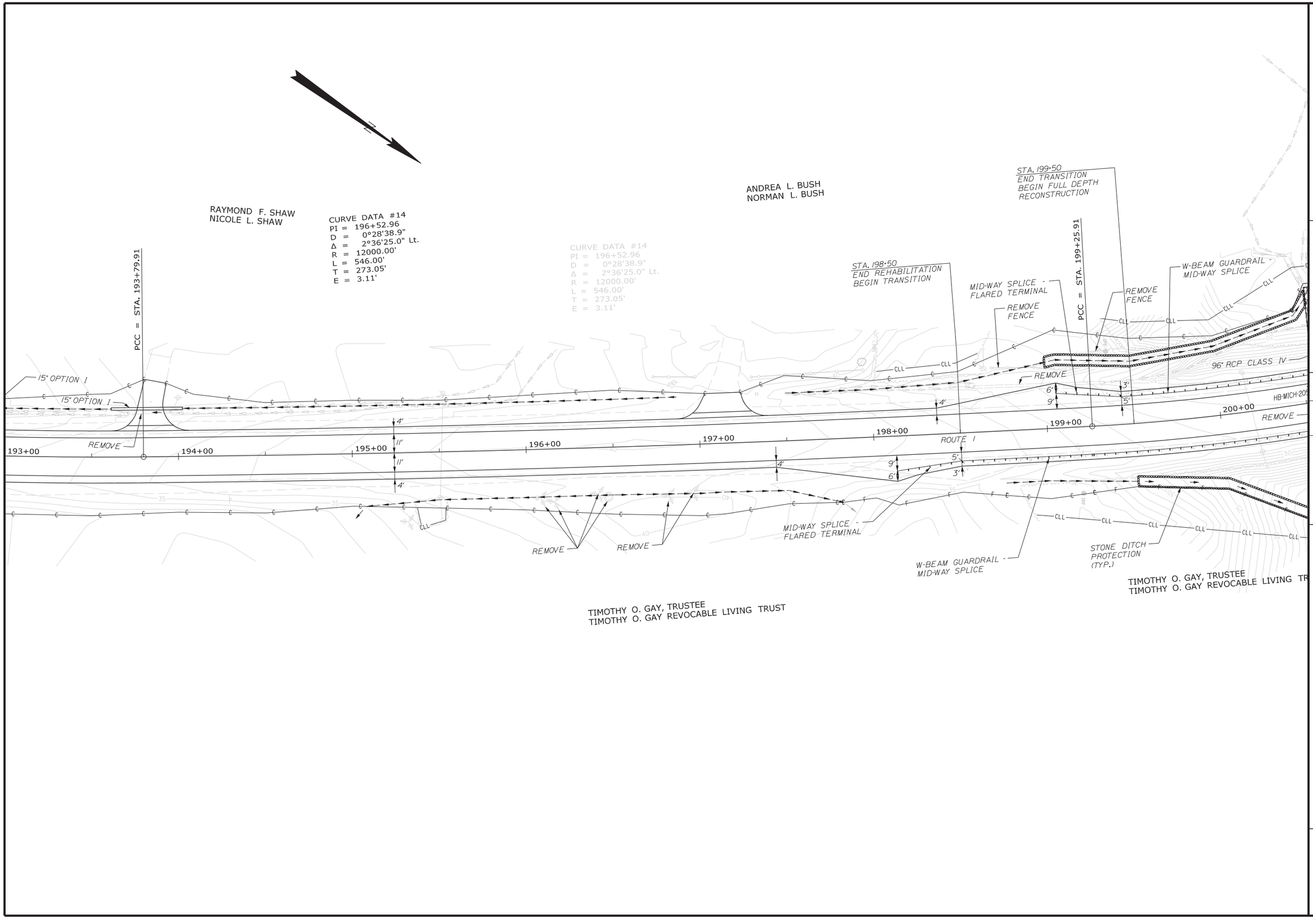
DATE

SHEET NUMBER 15 OF 47

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00 HIGHWAY PLANS



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED		
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

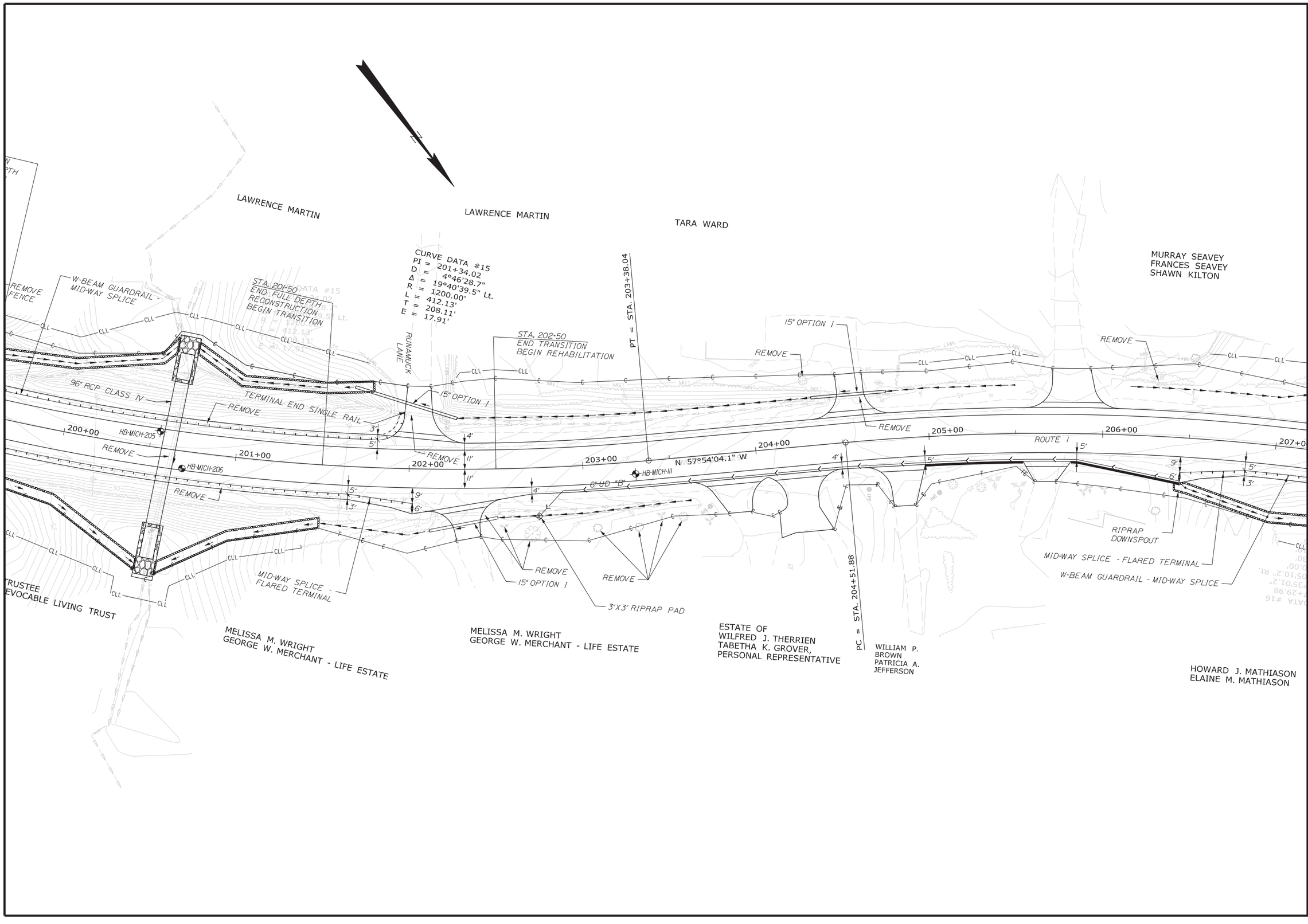
BORING LOCATION PLAN

SHEET NUMBER

16

OF 47

Filename: ...\00\GEOTECH\MSTA\016_BLP15.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	------	------
DESIGN-DETAILED	------	------
CHECKED-REVIEWED	-----	-----
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	------	------
REVISIONS 1	------	------
REVISIONS 2	------	------
REVISIONS 3	------	------
REVISIONS 4	------	------
FIELD CHANGES	------	------

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

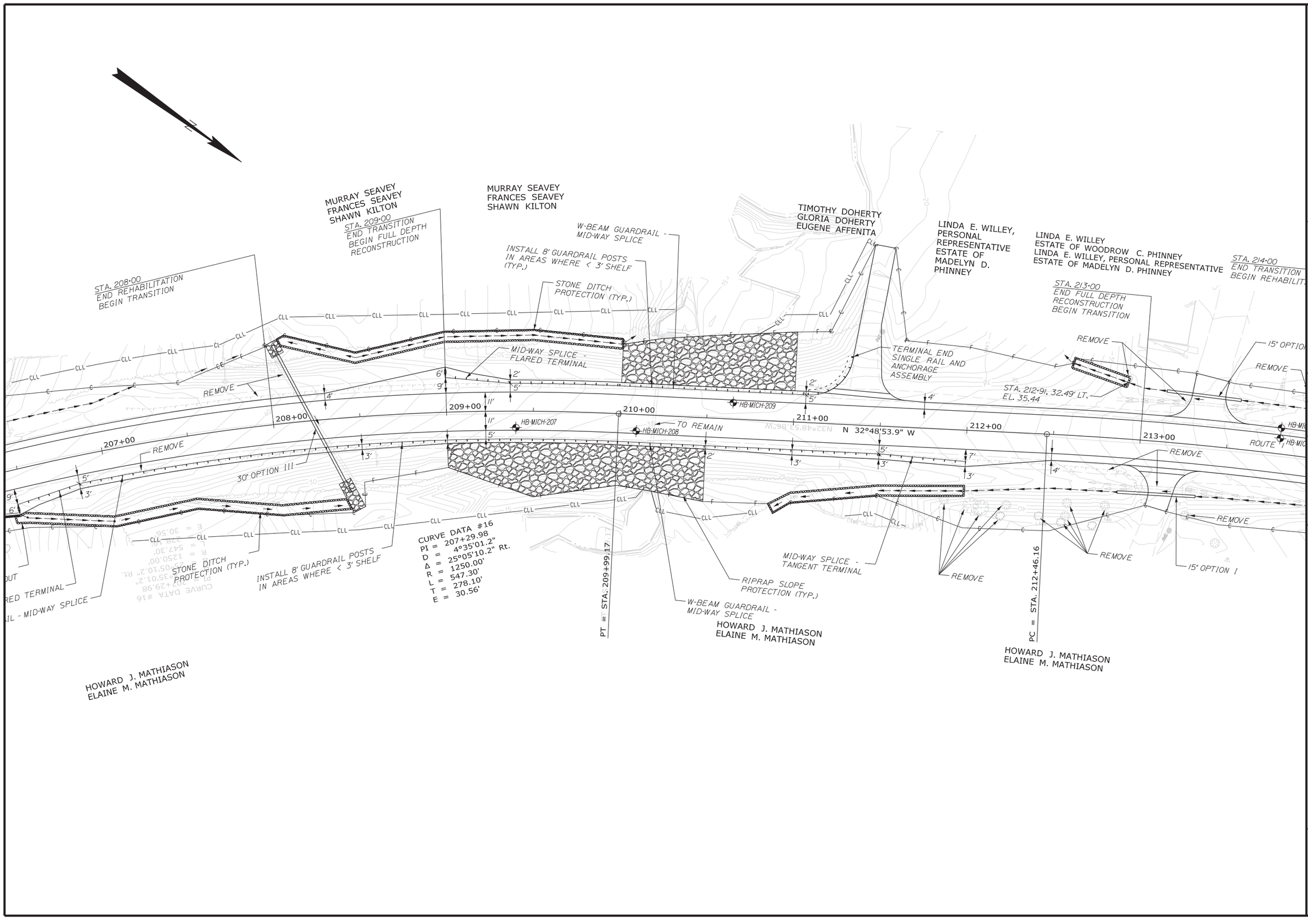
BORING LOCATION PLAN

SHEET NUMBER

17

OF 47

Filename: ...\00\GEOTECH\MSTA\017_BLP16.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE	SIGNATURE
PROJ. MANAGER	------	------	------
DESIGN-DETAILED	------	------	P.E. NUMBER
CHECKED-REVIEWED	T. WHITE	NOV 2024	------
DESIGN2-DETAILED2	Y-T LEE	------	DATE
DESIGN3-DETAILED3	------	------	------
REVISIONS 1	------	------	------
REVISIONS 2	------	------	------
REVISIONS 3	------	------	------
REVISIONS 4	------	------	------
FIELD CHANGES	------	------	------

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

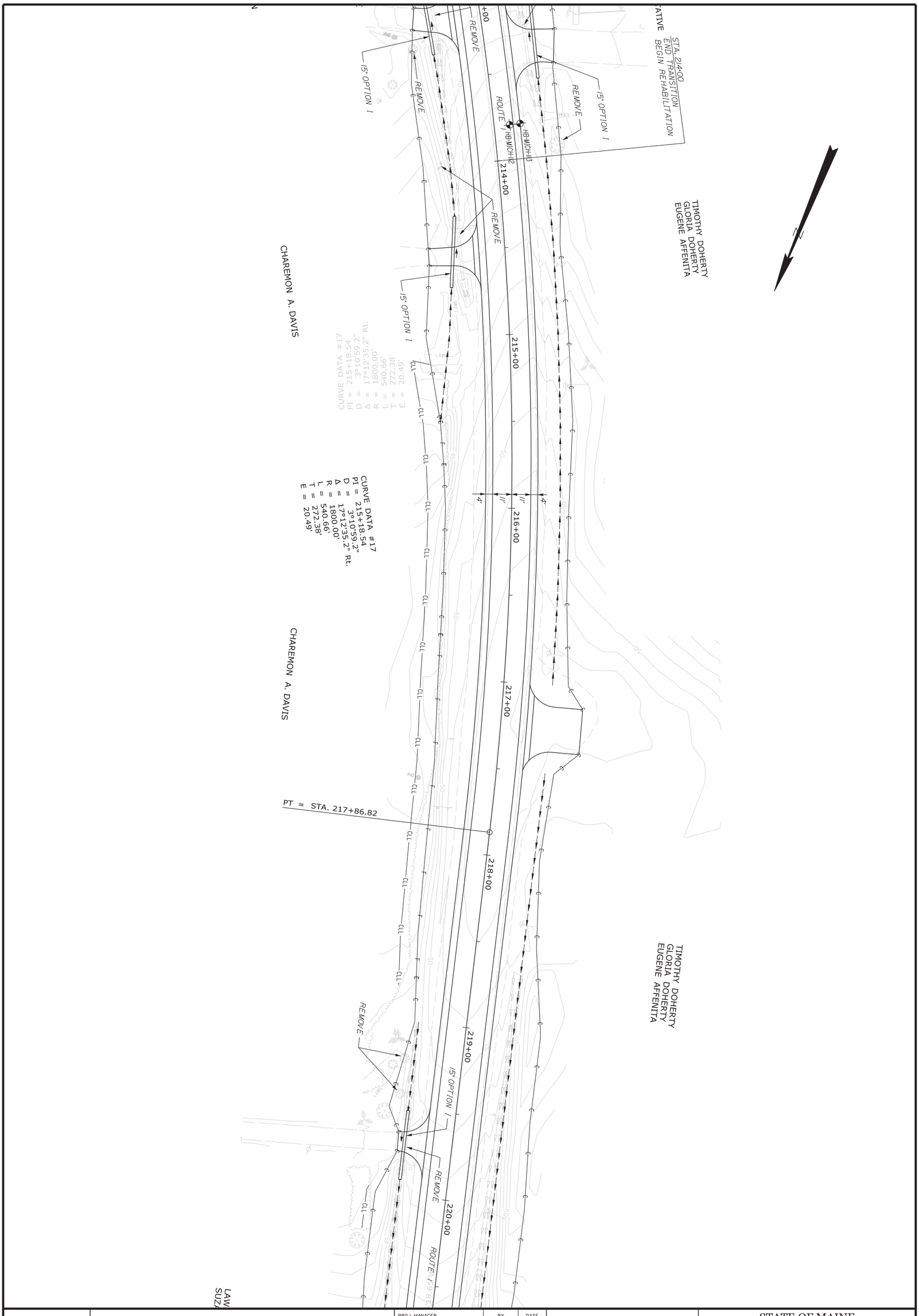
SHEET NUMBER

18

OF 47

Filename: ...\00\GEOTECH\MSTA\018_BLP17.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024

Filename: ...\00\GEOTECH\MSTA\019_BLP18.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024



PROJ. MANAGER		BY	DATE
DESIGN-DETAILED			
CHECKED-REVIEWED			
DESIGN2-DETAILED2	Y-T.LEE	T.WHITE	NOV 2024
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

SHEET NUMBER 19 OF 47

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

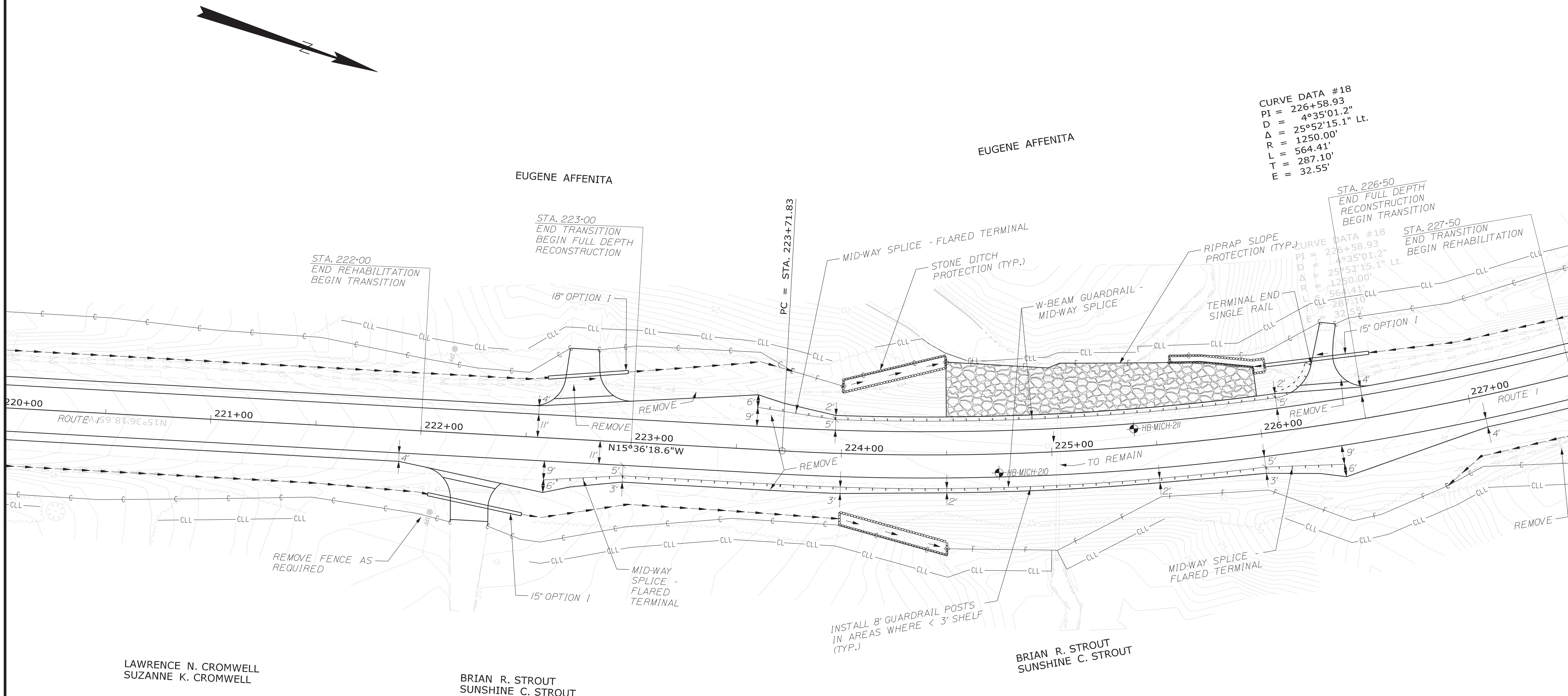
BORING LOCATION PLAN

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED		
DESIGN2-DETAILED2	Y-T.LEE	T.WHITE	NOV 2024
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER
20
OF 47

URVE DATA #18
= 226+58.93
= 4°35'01.2"
= 25°52'15.1" Lt.
= 1250.00'
564.41'
287.10'
32.55'

STA. 226+50
END FULL DEPTH
RECONSTRUCTION
BEGIN TRANSITION

STA. 227+50
END TRANSITION
BEGIN REHABILITATION

15" OPTION 1

CHURCH OF THE OPEN
BIBLE OF CHERRYFIELD

PT = STA. 229+36.25

CHURCH OF THE OPEN
BIBLE OF CHERRYFIELD

CLAYTON H. GAY, III
LORENA F. GAY

REMOVE

227+00
228+00
229+00
230+00
231+00
232+00
233+00

ROUTE 1

18" OPTION 1

N41°28'33.8"W

4'
11'
9'
6'
5'
3'

REMOVE

18" OPTION 1

REMOVE

MID-WAY SPLICE - FLARED TERMINAL

W-BEAM GUARDRAIL - MID-WAY SPLICE

24" OPTI

RIPRAP DO

CHEZ PEREZ, LLC

CHEZ PEREZ, LLC

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	DATE	BY	SIGNATURE
PROJ. MANAGER	-----	-----	-----
DESIGN-DETAILED	-----	-----	-----
CHECKED-REVIEWED	-----	T. WHITE	NOV 2024
DESIGN2-DETAILED2	-----	Y-T.LEE	-----
DESIGN3-DETAILED3	-----	-----	-----
REVISIONS 1	-----	-----	-----
REVISIONS 2	-----	-----	-----
REVISIONS 3	-----	-----	-----
REVISIONS 4	-----	-----	-----
FIELD CHANGES	-----	-----	-----

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

21

OF 47

AYTON H. GAY, III
RENA F. GAY

JEREMY S. GAY

PC = STA. 235+76.08

CURVE DATA #19
PI = 238+55.22
D = 0°57'17.7"
Δ = 5°19'38.5" Lt.
R = 6000.00'
L = 557.88'
T = 279.14'
E = 6.49'

JEREMY S. GAY

JEREMY S. GAY

CURVE DATA #19
PI = 238+55.22
D = 0°57'17.7"
Δ = 5°19'38.5" Lt.
R = 6000.00'
L = 557.88'
T = 279.14'
E = 6.49'

CLAYTON
LORENA

CONNEC
(NOT S

REMOVE

15" OPTION I

ABANDON PIPE
FLOWABLE FILL

234+00 235+00 236+00 237+00 238+00 239+00 240+00

ROUTE 1

ROUTE 1

5'
3'
9'
6'
4'
4'
11'
11'
4'
4'

REMOVE

15" OPTION I

REMOVE

24" OPTION III

MID-WAY SPLICE - FLARED TERMINAL

POTENTIAL
CELLAR
DRAINS

STONE DITCH
PROTECTION
(TYP.)

RIPRAP DOWNSPOUT

ELIZABETH C. SMITH
AGOSTINO ANANIA

ELIZABETH C. SMITH
AGOSTINO ANANIA

JAMES L. WHITE, JR.
KATHARINE K. WHITE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED		
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	T. WHITE	
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

22

OF 47

CLAYTON H. GAY, III
LORENA F. GAY

MICHAEL TENNEY
MELISSA TENNEY

MATHE
JENNY

PT = STA. 241+33.96

CONNECT CELLAR DRAIN (NOT SHOWN)

REMOVE

15" OPTION I

REMOVE

REMOVE

15" OPTION I
TO REMAIN

REMOVE

STA. 245+00
END REHABILITATION
BEGIN TRANSITION

15" OPTION I

STA. 246+00
END TRANSITION
BEGIN FULL DEPTH
RECONSTRUCTION

18" OPTION I

TERMINAL END
SINGLE RAIL

RIPRA
PROTE
(TYP.)

240+00 241+00 242+00 243+00 244+00 245+00 246+00 247+00

ROUTE 1

N 46°48'12.3" W

N 46°48'12.3" W

TO REMAIN

HB-MICH-212

HB-MICH-212

REMOVE

HANSON LANE

AVOID IMPACT TO FENCE

MID-WAY SPLICE - FLARED TERMINAL

INSTALL 8' GUARDRAIL POSTS IN AREAS WHERE < 3' SHELF (TYP.)

STONE DITCH PROTECTION (TYP.)

MID-WAY
FLARED

STROUT CEMETERY ASSOCIATION

JAMES L. WHITE, JR.
KATHARINE K. WHITE

BRUCE E. HALL, JR.
EILEEN BADER HALL

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	DATE	BY	SIGNATURE
PROJ. MANAGER			
DESIGN-DETAILED			
CHECKED-REVIEWED	NOV 2024	T. WHITE	
DESIGN2-DETAILED2		Y-TLEE	P.E. NUMBER
DESIGN3-DETAILED3			
REVISIONS 1			DATE
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

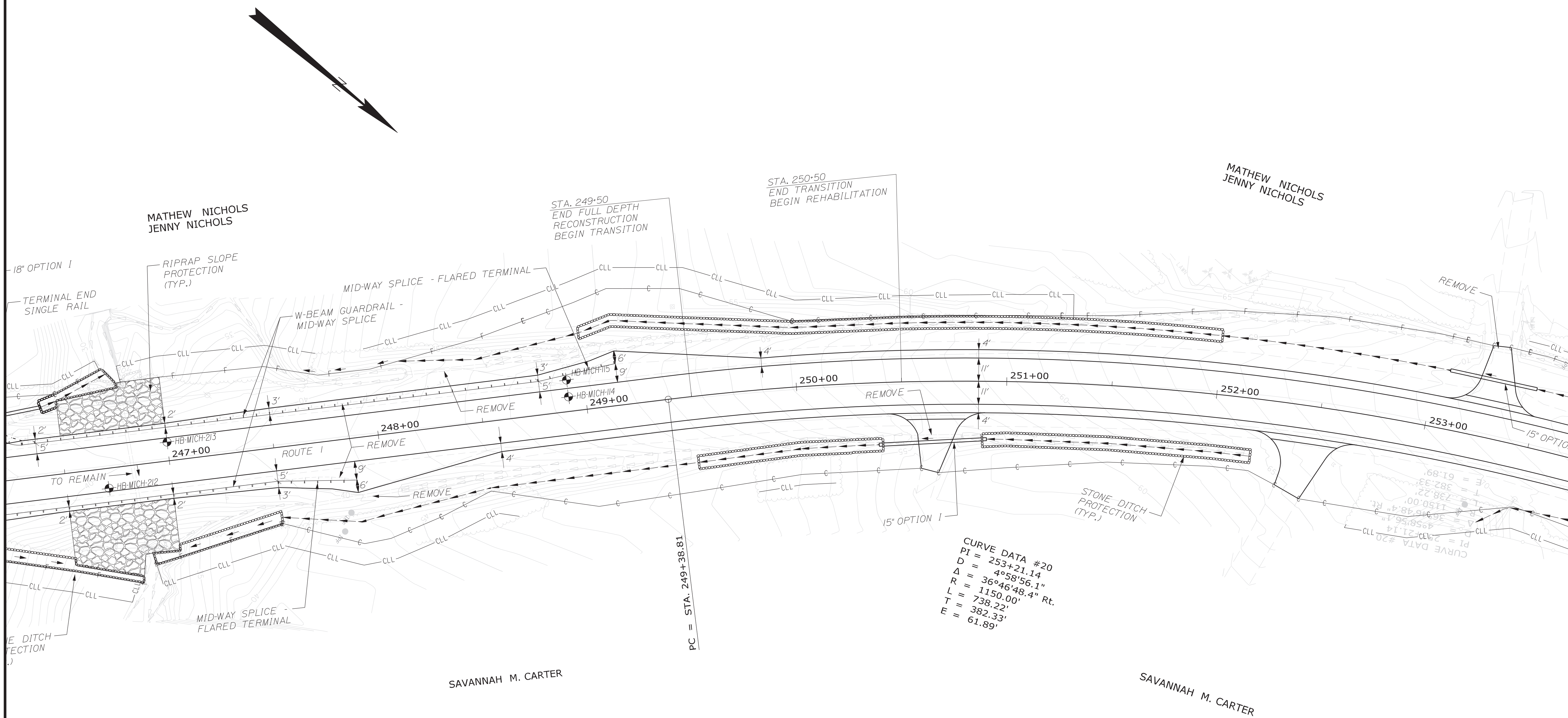
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

23

OF 47



Filename: ...\00\GEOTECH\MSTA\024_BLP23.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED	T.WHITE	NOV 2024
DESIGN2-DETAILED2	Y.T.LEE	
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

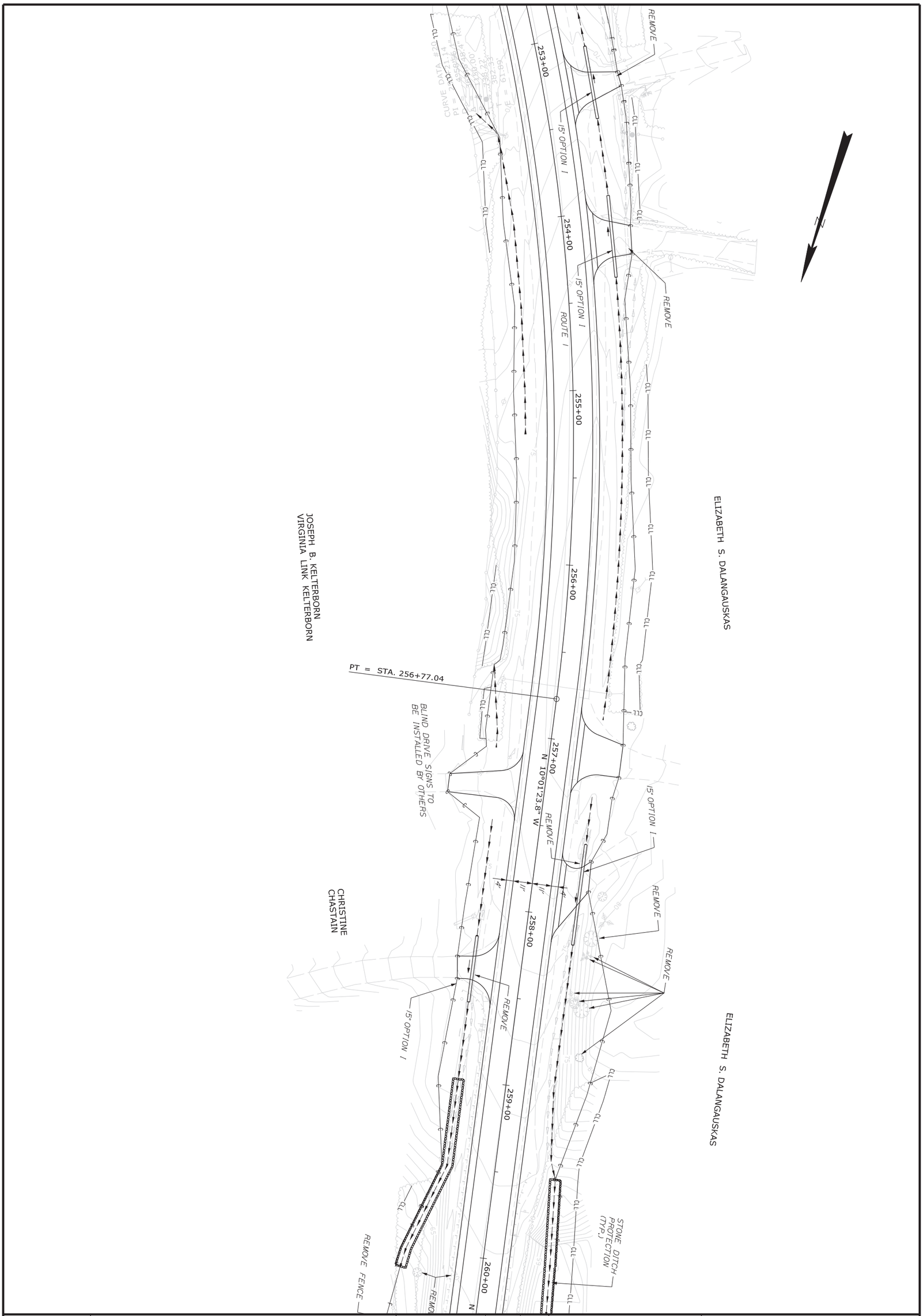
P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER
24
OF 47



PROJ. MANAGER		BY	DATE
DESIGN-DETAILED			
CHECKED-REVIEWED			
DESIGN2-DETAILED2	Y-T.LEE	T.WHITE	NOV 2024
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER 25 OF 47

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

STEPHEN W. BROWN
TRICIA C. BROWN

CHRISTINE CHASTAIN

NORMAN H. OLSEN, JR.
PATRICIA M. OLSEN

NORMAN H. OLSEN, JR.
PATRICIA M. OLSEN

STONE DITCH PROTECTION (TYP.)
REMOVE
W-BEAM GUARDRAIL - MID-WAY SPLICE TO REMAIN
TERMINAL END SINGLE RAIL
15" OPTION I
36" OPTION III
REMOVE FENCE WITHIN IMPACTED AREA
REMOVE FENCE
ABANDON PIPE FLOWABLE FILL
MID-WAY SPLICE - FLARED TERMINAL
W-BEAM GUARDRAIL - MID-WAY SPLICE
INSTALL 8' GUARDRAIL POSTS IN AREAS WHERE < 3' SHELF (TYP.)
PC = STA. 264+98.64
260+00
261+00
262+00
263+00
264+00
265+00
266+00
N 10°01'23.8" W
ROUTE 1
11'
4'
9'
6'
5'
3'
2'
CLL
E
F
C

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	DATE	BY	SIGNATURE
PROJ. MANAGER	-----	-----	-----
DESIGN-DETAILED	-----	-----	-----
CHECKED-REVIEWED	-----	-----	NOV 2024
DESIGN2-DETAILED2	-----	Y-T.LEE	T.WHITE
DESIGN3-DETAILED3	-----	-----	-----
REVISIONS 1	-----	-----	P.E. NUMBER
REVISIONS 2	-----	-----	-----
REVISIONS 3	-----	-----	DATE
REVISIONS 4	-----	-----	-----
FIELD CHANGES	-----	-----	-----

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

26

OF 47

Filename: ...\00\GEOTECH\MSTA\026_BLP25.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024

N

DAVID C. HAMPTON
ASTA L. HAMPTON

PLICE

DAVID C. HAMPTON
ASTA L. HAMPTON

CLL

C

F

10

6+00

267+00

268+00

269+00

270+00

271+00

272+00

273+00

ROUTE 1

HB-WICH-116

REMOVE

4"

15" OPTION I

24" OPTION

ERMINAL END SINGLE RAIL

DRAIL - MID-WAY SPLICE

DRAIL POSTS
RE < 3' SHELF

NORMAN H. OLSEN, JR.
PATRICIA M. OLSEN

CURVE DATA #21
PI = 268+59.22
D = 4°05'33.2"
Δ = 28°53'09.7" Rt.
R = 1400.00'
L = 705.82'
T = 360.58'
E = 45.69'

NORMAN H. OLSEN, JR.
PATRICIA M. OLSEN

PT = STA. 272+04.46

REMOVE FENCE WITHIN IMPACTED AREA

STONE DITCH PROTECTION (TYP.)

RIPRAP DOWNSPOUT

NORMAN H. OLSEN, JR.
PATRICIA M. OLSEN

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	-----	---
DESIGN-DETAILED	-----	-----
CHECKED-REVIEWED	-----	-----
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	-----	-----
REVISIONS 1	-----	-----
REVISIONS 2	-----	-----
REVISIONS 3	-----	-----
REVISIONS 4	-----	-----
FIELD CHANGES	-----	-----

SIGNATURE

P.E. NUMBER

DATE

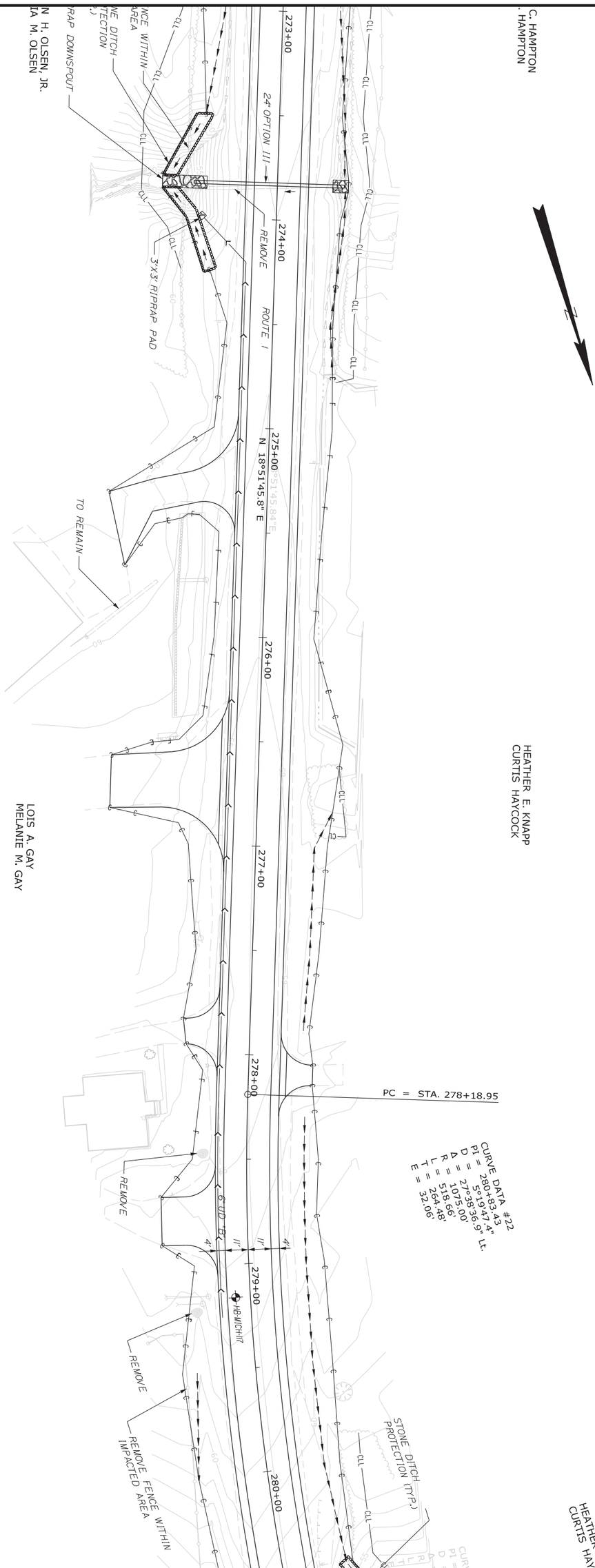
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

27

OF 47



MILBRIDGE-CHERRYFIELD ROUTES 1 & 182	PROJ. MANAGER	BY	DATE
	DESIGN-DETAILED		
	CHECKED-REVIEWED		
	DESIGN2-DETAILED2	Y-T.LEE T.WHITE	NOV 2024
	DESIGN3-DETAILED3		
	REVISIONS 1		
	REVISIONS 2		
	REVISIONS 3		
	REVISIONS 4		
	FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

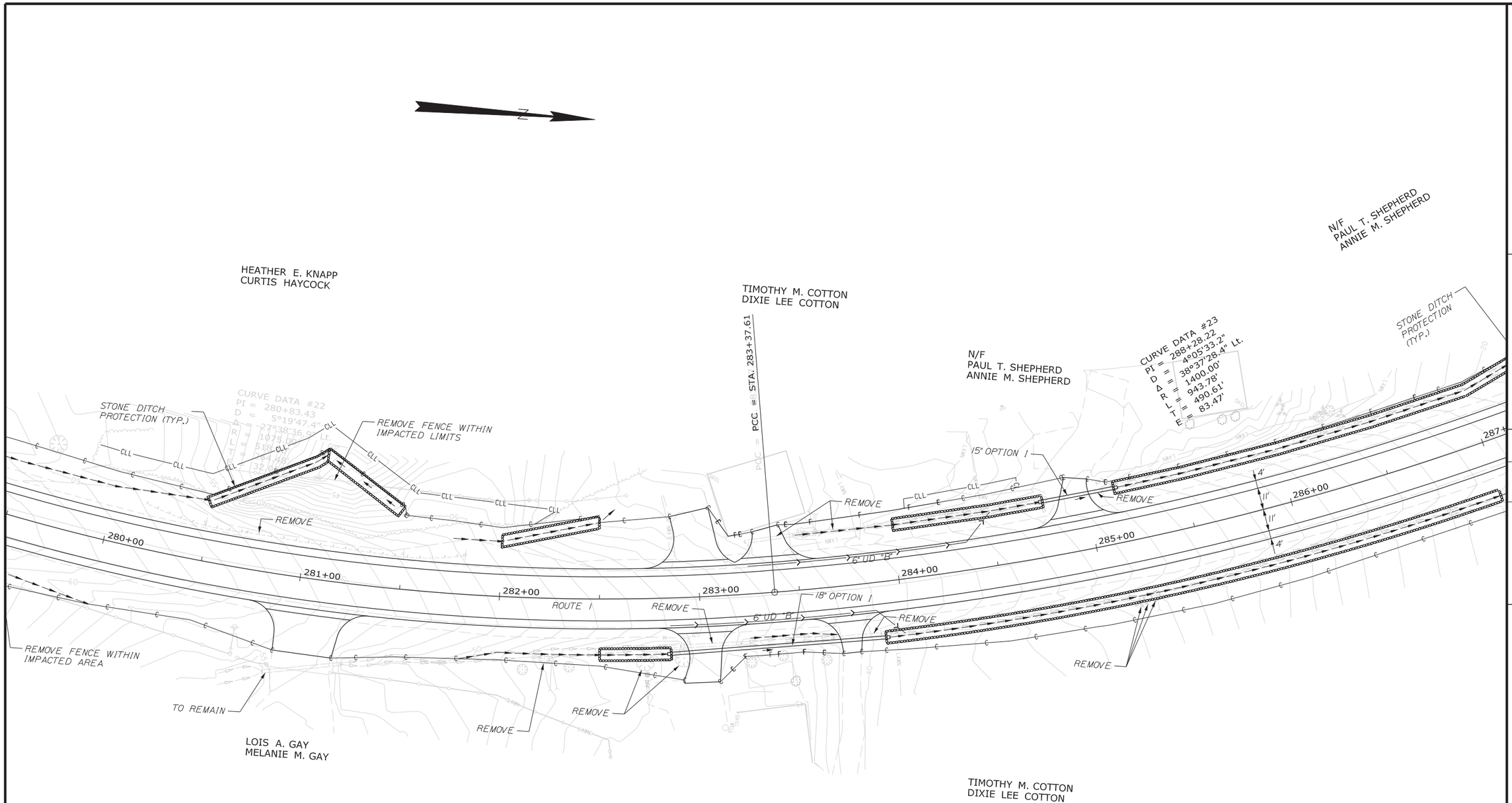
STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

BORING LOCATION PLAN

SHEET NUMBER 28 OF 47



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	----------	---
DESIGN-DETAILED	----------	---
CHECKED-REVIEWED	-----	-----
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	----------	-----
REVISIONS 1	------	------
REVISIONS 2	------	------
REVISIONS 3	------	------
REVISIONS 4	------	------
FIELD CHANGES	------	------

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

29

OF 47

N/F
PAUL T. SHEPHERD
ANNIE M. SHEPHERD

TIMOTHY M. COTTON
DIXIE COTTON

CARROLL MACLEAN
CHRISTIA MACLEAN

KENNETH E. RIPLEY
NICOLE M. RIPLEY

N/F
THORNHEDGE
INN, LLC

DRU ASLAM

SUSANNA B. PLACE
SCOTT STOLL

TIMOTHY M. COTTON
DIXIE LEE COTTON

MARSHLAND

ATA #23
+28.22
°05'33.2"
37'28.4" Lt.
00.00'
.78'
.61'
.47'

CURVE DATA #23
PI = 288+28.22
D = 4°05'33.2"
Δ = 38°37'28.4"
R = 1400.00'
L = 943.78'
T = 491.61'

STONE DITCH PROTECTION (TYP.)

INSTALL 8' GUARDRAIL POSTS IN AREAS WHERE < 3' SHELF (TYP.)

W-BEAM GUARDRAIL - MID-WAY SPLICE

MID-WAY SPLICE - FLARED TERMINAL

TERMINAL END SINGLE RAIL

TO REMAIN

REMOVE

ROUTE 1

COTTON LANE

PT STA 292+81.33

15" OPTION I

286+00
287+00
288+00
289+00
290+00
291+00
292+00
293+00

CLL
CL
CLI

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	-----	---
DESIGN-DETAILED	-----	---
CHECKED-REVIEWED	-----	-----
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	-----	-----
REVISIONS 1	-----	-----
REVISIONS 2	-----	-----
REVISIONS 3	-----	-----
REVISIONS 4	-----	-----
FIELD CHANGES	-----	-----

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

30

OF 47

N/F
THORNHEDGE
INN, LLC

DRU ASLAM

PT = STA. 292+81.39

REMOVE

CLL

4'
11'
11'
4'

293+00
294+00
295+00
296+00
297+00
298+00
299+00

N 47°24'19.4" W

ROUTE 1

HB-MICH-118
HB-MICH-119

REMOVE

REMOVE

REMOVE

24" OPTION III

STONE DITCH
PROTECTION
(TYP.)

N/F
THORNHEDGE INN, LLC

SUSANNA B. PLACE
SCOTT STOLL

PETER S. SAWYER
NICHOLE S. JAMISON

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	-----	-----
DESIGN-DETAILED	-----	-----
CHECKED-REVIEWED	-----	-----
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	-----	-----
REVISIONS 1	-----	-----
REVISIONS 2	-----	-----
REVISIONS 3	-----	-----
REVISIONS 4	-----	-----
FIELD CHANGES	-----	-----

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

31

OF 47

N/F
THORNHEDGE INN, LLC

N/F
THORNHEDGE INN, LLC

N/F
MU
FRA

REMOVE

CLL

4'
11'
11'
4'

24" OPTION III

299+00
300+00
301+00
302+00
303+00
304+00
305+00
306+00

N 47°24'19.4" W

HB-MICH-120

ROUTE 1

TO REMAIN

REMOVE

REMOVE

REMOVE

REMOVE

CLL

STONE DITCH PROTECTION (TYP.)

PC = STA. 304+75.10

S. SAWYER
LE S. JAMISON

PETER S. SAWYER
NICHOLE S. JAMISON

N/F
CHRISTOPHER CLOSSON

N/F
PETER S. SAWYER
NICHOLE S. JAMISON

SANDRA WHITE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

SIGNATURE

P.E. NUMBER

DATE

	BY	DATE
PROJ. MANAGER	-------	------
DESIGN-DETAILED	-------	------
CHECKED-REVIEWED	-------	------
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	T.WHITE	------
REVISIONS 1	-------	------
REVISIONS 2	-------	------
REVISIONS 3	-------	------
REVISIONS 4	-------	------
FIELD CHANGES	-------	------

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

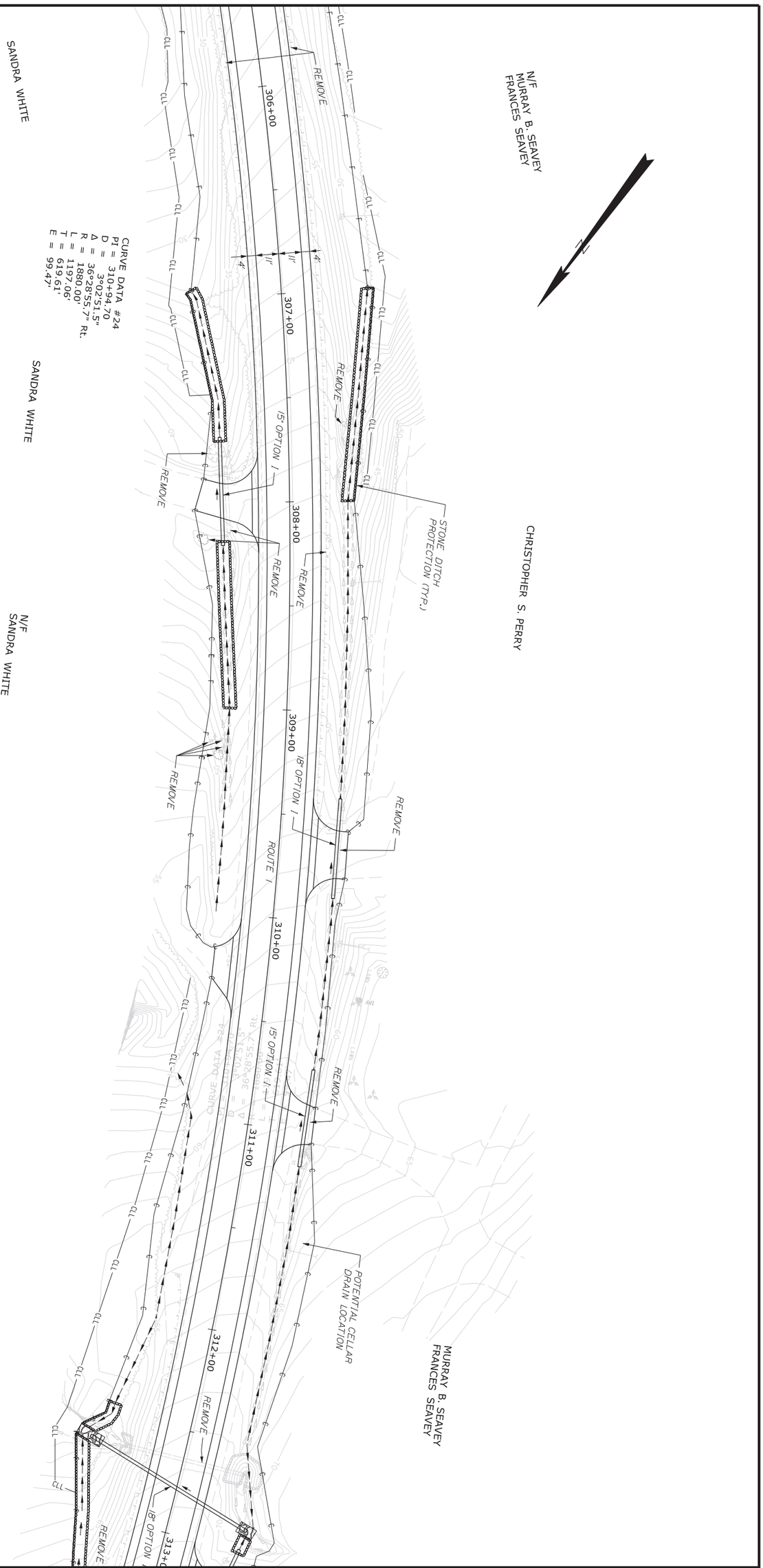
BORING LOCATION PLAN

SHEET NUMBER

32

OF 47

Filename: ...\00\GEOTECH\MSTA\032_BLP31.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024



MILBRIDGE-CHERRYFIELD ROUTES 1 & 182

BORING LOCATION PLAN

		BY	DATE
PROJ. MANAGER			
DESIGN-DETAILED			
CHECKED-REVIEWED			
DESIGN2-DETAILED2	Y-T.LEE	T.WHITE	NOV 2024
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

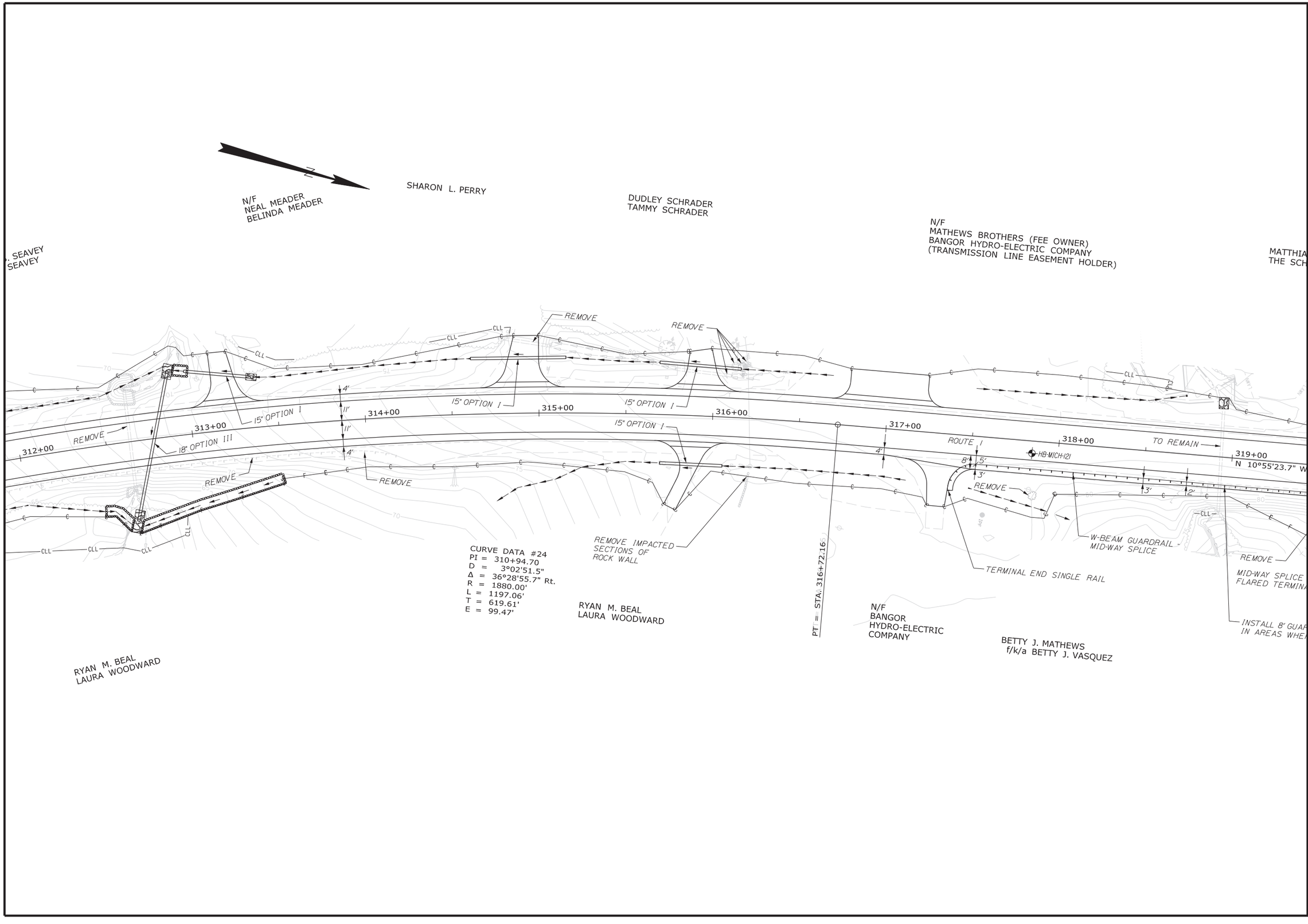
DATE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00 HIGHWAY PLANS

SHEET NUMBER 33 OF 47



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE	SIGNATURE
PROJ. MANAGER	------	---	
DESIGN-DETAILED	------	-----	
CHECKED-REVIEWED	-----	-----	
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024	
DESIGN3-DETAILED3	------	-----	P.E. NUMBER
REVISIONS 1	------	-----	------
REVISIONS 2	------	-----	------
REVISIONS 3	------	-----	DATE
REVISIONS 4	------	-----	------
FIELD CHANGES	------	-----	------

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

34

OF 47

MATTHIAS J. SCHNEIDER, TRUSTEE
THE SCHNEIDER REAL ESTATE TRUST OF 2021

MATTHIAS J. SCHNEIDER,
TRUSTEE
THE SCHNEIDER REAL
ESTATE TRUST OF 2021

SUZANNE M. GIBSON

LEONARD WOUTERS
CHRISTINE M. IKE

KIMBERLY C
JEFFREY DO
HEIRS OF K
ROGER O. D
CAROL E. DO

STA. 321+75
50 MPH | 40 MPH

REMOVE
REMOVE
REMOVE
15" OPTION I
MID-WAY SPLICE - FLARED TERMINAL
W-BEAM GUARDRAIL - MID-W
STONE DITCH PROTECTION (TYP.)
18" OPTION I
REMOVE
ROUTE 1
REMOVE
TO REMAIN
319+00
N 10°55'23.7" W
320+00
321+00
322+00
323+00
324+00
325+00
N 10°55'23.7" W
TO REMAIN
REMOVE
REMOVE
MID-WAY SPLICE - FLARED TERMINAL
REMOVE
INSTALL 8' GUARDRAIL POSTS IN AREAS WHERE < 3' SHELF
TO REMAIN
MID-WAY SPLICE - FLARED TERMINAL
REMOVE
W-BEAM GUARDRAIL - MID-WAY SPLICE
3'X3' RIPRAP PAD
MID-WAY SPLICE - FLARED TERMINAL
AM GUARDRAIL - AY SPLICE
CLL
4'
11'
5'
9'
6'
3'
2'

BETTY J. MATHEWS
f/k/a BETTY J. VASQUEZ
EZ

DAVID A. FARRAH
CATHERINE A. FARRAH

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
SIGNATURE		
P.E. NUMBER		
DATE		
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED	T.WHITE	NOV 2024
DESIGN2-DETAILED2	Y-T.LEE	
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

35

OF 47

KIMBERLY COFFIN
JEFFREY DORR
HEIRS OF KEVIN DORR
ROGER O. DORR, LIFE ESTATE
CAROL E. DORR, LIFE ESTATE

N/F
GREENBERG BLATT MANAGEMENT, L.P.

N/F
LARRY FARNSWORTH
PAMELA FARNSWORTH

N/F
SHELLEY E. GRAY

SHELLEY
ELESTINE

W-BEAM GUARDRAIL - MID-WAY SPLICE

STONE DITCH PROTECTION (TYP.)

MID-WAY SPLICE - FLARED TERMINAL

REMOVE

3'
6'
9'
5'
6" UD "B"

CB7

15" OPTION I

TO REMAIN

BARBER STREET

4'

11'

325+00
326+00
327+00
328+00
329+00
330+00
331+00
332+00

HB-MICH122

ROUTE 1

N 10°55'23.7" W

CLL

REMOVE

REMOVE

MID-WAY SPLICE - FLARED TERMINAL

W-BEAM GUARDRAIL
MID-WAY SPLICE

Y SPLICE -
D TERMINAL

ROLLING MEADOW LANE

N/F
KENYON R. KORES
RHONDA S. KORES

MAINE SEACOAST MISSION
f/k/a THE MAINE SEA COAST MISSIONARY SOCIETY

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
SIGNATURE		
P.E. NUMBER	T. WHITE	NOV 2024
DATE		

PROJ. MANAGER	
DESIGN-DETAILED	Y-T.LEE
CHECKED-REVIEWED	
DESIGN2-DETAILED2	
DESIGN3-DETAILED3	
REVISIONS 1	
REVISIONS 2	
REVISIONS 3	
REVISIONS 4	
FIELD CHANGES	

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

36

OF 47

Filename: ...\00\GEOTECH\MSTA\036_BLP35.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024

LLEY E. GRAY

SHELLEY E. GRAY
ELESTINE M. GRAY - LIFE LEASE

ARTHUR F. LEAVITT
ROBERTA J. LEAVITT

RANDY LEWIS HUNTER
JULIE NORMA-WIENINGER HUNTER

DAVIS CIRCLE

MID-WAY SPLICE - FLARED TERMINAL
REMOVE
CELLAR DRAIN (TO REMAIN)
TERMINAL END SINGLE RAIL
24" OPTION I
STONE DITCH PROTECTION (TYP.)
18" OPTION I
REMOVE
REMOVE
REMOVE
REMOVE
TO REMAIN
REMOVE
15" OPTION I
REMOVE
REMOVE

N 10°55'23.7" W
332+00
333+00
334+00
335+00
336+00
337+00
338+00
N 10°55'23.7" W
ROUTE 1

W-BEAM GUARDRAIL - MID-WAY SPLICE
STONE DITCH PROTECTION (TYP.)
MID-WAY SPLICE - FLARED TERMINAL
PC = STA. 338+66.12
POTENTIAL DRAIN LOC

MISSION
SEA COAST MISSIONARY SOCIETY

MAINE SEACOAST MISSION
f/k/a THE MAINE SEA COAST MISSIONARY SOCIETY

N/F
SUSANNE E. BUSSELL

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	----------	----------
DESIGN-DETAILED	T. WHITE	NOV 2024
CHECKED-REVIEWED	-----	-----
DESIGN2-DETAILED2	Y.-T.LEE	-----
DESIGN3-DETAILED3	----------	----------
REVISIONS 1	----------	----------
REVISIONS 2	----------	----------
REVISIONS 3	----------	----------
REVISIONS 4	----------	----------
FIELD CHANGES	----------	----------

SIGNATURE

P.E. NUMBER

DATE

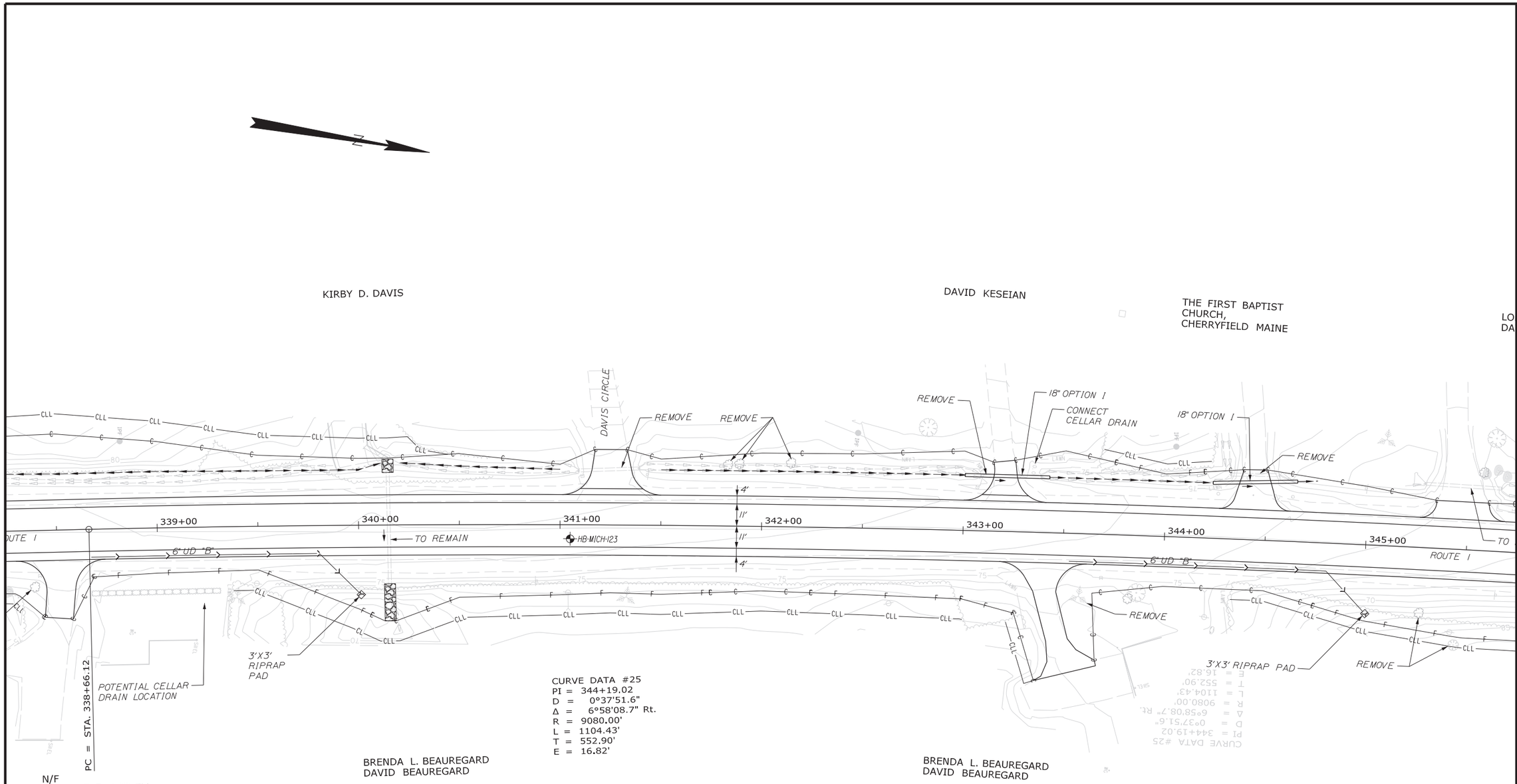
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

37

OF 47



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

SIGNATURE

P.E. NUMBER

DATE

	DATE	BY
PROJ. MANAGER		
DESIGN-DETAILED	NOV 2024	T. WHITE
CHECKED-REVIEWED		Y-T.LEE
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

SHEET NUMBER

38

OF 47

LORI-ANN MATHEWS
DAVID A. MATHEWS

N/F
RICHARD L. FICKETT
JOYCE E. FICKETT

KELLY J. BARBEE
LORI K. BARBEE

EVERETT MATHEWS, JR.
JEAN MATHEWS

PRIVOT DRIVE

15" OPTION I

REMOVE

CB8

3'X3' RIPRAP PAD

MILBRIDGE ROAD BRIDGE (#6697)
13' SPAN X 8' RISE X 136' LENGTH
PRECAST CONCRETE BOX CULVERT

6" UD "B"

4'

11'

11'

4'

TO REMAIN

ROUTE 1

345+00

346+00

347+00

348+00

349+00

350+00

351+00

352+00

N 3°57'15.1" W

HB-MICH-214

R=33'

41.9'

WILSON HILL ROAD

CLL

CONNECT CELLAR DRAIN

18" OPTION 1

ELLSWORTH FALLS
LUMBER COMPANY,
INC.

CURVE DATA #25
PI = 344+19.02
D = 0°37'51.6"
Δ = 6°58'08.7" Rt.
R = 9080.00'
L = 1104.43'
T = 552.90'
E = 16.82'

PT = STA. 349+70.55

BRENDA L. BEAUREGARD
DAVID BEAUREGARD

ELLSWORTH FALLS LUMBER COMPANY, INC.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	-----	-----
DESIGN-DETAILED	-----	-----
CHECKED-REVIEWED	-----	-----
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	-----	-----
REVISIONS 1	-----	-----
REVISIONS 2	-----	-----
REVISIONS 3	-----	-----
REVISIONS 4	-----	-----
FIELD CHANGES	-----	-----

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

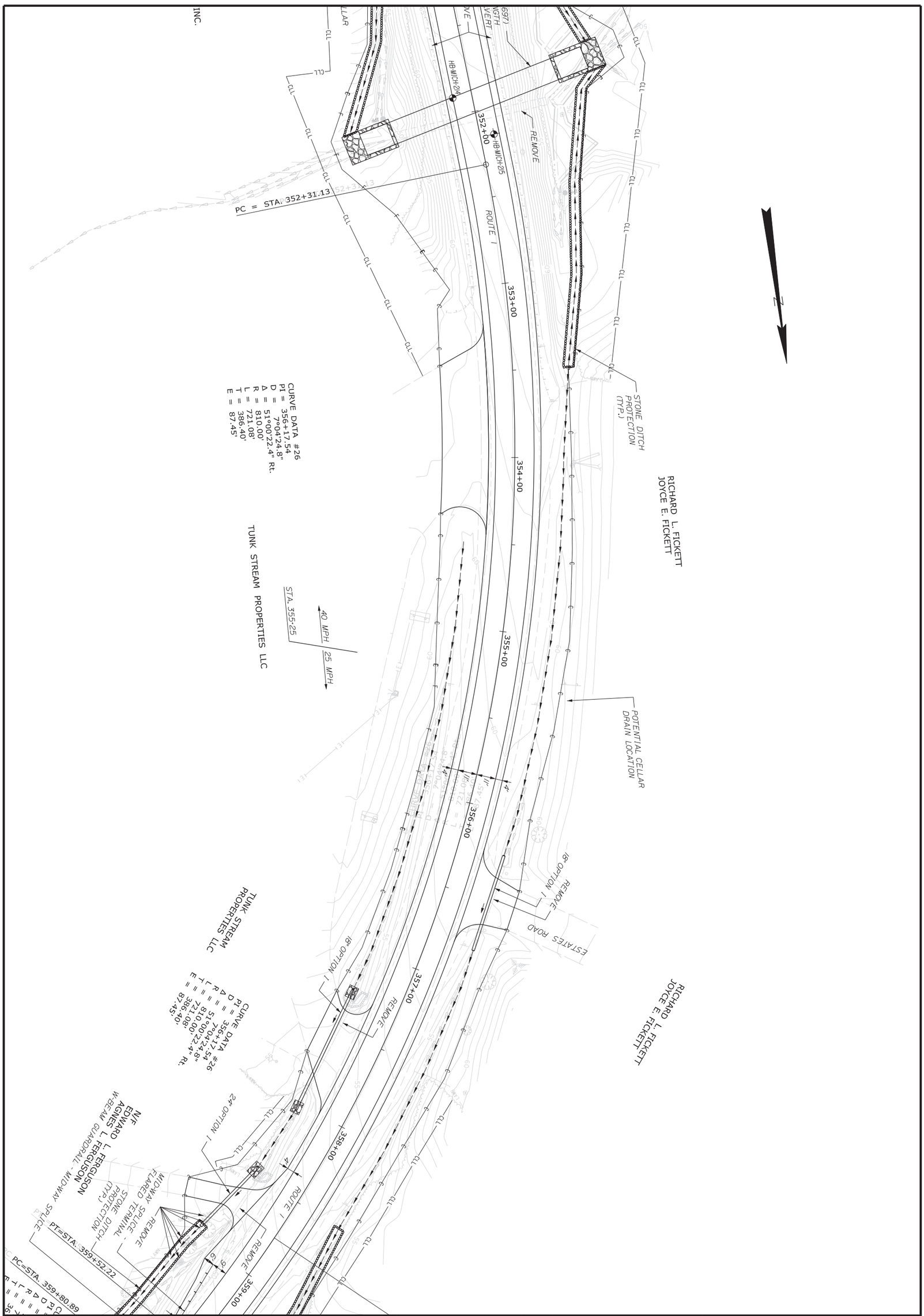
BORING LOCATION PLAN

SHEET NUMBER

39

OF 47

Filename: ...\00\GEOTECH\MSTA\039_BLP38.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/4/2024



PROJ. MANAGER		BY	DATE
DESIGN-DETAILED			
CHECKED-REVIEWED			
DESIGN2-DETAILED2	Y-T.LEE	T.WHITE	NOV 2024
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

SHEET NUMBER 40 OF 47

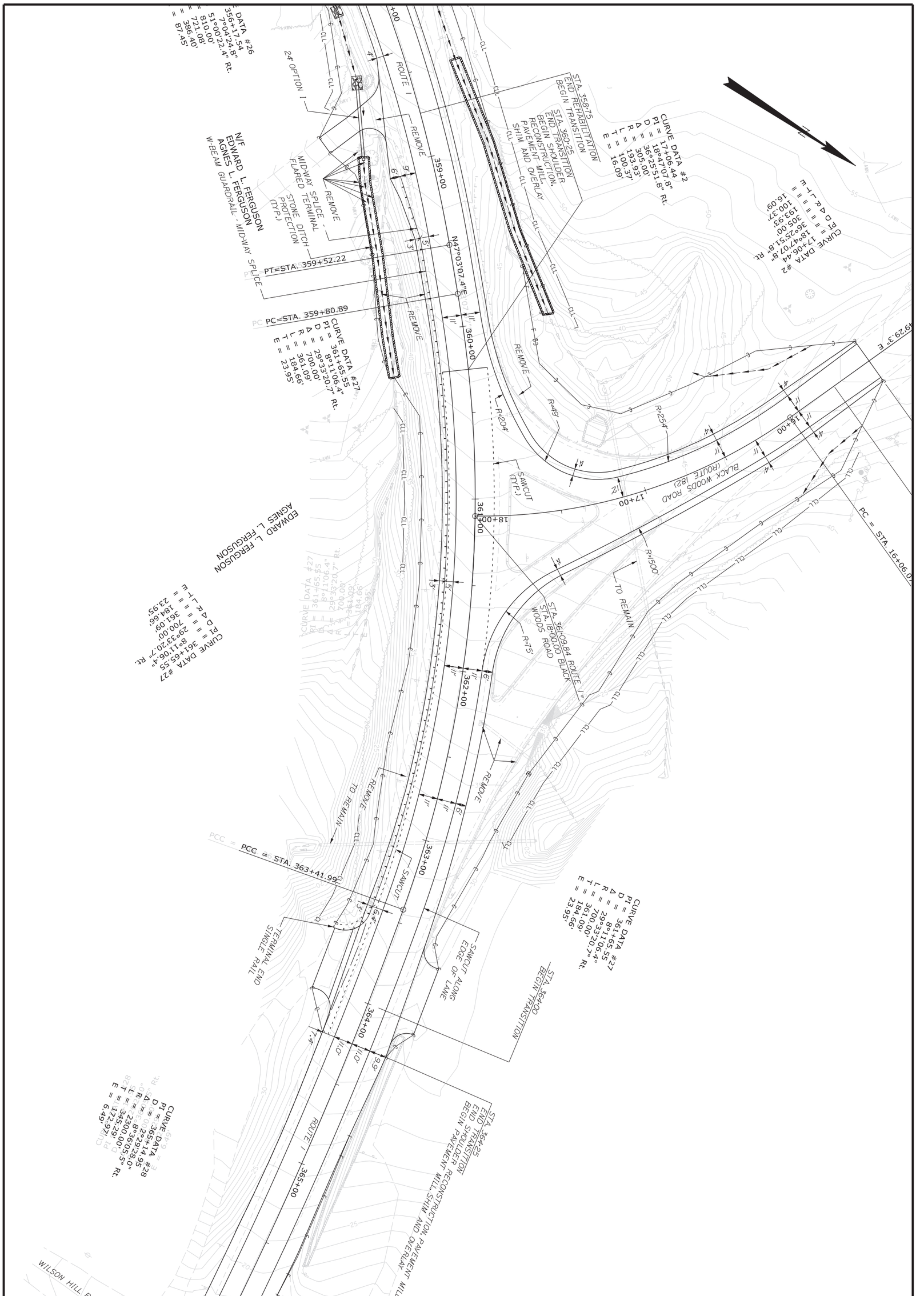
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00 HIGHWAY PLANS



PROJ. MANAGER		BY	DATE
DESIGN-DETAILED			
CHECKED-REVIEWED			
DESIGN2-DETAILED2	Y-T.LEE	T.WHITE	NOV 2024
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

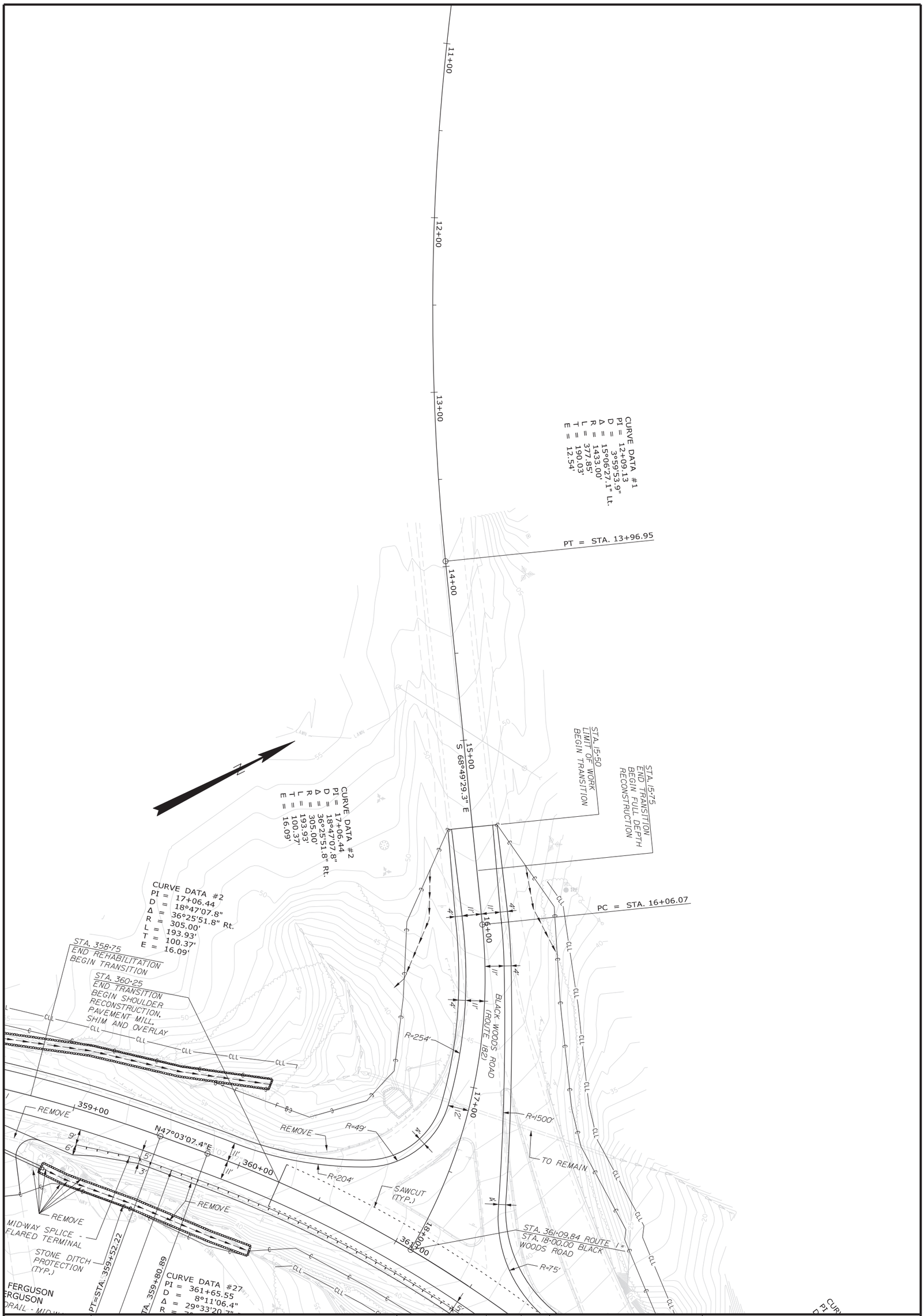
BORING LOCATION PLAN

SHEET NUMBER 41 OF 47

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00 HIGHWAY PLANS



PROJ. MANAGER		BY	DATE
DESIGN-DETAILED			
CHECKED-REVIEWED			
DESIGN2-DETAILED2	Y-T.LEE	T.WHITE	NOV 2024
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

SHEET NUMBER 42 OF 47

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

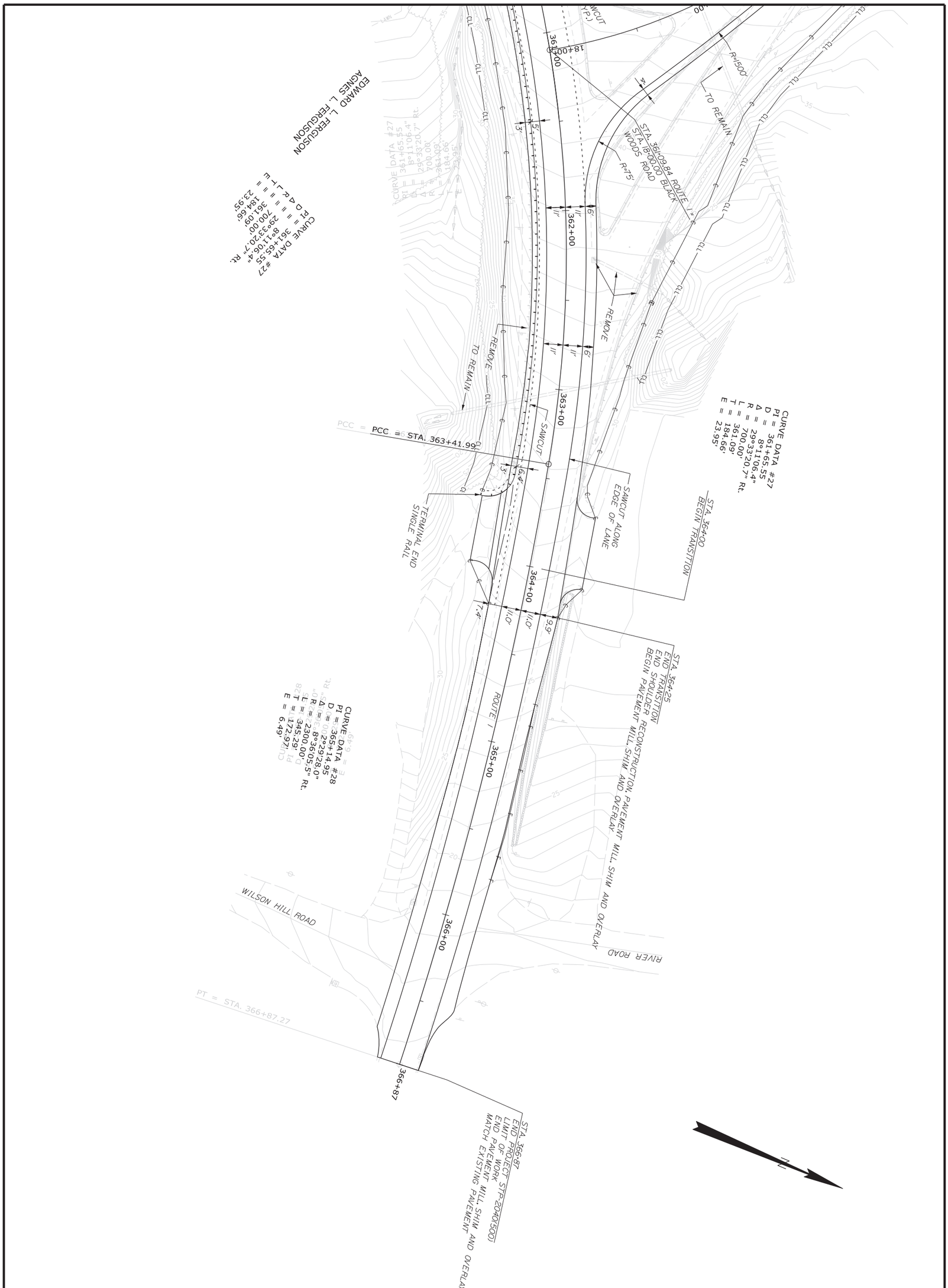
BORING LOCATION PLAN

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

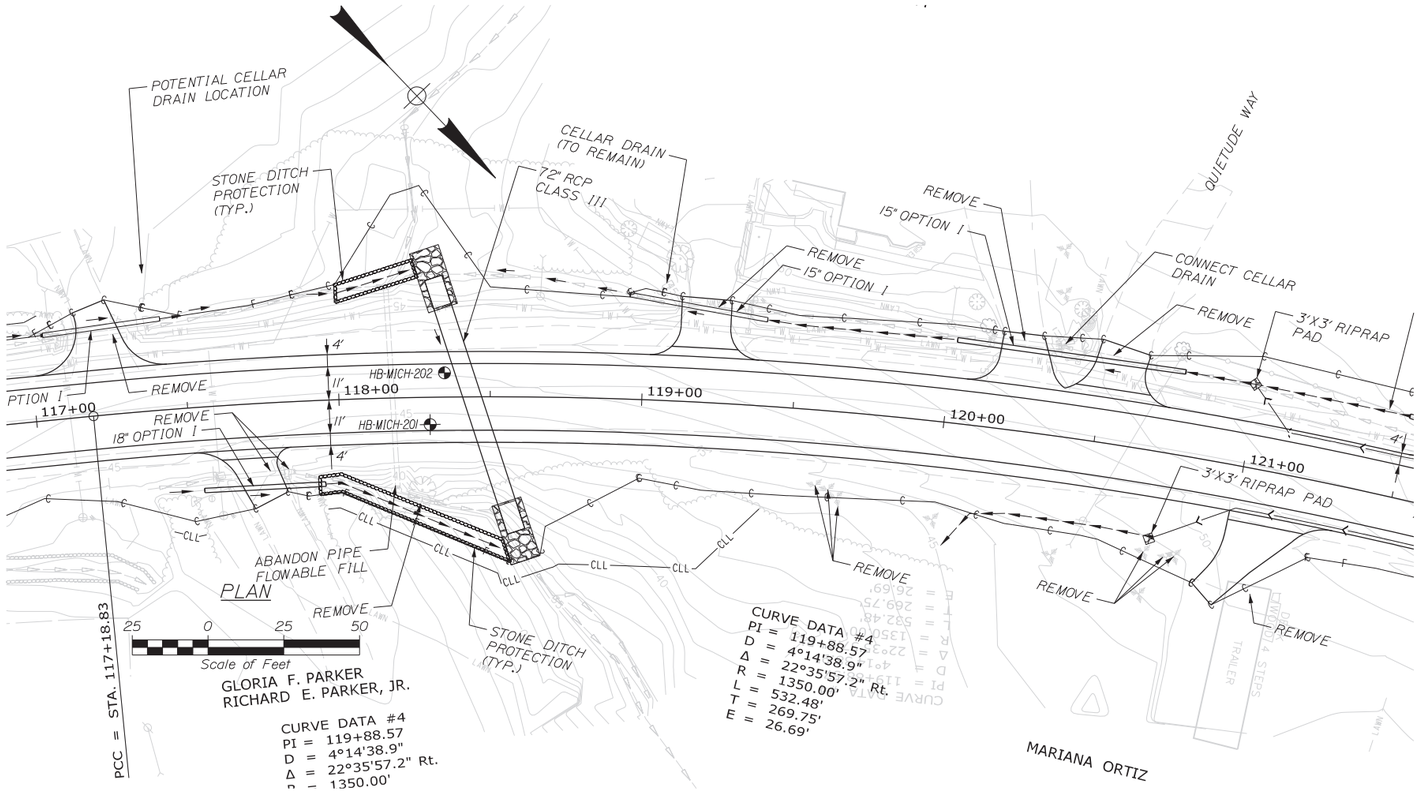


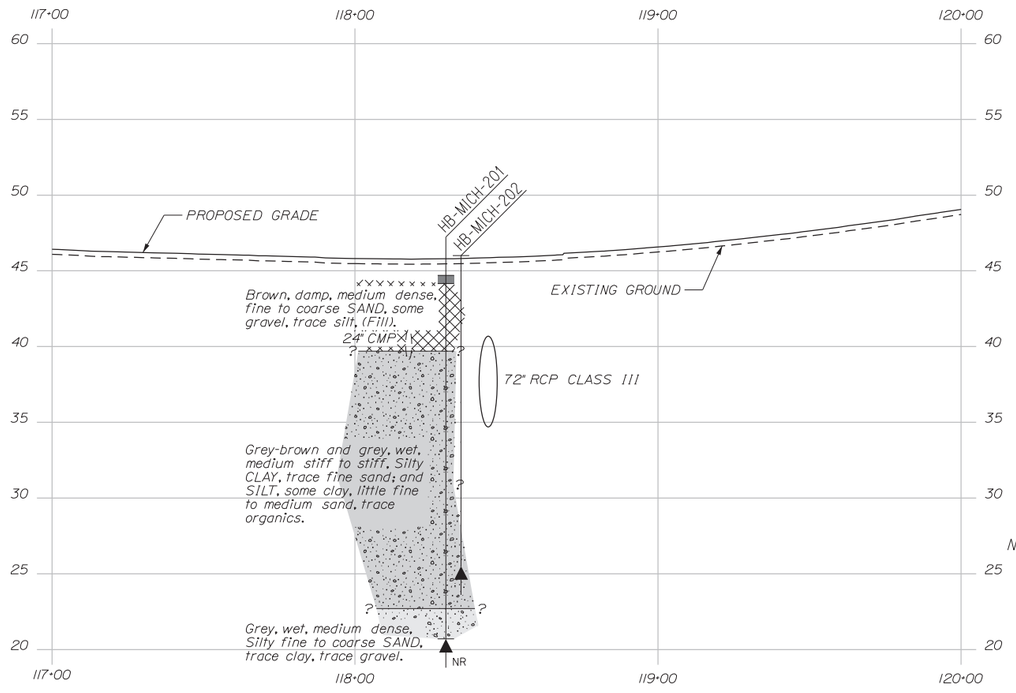
SHEET NUMBER 43 OF 47	MILBRIDGE-CHERRYFIELD ROUTES 1 & 182	PROJ. MANAGER	BY / DATE
		DESIGN-DETAILED	
		CHECKED-REVIEWED	
		DESIGN2-DETAILED2	Y-T.LEE / T.WHITE / NOV 2024
		DESIGN3-DETAILED3	
		REVISIONS 1	
		REVISIONS 2	
		REVISIONS 3	
		REVISIONS 4	
		FIELD CHANGES	
	BORING LOCATION PLAN	SIGNATURE / P.E. NUMBER / DATE	

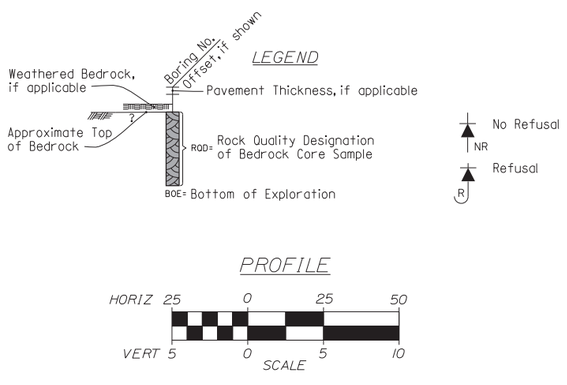
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00 HIGHWAY PLANS







Note: This generalized interpretive soil profile is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and have been developed by interpretations of widely spaced explorations and samples. Actual soil and bedrock transitions may vary and are probably more erratic. For more specific information refer to the exploration logs.

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

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-201
WIN: 20405.00

Driller:	MaineDOT	Elevation (ft.):	44.7
Operator:	Daggett/Niles	Datum:	NAVD88
Logged By:	B. Wilder	Rig Type:	CME 45C
Date Start/Finish:	5/3/2018: 0630-	Drilling Method:	Cased Wash Boring
Boring Location:	118+30, 9.0 ft Rt.	Casing ID/OD:	NW-3"
Auger ID/OD:	5" Solid Stem		
Sampler:	Standard Split Spoon		
Hammer Wt./Fall:	140#/30"		
Core Barrel:	N/A		
Water Level*:	7.0 ft bgs.		

Hammer Efficiency Factor= 0.854 — Hammer Type: Automatic ☒ Hydraulic ☐ Rope & Cathead ☐

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test
PP = Pocket Penetrometer
MW = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR = Weight of Rods or Casing
WOP = Weight of 1 Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(Lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (tsf)
N-value = Raw Field SPT N-value
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
L_L = Liquid Limit
P_L = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows f/6 in. or Shear Strength (psf) or RQD (%)	N-value	N60	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
							5⅝	44.2		6.5" HMA. (0.5)	
	10	24/16	1.00 - 3.00	6/11/5/11	20	28				Brown, damp, medium dense, fine to coarse SAND, some gravel, trace silt, (Fill).	GM336734 A-1-b, SM-SM WC=4.3%
5								39.7		(5.0)	
	20	24/18	5.00 - 7.00	2/3/4/5	7	10				Grey-brown, wet, stiff, Silty CLAY, trace fine sand.	GM336735 A-6, CL-ML WC=30.3% LL=26 PL=21 PI=5
								35.7		(9.0)	
10	30	24/24	10.00 - 12.00	3/5/5/5	10	14	11			Grey-brown, wet, stiff, SILT, some clay, little fine to medium sand, trace organics.	GM336736 A-6, CL WC=30.4% LL=27 PL=21 PI=16
							14				
							16				
							20				
							23				
	40	24/24	15.00 - 17.00	2/2/3/3	5	7	OPEN HOLE			Grey, wet, medium stiff, Silty CLAY, trace fine sand. Roller Cored ahead to 17.0 ft bgs.	GM336737 A-6, CL WC=30.8% LL=24 PL=21 PI=13
	MV		17.00 - 17.21	Would not Push						Failed 55x110 mm vane attempt.	
20	50	24/24	20.00 - 22.00	2/3/3/3	6	9				Grey, wet, stiff, Silty CLAY, trace fine sand.	GM336738 A-6, CL WC=30.2% LL=25 PL=20 PI=12
	60	24/---	22.00 - 24.00	4/4/5/7	9	13		22.7		Grey, wet, medium dense, Silty fine to coarse SAND, trace clay, trace gravel. (22.0)	GM336739 A-6, CL WC=28.6% LL=33 PL=19 PI=14
25								20.7		Bottom of Exploration at 24.0 feet below ground surface. (24.0) NO REFUSAL	

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-MICH-201

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

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-202
WIN: 20405.00

Drilling Contractor:	MaineDOT	Elevation (ft.):	46.0
Operator:	Daggett/Niles	Datum:	NAVD88
Logged By:	B. Wilder	Rig Type:	CME 45C
Date Start/Finish:	5/2/2018-5/2/2018	Drilling Method:	Solid Stem Auger
Boring Location:	118+35, 6.0 Ft Lt.	Casing ID/OD:	N/A
Auger ID/OD:	5" Dia.		
Sampler:	N/A		
Hammer Wt./Fall:	N/A		
Core Barrel:	N/A		
Water Level*:	None Observed		

Definitions: S = Split Spoon Sample; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MU = Unsuccessful Thin Wall Tube Sample Attempt; V = Field Vane Shear Test; MV = Unsuccessful Field Vane Shear Test Attempt; PP = Pocket Penetrometer; MW = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR = Weight of Rods or Casing; WOP = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(Lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (tsf); N-value = Raw Field SPT N-value; N-uncorrected = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent; L_L = Liquid Limit; P_L = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows f/6 in. or Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
						5⅝			Probe, no soil samples taken.	
5										
10										
15										
20							25.5		Bottom of Exploration at 20.5 feet below ground surface. (20.5) NO REFUSAL	
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-MICH-202

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN 020405.00

HIGHWAY PLANS

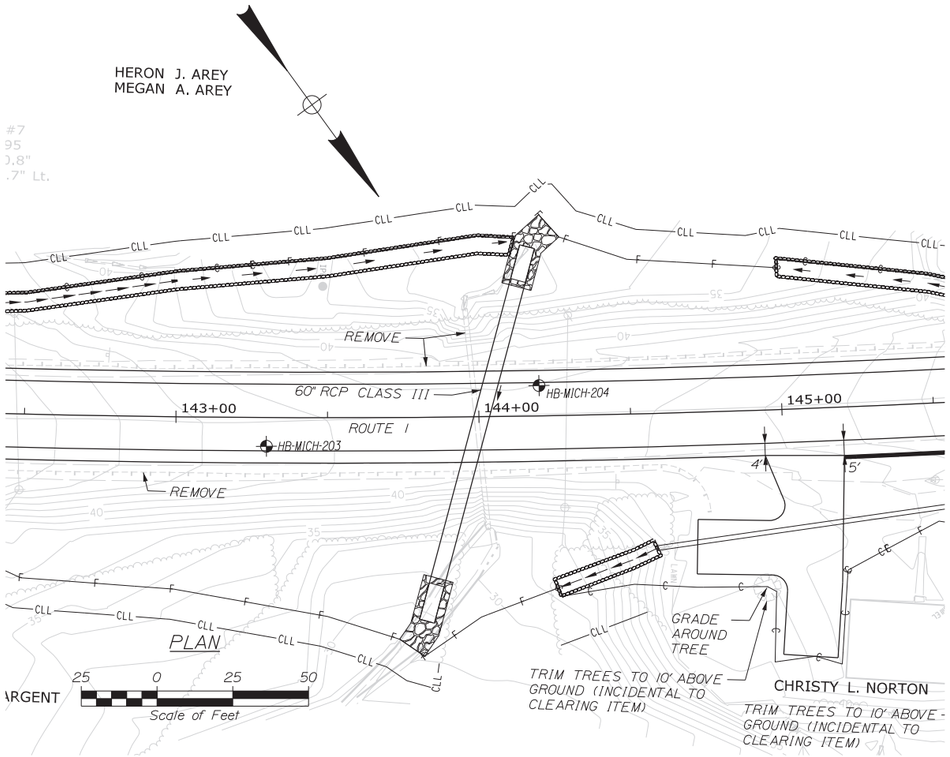
	BY	DATE
PROJ. MANAGER	---	---
DESIGN-DETAILED	---	---
CHECKED-REVIEWED	---	SIGNATURE
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	T.WHITE	P.E. NUMBER
REVISIONS 1	---	---
REVISIONS 2	---	---
REVISIONS 3	---	DATE
REVISIONS 4	---	---
FIELD CHANGES	---	---

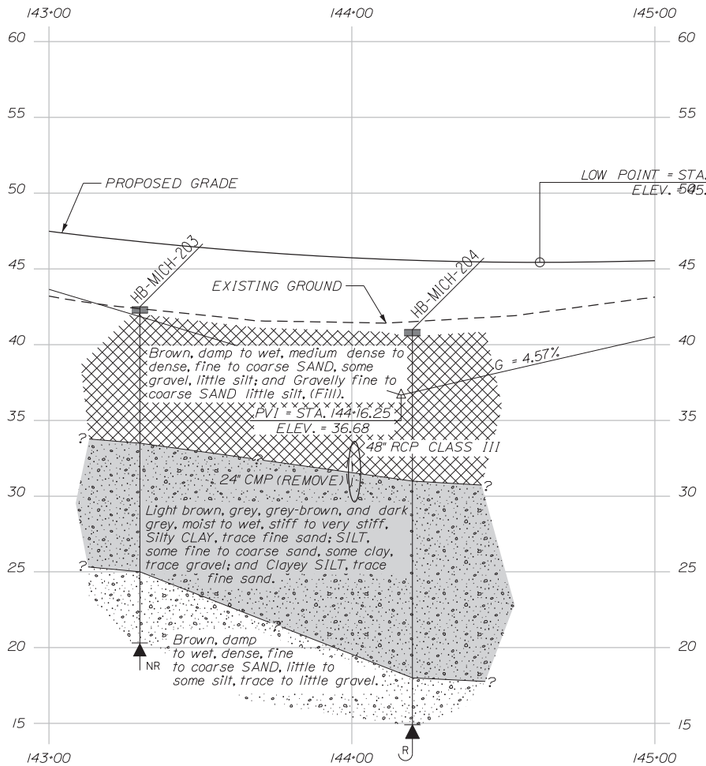
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

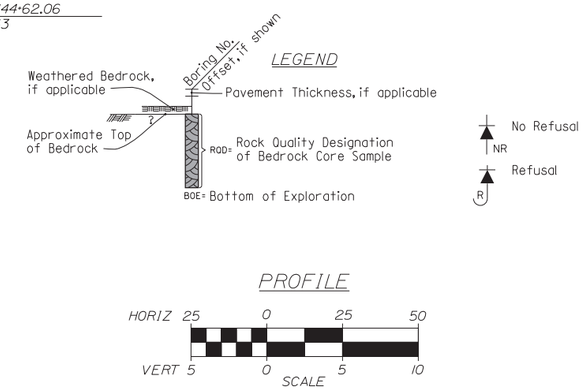
BORING LOCATION PLAN &
INTERPRETIVE SUBSURFACE PROFILE
WITH BORING LOGS

SHEET NUMBER
44
OF 47

Filename: ...\MSTA\044_BLP&SP wBL1.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/12/2024







Note: This generalized interpretive soil profile is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and have been developed by interpretations of widely spaced explorations and samples. Actual soil and bedrock transitions may vary and are probably more erratic. For more specific information refer to the exploration logs.

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

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-203
WIN: 20405.00

Driller:	Maine007	Elevation (ft.):	42.5
Operator:	Doggett/Niles	Datum:	NAVD88
Logged By:	B. Wilder	Rig Type:	CME 45C
Date Start/Finish:	5/1/2018; 10:00-	Drilling Method:	Cased Wash Boring
Boring Location:	143+30, 9.5 ft Rt.	Casing ID/OD:	NW-3"
Auger ID/OD:	5" Solid Stem	Sampler:	Standard Split Spoon
Hammer Wt./Fall:	140#/30"	Core Barrel:	N/A
Water Level*:	3.0 ft bgs.		

Hammer Efficiency Factor: 0.854 — Hammer Type: Automatic ☒ Hydraulic ☐ Rope & Cathead ☐

Definitions:
D = Split Spoon Sample; ST = Shelby Tube Sample; RC = 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; WOP = Weight of One Person; S_u = Field/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(LAB)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (tsf); N=uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Rig Specific Annual Calibration Value; N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency; N_{60} = Hammer Efficiency Factor*SPT-N-uncorrected; T_p = Pocket Torvane Shear Strength (psf); WC = Water Content, percent; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows / 6 in. Sheer Strength (psf) & qp (tsf)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
							5⅝	42.5		5" HMA. — 0.4	
5	10	24/17	1.00 - 3.00	6/13/21/20	34	48				Brown, damp, dense, fine to coarse SAND, some gravel, little silt, (Fill).	GM336740 A-1-b, SM WC=5.8%
	20	24/16	5.00 - 7.00	11/5/7/30	12	17				Brown, damp, medium dense, Gravelly fine to coarse SAND, little silt, (Fill).	GM336741 A-1-b, SM WC=5.4%
								35.9		Layer of Old Pavement. — 6.6	
								35.5		— 7.0	
10	30	24/19	10.00 - 12.00	3/5/6/13	11	16	24	33.5		Light brown, moist, very stiff, Silty CLAY, trace fine sand. — 9.0	GM336742 A-4, CL WC=22.8% LL=30 PL=20 PI=10
							33				
							47				
							55				
15	40	24/24	14.00 - 16.00	4/4/5/5	9	13	OPEN HOLE			Grey, wet, stiff, Silty CLAY, trace fine sand.	GM336743 A-6, CL WC=27.8% LL=36 PL=21 PI=15
								25.0		— 17.5	
20	50	24/13	20.00 - 22.00	7/12/11/10	23	33				Brown, damp, dense, fine to coarse SAND, little silt, little gravel.	GM336744 A-1-b, SM WC=14.8%
								20.5		Bottom of Exploration at 22.0 feet below ground surface. NO REFUSAL — 22.0	
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-MICH-203

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

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-204
WIN: 20405.00

Driller:	Maine007	Elevation (ft.):	41.0
Operator:	Doggett/Niles	Datum:	NAVD88
Logged By:	B. Wilder	Rig Type:	CME 45C
Date Start/Finish:	5/1/2018; 12:30-	Drilling Method:	Cased Wash Boring
Boring Location:	144+20, 10.0 ft Lt.	Casing ID/OD:	NW-3"
Auger ID/OD:	5" Solid Stem	Sampler:	Standard Split Spoon
Hammer Wt./Fall:	140#/30"	Core Barrel:	N/A
Water Level*:	2.0 ft bgs.		

Hammer Efficiency Factor: 0.854 — Hammer Type: Automatic ☒ Hydraulic ☐ Rope & Cathead ☐

Definitions:
D = Split Spoon Sample; ST = Shelby Tube Sample; RC = 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; WOP = Weight of One Person; S_u = Field/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(LAB)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (tsf); N=uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Rig Specific Annual Calibration Value; N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency; N_{60} = Hammer Efficiency Factor*SPT-N-uncorrected; T_p = Pocket Torvane Shear Strength (psf); WC = Water Content, percent; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows / 6 in. Sheer Strength (psf) & qp (tsf)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
							5⅝	40.6		5" HMA. — 0.4	
5	10	24/14	1.00 - 3.00	7/12/16/8	28	40				Brown, damp, dense, Gravelly fine to coarse SAND, little silt, (Fill).	GM336745 A-1-b, SM WC=5.1%
	20	24/13	5.00 - 7.00	3/4/6/6	10	14				Brown, wet, medium dense, fine to coarse SAND, some gravel, little silt, (Fill).	GM336746 A-1-b, SM WC=5.2%
								31.0		Casing sunk to 11.0 ft bgs., while washing out. — 10.0	
10	30	24/18	11.00 - 13.00	1/3/4/7	7	10	11			Grey, wet, stiff, SILT, some fine to coarse sand, some clay, trace gravel.	GM336747 A-4, CL WC=19.9%
							18				
							29				
15							42	27.0		— 14.0	
	40	24/20	15.00 - 17.00	4/5/8/10	13	19	OPEN HOLE			Grey-brown, wet, very stiff, Clayey SILT, trace fine sand.	GM336748 A-4, CL WC=25.6% LL=31 PL=21 PI=10
20	50	24/18	20.00 - 22.00	3/3/4/4	7	10				Dark grey, wet, stiff, Silty CLAY, trace fine sand.	GM336749 A-6, CL WC=26.6% LL=32 PL=18 PI=14
								18.0		— 23.0	
25	60	13.2/ 13.2	25.00 - 26.10	4/10/30(1.2")	---					Brown, wet, dense, fine to coarse SAND, some silt, trace gravel.	GM336750 A-2-4, SM WC=20.8%
								14.9		Bottom of Exploration at 26.1 feet below ground surface. REFUSAL — 26.1	
30											

Remarks:

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.
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Page 1 of 1
Boring No.: HB-MICH-204

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

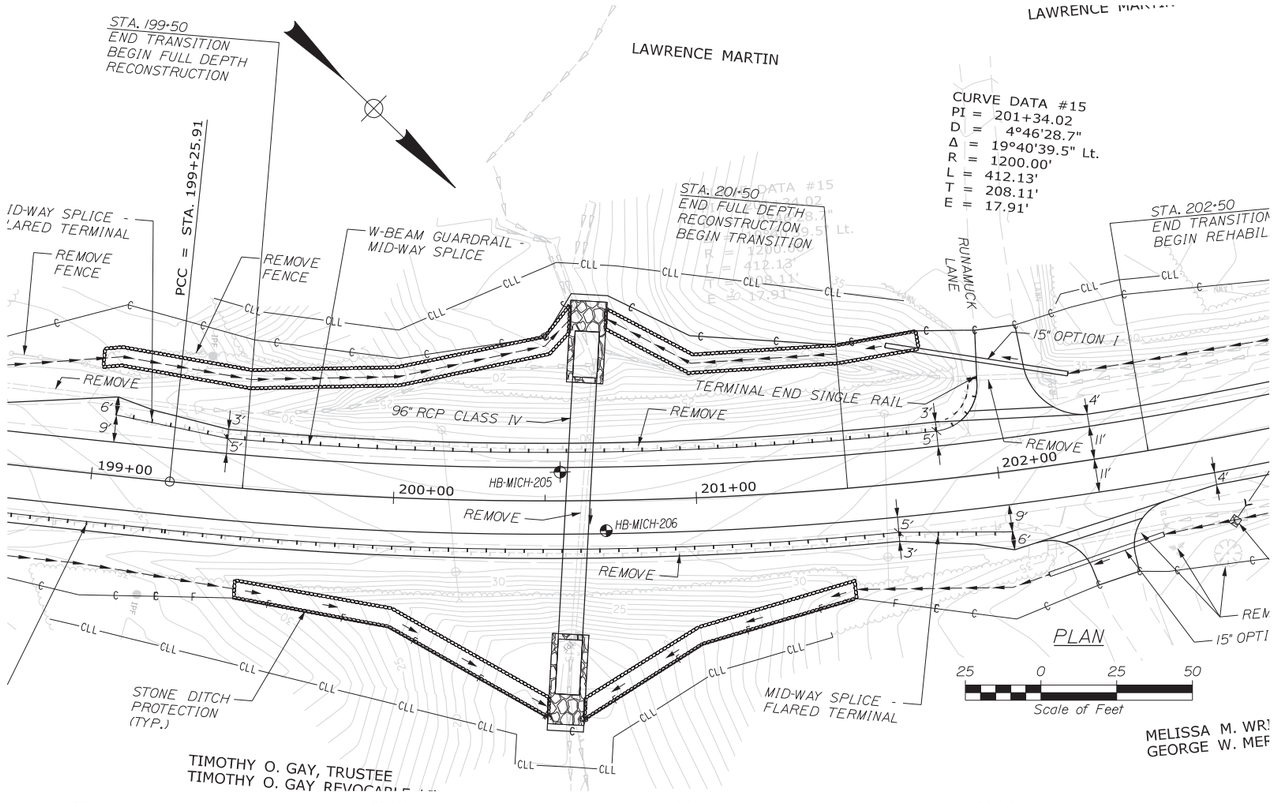
	DATE	BY	SIGNATURE
PROJ. MANAGER			
DESIGN-DETAILED			
CHECKED-REVIEWED	NOV 2024	T.WHITE	P.E. NUMBER
DESIGN2-DETAILED2		Y-TLEE	
DESIGN3-DETAILED3			DATE
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

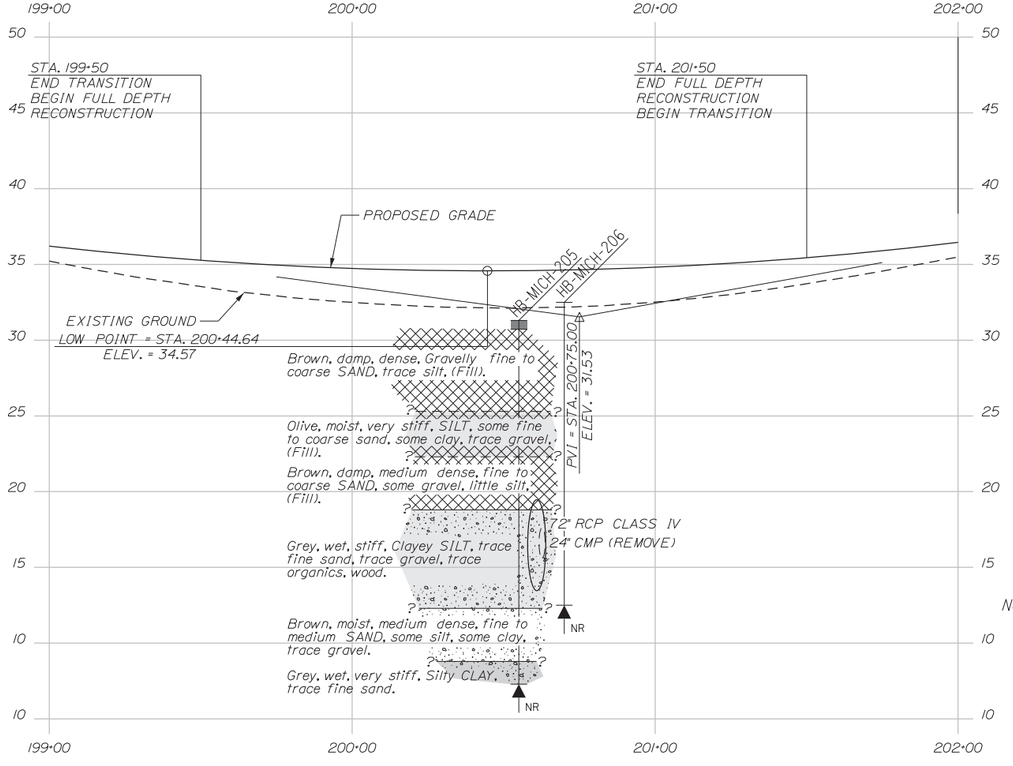
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

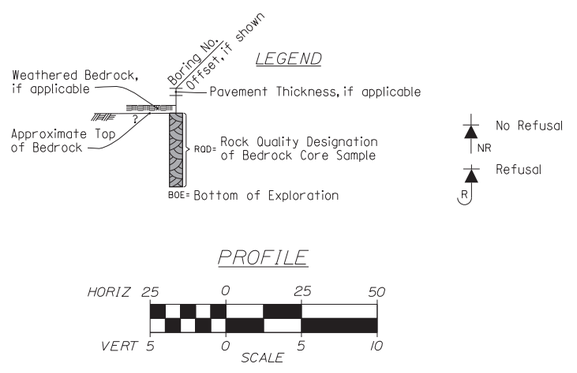
BORING LOCATION PLAN &
INTERPRETIVE SUBSURFACE PROFILE
WITH BORING LOGS

SHEET NUMBER
45
OF 47

Filename: ...\MSTA\045_BLP&ISP wBL2.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/12/2024







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

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-205
WIN: 20405.00

Driller:	MaineDOT	Elevation (ft.):	31.3
Operator:	Daggett/Niles	Datum:	NAVD88
Logged By:	B. Wilder	Rig Type:	CME 45C
Date Start/Finish:	5/2/2018: 0630-	Drilling Method:	Solid Stem Auger
Boring Location:	200+55, 9.5 ft Lt.	Casing ID/OD:	N/A
Hammer Efficiency Factor:	0.854	Hammer Type:	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐
Auger ID/OD:	5" Dia.		
Sampler:	Standard Split Spoon		
Hammer Wt./Fall:	140#/30"		
Core Barrel:	N/A		
Water Level*:	14.5 ft bgs.		

Definitions:
D = Split Spoon Sample
ND = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
WU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test
WV = Unsuccessful Field Vane Shear Test Attempt
B = Bucket Sample off Auger Flights
WD = Unsuccessful Split Spoon Sample Attempt
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
WOR = Weight of Rods
q_u = Peak/Remolded Field Vane Undrained Shear Strength (psf), Pocket Torvane Shear Strength (psf)
$q_{u\,(LAB)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (psf)
Unconfined = Rod Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = Hammer Efficiency Factor/85%xN-uncorrected
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. Sieve Strength (psf) or RQD (%)	N-uncorrected	N60	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
							SSA	30.7		7" HMA.	
										0.6	
	1D	24/14	1.00 - 3.00	7/11/18/12	29	41				Brown, damp, dense, Gravelly fine to coarse SAND, trace silt, (Fill).	GM336676 A-1-a-b, SM-GM WC=4.4%
								25.3		6.0	
	2D	24/6	5.00 - 7.00	6/3/9/10	12	17				Olive, moist, very stiff, SILT, some fine to coarse sand, some clay, trace gravel, (Fill).	GM336677 A-4, CL WC=15.9%
								22.3		9.0	
	3D	24/15	10.00 - 12.00	10/9/6/3	15	21				Brown, damp, medium dense, fine to coarse SAND, some gravel, little silt, (Fill).	GM336678 A-1-b, SM WC=6.7%
								18.8		12.5	
	4D	24/18	15.00 - 17.00	3/3/5/5	8	11				Grey, wet, stiff, Clayey SILT, trace fine sand, trace gravel, trace organics, wood.	GM336679 A-4, CL WC=29.7% LL=31 PL=23 PI=8
								12.3		19.0	
	5D	24/17	20.00 - 22.00	3/4/4/5	8	11				Brown, moist, medium dense, fine to coarse SAND, some silt, some clay, trace gravel.	GM336680 A-4, CL WC=27.4% LL=38 PL=22 PI=16
	6D	24/22	22.00 - 24.00	5/6/9/9	15	21		8.0		22.5	
										Grey, wet, very stiff, Silty CLAY, trace fine sand.	GM336681 A-4, CL WC=31.3%
								7.3		24.0 Bottom of Exploration at 24.0 feet below ground surface. NO REFUSAL	

Remarks:

Stratification lines represent approximate boundaries between soil typesat 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-MICH-205

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

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-206
WIN: 20405.00

Drilling Contractor:	MaineDOT	Elevation (ft.):	32.5
Operator:	Daggett/Niles	Datum:	NAVD88
Logged By:	B. Wilder	Rig Type:	CME 45C
Date Start/Finish:	5/1/2018-5/1/2018	Drilling Method:	Solid Stem Auger
Boring Location:	200+70, 10.0 ft Rt.	Casing ID/OD:	N/A
Auger ID/OD:	5" Dia.		
Sampler:	N/A		
Hammer Wt./Fall:	N/A		
Core Barrel:	N/A		
Water Level*:	None Observed		

Definitions:
D = Split Spoon Sample
B = Bucket Sample off Auger Flights
WD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
WU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test
WV = Unsuccessful Field Vane Shear Test Attempt
WOH = Weight of 140lb. Hammer
WOR = Weight of Rods
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
q_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$q_{u\,(LAB)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (psf)
Unconfined = Rod Field SPT N-value
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows /6 in. Sieve Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
						SSA			Probe, no soil samples taken.	
							12.5		Bottom of Exploration at 20.0 feet below ground surface. NO REFUSAL.	20.0

Remarks:

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Page 1 of 1
Boring No.: HB-MICH-206

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER	-----	-----
DESIGN-DETAILED	-----	-----
CHECKED-REVIEWED	-----	-----
DESIGN2-DETAILED2	Y-T.LEE	NOV 2024
DESIGN3-DETAILED3	-----	-----
REVISIONS 1	-----	-----
REVISIONS 2	-----	-----
REVISIONS 3	-----	-----
REVISIONS 4	-----	-----
FIELD CHANGES	-----	-----

SIGNATURE

P.E. NUMBER

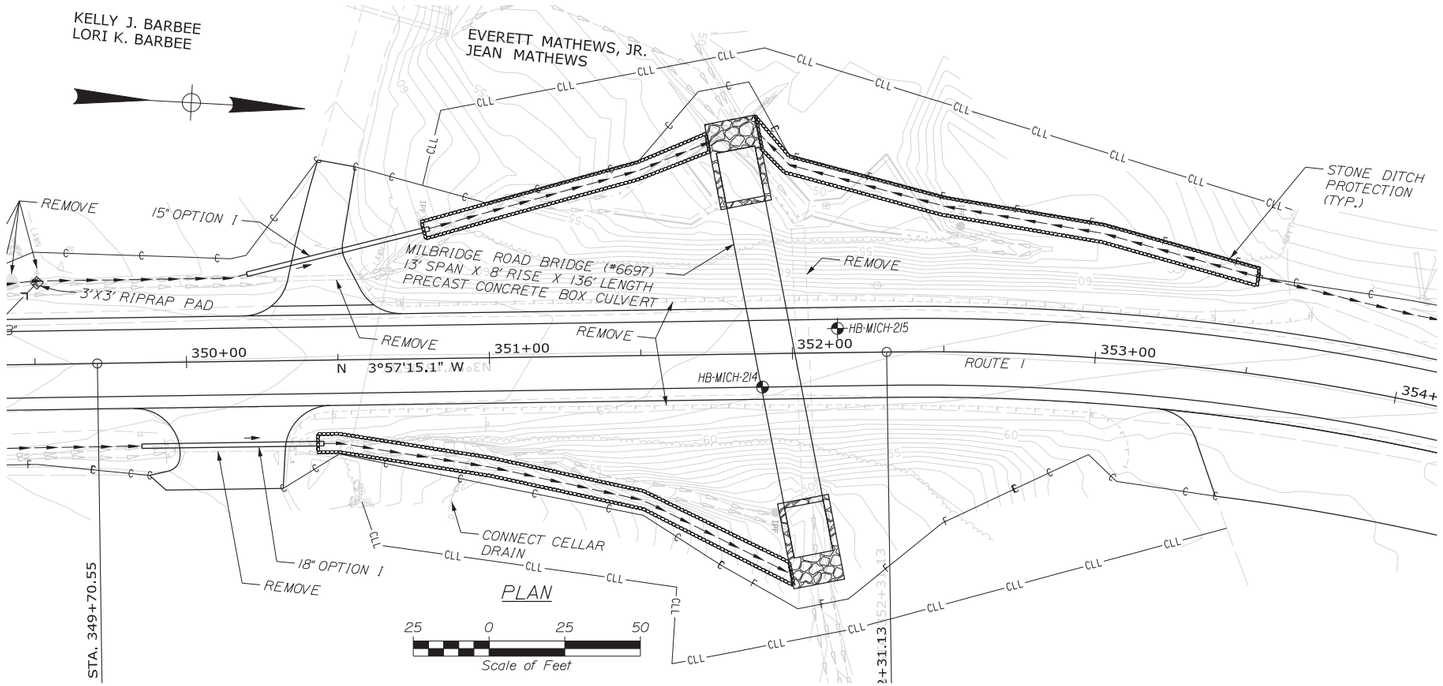
DATE

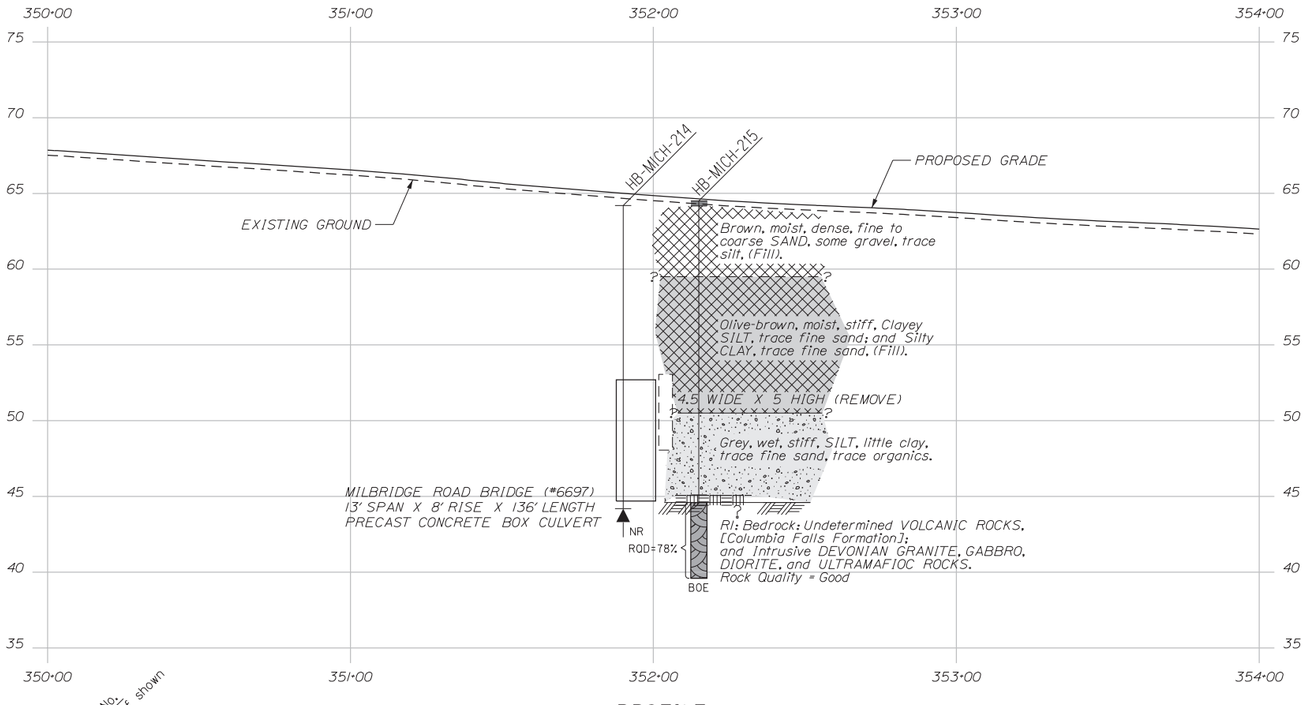
MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

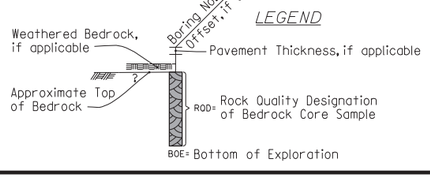
BORING LOCATION PLAN &
INTERPRETIVE SUBSURFACE PROFILE
WITH BORING LOGS

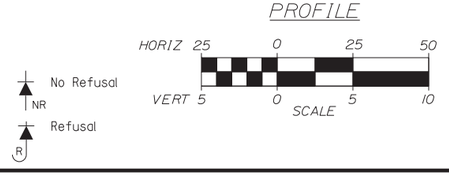
SHEET NUMBER
46
OF 47

Username: Yueh-Ti.Lee Date:11/12/2024
Filename: ...\MSTA\046_BLP&ISP wBL3.dgn Division: GEOTECH









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

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-214
WIN: 20405.00

Drilling Contractor: MaineDOT	Elevation (ft.): 64.2	Auger ID/OD:	5" Dia.
Operator: Daggett/Niles	Datum: NAVD88	Sampler:	N/A
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall:	N/A
Date Start/Finish: 5/1/2018-5/1/2018	Drilling Method: Solid Stem Auger	Core Barrel:	N/A
Boring Location: 351+90, 11.0 ft Rt.	Casing ID/OD: N/A	Water Level(ft):	None Observed

Definitions: S = Split Spoon Sample; D = Split Spoon Sample; B = Bucket Sample off auger Flights; MS = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MU = Unsuccessful Thin Wall Tube Sample Attempt; V = Field Vane Shear Test; MV = Unsuccessful Field Vane Shear Test Attempt; WS = Wash Sample; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR = Weight of Rods or Casing; WOP = Weight of 1 Person; q_u = Peak-Remolded Field Vane Undrained Shear Strength (psf); $q_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (tsf); Uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Rig Specific Annual Calibration Value; N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency; T_v = Pocket Torvane Shear Strength (psf); q_u = Roller Dynamic Cone Test; PP = Pocket Penetrometer; 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 t/6 in. or Compressive Strength or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0						5/4			Probe, no soil samples taken.	
5										
10										
15										
20							44.2		Bottom of Exploration at 20.0 feet below ground surface. NO REFUSAL	
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-MICH-214

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

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-215
WIN: 20405.00

Drillers: Maine001	Elevation (ft.): 64.5	Auger ID/OD:	5" Solid Stem
Operator: Daggett/Niles	Datum: NAVD88	Sampler:	Standard Split Spoon
Logged By: B. Wilder	Rig Type: CME 45C	Hammer Wt./Fall:	140#/30"
Date Start/Finish: 5/1/2018: 07:00-	Drilling Method: Cased Wash Boring	Core Barrel:	NQ-2"
Boring Location: 352+15, 8.0 ft Lt.	Casing ID/OD: NW-3"	Water Level(ft):	12.5 ft bgs.

Hammer Efficiency Factor: 0.854 | Hammer Type: Automatic ☒ Hydraulic ☐ Rope & Cathead ☐

Definitions: S = Split Spoon Sample; D = Split Spoon Sample; B = Bucket Sample off auger Flights; MS = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MU = Unsuccessful Thin Wall Tube Sample Attempt; V = Field Vane Shear Test; MV = Unsuccessful Field Vane Shear Test Attempt; WS = Wash Sample; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR = Weight of Rods or Casing; WOP = Weight of One Person; q_u = Peak-Remolded Field Vane Undrained Shear Strength (psf); $q_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (tsf); Uncorrected = Raw Field SPT N-value; Hammer Efficiency Factor = Rig Specific Annual Calibration Value; N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency; T_v = Pocket Torvane Shear Strength (psf); q_u = Roller Dynamic Cone Test; PP = Pocket Penetrometer; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test; N_{60} = Hammer Efficiency Factor-Driller-uncorrected

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows t/6 in. or Compressive Strength or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class
0							5/4	64.2		4" HMA. 0.3	
5	10	24/16	1.00 - 3.00	9/14/14/9	28	40				Brown, moist, dense, fine to coarse SAND, some gravel, trace silt, (Fill).	GM296334 A-1-b, SM-SW WC=5.1%
	20	24/17	5.00 - 7.00	3/3/4/6	7	10				Olive-brown, moist, stiff, Clayey SILT, trace fine sand, (Fill).	GM296335 A-6, CL WC=23.8% LL=30 PL=18 PI=12
10	30	24/20	10.00 - 12.00	3/4/6/7	10	14	10			Olive-brown, stiff, Silty CLAY, trace fine sand, (Fill).	GM296336 A-6, CL WC=24.2% LL=30 PL=18 PI=12
							21				
							28				
							33				
							52	50.5		14.0	
15	40	24/20	15.00 - 17.00	2/4/5/6	9	13	23			Grey, wet, stiff, SILT, little clay, trace fine sand, trace organics.	GM296337 A-4, CL WC=24.8%
							42				
							85				
							202				
20	R1	60/59	19.90 - 24.90	RQD = 78%			0150 WC=1	45.1		0150 blows for 0.4 ft. Roller Caned ahead to 19.9 ft bgs. 19.4	
								44.6		Weathered Bedrock. 19.9	
25								39.6		Top of Bedrock at Elev. 44.6 ft. R1: Bedrock: Undetermined VOLCANIC ROCKS, [Columbia Falls Formation]; and Intrusive DEVONIAN GRANITE, GABBRO, DIORITE, and ULTRAMAFIC ROCKS. Rock Quality = Good R1: Core Times (minsec): 19.9-20.9 ft (2:03) 20.9-21.9 ft (2:30) 21.9-22.9 ft (2:29) 22.9-23.9 ft (3:06) 23.9-24.9 ft (3:01) 98% Recovery 24.9 Bottom of Exploration at 24.9 feet below ground surface.	
30											

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-MICH-215

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2040(500)

WIN
020405.00

HIGHWAY PLANS

	BY	DATE
PROJ. MANAGER		
DESIGN-DETAILED		
CHECKED-REVIEWED	T.WHITE	NOV 2024
DESIGN2-DETAILED2	Y-T.LEE	
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

SIGNATURE

P.E. NUMBER

DATE

MILBRIDGE-CHERRYFIELD
ROUTES 1 & 182

BORING LOCATION PLAN &
INTERPRETIVE SUBSURFACE PROFILE
WITH BORING LOGS

SHEET NUMBER
47
OF 47

Filename: ...\MSTA\047_BLP&ISP wBL4.dgn Division: GEOTECH Username: Yueh-Ti.Lee Date:11/12/2024

Appendix A

Boring Logs

UNIFIED SOIL CLASSIFICATION SYSTEM

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

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

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

MODIFIED BURMISTER SYSTEM

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

TERMS DESCRIBING DENSITY/CONSISTENCY

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

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

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

Consistency of Cohesive soils	SPT N-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):

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

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

Rock Quality Based on RQD

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

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

Color (Munsell color chart)
Texture (aphanitic, fine-grained, etc.)
Rock Type (granite, schist, sandstone, etc.)
Hardness (very hard, hard, mod. hard, etc.)
Weathering (fresh, very slight, slight, moderate, mod. severe, severe, etc.)
Geologic discontinuities/jointing:
- -dip (horiz - 0-5 deg., low angle - 5-35 deg., mod. dipping - 35-55 deg., steep - 55-85 deg., vertical - 85-90 deg.)
- -spacing (very close - <2 inch, close - 2-12 inch, mod. close - 1-3 feet, wide - 3-10 feet, very wide >10 feet)
- -tightness (tight, open, or healed)
- -infilling (grain size, color, etc.)

Formation (Waterville, Ellsworth, Cape Elizabeth, etc.)
RQD and correlation to rock quality (very poor, poor, etc.)
ref: ASTM D6032 and FHWA NHI-16-072 GEC 5 - Geotechnical Site Characterization, Table 4-12
Recovery (inch/inch and percentage)
Rock Core Rate (X.X ft - Y.Y ft (min:sec))

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

Sample Container Labeling Requirements:

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

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-101
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	46.9	**Auger ID/OD:**	10" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	115+60, 6.5 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B1		0.75 - 1.50			SSA	46.4		6" PAVEMENT	
									0.5	
							46.2		3" Unbound PAVEMENT.	G#264743
	S1		1.50 - 5.00				45.4		0.8	A-1-b, SW-SM
									Black-brown, wet, fine to coarse SAND, some gravel, trace silt, occasional cobble, (Fill).	WC=1.6%
									1.5	G#264766
									Grey-brown, wet, Silty fine to coarse SAND, trace gravel.	A-4, SM
										WC=29.4%
5							41.9		5.0	
									Bottom of Exploration at 5.0 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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-102
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	58.0	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	127+65, 7.5 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions: D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer; MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing; WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S2		0.50 - 2.40			SSA	57.5		6" PAVEMENT (0.5)	G#264754 A-1-a, SW-SM WC=5.1%
									Brown, moist, Gravelly fine to coarse SAND, trace silt, (Fill).	
	S3		2.40 - 5.00				55.6		(2.4) Brown, wet, SILT, some fine to medium sand.	
5							53.0		(5.0) **Bottom of Exploration at 5.0 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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-103
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	55.0	**Auger ID/OD:**	10" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	140+95, 8.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B2		0.33 - 5.00			SSA	54.7		4" PAVEMENT (0.3)	G#264744 A-1-a, SW-SM WC=2.9%
									Brown, wet, Gravelly fine to coarse SAND, trace silt, occasional cobble, (Fill).	
5							50.0		(5.0) **Bottom of Exploration at 5.0 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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-104
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	54.1	**Auger ID/OD:**	10" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	140+95, 18.0 ft Lt. Shoulder	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B3		0.00 - 1.60			SSA			Brown, moist, fine to coarse SAND, some gravel, trace silt, (Fill).	G#264745 A-1-b, SW-SM WC=0.8%
	S4		1.60 - 5.00				52.5		1.6	
									Brown, wet, SILT, little fine to medium sand.	
5							49.1		5.0	
									Bottom of Exploration at 5.0 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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-105
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	58.6	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	150+87, 8.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions: D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer; MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing; WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S5		0.50 - 3.50			SSA	58.1		6" PAVEMENT	
									0.5	
									Brown, wet, fine to coarse SAND, little gravel, little silt, (Fill).	G#264755 A-1-b, SM WC=7.5%
	S6		3.50 - 5.00				55.1		3.5	
									Olive-brown, wet, SILT, some fine to coarse sand, trace gravel.	G#264768 A-4, ML WC=20.7%
5							53.6		5.0	
									Bottom of Exploration at 5.0 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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-106
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	67.4	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	161+00, 7.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S7		0.58 - 2.70			SSA	66.8		7" PAVEMENT (0.6)	G#264756 A-1-b, SM WC=6.5%
									Black-brown, fine to coarse SAND, little gravel, little silt, (Fill).	
	S8		2.70 - 5.00				64.7		(2.7) Brown, moist, SILT, trace sand.	
5							62.4		(5.0) **Bottom of Exploration at 5.0 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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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-107
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	53.9	**Auger ID/OD:**	10" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	171+50, 6.5 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	2.2 ft bgs.

Definitions: D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer; MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing; WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B4		0.42 - 2.30			SSA	53.5		5" PAVEMENT (0.4)	G#264746 A-1-a, GW-GM WC=2.5%
									Brown, wet, fine to coarse Sandy GRAVEL, trace silt, occasional cobble, (Fill).	
	S9		2.30 - 5.00				51.6		(2.3) Brown, moist, SILT, trace fine to coarse sand, trace gravel.	G#264767 A-4, ML WC=18.6%
5							48.9		(5.0) **Bottom of Exploration at 5.0 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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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-108
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	53.5	**Auger ID/OD:**	10" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	171+50, 15.0 ft Rt. Shoulder	**Casing ID/OD:**	N/A	**Water Level*:**	1.1 ft bgs.

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B5		0.00 - 2.00			SSA			Brown, wet, fine to coarse SAND, some gravel, trace silt, occasional cobble, (Fill).	G#264747 A-1-b, SW-SM WC=3.0%
							51.5		2.0	
	S10		2.00 - 5.00						Brown, wet, fine to medium Sandy SILT, little clay.	
5							48.5		5.0	
									Bottom of Exploration at 5.0 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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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-109
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	53.7	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	180+00, 8.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions: D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer; MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing; WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S11		0.58 - 3.60			SSA	53.1		7" PAVEMENT (0.6)	
									Brown, moist, fine to coarse SAND, some silt, little gravel, (Fill).	G#264757 A-1-b, SM WC=5.2%
	S12		3.60 - 5.00				50.1		(3.6)	
									Grey-brown, SILT, some fine to coarse sand, trace gravel.	G#264769 A-4, ML WC=16.5%
5							48.7		(5.0)	
									Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-110
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	32.7	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	192+67, 7.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	2.7 ft bgs.

Definitions:
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MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S13		0.42 - 3.90			SSA	32.3		5" PAVEMENT (0.4)	G#264758 A-1-b, SM WC=6.6%
									Brown, wet, fine to coarse SAND, some gravel, little silt, (Fill).	
							28.8		(3.9)	
									Bottom of Exploration at 3.9 feet below ground surface. REFUSAL	
5										
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-111
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	40.6	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	203+30, 7.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S14		0.42 - 3.30			SSA	40.2		5" PAVEMENT (0.4)	G#264759 A-1-b, SM WC=4.9%
									Brown, moist, fine to coarse SAND, some gravel, little silt, (Fill).	
	S15		3.30 - 5.00				37.3		(3.3) Light brown, wet, SILT, trace sand.	
5							35.6		(5.0) **Bottom of Exploration at 5.0 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-112
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	42.7	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	213+80, 9.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
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MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B6		0.42 - 2.90			SSA	42.3		5" PAVEMENT (0.4)	
									Brown, moist, Gravelly fine to coarse SAND, trace silt, (Fill).	G#264748 A-1-a, SW-SM WC=1.7%
	S16		2.90 - 5.00				39.8		(2.9)	
									Olive, wet, SILT, trace fine to coarse sand, trace gravel.	G#264770 A-4, ML WC=25.6%
5							37.7		(5.0)	
									Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-113
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	42.5	**Auger ID/OD:**	10" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	213+80, 15.0 ft Lt. Shoulder	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B7		0.00 - 2.60			SSA			Brown, moist, fine to coarse SAND, some gravel, trace silt, occasional cobble, (Fill).	G#264749 A-1-b, SW-SM WC=2.6%
							39.9		2.6
									Olive, wet, SILT, trace sand.
5							37.5		5.0
									Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL
10									
15									
20									
25									

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-114
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	45.4	**Auger ID/OD:**	10" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	248+92, 7.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B8		0.33 - 2.20			SSA	45.1		4" PAVEMENT (0.3)	G#264750 A-1-a, GW-GM WC=0.6%
									Brown, moist, GRAVEL, some fine to coarse sand, trace silt, occasional cobble, (Fill).	
	S17		2.20 - 5.00				43.2		(2.2) Grey, wet, SILT, trace sand.	
5							40.4		(5.0) **Bottom of Exploration at 5.0 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-115
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	45.4	**Auger ID/OD:**	10" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	248+92, 15.0 ft Lt. Shoulder	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B9		0.00 - 2.50			SSA			Brown, moist, fine to coarse Sandy GRAVEL, trace silt, occasional cobble, (Fill).	G#264751 A-1-a, GW-GM WC=2.7%
							42.9		2.5	
									Grey, wet, SILT, trace sand.	
5							40.4		5.0	
									Bottom of Exploration at 5.0 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.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-116
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	71.7	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/11/2016-1/11/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	269+42, 7.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S18		0.33 - 3.00			SSA	71.4		4" PAVEMENT (0.3)	G#264760 A-1-b, SM WC=3.4%
									Brown, damp, fine to coarse SAND, some gravel, little silt, (Fill).	
							68.7		(3.0)	
	S19		3.00 - 5.00						Brown, moist, Silty fine to coarse SAND, some gravel.	
5							66.7		(5.0)	
									Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-117
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	63.6	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/12/2016-1/12/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	279+16, 7.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions: D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer; MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing; WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S20		0.42 - 3.10			SSA	63.2		5" PAVEMENT (0.4)	
									Brown, moist, fine to coarse SAND, some gravel, some silt, (Fill).	G#264761 A-1-b, SM WC=4.0%
							60.5		(3.1)	
	S21		3.10 - 5.00						Light brown, moist, SILT, trace fine to coarse sand, trace gravel.	G#264771 A-4, ML WC=26.5%
5							58.6		(5.0) **Bottom of Exploration at 5.0 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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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-118
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	23.9	**Auger ID/OD:**	10" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/12/2016-1/12/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	294+64, 7.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	2.9 ft bgs.

Definitions: D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer; MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing; WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B10		0.42 - 3.00			SSA	23.5		5" PAVEMENT (0.4)	G#264752 A-1-a, GW-GM WC=1.8%
									Brown, wet, fine to coarse Sandy GRAVEL, trace silt, occasional cobble, (Fill).	
	S22		3.00 - 5.00				20.9		(3.0) Light brown, wet, SILT, trace fine sand.	
5							18.9		(5.0) **Bottom of Exploration at 5.0 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-119
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	23.4	**Auger ID/OD:**	10" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/12/2016-1/12/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	294+64, 16.0 ft Rt. Shoulder	**Casing ID/OD:**	N/A	**Water Level*:**	1.6 ft bgs.

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	B11		0.00 - 2.80			SSA			Brown, wet, Gravelly fine to coarse SAND, trace silt, occasional cobble, (Fill).	G#264753 A-1-a, SW-SM WC=2.3%
							20.6		2.8	
									Light brown, moist, SILT, trace sand, trace gravel.	
5							18.4		5.0	
									Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-120
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	28.1	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/12/2016-1/12/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	303+70, 7.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S23		0.42 - 3.30			SSA	27.7		5" PAVEMENT (0.4) Brown, moist, fine to coarse SAND, some silt, little gravel, (Fill).	G#264762 A-1-b, SM WC=7.7%
	S24		3.30 - 5.00				24.8		Grey-brown, wet, SILT, trace fine sand. (3.3)	
5							23.1		(5.0) **Bottom of Exploration at 5.0 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-121
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	82.2	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/12/2016-1/12/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	317+85, 7.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	3.0 ft bgs.

Definitions: D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer; MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing; WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too; LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S25		0.42 - 2.60			SSA	81.8		5" PAVEMENT (0.4)	G#264763 A-1-b, SM WC=4.0%
									Brown, damp, fine to coarse SAND, some gravel, little silt, (Fill).	
	S26		2.60 - 5.00				79.6		(2.6) Brown, wet, SILT, trace fine sand.	
5							77.2		(5.0) **Bottom of Exploration at 5.0 feet below ground surface.** NO REFUSAL	
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-122
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	82.5	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/12/2016-1/12/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	329+50, 7.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S27		0.42 - 2.30			SSA	82.1		5" PAVEMENT	
									0.4	
									Black-brown, damp, fine to coarse SAND, little silt, little gravel, (Fill).	G#264764 A-1-b, SM WC=5.9%
	S28		2.30 - 5.00				80.2		2.3	
									Brown, moist, SILT, some fine to coarse sand, trace gravel.	G#264772 A-4, ML WC=16.8%
5							77.5		5.0	
									Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL	
10										
15										
20										
25										

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-123
WIN: 20405.00

Drilling Contractor:	Northern Test Boring	**Elevation (ft.)**	77.5	**Auger ID/OD:**	5" Dia.
Operator:	Mike/Adam	**Datum:**	NAVD88	**Sampler:**	Off Flights
Logged By:	Wilder/Daggett	**Rig Type:**	Diedrich D-50	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	1/12/2016-1/12/2016	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	341+05, 7.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed

Definitions:
D = Spilt Spoon Sample; S = Sample off Auger Flights; B = Bucket Sample off Auger Flights; MD = Unsuccessful Split Spoon Sample Attempt; U = Thin Wall Tube Sample; MV = Unsuccessful Field Vane Shear Test Attempt; V = Field Vane Shear Test, PP= Pocket Penetrometer
MU = Unsuccessful Thin Wall Tube Sample Attempt; R = Rock Core Sample; SSA = Solid Stem Auger; HSA = Hollow Stem Auger; RC = Roller Cone; WOH = Weight of 140lb. Hammer; WOR/C = Weight of Rods or Casing
WO1P = Weight of 1 Person; S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf); $S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf); q_p = Unconfined Compressive Strength (ksf); N-value = Raw Field SPT N-value; T_v = Pocket Torvane Shear Strength (psf); WC = Water Content, percent ≅ = Similar or Equal too
LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index; G = Grain Size Analysis; C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	S29		0.42 - 3.50			SSA	77.1		5" PAVEMENT (0.4)	G#264765 A-1-b, SM WC=4.4%
									Brown, damp, fine to coarse SAND, some gravel, some silt, (Fill).	
	S30		3.50 - 5.00				74.0		(3.5) Brown, wet, SILT, trace sand.	
5							72.5		(5.0) **Bottom of Exploration at 5.0 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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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-201
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	44.7	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/3/2018; 06:30-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	N/A
Boring Location:	118+30, 9.0 ft Rt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	7.0 ft bgs.
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	44.2		6½" HMA.	
										0.5	
	1D	24/16	1.00 - 3.00	6/11/9/11	20	28				Brown, damp, medium dense, fine to coarse SAND, some gravel, trace silt, (Fill).	G#336734 A-1-b, SW-SM WC=4.3%
5								39.7		5.0	
	2D	24/18	5.00 - 7.00	2/3/4/5	7	10				Grey-brown, wet, stiff, Silty CLAY, trace fine sand.	G#336735 A-4, CL-ML WC=30.3% LL=26 PL=21 PI=5
								35.7		9.0	
10											
	3D	24/24	10.00 - 12.00	3/5/5/5	10	14	11			Grey-brown, wet, stiff, SILT, some clay, little fine to medium sand, trace organics.	G#336736 A-6, CL WC=30.4% LL=37 PL=21 PI=16
							14				
							16				
							20				
							23	30.7		14.0	
15											
	4D	24/24	15.00 - 17.00	2/2/3/3	5	7	OPEN HOLE			Grey, wet, medium stiff, Silty CLAY, trace fine sand. Roller Coned ahead to 17.0 ft bgs.	G#336737 A-6, CL WC=30.8% LL=34 PL=21 PI=13
	MV		17.00 - 17.21	Would not Push						Failed 55x110 mm vane attempt.	
20											
	5D	24/24	20.00 - 22.00	2/3/3/3	6	9				Grey, wet, stiff, Silty CLAY, trace fine sand.	G#336738 A-6, CL WC=30.2% LL=35 PL=23 PI=12
								22.7		22.0	
	6D	24/---	22.00 - 24.00	4/4/5/7	9	13				Grey, wet, medium dense, Silty fine to coarse SAND, trace clay, trace gravel.	G#336739 A-6, CL WC=28.6% LL=33 PL=19
								20.7		24.0	
25										**Bottom of Exploration at 24.0 feet below ground surface.** NO REFUSAL	

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-MICH-201

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-201
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	44.7	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/3/2018; 06:30-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	N/A
Boring Location:	118+30, 9.0 ft Rt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	7.0 ft bgs.
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140 lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_V = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25											PI=14
30											
35											
40											
45											
50											

Remarks:

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

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-202

WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	46.0	**Auger ID/OD:**	5" Dia.
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	N/A
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	5/2/2018-5/2/2018	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	118+35, 8.0 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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MD = Unsuccessful Split Spoon Sample Attempt
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MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA			Probe, no soil samples taken.	
5											
10											
15											
20								25.5		20.5 **Bottom of Exploration at 20.5 feet below ground surface.** NO REFUSAL	
25											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-203
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	42.5	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/1/2018; 10:00-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	N/A
Boring Location:	143+30, 9.5 ft Rt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	3.0 ft bgs.
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
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V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	42.1		5" HMA. 0.4	
	1D	24/17	1.00 - 3.00	6/13/21/20	34	48				Brown, damp, dense, fine to coarse SAND, some gravel, little silt, (Fill).	G#336740 A-1-b, SM WC=5.8%
5	2D	24/16	5.00 - 7.00	11/5/7/30	12	17				Brown, damp, medium dense, Gravelly fine to coarse SAND, little silt, (Fill) .	G#336741 A-1-b, SM WC=5.4%
								35.9		6.6	
								35.5		Layer of Old Pavement. 7.0	
								33.5		9.0	
10	3D	24/19	10.00 - 12.00	3/5/6/13	11	16	24			Light brown, moist, very stiff, Silty CLAY, trace fine sand.	G#336742 A-4, CL WC=22.8% LL=30 PL=20 PI=10
							33				
							47				
							55				
	4D	24/24	14.00 - 16.00	4/4/5/5	9	13	OPEN HOLE			Grey, wet, stiff, Silty CLAY, trace fine sand.	G#336743 A-6, CL WC=27.8% LL=36 PL=21 PI=15
15											
								25.0		17.5	
20	5D	24/13	20.00 - 22.00	7/12/11/10	23	33				Brown, damp, dense, fine to coarse SAND, little silt, little gravel.	G#336744 A-1-b, SM WC=14.8%
								20.5		22.0	
										Bottom of Exploration at 22.0 feet below ground surface. NO REFUSAL	
25											

Remarks:

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Boring No.: HB-MICH-203

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-204

WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	41.0	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/1/2018; 12:30-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	N/A
Boring Location:	144+20, 10.0 ft Lt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	2.0 ft bgs.
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	40.6		5" HMA. (0.4)	
	1D	24/14	1.00 - 3.00	7/12/16/8	28	40				Brown, damp, dense, Gravelly fine to coarse SAND, little silt, (Fill).	G#336745 A-1-a, SM WC=5.7%
5	2D	24/13	5.00 - 7.00	3/4/6/6	10	14				Brown, wet, medium dense, fine to coarse SAND, some gravel, little silt, (Fill).	G#336746 A-1-b, SM WC=5.2%
10								31.0		(10.0) Casing sunk to 11.0 ft bgs., while washing out.	
	3D	24/18	11.00 - 13.00	1/3/4/7	7	10	11			Grey, wet, stiff, SILT, some fine to coarse sand, some clay, trace gravel.	G#336747 A-4, CL WC=19.9%
							18				
							29				
							42	27.0		(14.0)	
15	4D	24/20	15.00 - 17.00	4/5/8/10	13	19	OPEN HOLE			Grey-brown, wet, very stiff, Clayey SILT, trace fine sand.	G#336748 A-4, CL WC=25.6% LL=31 PL=21 PI=10
20	5D	24/18	20.00 - 22.00	3/3/4/4	7	10				Dark grey, wet, stiff, Silty CLAY, trace fine sand.	G#336749 A-6, CL WC=26.6% LL=32 PL=18 PI=14
								18.0		(23.0)	
25											

Remarks:

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Boring No.: HB-MICH-204

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-204
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	41.0	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/1/2018; 12:30-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	N/A
Boring Location:	144+20, 10.0 ft Lt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	2.0 ft bgs.
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
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R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140 lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_V = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25	6D	13.2/13.2	25.00 - 26.10	4/10/30(1.2")	---			14.9		Brown, wet, dense, fine to coarse SAND, some silt, trace gravel.	G#336750 A-2-4, SM WC=20.8%
										26.1 **Bottom of Exploration at 26.1 feet below ground surface.** REFUSAL	
30											
35											
40											
45											
50											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-205
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	31.3	**Auger ID/OD:**	5" Dia.
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/2/2018; 06:30-	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	200+55, 9.5 ft Lt.	**Casing ID/OD:**	N/A	**Water Level*:**	14.5 ft bgs.
Hammer Efficiency Factor:	0.854	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	30.7		7" HMA. 0.6	
	1D	24/14	1.00 - 3.00	7/11/18/12	29	41				Brown, damp, dense, Gravelly fine to coarse SAND, trace silt, (Fill).	G#336676 A-1-a, SW-SM WC=4.4%
5	2D	24/6	5.00 - 7.00	6/3/9/10	12	17		25.3		6.0 Olive, moist, very stiff, SILT, some fine to coarse sand, some clay, trace gravel, (Fill).	G#336677 A-4, CL WC=15.9%
								22.3		9.0	
10	3D	24/15	10.00 - 12.00	10/9/6/3	15	21				Brown, damp, medium dense, fine to coarse SAND, some gravel, little silt, (Fill).	G#336678 A-1-b, SM WC=6.7%
								18.8		12.5	
15	4D	24/18	15.00 - 17.00	3/3/5/5	8	11				Grey, wet, stiff, Clayey SILT, trace fine sand, trace gravel, trace organics, wood.	G#336679 A-4, CL WC=29.7% LL=31 PL=23 PI=8
								12.3		19.0	
20	5D	24/17	20.00 - 22.00	3/4/4/5	8	11				Brown, moist, medium dense, fine to coarse SAND, some silt, some clay, trace gravel.	G#336680 A-6, CL WC=27.4% LL=38 PL=22 PI=16
	6D	24/22	22.00 - 24.00	5/6/9/9	15	21		8.8		22.5 Grey, wet, very stiff, Silty CLAY, trace fine sand.	G#336681 A-4, CL WC=31.3%
25								7.3		24.0 **Bottom of Exploration at 24.0 feet below ground surface.** NO REFUSAL	

Remarks:

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Boring No.: HB-MICH-205

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-206

WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	32.5	**Auger ID/OD:**	5" Dia.
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	N/A
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	5/1/2018-5/1/2018	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	200+70, 10.0 ft Rt.	**Casing ID/OD:**	N/A	**Water Level*:**	None Observed
Hammer Efficiency Factor:		**Hammer Type:**	Automatic ☐ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
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R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA			Probe, no soil samples taken.	
5											
10											
15											
20								12.5		20.0 **Bottom of Exploration at 20.0 feet below ground surface.** NO REFUSAL	
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: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-207
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	32.3	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/2/2018; 08:30-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	N/A
Boring Location:	209+40, 9.5 ft Rt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	None Observed
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	31.8		6" HMA. (0.5)	
	1D	24/12	1.00 - 3.00	7/13/12/6	25	36				Brown, damp, dense, fine to coarse SAND, some gravel, trace silt, (Fill).	G#336682 A-1-b, SW-SM WC=5.5%
5	2D	24/15	5.00 - 7.00	3/4/6/11	10	14				Brown, wet, medium dense, GRAVEL, some fine to coarse sand, some silt, (Fill).	G#336683 A-2-4, GM WC=11.3%
								25.8		(6.5)	
								25.5		Layer of Old Pavement. (6.8)	
10	3D	12/10	10.00 - 11.00	6/50	---		18			Brown, wet, SILT, some fine to coarse sand, some gravel, (Fill). (10.6)	G#336684 A-2-4, SM WC=14.8%
							20	21.7		Layer of Old Pavement. (11.4)	
							14	20.9		Roller coned ahead to 14.0 ft bgs.	
							22				
							66				
15	4D	24/13	15.00 - 17.00	25/25/31/28	56	80	17			Brown, wet, very dense, Gravelly fine to coarse SAND, trace silt, (Fill).	G#336685 A-1-a, SW-SM WC=8.4%
							32				
							53				
							57				
							61	13.3		(19.0)	
20	5D	24/14	20.00 - 22.00	7/8/10/15	18	26				Brown, wet, medium dense, fine to coarse SAND, trace gravel, trace silt.	G#336686 A-1-b, SP-SM WC=15.7%
								10.3		(22.0)	
										Bottom of Exploration at 22.0 feet below ground surface. NO REFUSAL	
25											

Remarks:

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Boring No.: HB-MICH-207

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-208
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	29.7	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/2/2018; 10:30-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	N/A
Boring Location:	210+10, 9.5 ft Rt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	14.5 ft bgs.
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	29.2		6" HMA.	
										0.5	
										Brown, damp, fine to coarse SAND, some gravel, trace silt, (Fill).	
5	1D	24/6	5.00 - 7.00	5/4/4/5	8	11				Brown-grey, wet, medium dense, GRAVEL, some fine to coarse sand, little silt, (Fill).	G#336687 A-1-b, GM WC=8.7%
										Layer of Old Pavement at 8.5 ft bgs.	
10	2D	24/13	10.00 - 12.00	28/20/18/13	38	54	46			Brown, moist, very dense, fine to coarse SAND, some gravel, little silt, (Fill).	G#336688 A-1-b, SM WC=6.0%
							34				
							20				
							31				
							96				
15	3D	24/16	15.50 - 17.50	3/3/9/15	12	17	12			Wood from 15.0-15.3 ft bgs. Roller Coned ahead to 15.5 ft bgs. Grey-brown, wet, very stiff, SILT, some fine to coase sand, little gravel, trace organics, wood, (Fill).	G#336689 A-4, CL WC=30.3%
							10				
							9				
							48				
							111			Roller Coned ahead to 20.0 ft bgs.	
20	4D	24/13	20.00 - 22.00	13/21/12/13	33	47				Brown, wet, dense, fine to coarse Sandy GRAVEL, trace silt, (Fill).	G#336690 A-1-a, GW-GM WC=8.8%
								7.7		22.0	
										Bottom of Exploration at 22.0 feet below ground surface. NO REFUSAL	
25											

Remarks:

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Boring No.: HB-MICH-208

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-209
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	29.9	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/2/2018; 12:30-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	N/A
Boring Location:	210+65, 9.5 ft Lt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	None Observed
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	29.4		6" HMA.	
										0.5	
	1D	24/6	1.00 - 3.00	6/5/6/5	11	16				Brown, damp, medium dense, fine to coarse SAND, some gravel, trace silt, (Fill).	G#336691 A-1-a, SW-SM WC=4.0%
								25.4		4.5	
5	2D	24/18	5.00 - 7.00	2/2/3/4	5	7	8			Grey-brown, wet, medium stiff, SILT, some clay, little fine sand, trace gravel, some organics-PEAT Layer.	G#336692 A-4, CL WC=23.7% Ignition Loss 10.8%
							15				
							15				
							22				
							29				
10	3D	24/16	10.00 - 12.00	2/3/2/3	5	7	21	19.9		10.0	G#336693 A-4, SC-SM WC=19.3%
										Grey-brown, wet, loose, fine to coarse SAND, some silt, little clay, little gravel, trace organics.	
							29				
							39				
							35				
							50				
15	4D	24/10	15.00 - 17.00	15/10/10/13	20	28	48			Grey-brown, wet, medium dense, fine to coarse SAND, some gravel, little silt.	G#336694 A-1-b, SM WC=12.4%
							46				
							66				
							64	11.4		18.5	
							82				
20	5D	24/15	20.00 - 22.00	11/18/14/47	32	46				Brown, wet, dense, fine to coarse Sandy GRAVEL, little silt.	G#336695 A-1-a, GW-GM WC=7.0%
								7.9		22.0	
										Bottom of Exploration at 22.0 feet below ground surface. NO REFUSAL	
25											

Remarks:

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Boring No.: HB-MICH-209

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-210
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	30.8	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/3/2018; 08:30-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	N/A
Boring Location:	224+75, 9.0 ft Rt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	8.0 ft bgs.
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
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MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	30.3		6" HMA. 0.5	
	1D	24/15	1.00 - 3.00	9/10/11/12	21	30				Brown, damp, medium dense, fine to coarse SAND, some gravel, little silt, (Fill).	G#336696 A-1-b, SM WC=6.5%
5	2D	24/16	5.00 - 7.00	5/5/6/7	11	16	15			Grey-brown, moist, very stiff, fine to coarse Sandy SILT, little gravel (Fill).	G#336697 A-4, SM WC=12.8%
							21	24.0		6.8	
							68	23.7		Layer of Old Pavement. 7.1	
							73				
							92				
10	3D	24/13	10.00 - 12.00	3/3/3/3	6	9	27			Grey, wet, loose, GRAVEL, some silt, some fine to coarse sand, (Fill).	G#336698 A-2-4, SM WC=12.6%
							25				
							28				
							25				
							24				
15	4D	24/12	15.00 - 17.00	15/14/7/6	21	30				Grey, wet, medium dense, fine to coarse Sandy GRAVEL, trace silt, (Fill). Wood from 15.3-16.1 ft bgs.	G#336699 A-1-a, GW-GM WC=50.0%
								12.8		18.0	
20	5D	24/18	20.00 - 22.00	5/6/6/8	12	17				Brown, wet, very stiff, Silty CLAY, trace fine to coarse sand, trace gravel, wood.	G#336700 A-6, CL WC=32.7% LL=39 PL=21 PI=18
								8.8		22.0	
										Bottom of Exploration at 22.0 feet below ground surface. NO REFUSAL	
25											

Remarks:

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-211
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	29.5	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/3/2018; 10:15-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	N/A
Boring Location:	225+40, 8.5 ft Lt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	7.0 ft bgs.
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
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MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	28.9		7" HMA.	
										0.6	
	1D	24/13	1.00 - 3.00	6/7/5/4	12	17				Brown, damp, medium dense, fine to coarse SAND, some gravel, little silt, (Fill).	G#336662 A-1-b, SM WC=8.0%
5	2D	24/15	5.00 - 7.00	9/9/8/9	17	24	23			Brown, damp, medium dense, fine to coarse SAND, some gravel, trace silt, (Fill).	G#336663 A-1-b, SW-SM WC=7.4%
							24				
							22				
							13	21.5		8.0	
							25				
10	3D	24/18	10.00 - 12.00	6/3/2/2	5	7	8			Grey, wet, medium stiff, SILT, some fine to coarse sand.	G#336694 A-4, CL WC=25.0%
							10				
							10				
							10				
							13				
15	4D	24/20	15.00 - 17.00	1/1/2/2	3	4	OPEN HOLE			Grey, wet, soft, SILT, some clay, some fine to coarse sand, trace gravel.	G#336665 A-4, CL WC=32.1%
								11.0		18.5	
20	5D	24/14	20.00 - 22.00	4/9/16/18	25	36				Brown, damp, dense, fine to coarse SAND, trace silt, trace gravel.	G#336666 A-3, SP-SM WC=9.9%
								7.5		22.0	
										Bottom of Exploration at 22.0 feet below ground surface. NO REFUSAL	
25											

Remarks:

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Boring No.: HB-MICH-211

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-212
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	39.7	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/3/2018-5/4/2018	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	NQ-2"
Boring Location:	246+70, 9.5 ft Rt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	None Observed
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	39.3		5" HMA.	
										0.4	
	1D	24/14	1.00 - 3.00	8/10/8/7	18	26				Brown, damp, medium dense, Gravelly fine to coarse SAND, little silt, (Fill).	G#336667 A-1-b, SM WC=5.0%
5	2D	9.6/9.6	5.00 - 5.80	15/50(3.6")	---			34.2		Brown, damp, GRAVEL, some fine to coarse sand, trace silt, (Fill).	G#336668
										5.5	
								33.8		Layer of Old Pavement.	A-1-a, GW-GM
										5.9	WC=3.5%
								30.2		9.5	
10	3D	24/6	10.00 - 12.00	2/2/3/4	5	7				Grey-brown, moist, loose, Silty GRAVEL, some fine to coarse sand.	G#336669 A-4, GM WC=10.8%
										Cobble from 12.8-13.2 ft bgs.	
15	4D	24/18	15.00 - 17.00	12/32/44/48	76	108		24.2		15.5	
										Grey, wet, very dense, Gravelly fine to coarse SAND, little silt.	G#336670 A-1-b, SM WC=10.1%
								20.7		19.0	
20	5D	12/12	20.00 - 21.00	48/55	---		50			Grey, wet, GRAVEL, some fine to coarse sand, little silt.	G#336671 A-1-a, GM WC=9.1%
	R1	60/60	21.20 - 26.20	RQD = 37%			[a]25 NQ-2	18.5		[a]25 blows for 0.2 ft.	
										21.2	
										Top of Bedrock at Elev. 18.5 ft. R1: Bedrock: Undetermined VOLCANIC ROCKS, [Columbia Falls Formation]; and Intrusive DEVONIAN GRANITE, GABBRO, DIORITE, and ULTRAMAFIC ROCKS. Rock Quality = Poor R1: Core Times (min:sec) 21.2-22.2 ft (3:40) 22.2-23.2 ft (3:31)	
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-MICH-212

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-212
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	39.7	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/3/2018-5/4/2018	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	NQ-2"
Boring Location:	246+70, 9.5 ft Rt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	None Observed
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140 lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_V = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25								13.5		23.2-24.2 ft (3:10) 24.2-25.2 ft (2:43) 25.2-26.2 ft (2:25) 100% Recovery 26.2- **Bottom of Exploration at 26.2 feet below ground surface.**	
30											
35											
40											
45											
50											

Remarks:

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

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

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-213
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	39.6	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/4/2018; 08:00-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	NQ-2"
Boring Location:	247+00, 9.0 ft Lt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	None Observed
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	39.1		6" HMA.	
										0.5	
	1D	18/12	1.00 - 2.50	9/10/21	31	44				Brown, damp, dense, fine to coarse Sandy GRAVEL, little silt, (Fill).	G#336672 A-1-a, GW-GM WC=3.8%
										Cobble from 2.5-2.8 ft bgs.	
5	2D	24/14	5.00 - 7.00	6/12/11/7	23	33				Grey-brown, moist, dense, Gravelly fine to coarse SAND, little silt, (Fill).	G#336673 A-1-b, SM WC=8.1%
10	3D	24/20	10.00 - 12.00	WOH/WOH/1/1	1	1	1	29.6		10.0	
							3			Grey, wet, very soft, SILT, some clay, little fine to coarse sand, trace gravel.	G#336674 A-4, CL WC=27.5%
							9				
							11				
							15	25.6		14.0	
15	4D	24/16	15.00 - 17.00	10/13/18/14	31	44	9			Grey, wet, dense, fine to coarse SAND, some gravel, some silt, (Till).	G#336675 A-1-b, SM WC=8.1%
							13				
	R1	60/59	17.70 - 22.70	RQD = 60%			[a]75 NQ-2	21.9		[a]75 blows for 0.7 ft. Roller Coned ahead to 17.7 ft bgs.	
										17.7	
										Top of Bedrock at Elev. 21.9 ft. R1: Bedrock: Undetermined VOLCANIC ROCKS, [Columbia Falls Formation]; and Intrusive DEVONIAN GRANITE, GABBRO, DIORITE, and ULTRAMAFIC ROCKS. Rock Quality = Fair	
20										R1: Core Times (min:sec) 17.7-18.7 ft (3:19) 18.7-19.7 ft (3:24) 19.7-20.7 ft (3:00) 20.7-21.7 ft (2:45) 21.7-22.7 ft (2:16) 98% Recovery	
								16.9		22.7	
25										**Bottom of Exploration at 22.7 feet below ground surface.**	

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-MICH-213

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-214
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	64.2	**Auger ID/OD:**	5" Dia.
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	N/A
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	N/A
Date Start/Finish:	5/1/2018-5/1/2018	**Drilling Method:**	Solid Stem Auger	**Core Barrel:**	N/A
Boring Location:	351+90, 11.0 ft Rt.	**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 = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA			Probe, no soil samples taken.	
5											
10											
15											
20								44.2		20.0 **Bottom of Exploration at 20.0 feet below ground surface.** NO REFUSAL	
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: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-215
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	64.5	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/1/2018; 07:00-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	NQ-2"
Boring Location:	352+15, 8.0 ft Lt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	12.5 ft bgs.
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
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V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0							SSA	64.2		4" HMA.	
										0.3	
	1D	24/16	1.00 - 3.00	9/14/14/9	28	40				Brown, moist, dense, fine to coarse SAND, some gravel, trace silt, (Fill).	G#296334 A-1-b, SW-SM WC=5.1%
5								59.5		5.0	
	2D	24/17	5.00 - 7.00	3/3/4/6	7	10				Olive-brown, moist, stiff, Clayey SILT, trace fine sand, (Fill).	G#296335 A-6, CL WC=23.8% LL=30 PL=18 PI=12
								55.5		9.0	
10	3D	24/20	10.00 - 12.00	3/4/6/7	10	14	10			Olive-brown, stiff, Silty CLAY, trace fine sand, (Fill).	G#296336 A-6, CL WC=24.2% LL=30 PL=18 PI=12
							21				
							28				
							33				
							52	50.5		14.0	
15	4D	24/20	15.00 - 17.00	2/4/5/6	9	13	23			Grey, wet, stiff, SILT, little clay, trace fine sand, trace organics.	G#296337 A-4, CL WC=24.8%
							42				
							85				
							202				
	R1	60/59	19.90 - 24.90	RQD = 78%			[a]150	45.1		[a]150 blows for 0.4 ft. Roller Coned ahead to 19.9 ft bgs.	
20							NQ-2	44.6		19.4	
										Weathered Bedrock.	
										19.9	
										Top of Bedrock at Elev. 44.6 ft. R1: Bedrock: Undetermined VOLCANIC ROCKS, [Columbia Falls Formation]; and Intrusive DEVONIAN GRANITE, GABBRO, DIORITE, and ULTRAMAFIC ROCKS. Rock Quality = Good R1: Core Times (min:sec) 19.9-20.9 ft (2:03) 20.9-21.9 ft (2:30) 21.9-22.9 ft (2:29)	
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-MICH-215

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Reconstruction of a 4.81 mile portion of Route 1
Location: Milbridge-Cherryfield, Maine

Boring No.: HB-MICH-215
WIN: 20405.00

Driller:	MaineDOT	**Elevation (ft.)**	64.5	**Auger ID/OD:**	5" Soild Stem
Operator:	Daggett/Niles	**Datum:**	NAVD88	**Sampler:**	Standard Split Spoon
Logged By:	B. Wilder	**Rig Type:**	CME 45C	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	5/1/2018; 07:00-	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	NQ-2"
Boring Location:	352+15, 8.0 ft Lt.	**Casing ID/OD:**	NW-3"	**Water Level*:**	12.5 ft bgs.
Hammer Efficiency Factor: 0.854		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140 lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_V = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25								39.6		22.9-23.9 ft (3:06) 23.9-24.9 ft (3:01) 98% Recovery	
										24.9-	
										Bottom of Exploration at 24.9 feet below ground surface.	
30											
35											
40											
45											
50											

Remarks:

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

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

Appendix B

Laboratory Test Results

State of Maine - Department of Transportation

Laboratory Testing Summary Sheet

Town(s): Milbridge-Cherryfield Work Number: 20405.00

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
Subbase: 10" Auger: Bucket Sample											
HB-MICH-101, B1	115+60	6.5 Lt.	0.75-1.5	264743	1	1.6			SW-SM	A-1-b	0
HB-MICH-103, B2	140+95	8.0 Lt.	0.33-5.0	264744	1	2.9			SW-SM	A-1-a	0
HB-MICH-104, B3	140+95	18.0 Lt.	0.0-1.6	264745	1	0.8			SW-SM	A-1-b	0
HB-MICH-107, B4	171+50	6.5 Rt.	0.42-2.3	264746	1	2.5			GW-GM	A-1-a	0
HB-MICH-108, B5	171+50	15.0 Rt.	0.0-2.0	264747	1	3.0			SW-SM	A-1-b	0
HB-MICH-112, B6	213+80	9.0 Lt.	0.42-2.9	264748	1	1.7			SW-SM	A-1-a	0
HB-MICH-113, B7	213+80	15.0 Lt.	0.0-2.6	264749	2	2.6			SW-SM	A-1-b	0
HB-MICH-114, B8	248+92	7.0 Lt.	0.33-2.2	264750	2	0.6			GW-GM	A-1-a	0
HB-MICH-115, B9	248+92	15.0 Lt.	0.0-2.5	264751	2	2.7			GW-GM	A-1-a	0
HB-MICH-118, B10	294+64	7.0 Rt.	0.42-3.0	264752	2	1.8			GW-GM	A-1-a	0
HB-MICH-119, B11	294+64	16.0 Rt.	0.0-2.8	264753	2	2.3			SW-SM	A-1-a	0
Subbase: 5" Auger: Cup Sample											
HB-MICH-102, S2	127+65	7.5 Rt.	0.5-2.4	264754	3	5.1			SW-SM	A-1-a	0
HB-MICH-105, S5	150+87	8.0 Rt.	0.5-3.5	264755	3	7.5			SM	A-1-b	II
HB-MICH-106, S7	161+00	7.0 Lt.	0.58-2.7	264756	3	6.5			SM	A-1-b	II
HB-MICH-109, S11	180+00	8.0 Rt.	0.58-3.6	264757	3	5.2			SM	A-1-b	II
HB-MICH-110, S13	192+67	7.0 Lt.	0.42-3.9	264758	3	6.6			SM	A-1-b	II
HB-MICH-111, S14	203+30	7.0 Rt.	0.42-3.3	264759	3	4.9			SM	A-1-b	II
HB-MICH-116, S18	269+42	7.0 Rt.	0.33-3.0	264760	4	3.4			SM	A-1-b	II
HB-MICH-117, S20	279+16	7.0 Rt.	0.42-3.1	264761	4	4.0			SM	A-1-b	II
HB-MICH-120, S23	303+70	7.0 Lt.	0.42-3.3	264762	4	7.7			SM	A-1-b	II
HB-MICH-121, S25	317+85	7.0 Rt.	0.42-2.6	264763	4	4.0			SM	A-1-b	II
HB-MICH-122, S27	329+50	7.0 Lt.	0.42-2.3	264764	4	5.9			SM	A-1-b	II
HB-MICH-123, S29	341+05	7.0 Rt.	0.42-3.5	264765	4	4.4			SM	A-1-b	II
Subgrade: 5" Auger: Cup Sample											
HB-MICH-101, S1	115+60	6.5 Lt.	1.5-5.0	264766	5	29.4			SM	A-4	III
HB-MICH-105, S6	150+87	8.0 Rt.	3.5-5.0	264768	5	20.7			ML	A-4	IV
HB-MICH-107, S9	171+50	6.5 Rt.	2.3-5.0	264767	5	18.6			ML	A-4	IV
HB-MICH-109, S12	180+00	8.0 Rt.	3.6-5.0	264769	5	16.5			ML	A-4	IV
HB-MICH-112, S16	213+80	9.0 Lt.	2.9-5.0	264770	6	25.6			ML	A-4	IV
HB-MICH-117, S21	279+16	7.0 Rt.	3.1-5.0	264771	6	26.5			ML	A-4	IV
HB-MICH-122, S28	329+50	7.0 Lt.	2.3-5.0	264772	6	16.8			ML	A-4	IV

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

Laboratory Testing Summary Sheet

Town(s): Milbridge-Cherryfield Work Number: 20405.00

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-MICH-201, 1D	118+30	9.0 Rt.	1.0-3.0	336734	7	4.3			SW-SM	A-1-b	0
HB-MICH-201, 2D	118+30	9.0 Rt.	5.0-7.0	336735	7	30.3	26	5	CL-ML	A-4	IV
HB-MICH-201, 3D	118+30	9.0 Rt.	10.0-12.0	336736	7	30.4	37	16	CL	A-6	III
HB-MICH-201, 4D	118+30	9.0 Rt.	15.0-17.0	336737	7	30.8	34	13	CL	A-6	III
HB-MICH-201, 5D	118+30	9.0 Rt.	20.0-22.0	336738	7	30.2	35	12	CL	A-6	III
HB-MICH-201, 6D	118+30	9.0 Rt.	22.0-24.0	336739	7	28.6	33	14	CL	A-6	III
HB-MICH-203, 1D	143+30	9.5 Rt.	1.0-3.0	336740	8	5.8			SM	A-1-b	II
HB-MICH-203, 2D	143+30	9.5 Rt.	5.0-7.0	336741	8	5.4			SM	A-1-b	II
HB-MICH-203, 3D	143+30	9.5 Rt.	10.0-12.0	336742	8	22.8	30	10	CL	A-4	IV
HB-MICH-203, 4D	143+30	9.5 Rt.	14.0-16.0	336743	8	27.8	36	15	CL	A-6	III
HB-MICH-203, 5D	143+30	9.5 Rt.	20.0-22.0	336744	8	14.8			SM	A-1-b	II
HB-MICH-204, 1D	144+20	10.0 Lt.	1.0-3.0	336745	9	5.7			SM	A-1-a	II
HB-MICH-204, 2D	144+20	10.0 Lt.	5.0-7.0	336746	9	5.2			SM	A-1-b	II
HB-MICH-204, 3D	144+20	10.0 Lt.	11.0-13.0	336747	9	19.9			CL	A-4	IV
HB-MICH-204, 4D	144+20	10.0 Lt.	15.0-17.0	336748	9	25.6	31	10	CL	A-4	IV
HB-MICH-204, 5D	144+20	10.0 Lt.	20.0-22.0	336749	9	26.6	32	14	CL	A-6	III
HB-MICH-204, 6D	144+20	10.0 Lt.	25.0-26.1	336750	9	20.8			SM	A-2-4	III
HB-MICH-205, 1D	200+55	9.5 Lt.	1.0-3.0	336676	10	4.4			SW-SM	A-1-a	0
HB-MICH-205, 2D	200+55	9.5 Lt.	6.0-7.0	336677	10	15.9			CL	A-4	IV
HB-MICH-205, 3D	200+55	9.5 Lt.	10.0-12.0	336678	10	6.7			SM	A-1-b	II
HB-MICH-205, 4D	200+55	9.5 Lt.	15.0-17.0	336679	10	29.7	31	8	CL	A-4	IV
HB-MICH-205, 5D	200+55	9.5 Lt.	20.0-22.0	336680	10	27.4	38	16	CL	A-6	III
HB-MICH-205, 6D	200+55	9.5 Lt.	22.5-24.0	336681	10	31.3			CL	A-4	IV
HB-MICH-207, 1D	209+40	9.5 Rt.	1.0-3.0	336682	11	5.5			SW-SM	A-1-b	0
HB-MICH-207, 2D	209+40	9.5 Rt.	5.0-7.0	336683	11	11.3			GM	A-2-4	III
HB-MICH-207, 3D	209+40	9.5 Rt.	10.0-11.0	336684	11	14.8			SM	A-2-4	III
HB-MICH-207, 4D	209+40	9.5 Rt.	15.0-17.0	336685	11	8.4			SW-SM	A-1-a	0
HB-MICH-207, 5D	209+40	9.5 Rt.	20.0-22.0	336686	11	15.7			SP-SM	A-1-b	0
HB-MICH-208, 1D	210+10	9.5 Rt.	5.0-7.0	336687	12	8.7			GM	A-1-b	I
HB-MICH-208, 2D	210+10	9.5 Rt.	10.0-12.0	336688	12	6.0			SM	A-1-b	II
HB-MICH-208, 3D	210+10	9.5 Rt.	15.5-17.5	336689	12	30.3			CL	A-4	IV
HB-MICH-208, 4D	210+10	9.5 Rt.	20.0-22.0	336690	12	8.8			GW-GM	A-1-a	0
HB-MICH-209, 1D	210+65	9.5 Lt.	1.0-3.0	336691	13	4.0			SW-SM	A-1-a	0
HB-MICH-209, 2D	210+65	9.5 Lt.	5.0-7.0	336692	13	23.7			CL	A-4	IV
HB-MICH-209, 3D	210+65	9.5 Lt.	10.0-12.0	336693	13	19.3			SC-SM	A-4	IV
HB-MICH-209, 4D	210+65	9.5 Lt.	15.0-17.0	336694	13	12.4			SM	A-1-b	II
HB-MICH-209, 5D	210+65	9.5 Lt.	20.0-22.0	336695	13	7.0			GW-GM	A-1-a	0
HB-MICH-210, 1D	224+75	9.0 Rt.	1.0-3.0	336696	14	6.5			SM	A-1-b	II
HB-MICH-210, 2D	224+75	9.0 Rt.	5.0-7.0	336697	14	12.8			SM	A-4	IV
HB-MICH-210, 3D	224+75	9.0 Rt.	10.0-12.0	336698	14	12.6			SM	A-2-4	II
HB-MICH-210, 4D	224+75	9.0 Rt.	15.0-17.0	336699	14	50.0			GW-GM	A-1-a	0
HB-MICH-210, 5D	224+75	9.0 Rt.	20.0-22.0	336700	14	32.7	39	18	CL	A-6	III

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

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Laboratory Testing Summary Sheet

Town(s): Milbridge-Cherryfield Work Number: 20405.00

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-MICH-211, 1D	225+40	8.5 Lt.	1.0-3.0	336662	15	8.0			SM	A-1-b	II
HB-MICH-211, 2D	225+40	8.5 Lt.	5.0-7.0	336663	15	7.4			SW-SM	A-1-b	0
HB-MICH-211, 3D	225+40	8.5 Lt.	10.0-12.0	336664	15	25.0			CL	A-4	IV
HB-MICH-211, 4D	225+40	8.5 Lt.	15.0-17.0	336665	15	32.1			CL	A-4	IV
HB-MICH-211, 5D	225+40	8.5 Lt.	20.0-22.0	336666	15	9.9			SP-SM	A-3	0
HB-MICH-212, 1D	246+70	9.5 Rt.	1.0-3.0	336667	16	5.0			SM	A-1-b	II
HB-MICH-212, 2D	246+70	9.5 Rt.	5.0-5.8	336668	16	3.5			GW-GM	A-1-a	0
HB-MICH-212, 3D	246+70	9.5 Rt.	10.0-12.0	336669	16	10.8			GM	A-4	II
HB-MICH-212, 4D	246+70	9.5 Rt.	15.5-17.0	336670	16	10.1			SM	A-1-b	II
HB-MICH-212, 5D	246+70	9.5 Rt.	20.0-21.0	336671	16	9.1			GM	A-1-a	0
HB-MICH-213, 1D	247+00	9.0 Lt.	1.0-2.5	336672	17	3.8			GW-GM	A-1-a	0
HB-MICH-213, 2D	247+00	9.0 Lt.	5.0-7.0	336673	17	8.1			SM	A-1-b	II
HB-MICH-213, 3D	247+00	9.0 Lt.	10.0-12.0	336674	17	27.5			CL	A-4	IV
HB-MICH-213, 4D	247+00	9.0 Lt.	15.0-17.0	336675	17	8.1			SM	A-1-b	II
HB-MICH-215, 1D	352+15	8.0 Lt.	1.0-3.0	296334	18	5.1			SW-SM	A-1-b	0
HB-MICH-215, 2D	352+15	8.0 Lt.	5.0-7.0	296335	18	23.8	30	12	CL	A-6	III
HB-MICH-215, 3D	352+15	8.0 Lt.	10.0-12.0	296336	18	24.2	30	12	CL	A-6	III
HB-MICH-215, 4D	352+15	8.0 Lt.	15.0-17.0	296337	18	24.8			CL	A-4	IV
							Loss on Ignition, % (T 267)				
HB-MICH-209, 2D	210+65	9.5 Lt.	5.0-7.0	336692	13	23.7	10.8				

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

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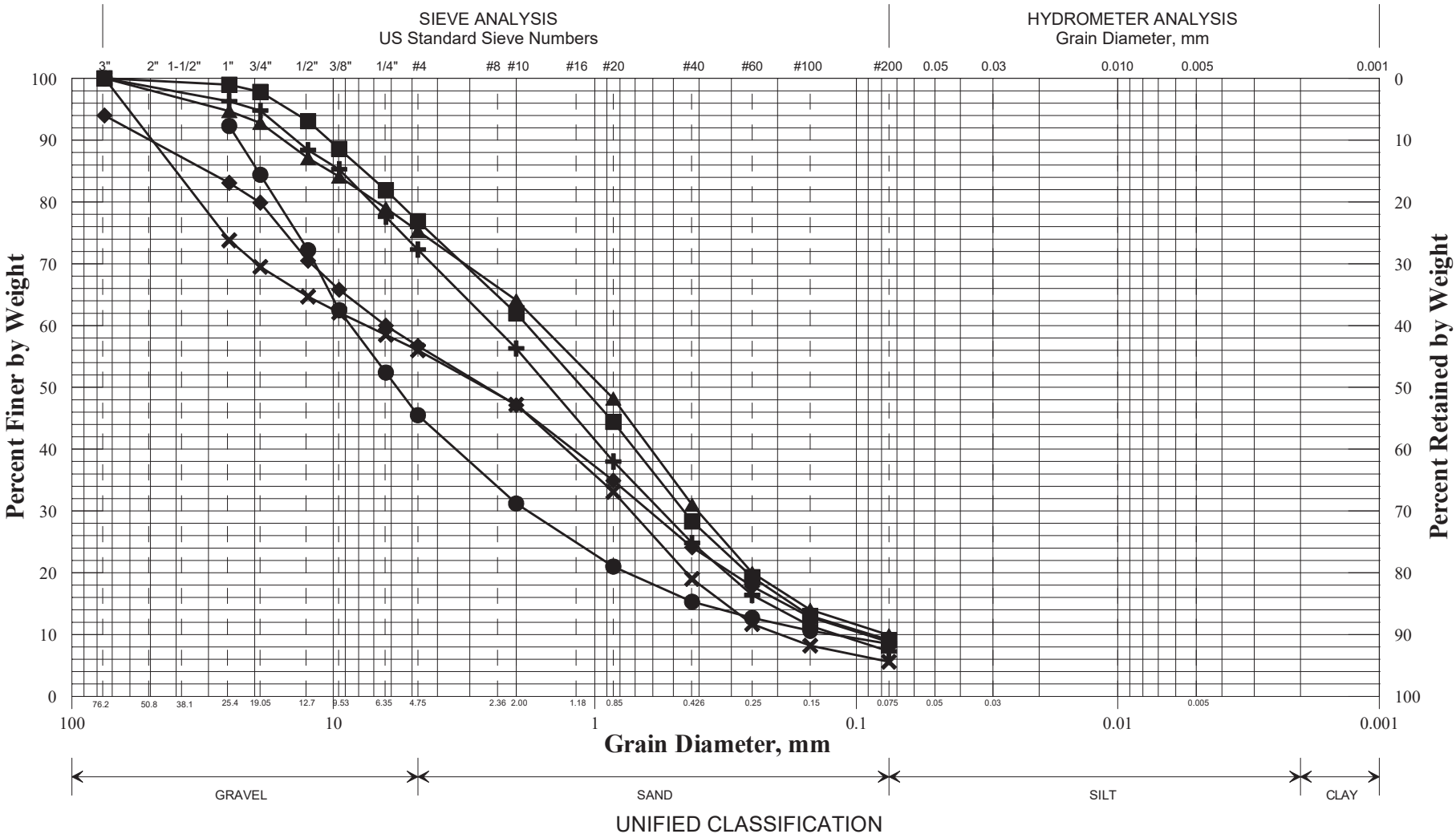
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-101/B1	115+60	6.5 LT	0.75-1.5	SAND, some gravel, trace silt.	1.6			
◆	HB-MICH-103/B2	140+95	8.0 LT	0.33-5.0	Gravelly SAND, trace silt.	2.9			
■	HB-MICH-104/B3	140+95	18.0 LT	0.0-1.6	SAND, some gravel, trace silt.	0.8			
●	HB-MICH-107/B4	171+50	6.5 RT	0.42-2.3	Sandy GRAVEL, trace silt.	2.5			
▲	HB-MICH-108/B5	171+50	15.0 RT	0.0-2.0	SAND, some gravel, trace silt.	3.0			
✖	HB-MICH-112/B6	213+80	9.0 LT	0.42-2.9	Gravelly SAND, trace silt.	1.7			

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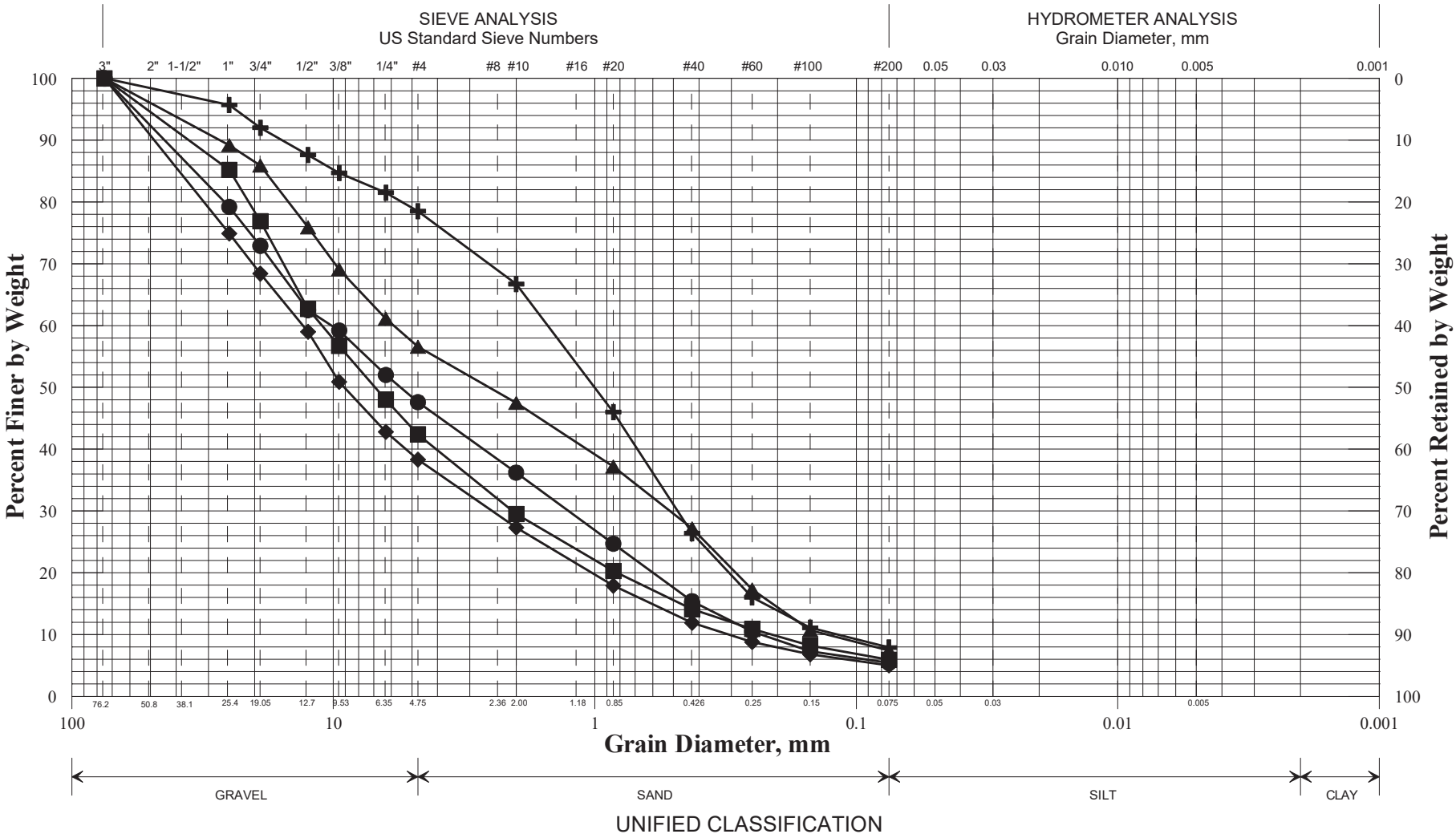
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-113/B7	213+80	15.0 LT	0.0-2.6	SAND, some gravel, trace silt.	2.6			
◆	HB-MICH-114/B8	248+92	7.0 LT	0.33-2.2	GRAVEL, some sand, trace silt.	0.6			
■	HB-MICH-115/B9	248+92	15.0 LT	0.0-2.5	Sandy GRAVEL, trace silt.	2.7			
●	HB-MICH-118/B10	294+64	7.0 RT	0.42-3.0	Sandy GRAVEL, trace silt.	1.8			
▲	HB-MICH-119/B11	294+64	16.0 RT	0.0-2.8	Gravelly SAND, trace silt.	2.3			
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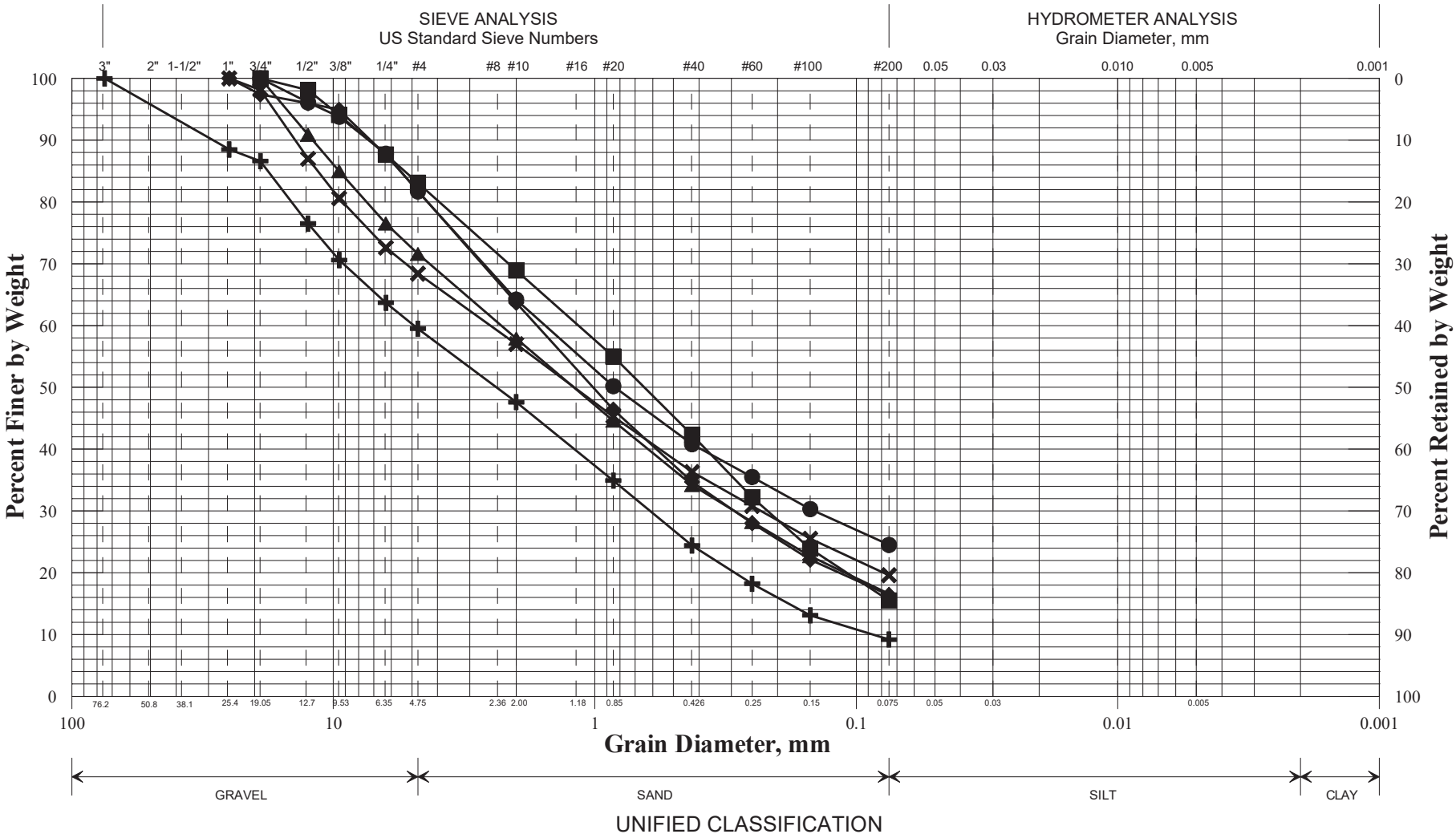

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-102/S2	127+65	7.5 RT	0.5-2.4	Gravelly SAND, trace silt.	5.1			
◆	HB-MICH-105/S5	150+87	8.0 RT	0.5-3.5	SAND, little gravel, little silt.	7.5			
■	HB-MICH-106/S7	161+00	7.0 LT	0.58-2.70	SAND, little gravel, little silt.	6.5			
●	HB-MICH-109/S11	180+00	8.0 RT	0.58-3.6	SAND, some silt, little gravel.	5.2			
▲	HB-MICH-110/S13	192+67	7.0 LT	0.42-3.9	SAND, some gravel, little silt.	6.6			
✖	HB-MICH-111/S14	203+30	7.0 RT	0.42-3.3	SAND, some gravel, little silt.	4.9			

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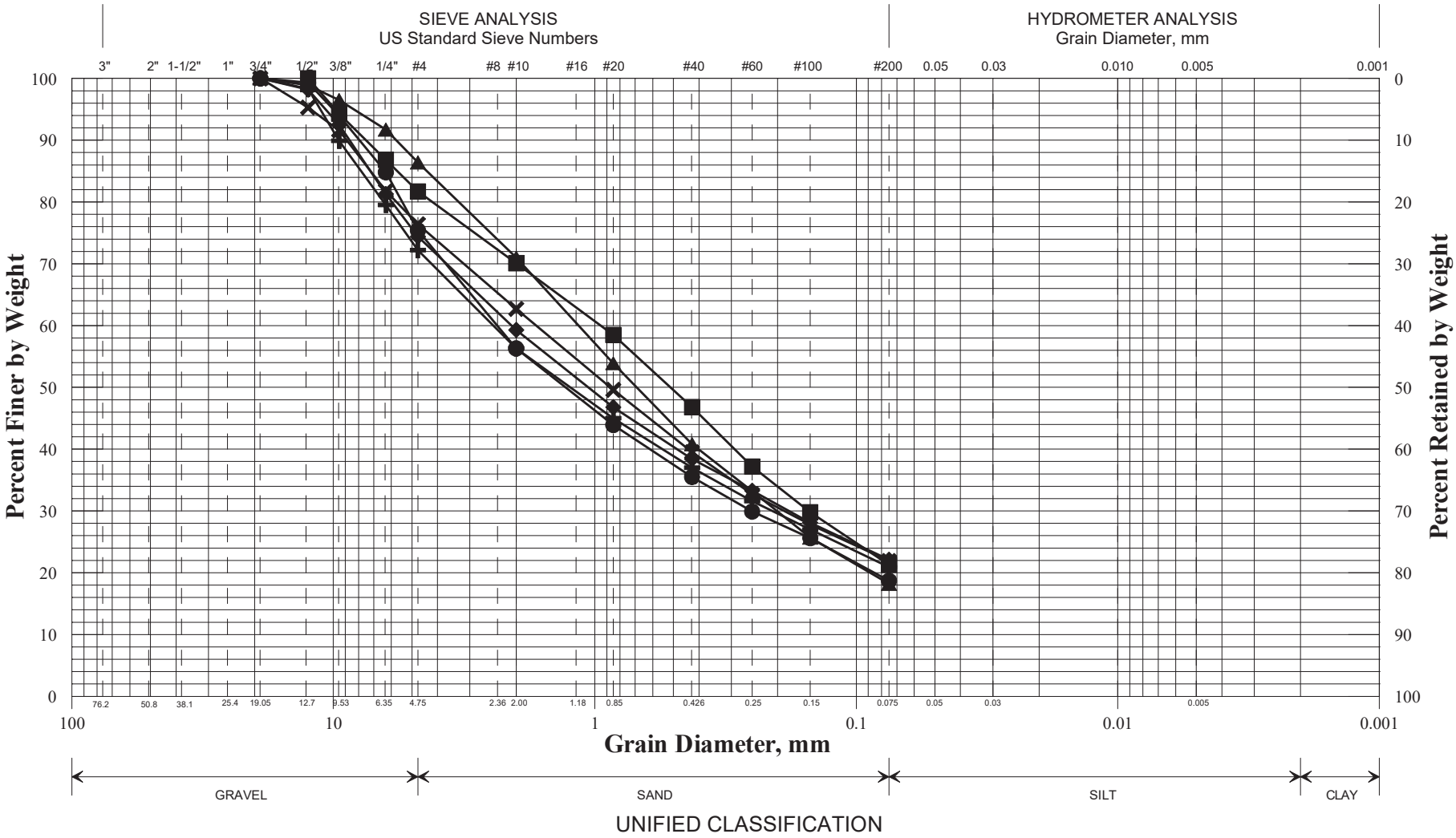

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-116/S18	269+42	7.0 RT	0.33-3.0	SAND, some gravel, little silt.	3.4			
◆	HB-MICH-117/S20	276+16	7.0 RT	0.42-3.1	SAND, some gravel, some silt.	4.0			
■	HB-MICH-120/S23	303+70	7.0 LT	0.42-3.3	SAND, some silt, little gravel.	7.7			
●	HB-MICH-121/S25	317+85	7.0 RT	0.42-2.6	SAND, some gravel, little silt.	4.0			
▲	HB-MICH-122/S27	329+50	7.0 LT	0.42-2.3	SAND, little silt, little gravel.	5.9			
✖	HB-MICH-123/S29	341+05	7.0 RT	0.42-3.5	SAND, some gravel, some silt.	4.4			

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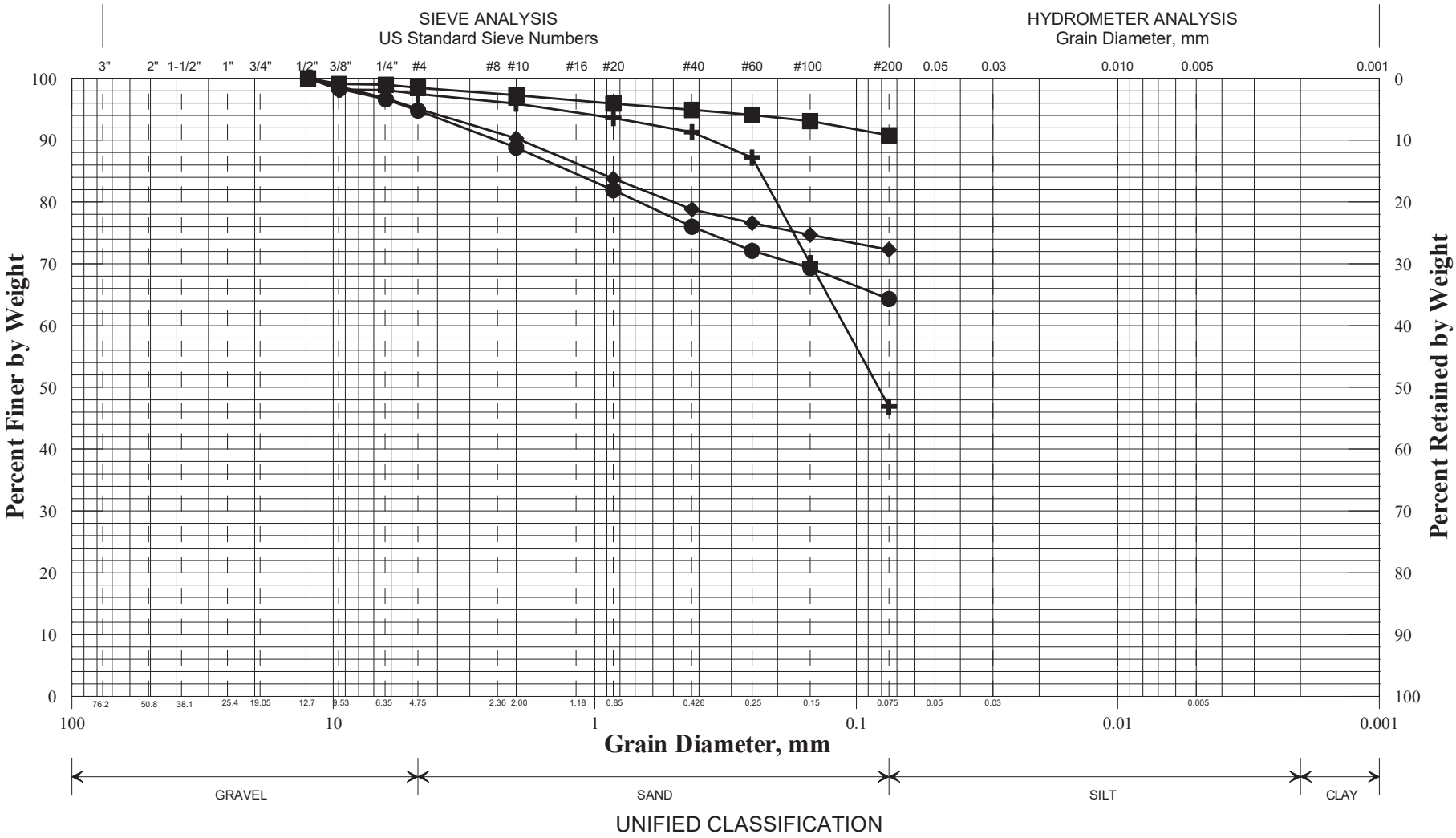

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-101/S1	115+60	6.5 LT	1.5-5.0	Silty SAND, trace gravel.	29.4			
◆	HB-MICH-105/S6	150+87	8.0 RT	3.5-5.0	SILT, some sand, trace gravel.	20.7			
■	HB-MICH-107/S9	171+50	6.5 RT	2.3-5.0	SILT, trace sand, trace gravel.	18.6			
●	HB-MICH-109/S12	180+00	8.0 RT	3.6-5.0	SILT, some sand, trace gravel.	16.5			
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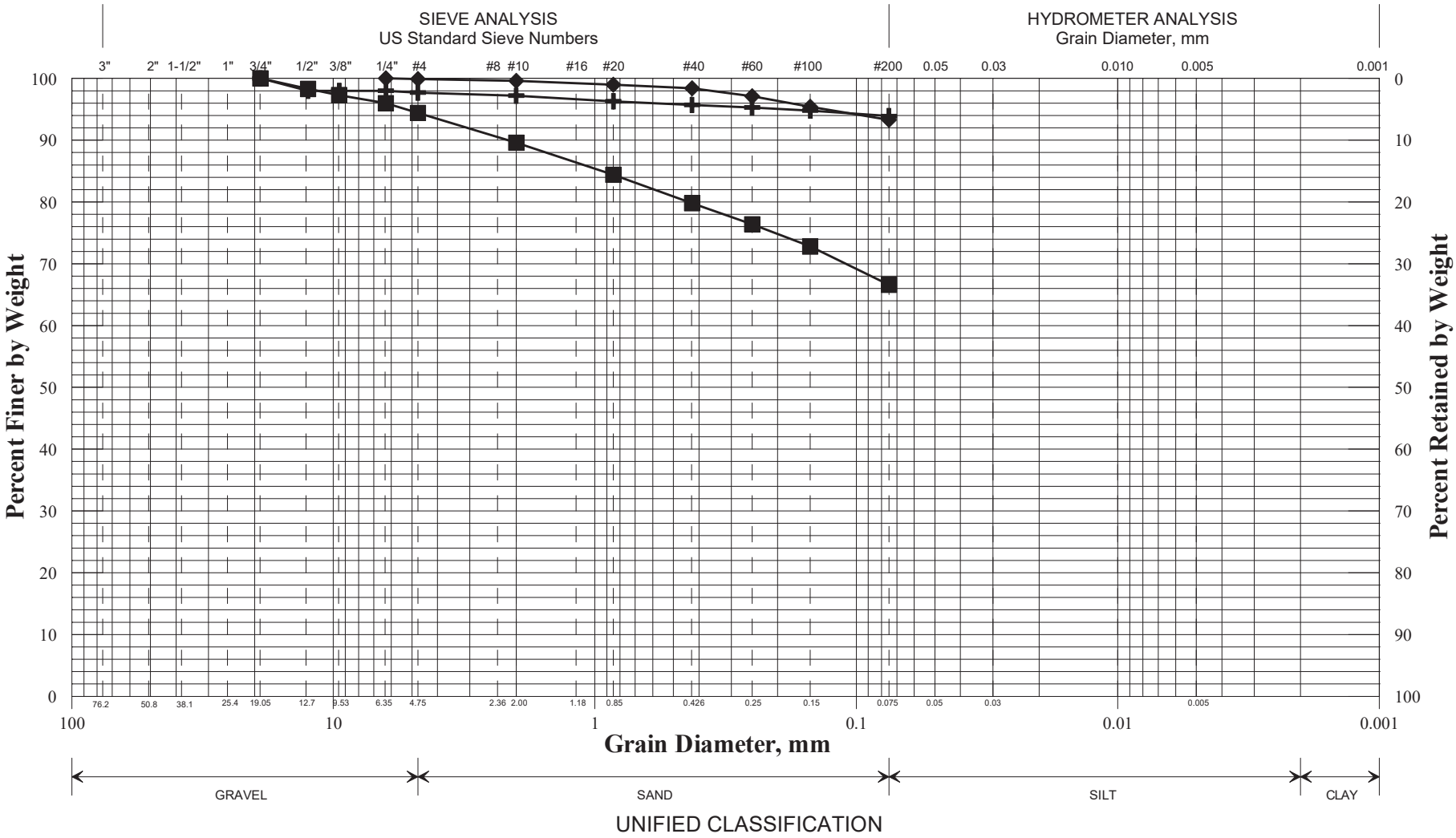

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-112/S16	213+80	9.0 LT	2.9-5.0	SILT, trace sand, trace gravel.	25.6			
◆	HB-MICH-117/S21	279+16	7.0 RT	3.1-5.0	SILT, trace sand, trace gravel.	25.6			
■	HB-MICH-122/S28	329+50	7.0 LT	2.3-5.0	SILT, some sand, trace gravel.	16.8			
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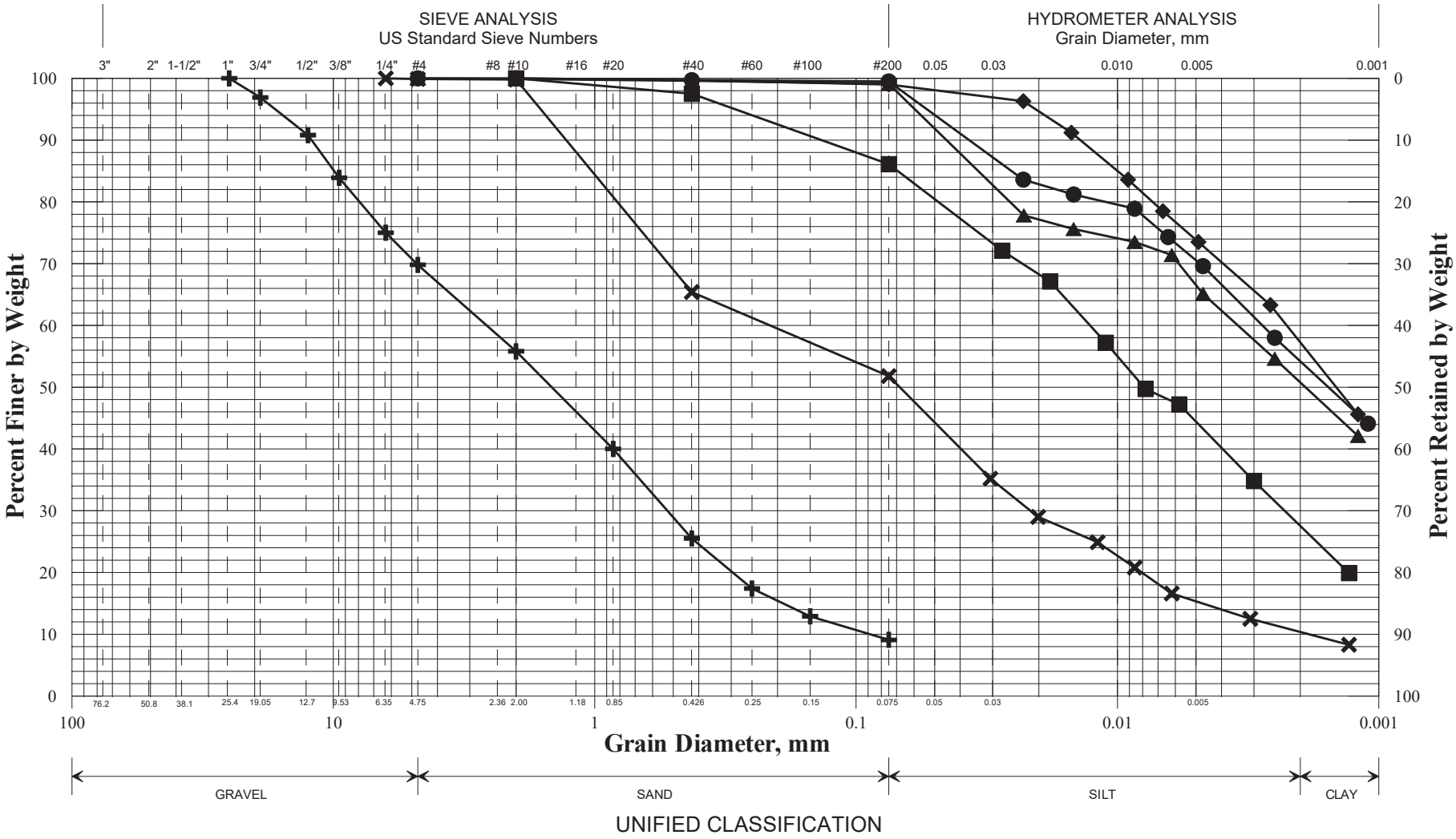

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-201/1D	118+30	9.0 RT	1.0-3.0	SAND, some gravel, trace silt.	4.3			
◆	HB-MICH-201/2D	118+30	9.0 RT	5.0-7.0	Silty CLAY, trace sand.	30.3	26	21	5
■	HB-MICH-201/3D	118+30	9.0 RT	10.0-12.0	SILT, some clay, little sand.	30.4	37	21	16
●	HB-MICH-201/4D	118+30	9.0 RT	15.0-17.0	Silty CLAY, trace sand.	30.8	34	21	13
▲	HB-MICH-201/5D	118+30	9.0 RT	20.0-22.0	Silty CLAT, trace sand.	30.2	35	23	12
✖	HB-MICH-201/6D	118+30	9.0 RT	22.0-24.0	Silty SAND, trace clay, trace gravel.	28.6	33	19	14

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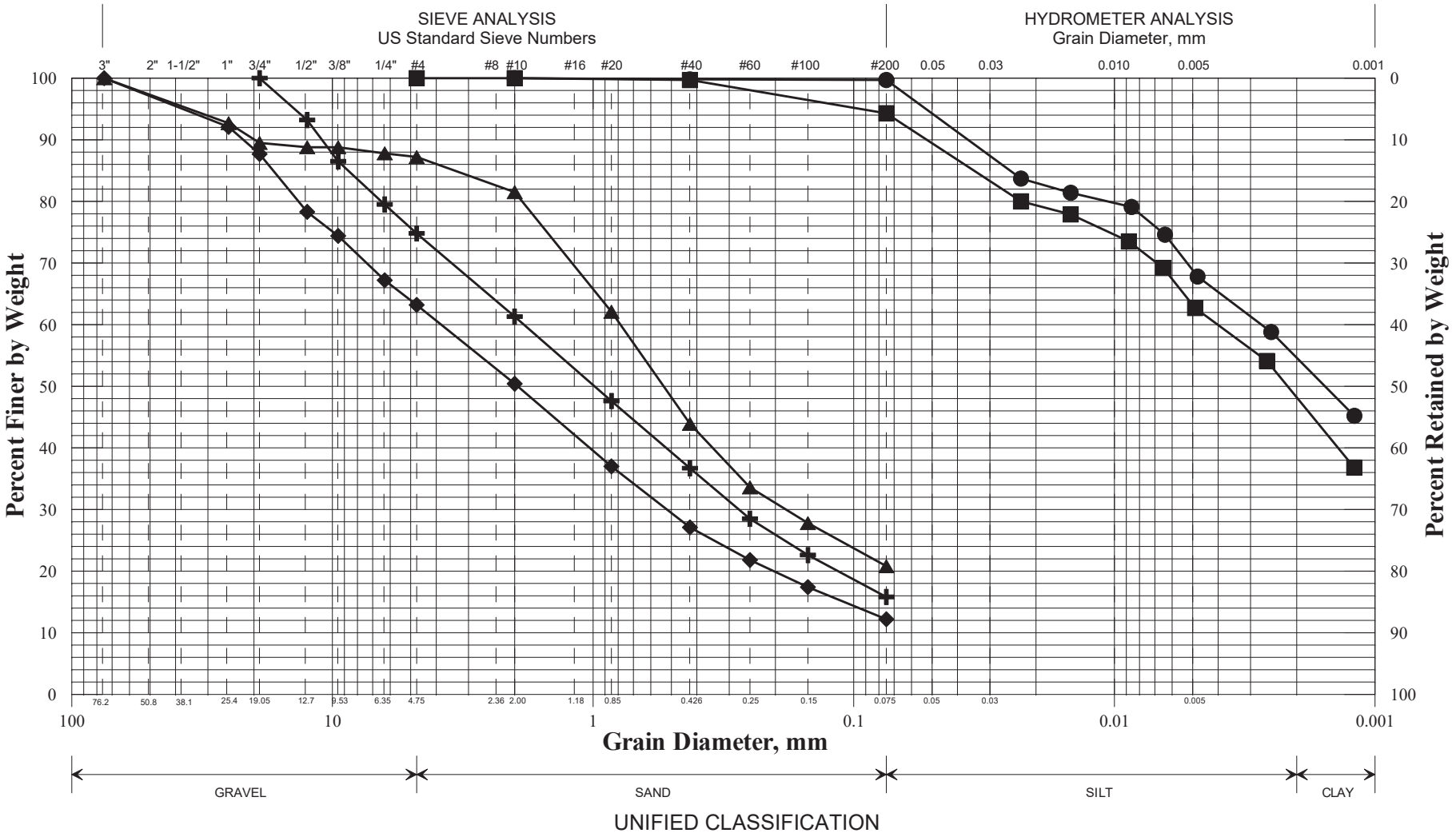

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-203/1D	143+30	9.5 RT	1.0-3.0	SAND, some gravel, little silt.	5.8			
◆	HB-MICH-203/2D	143+30	9.5 RT	5.0-7.0	Gravelly SAND, little silt.	5.4			
■	HB-MICH-203/3D	143+30	9.5 RT	10.0-12.0	Silty CLAY, trace sand.	22.8	30	20	10
●	HB-MICH-203/4D	143+30	9.5 RT	14.0-16.0	Silty CLAY, trace sand.	27.8	36	21	15
▲	HB-MICH-203/5D	143+30	9.5 RT	20.0-22.0	SAND, little silt, little gravel.	14.8			
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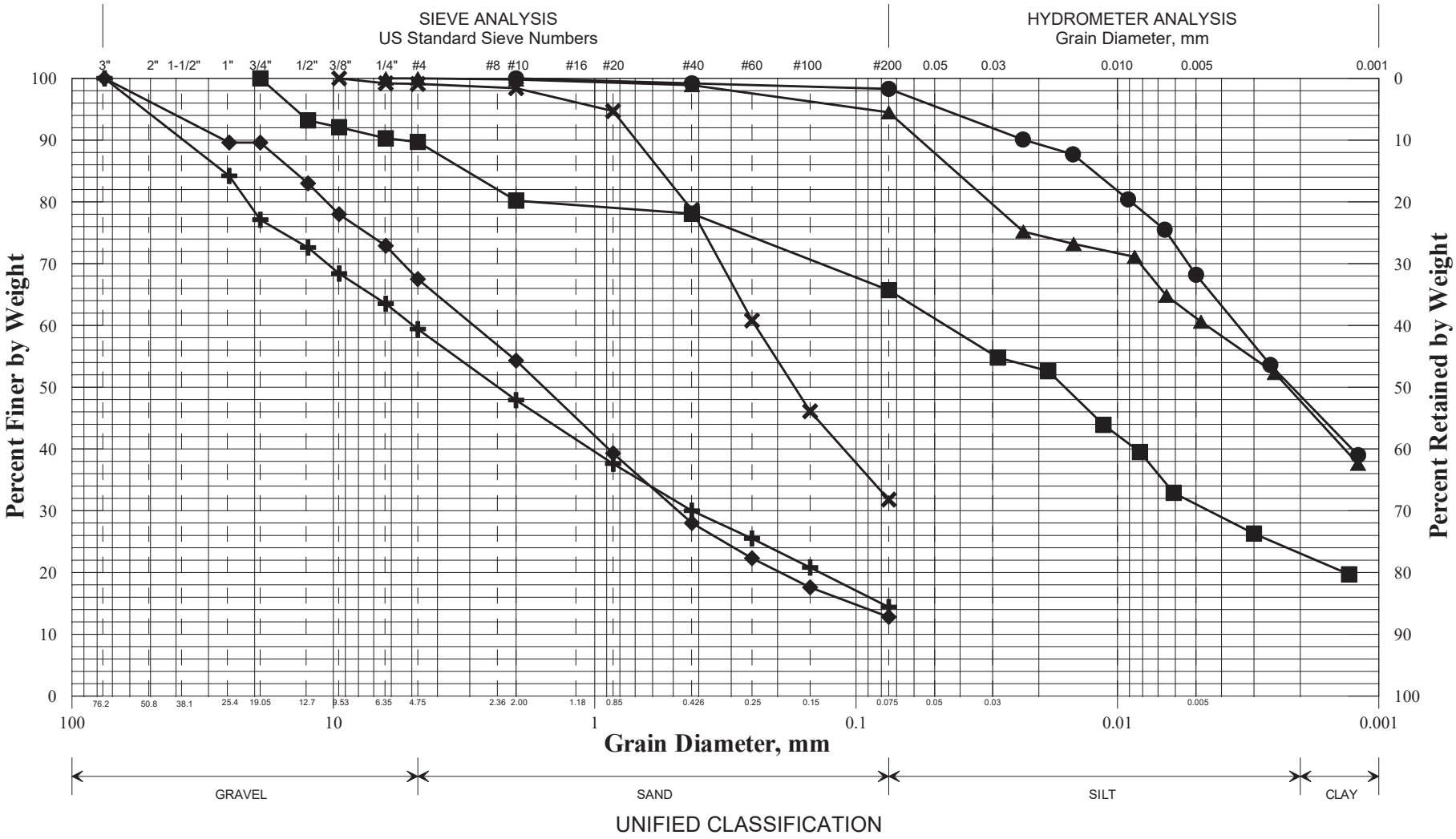

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-204/1D	144+20	10.0 LT	1.0-3.0	Gravelly SAND, little silt.	5.7			
◆	HB-MICH-204/2D	144+20	10.0 LT	5.0-7.0	SAND, some gravel, little silt.	5.2			
■	HB-MICH-204/3D	144+20	10.0 LT	11.0-13.0	SILT, some sand, some clay, trace gravel.	19.9			
●	HB-MICH-204/4D	144+20	10.0 LT	15.0-17.0	Clayey SILT, trace sand.	25.6	31	21	10
▲	HB-MICH-204/5D	144+20	10.0 LT	20.0-22.0	Silty CLAY, trace sand.	26.6	32	18	14
✖	HB-MICH-204/6D	144+20	10.0 LT	25.0-26.1	SAND, some silt, trace gravel.	20.8			

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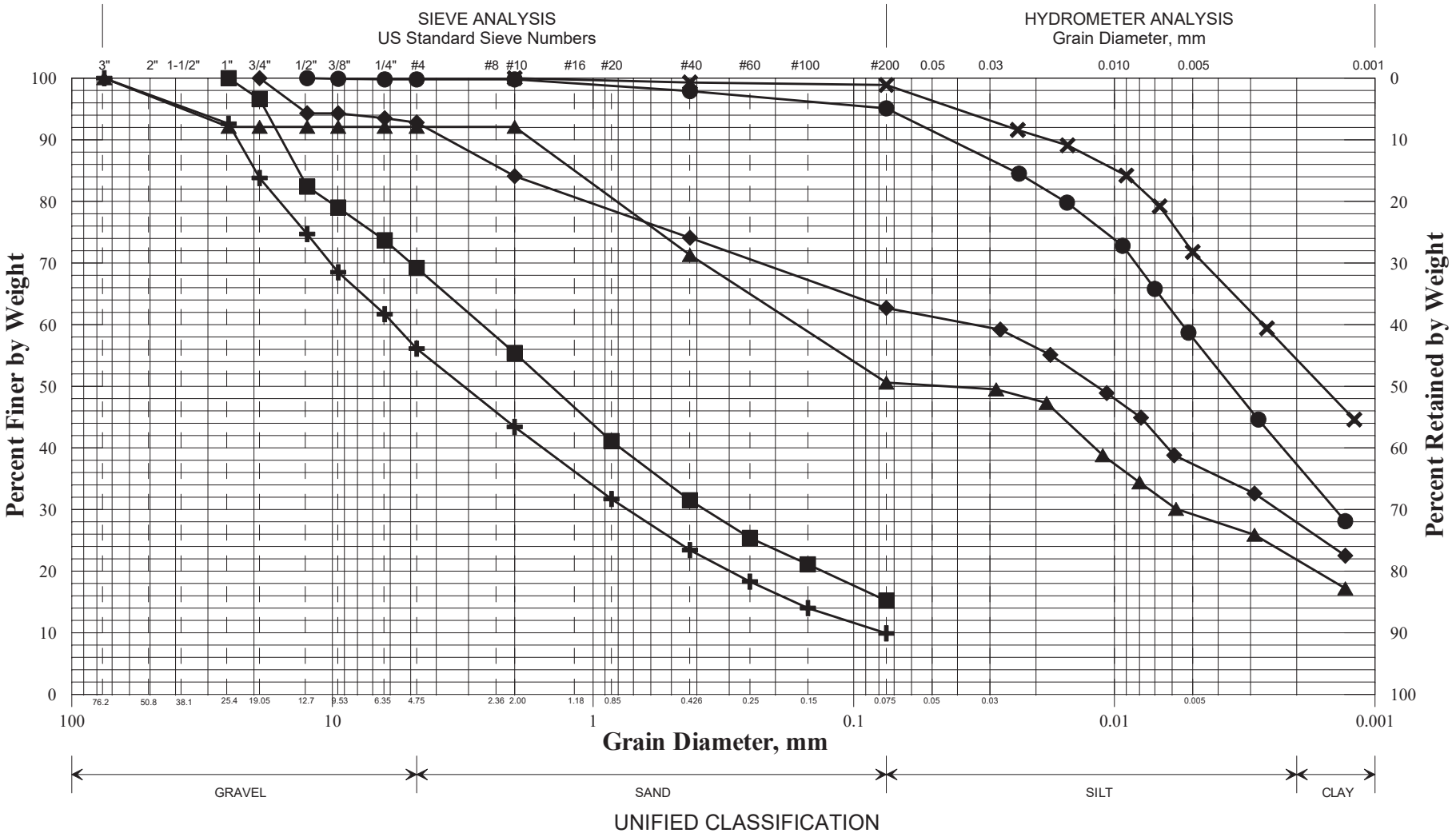

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-205/1D	200+55	9.5 LT	1.0-3.0	Gravelly SAND, trace silt.	4.4			
◆	HB-MICH-205/2D	200+55	9.5 LT	6.0-7.0	SILT, some sand, some clay, trace gravel.	15.9			
■	HB-MICH-205/3D	200+55	9.5 LT	10.0-12.0	SAND, some gravel, little silt.	6.7			
●	HB-MICH-205/4D	200+55	9.5 LT	15.0-17.0	Clayey SILT, trace sand, trace gravel.	29.7	31	23	8
▲	HB-MICH-205/5D	200+55	9.5 LT	20.0-22.0	SAND, some silt, some clay, trace gravel.	27.4	38	22	16
✕	HB-MICH-205/6D	200+55	9.5 LT	22.0-24.0	Silty CLAY, trace sand.	31.3			

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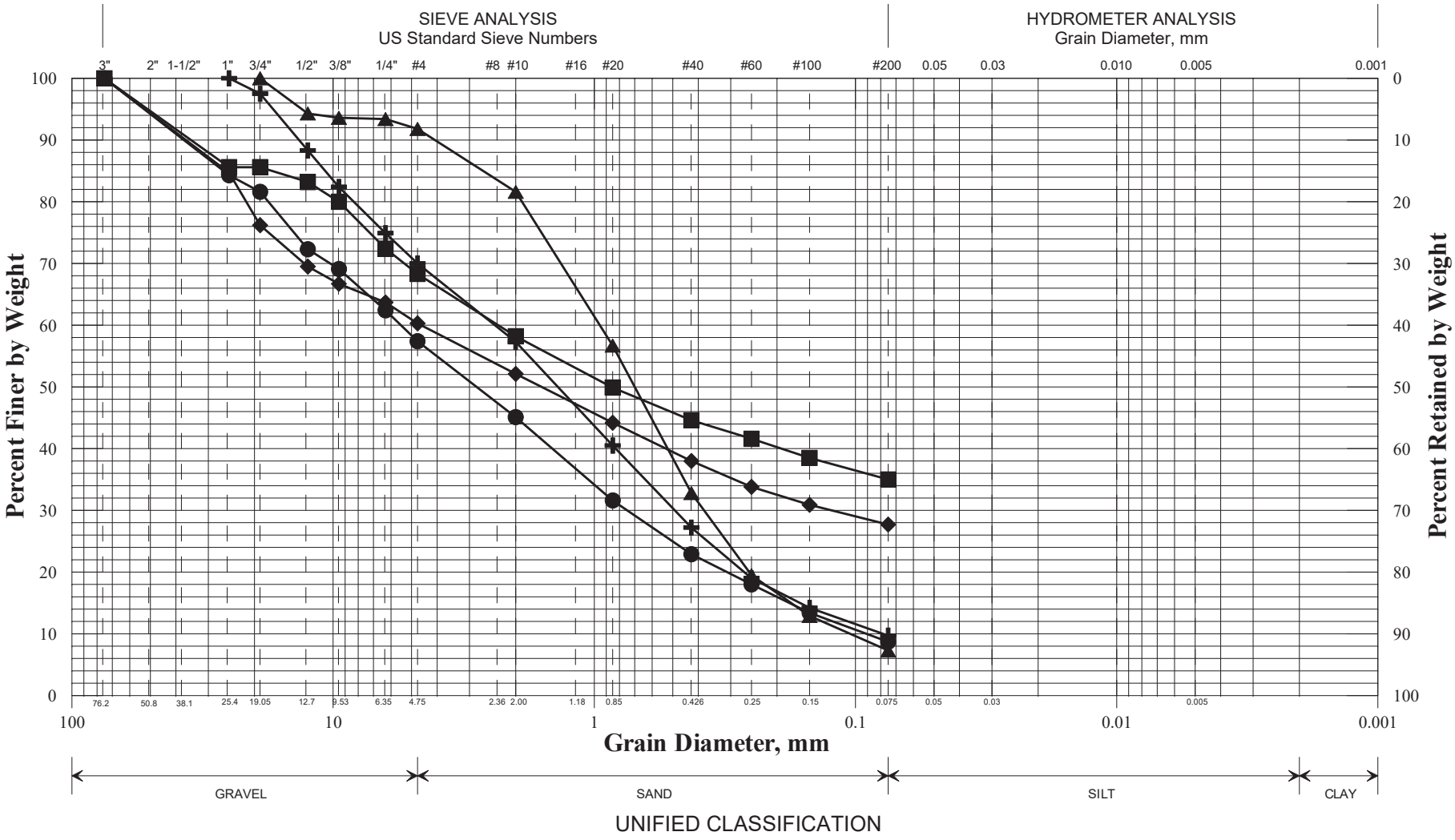

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-207/1D	209+40	9.5 RT	1.0-3.0	SAND, some gravel, trace silt.	5.5			
◆	HB-MICH-207/2D	209+40	9.5 RT	5.0-7.0	GRAVEL, some sand, some silt.	11.3			
■	HB-MICH-207/3D	209+40	9.5 RT	10.0-11.0	SILT, some sand, some gravel.	14.8			
●	HB-MICH-207/4D	209+40	9.5 RT	15.0-17.0	Gravelly SAND, trace silt.	8.4			
▲	HB-MICH-207/5D	209+40	9.5 RT	20.0-22.0	SAND, trace gravel, trace silt.	15.7			
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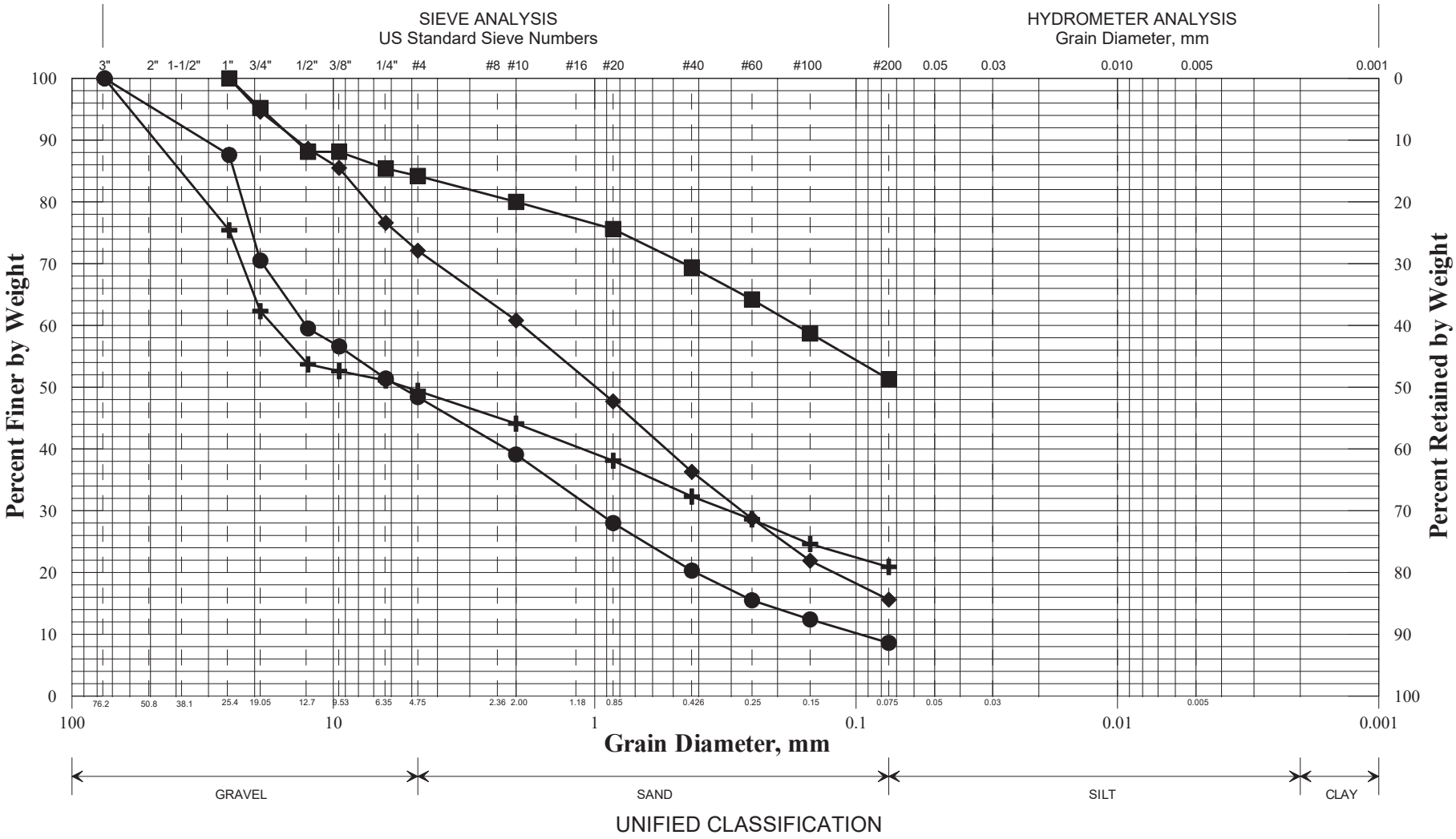

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-208/1D	210+10	9.5 RT	5.0-7.0	GRAVEL, some sand, little silt.	8.7			
◆	HB-MICH-208/2D	210+10	9.5 RT	10.0-12.0	SAND, some gravel, little silt.	6.0			
■	HB-MICH-208/3D	210+10	9.5 RT	15.5-17.5	SILT, some sand, little gravel.	30.3			
●	HB-MICH-208/4D	210+10	9.5 RT	20.0-22.0	Sandy GRAVEL, trace silt.	8.8			
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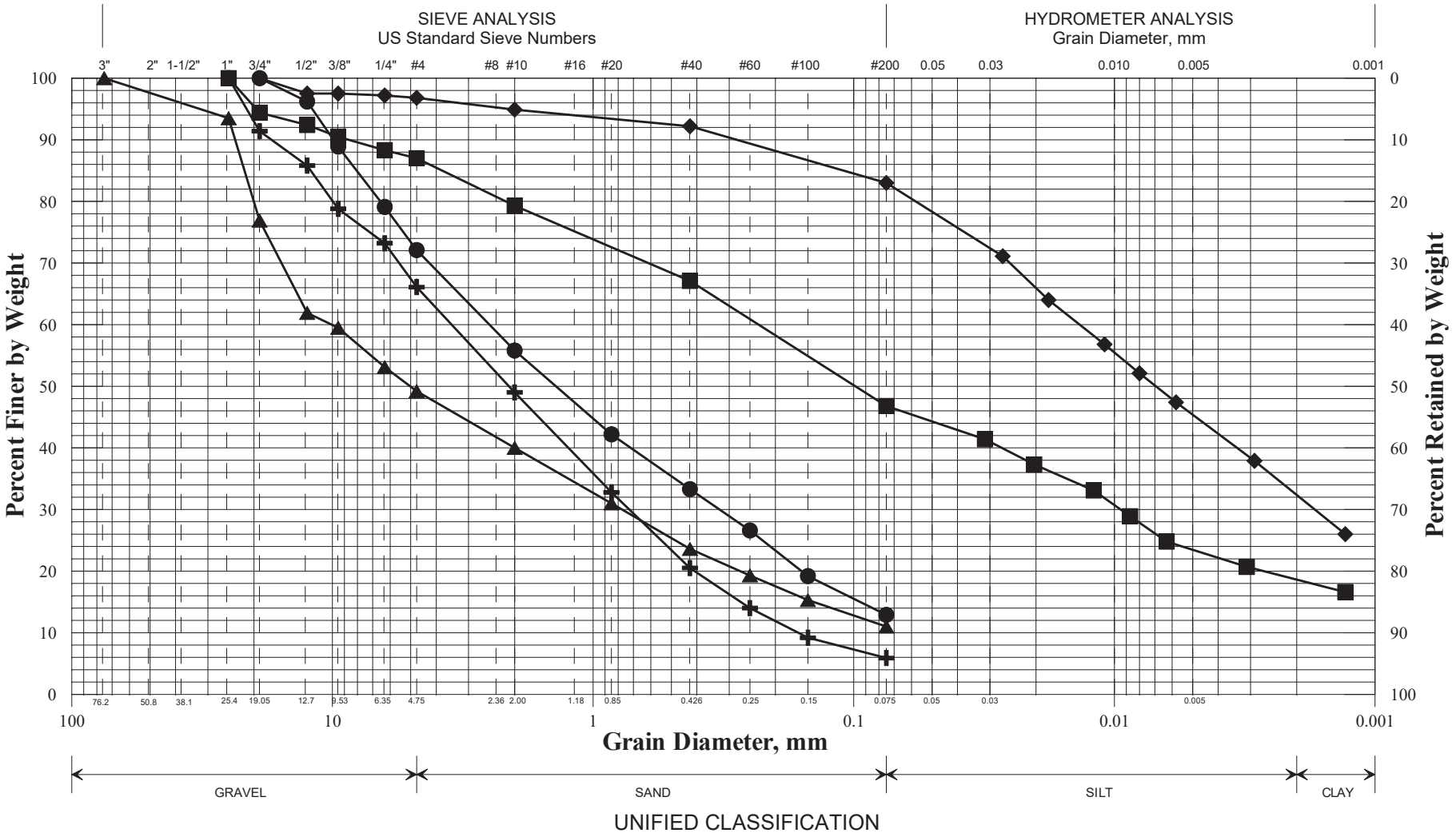

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-209/1D	210+65	9.5 LT	1.0-3.0	SAND, some gravel, trace silt.	4.0			
◆	HB-MICH-209/2D	210+65	9.5 LT	5.0-7.0	SILT, some clay, little sand, trace gravel.	23.7			
■	HB-MICH-209/3D	210+65	9.5 LT	10.0-12.0	SAND, some silt, little clay, little gravel.	19.3			
●	HB-MICH-209/4D	210+65	9.5 LT	15.0-17.0	SAND, some gravel, little silt.	12.4			
▲	HB-MICH-209/5D	210+65	9.5 LT	20.0-22.0	Sandy GRAVEL, little silt.	7.0			
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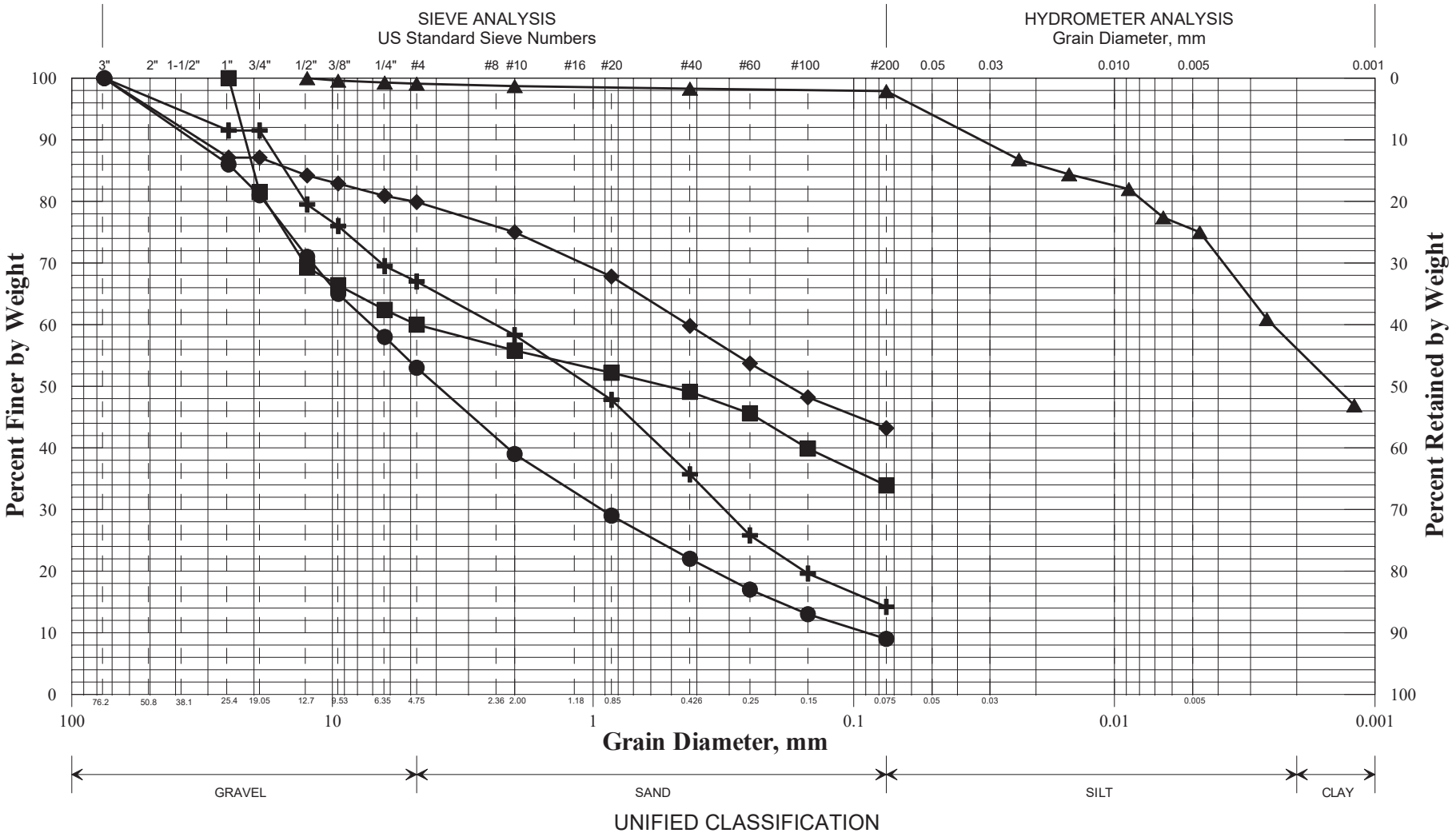

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-210/1D	224+75	9.0 RT	1.0-3.0	SAND, some gravel, little silt.	6.5			
◆	HB-MICH-210/2D	224+75	9.0 RT	5.0-7.0	Sandy SILT, little gravel.	12.8			
■	HB-MICH-210/3D	224+75	9.0 RT	10.0-12.0	GRAVEL, some silt, some sand.	12.6			
●	HB-MICH-210/4D	224+75	9.0 RT	15.0-17.0	Sandy GRAVEL, trace silt.	50.0			
▲	HB-MICH-210/5D	224+75	9.0 RT	20.0-22.0	Silty CLAY, trace sand, trace gravel.	32.7	39	21	18
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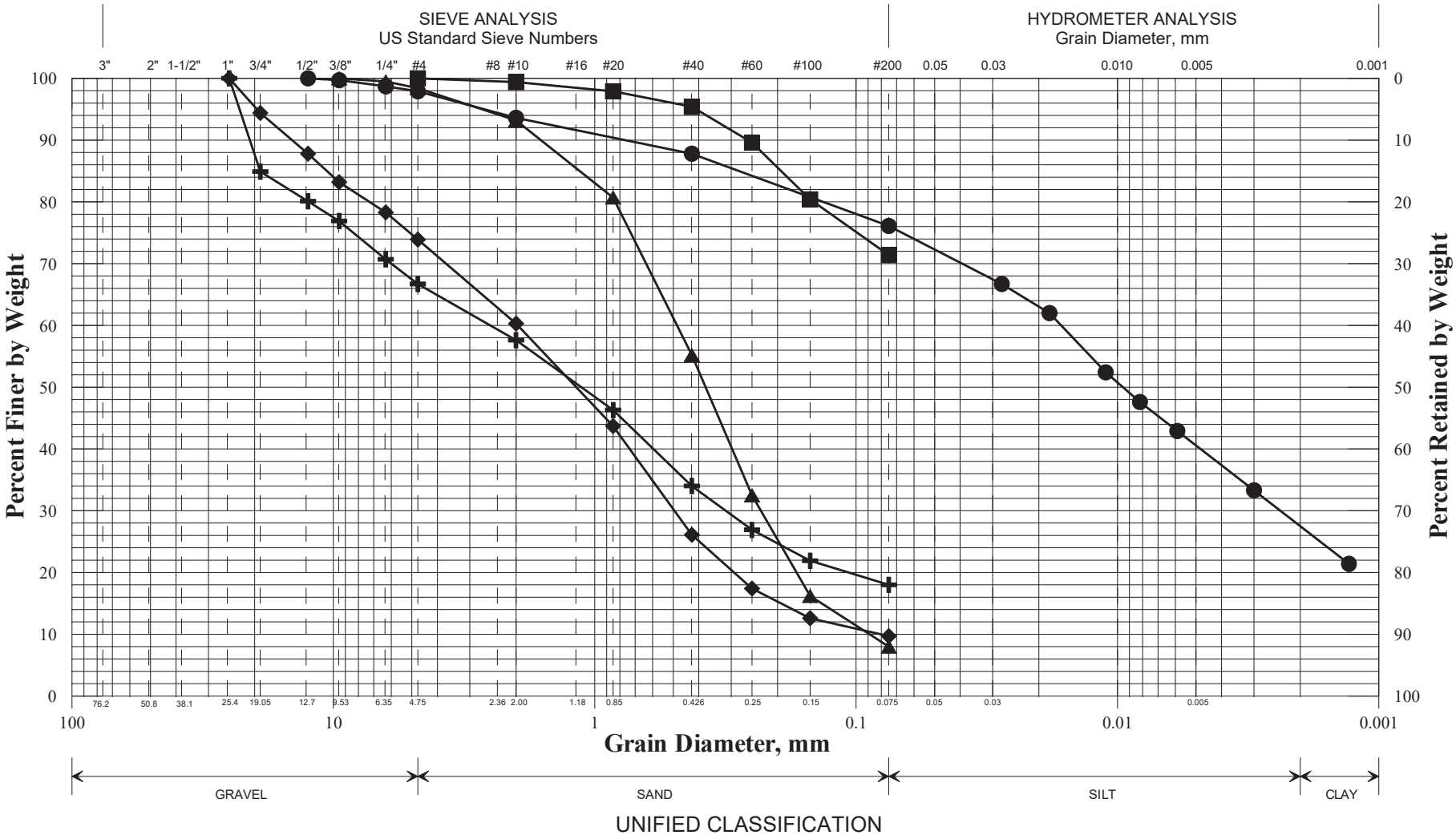

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-211/1D	225+40	8.5 LT	1.0-3.0	SAND, some gravel, little silt.	8.0			
◆	HB-MICH-211/2D	225+40	8.5 LT	5.0-7.0	SANDm some gravel, trace silt.	7.4			
■	HB-MICH-211/3D	225+40	8.5 LT	10.0-12.0	SILT, some sand.	25.0			
●	HB-MICH-211/4D	225+40	8.5 LT	15.0-17.0	SILT, some clay, some sand, trace gravel.	32.1			
▲	HB-MICH-211/5D	225+40	8.5 LT	20.0-22.0	SAND, trace silt, trace gravel.	9.9			
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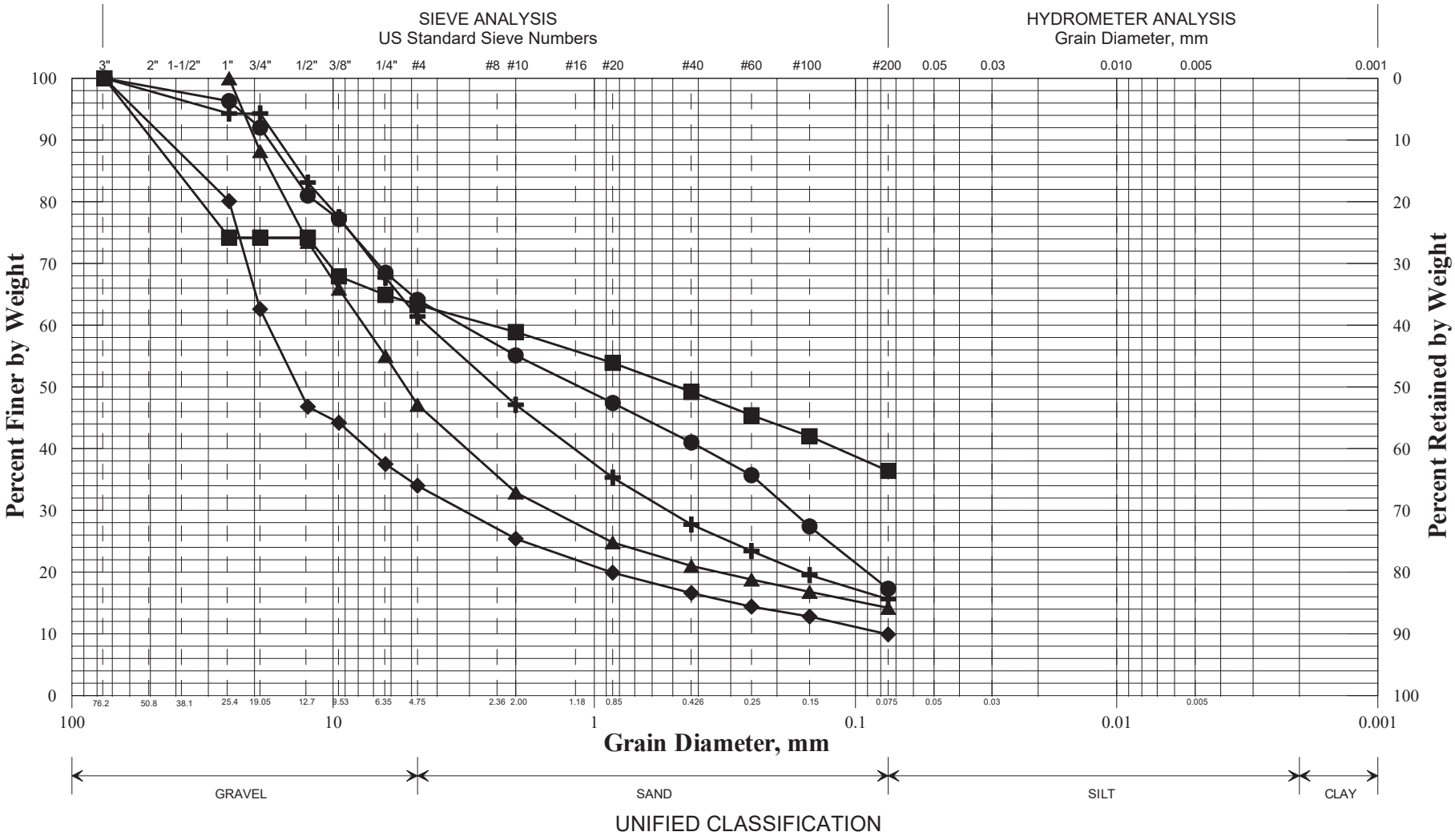

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-212/1D	246+70	9.5 RT	1.0-3.0	Gravelly SAND, little silt.	5.0			
◆	HB-MICH-212/2D	246+70	9.5 RT	5.0-5.8	GRAVEL, some sand, trace silt.	3.5			
■	HB-MICH-212/3D	246+70	9.5 RT	10.0-12.0	Silty GRAVEL, some sand.	10.8			
●	HB-MICH-212/4D	246+70	9.5 RT	15.0-17.0	Gravelly SAND, little silt.	10.1			
▲	HB-MICH-212/5D	246+70	9.5 RT	20.0-21.0	GRAVEL, some sand, little silt.	9.1			
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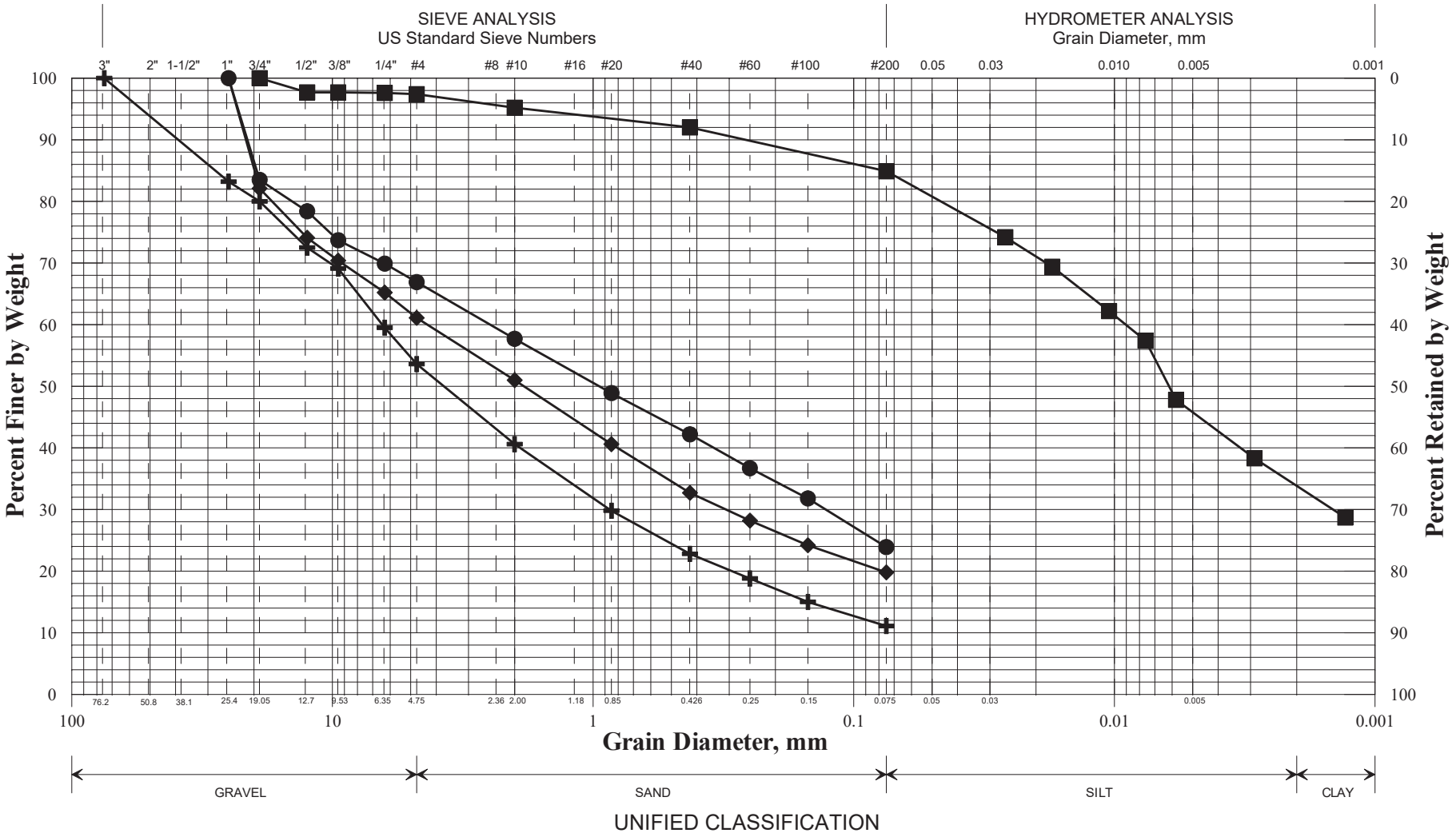

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-213/1D	247+00	9.0 LT	1.0-2.5	Sandy GRAVEL, little silt.	3.8			
◆	HB-MICH-213/2D	247+00	9.0 LT	5.0-7.0	Gravelly SAND, little silt.	8.1			
■	HB-MICH-213/3D	247+00	9.0 LT	10.0-12.0	SILT, some clay, little sand, trace gravel.	27.5			
●	HB-MICH-213/4D	247+00	9.0 LT	15.0-17.0	SAND, some gravel, some silt.	8.1			
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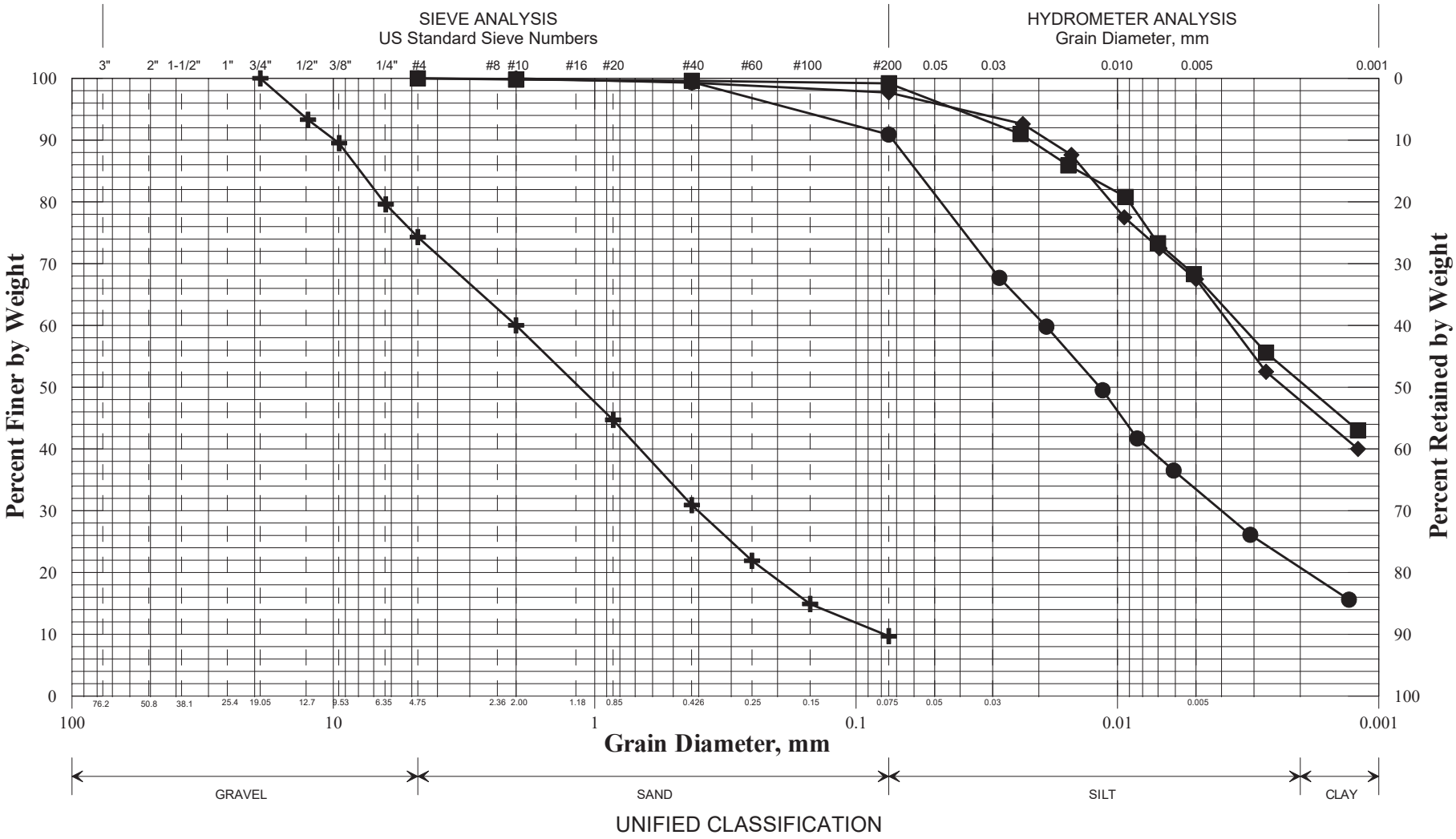

	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	HB-MICH-215/1D	352+15	8.0 LT	1.0-3.0	SAND, some gravel, trace silt.	5.1			
◆	HB-MICH-215/2D	352+15	8.0 LT	5.0-7.0	Clayey SILT, trace sand.	23.8	30	18	12
■	HB-MICH-215/3D	352+15	8.0 LT	10.0-12.0	Silty CLAY, trace sand.	24.2	30	18	12
●	HB-MICH-215/4D	352+15	8.0 LT	15.0-17.0	SILT, little clay, trace sand.	24.8			
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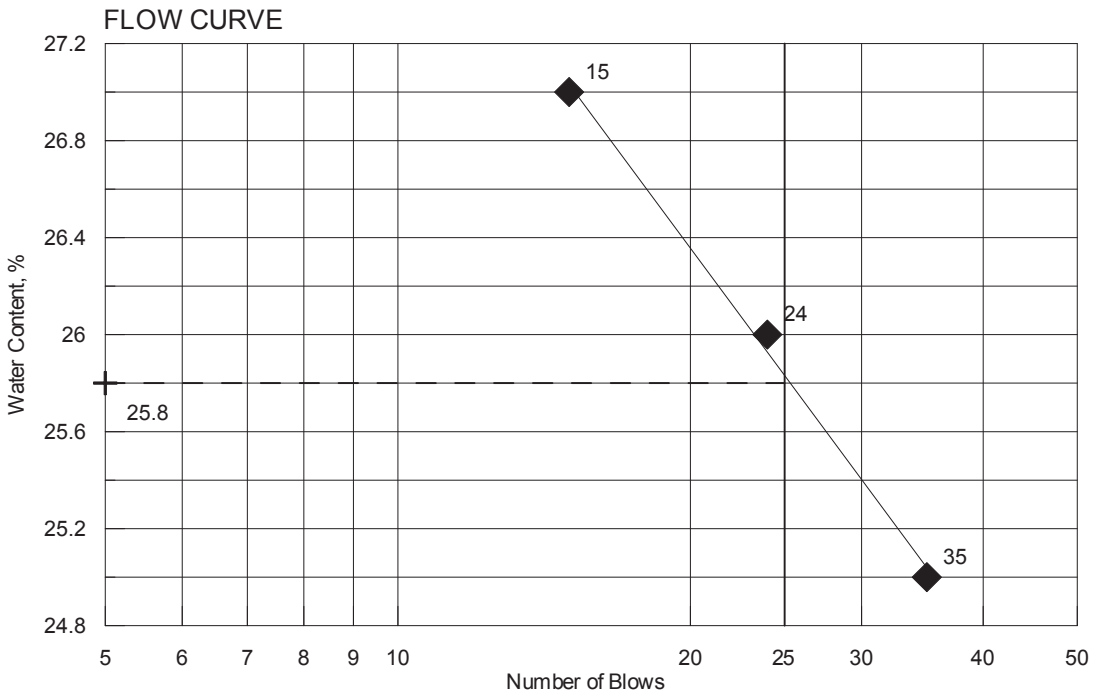
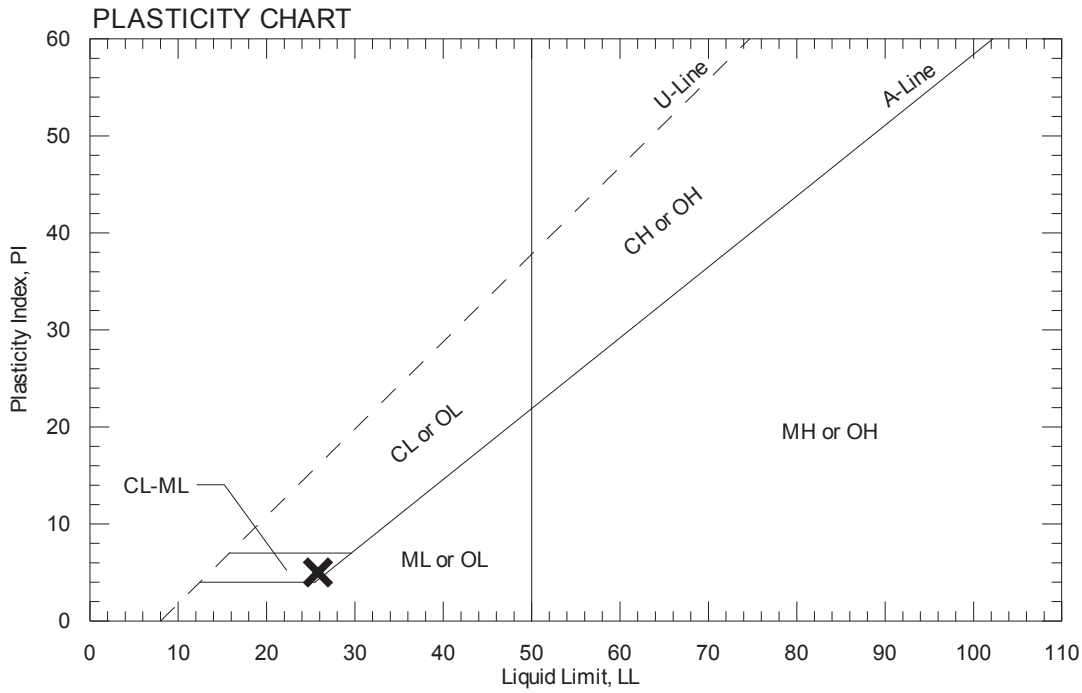
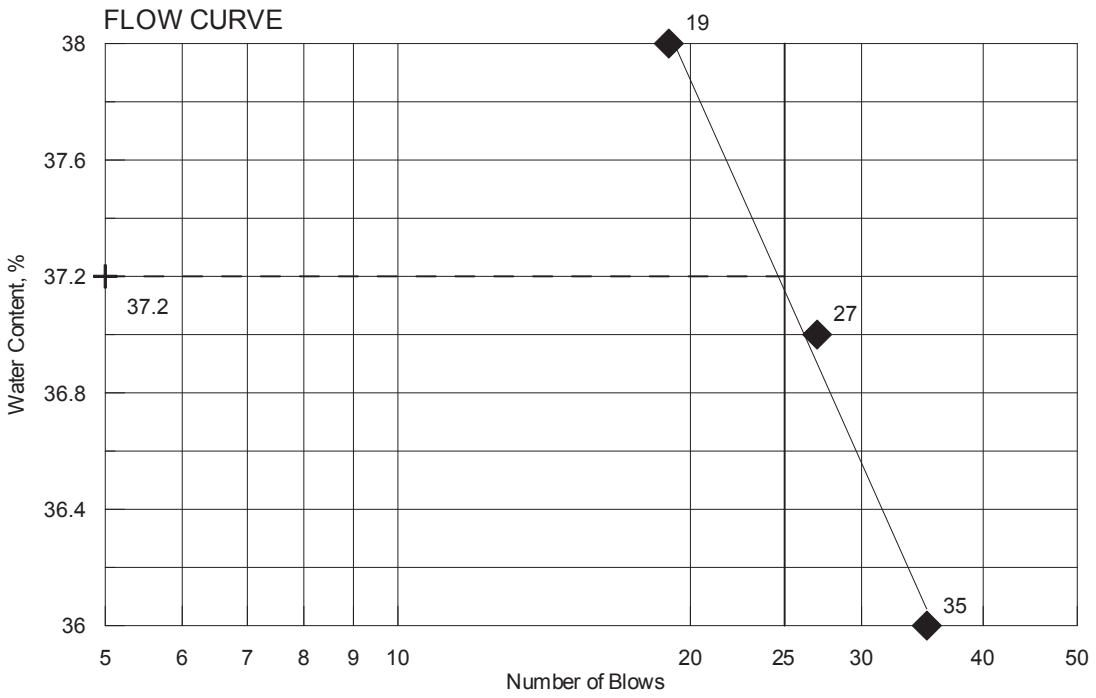
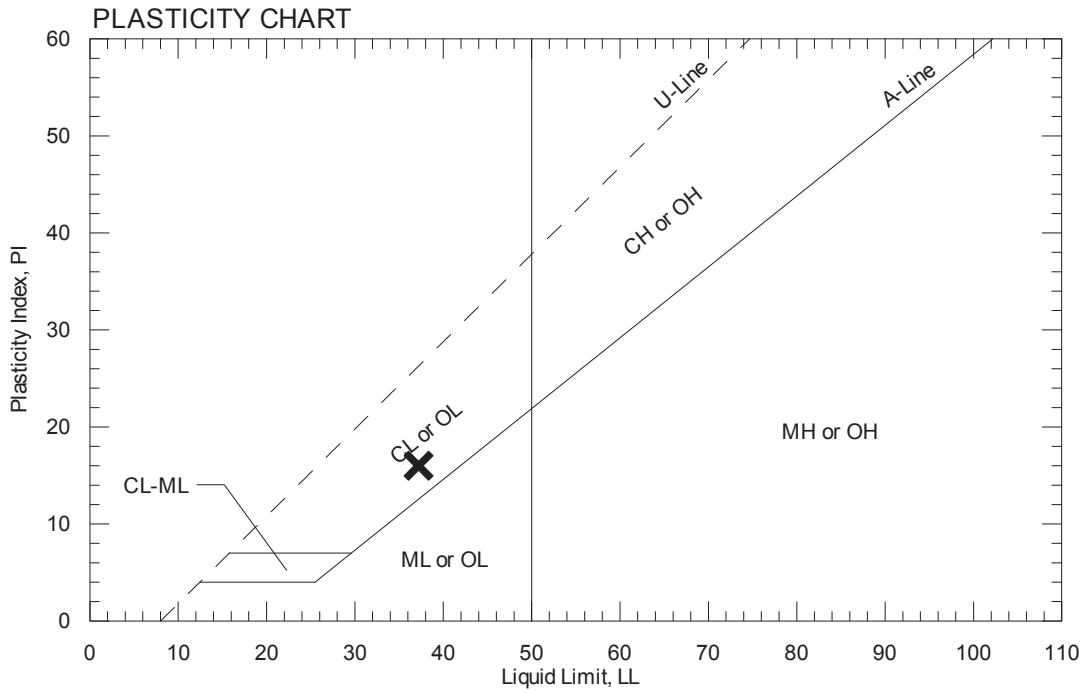
TOWN	Cherryfield, Milbridge	Reference No.	336735
WIN	020405.00	Water Content, %	30.3
Sampled	5/3/2018	Liquid Limit @ 25 blows (T 89), %	26
Boring No./Sample No.	HB-MICH-201/2D	Plastic Limit (T 90), %	21
Station	118+30	Plasticity Index (T 90), %	5
Depth	5.0-7.0	Tested By	BBURR



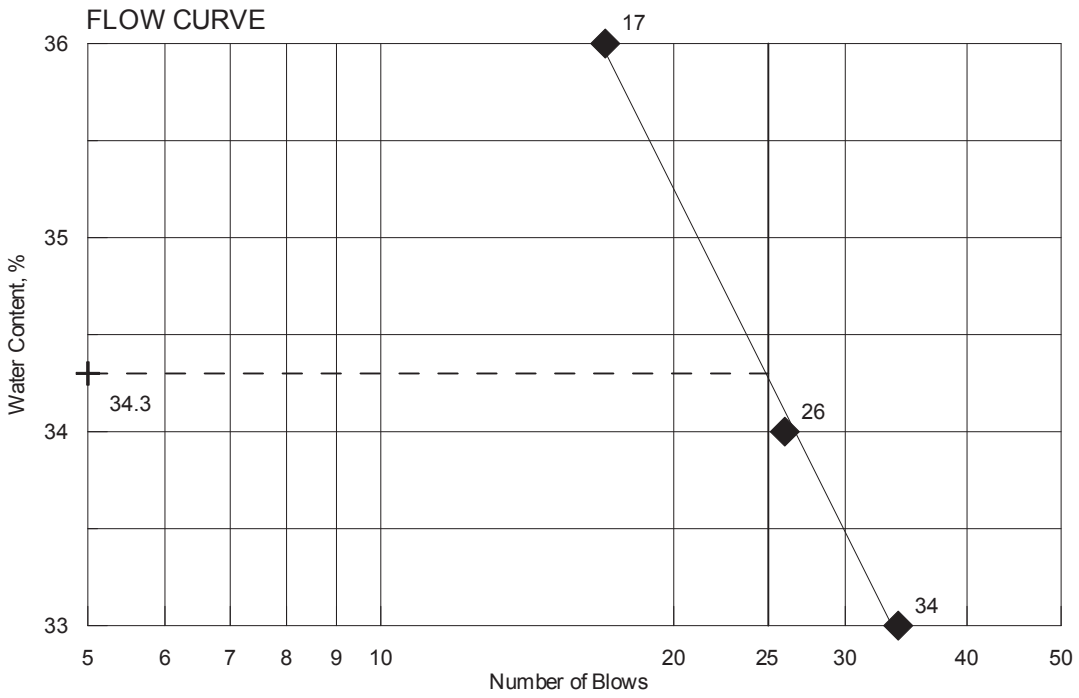


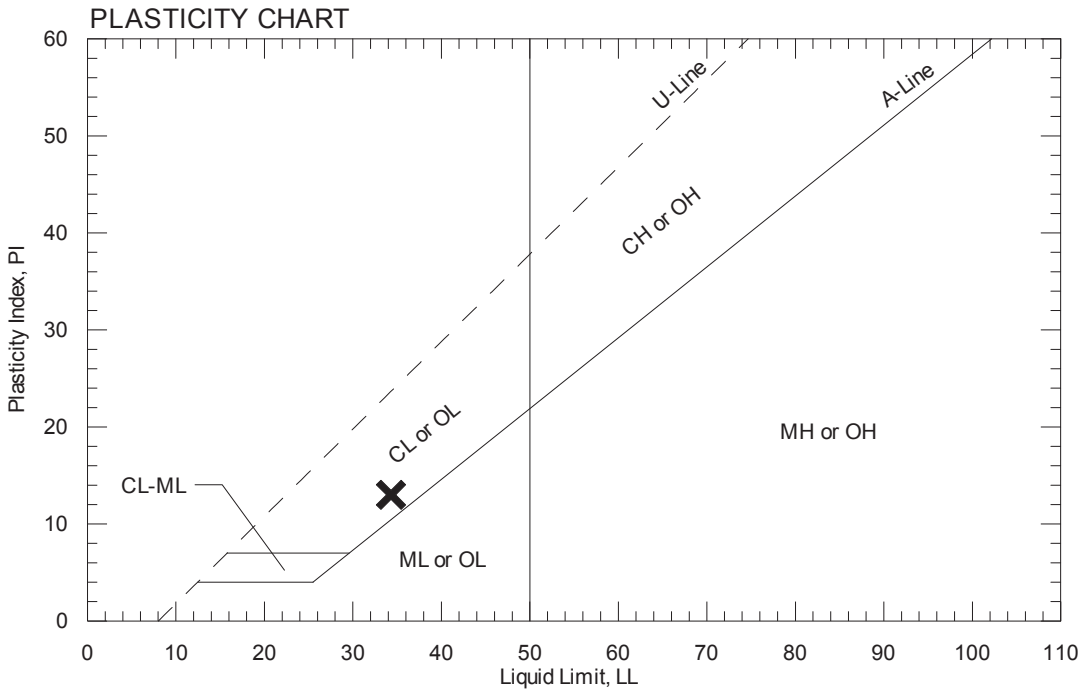
TOWN	Cherryfield, Milbridge	Reference No.	336736
WIN	020405.00	Water Content, %	30.4
Sampled	5/3/2018	Liquid Limit @ 25 blows (T 89), %	37
Boring No./Sample No.	HB-MICH-201/3D	Plastic Limit (T 90), %	21
Station	118+30	Plasticity Index (T 90), %	16
Depth	10.0-12.0	Tested By	BBURR



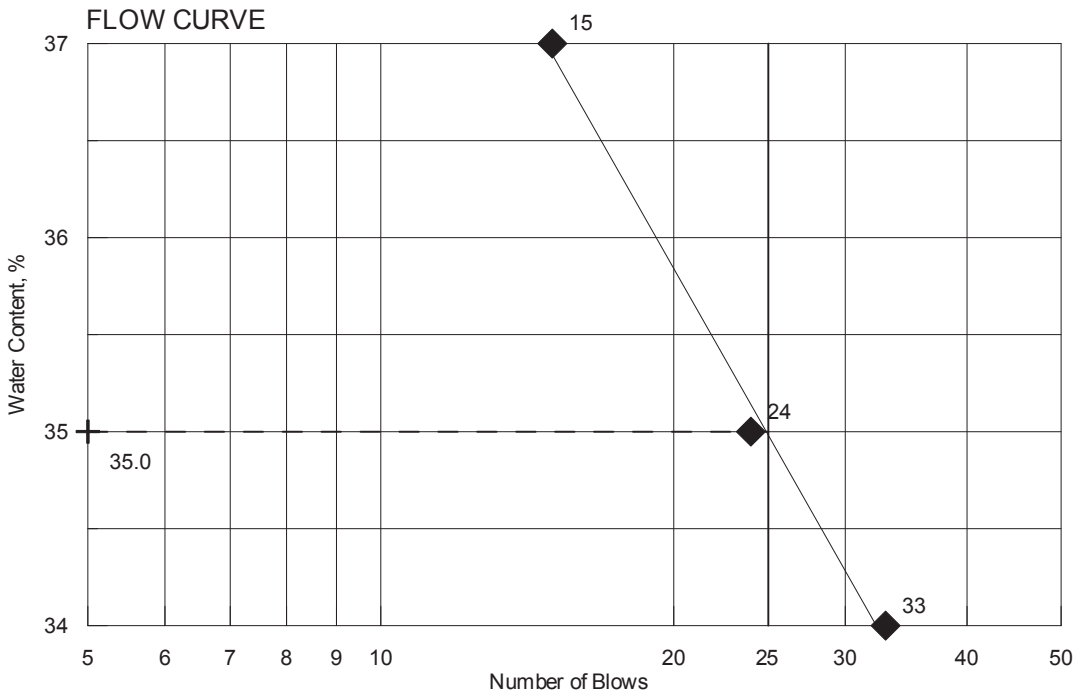


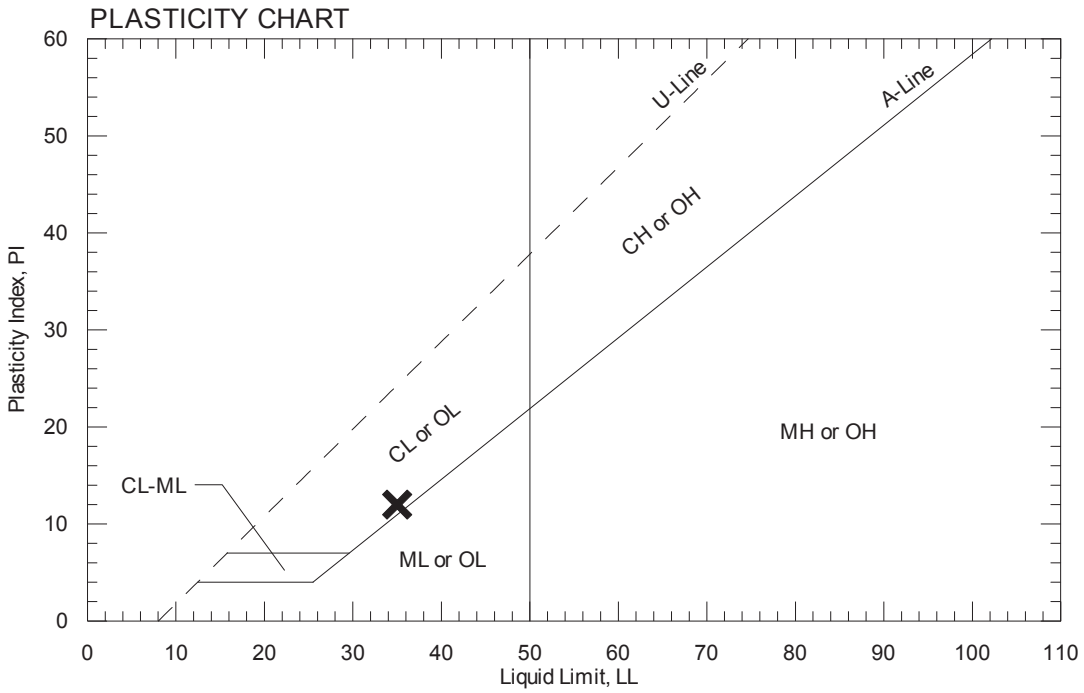
TOWN	Cherryfield, Milbridge	Reference No.	336737
WIN	020405.00	Water Content, %	30.8
Sampled	5/3/2018	Liquid Limit @ 25 blows (T 89), %	34
Boring No./Sample No.	HB-MICH-201/4D	Plastic Limit (T 90), %	21
Station	118+30	Plasticity Index (T 90), %	13
Depth	15.0-17.0	Tested By	BBURR



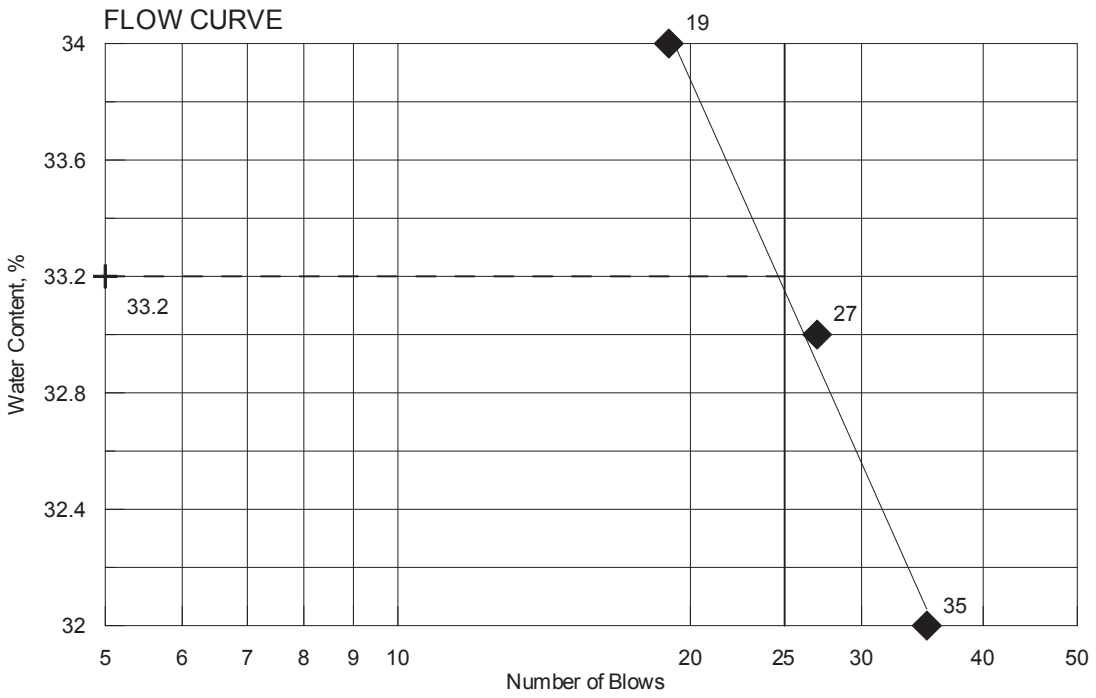


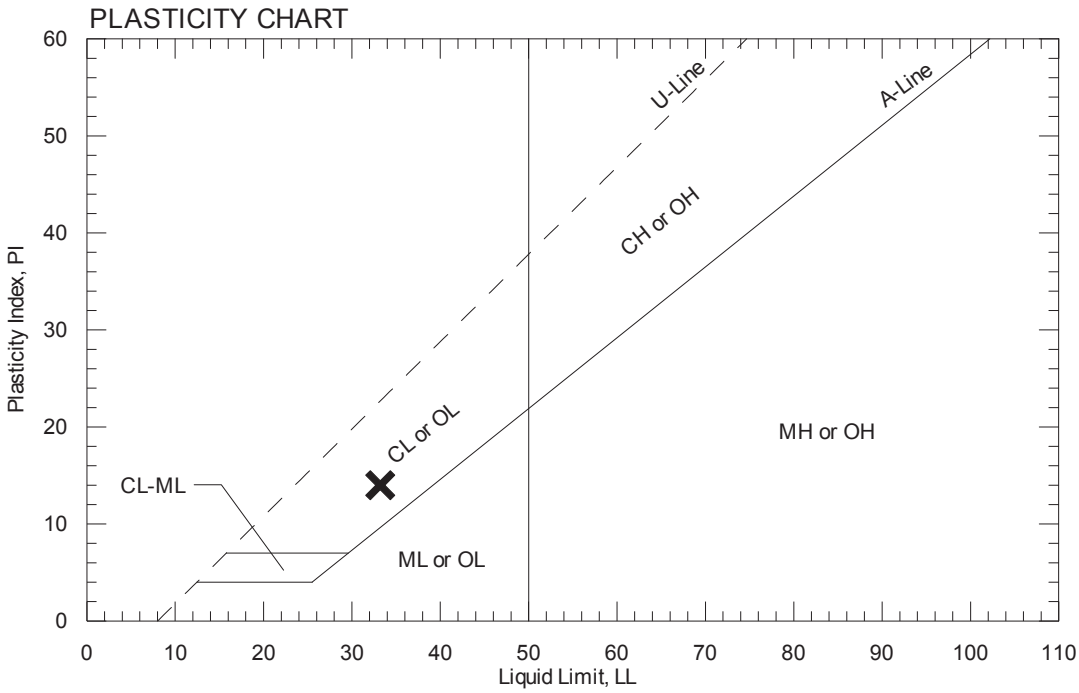
TOWN	Cherryfield, Milbridge	Reference No.	336738
WIN	020405.00	Water Content, %	30.2
Sampled	5/3/2018	Liquid Limit @ 25 blows (T 89), %	35
Boring No./Sample No.	HB-MICH-201/5D	Plastic Limit (T 90), %	23
Station	118+30	Plasticity Index (T 90), %	12
Depth	20.0-22.0	Tested By	BBURR



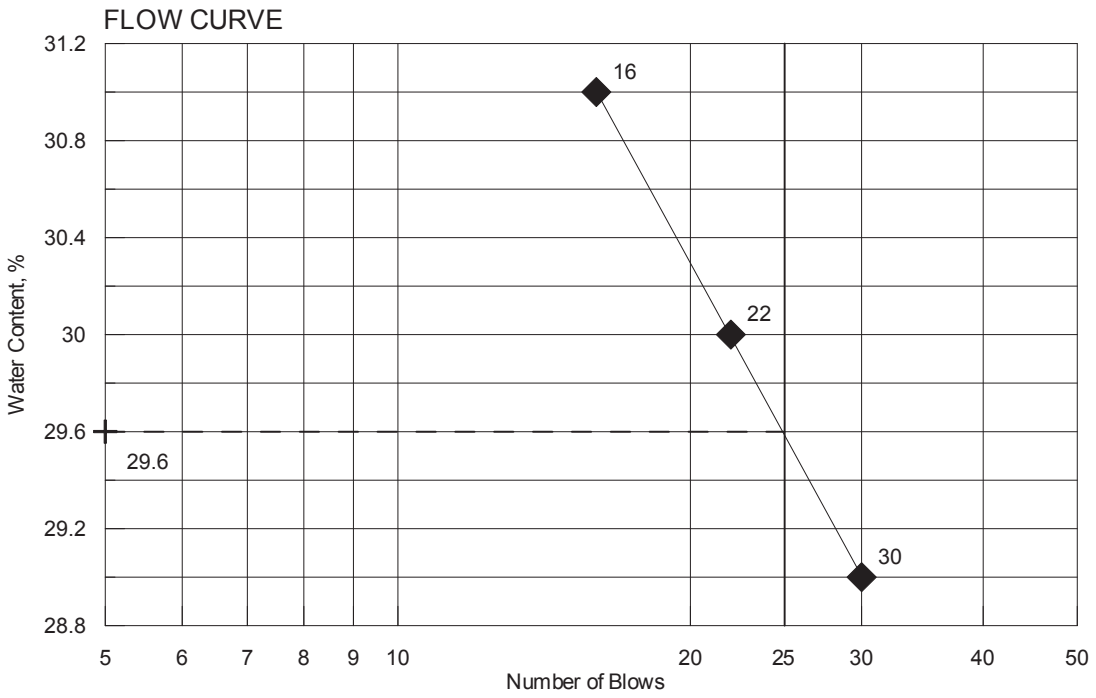


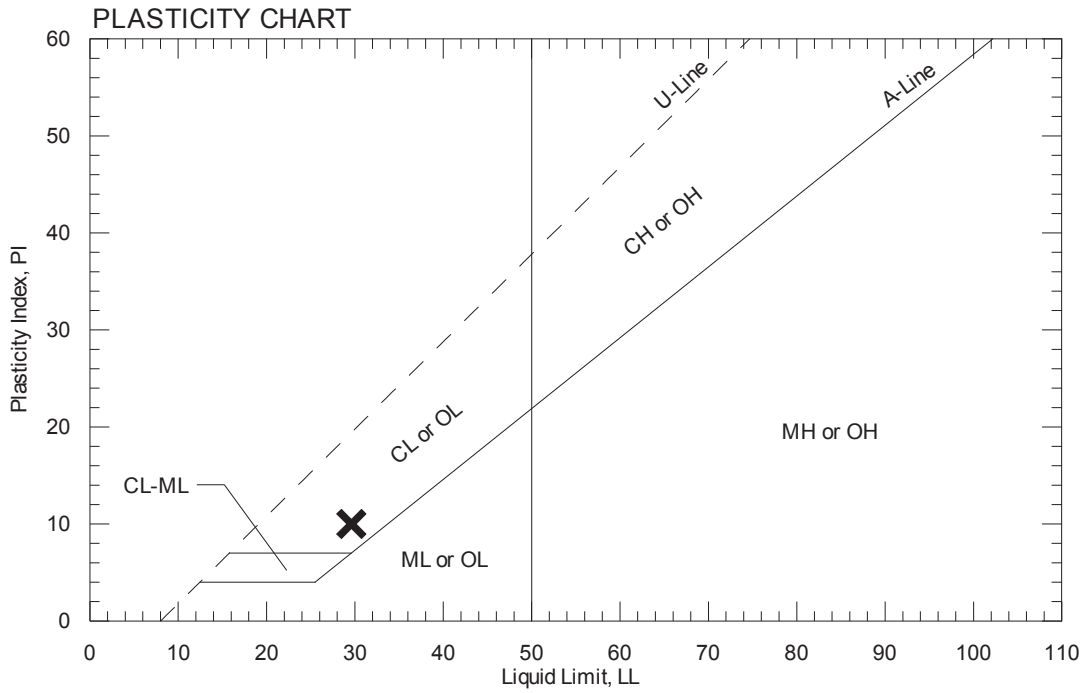
TOWN	Cherryfield, Milbridge	Reference No.	336739
WIN	020405.00	Water Content, %	28.6
Sampled	5/3/2018	Liquid Limit @ 25 blows (T 89), %	33
Boring No./Sample No.	HB-MICH-201/6D	Plastic Limit (T 90), %	19
Station	118+30	Plasticity Index (T 90), %	14
Depth	22.0-24.0	Tested By	BBURR



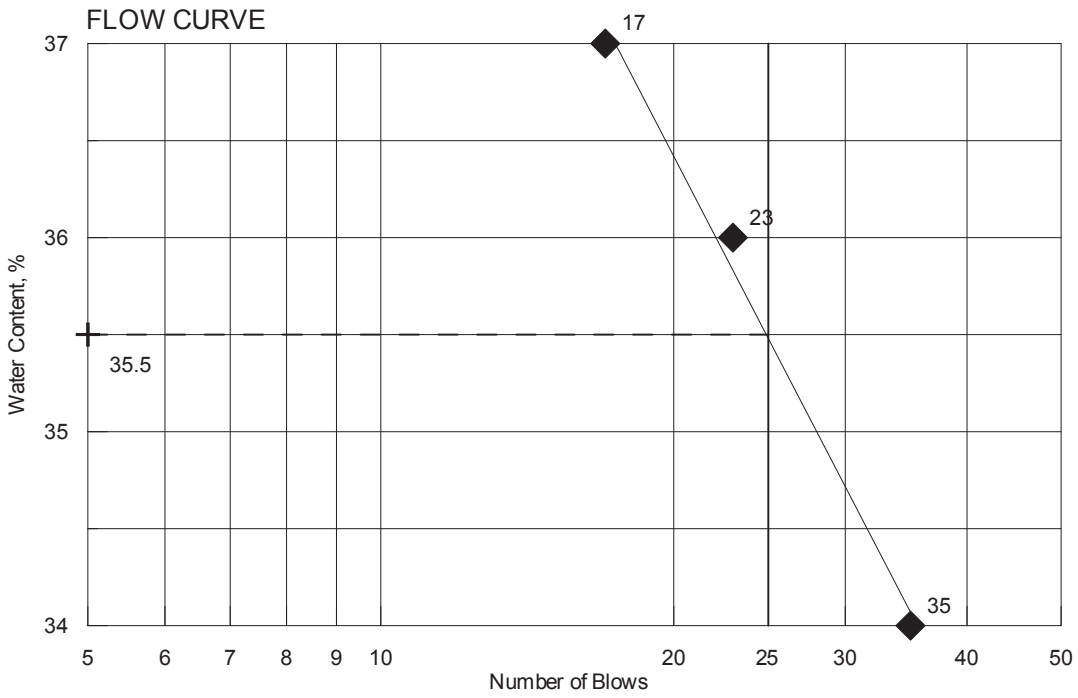


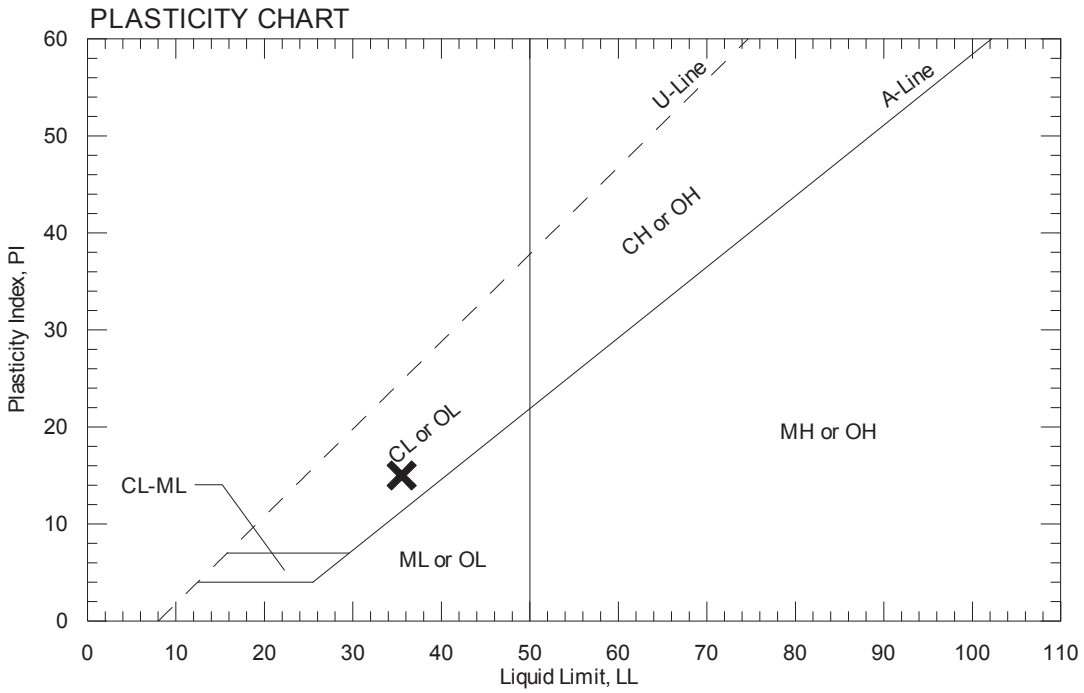
TOWN	Cherryfield, Milbridge	Reference No.	336742
WIN	020405.00	Water Content, %	22.8
Sampled	5/1/2018	Liquid Limit @ 25 blows (T 89), %	30
Boring No./Sample No.	HB-MICH-203/3D	Plastic Limit (T 90), %	20
Station	143+30	Plasticity Index (T 90), %	10
Depth	10.0-12.0	Tested By	BBURR



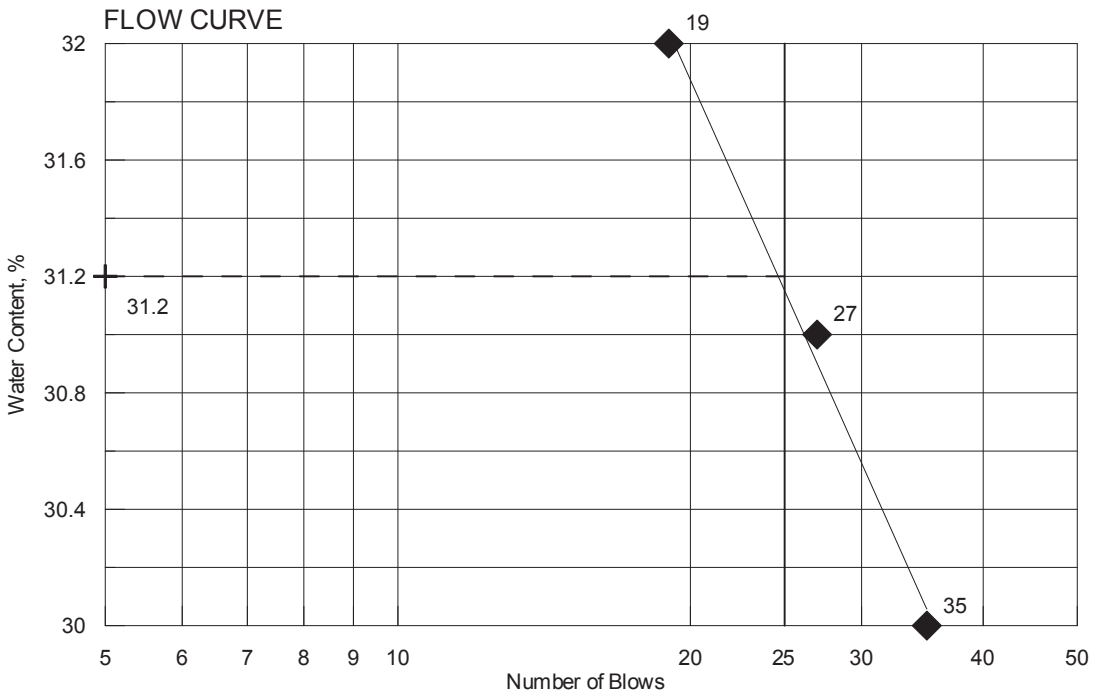


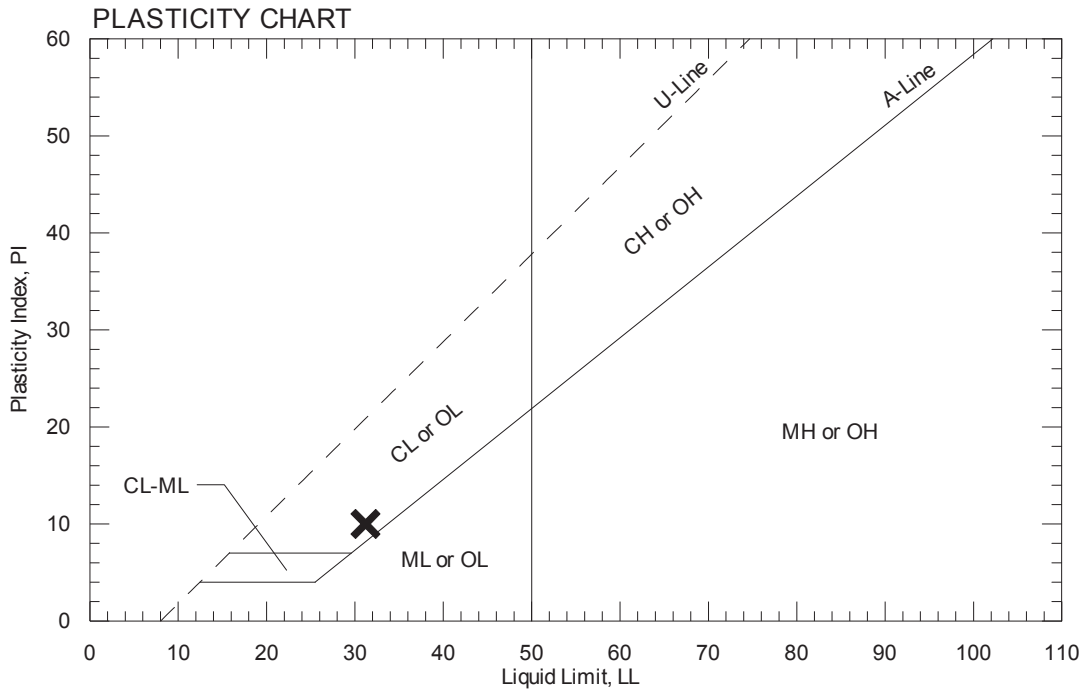
TOWN	Cherryfield, Milbridge	Reference No.	336743
WIN	020405.00	Water Content, %	27.8
Sampled	5/1/2018	Liquid Limit @ 25 blows (T 89), %	36
Boring No./Sample No.	HB-MICH-203/4D	Plastic Limit (T 90), %	21
Station	143+30	Plasticity Index (T 90), %	15
Depth	14.0-16.0	Tested By	BBURR



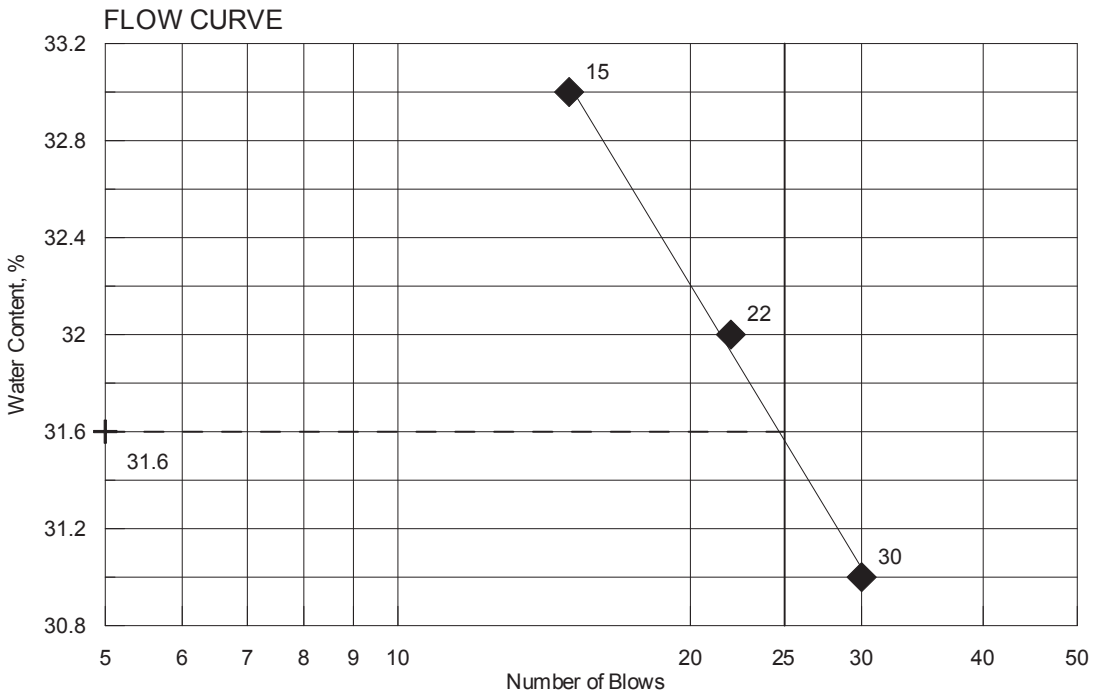


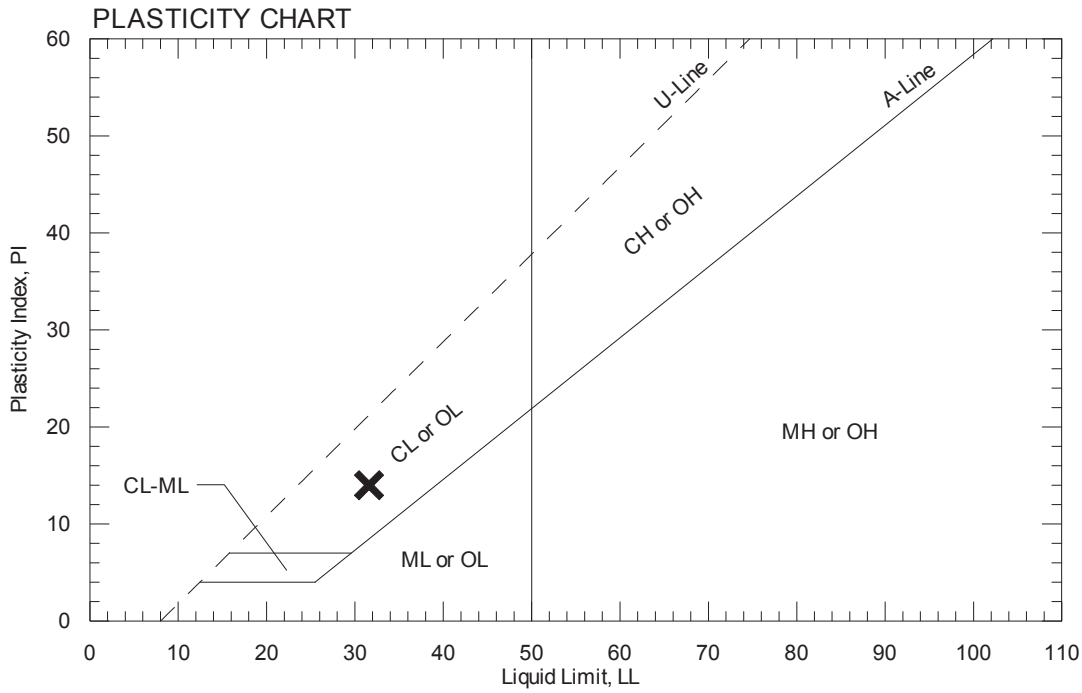
TOWN	Cherryfield, Milbridge	Reference No.	336748
WIN	020405.00	Water Content, %	25.6
Sampled	5/1/2018	Liquid Limit @ 25 blows (T 89), %	31
Boring No./Sample No.	HB-MICH-204/4D	Plastic Limit (T 90), %	21
Station	144+20	Plasticity Index (T 90), %	10
Depth	15.0-17.0	Tested By	BBURR



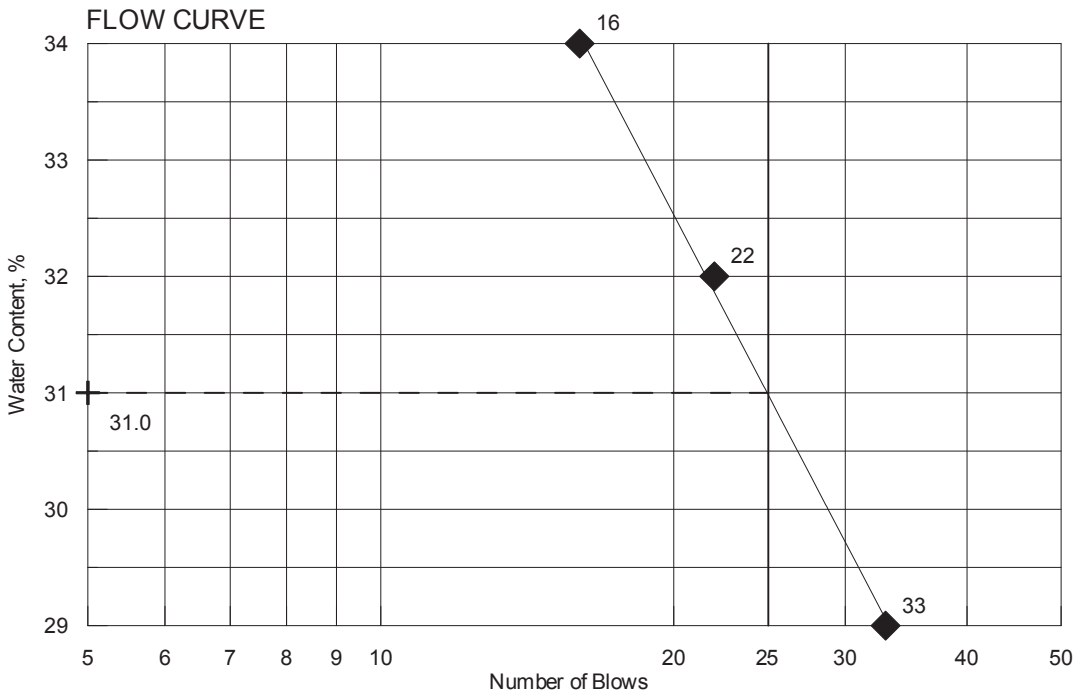


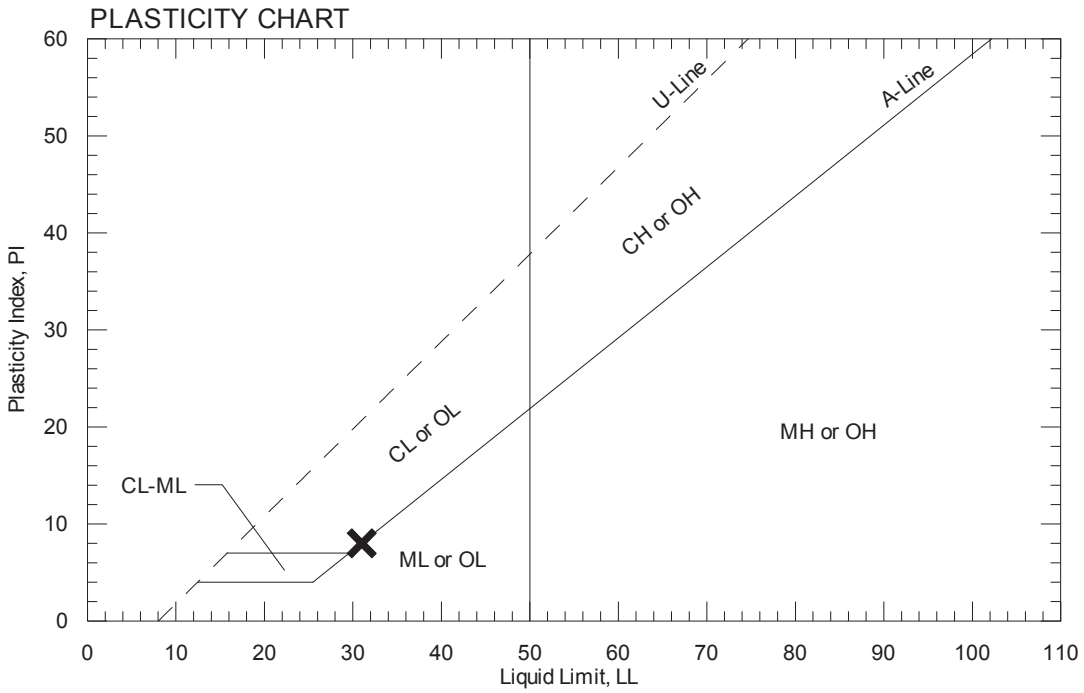
TOWN	Cherryfield, Milbridge	Reference No.	336749
WIN	020405.00	Water Content, %	26.6
Sampled	5/1/2018	Liquid Limit @ 25 blows (T 89), %	32
Boring No./Sample No.	HB-MICH-204/5D	Plastic Limit (T 90), %	18
Station	144+20	Plasticity Index (T 90), %	14
Depth	20.0-22.0	Tested By	BBURR



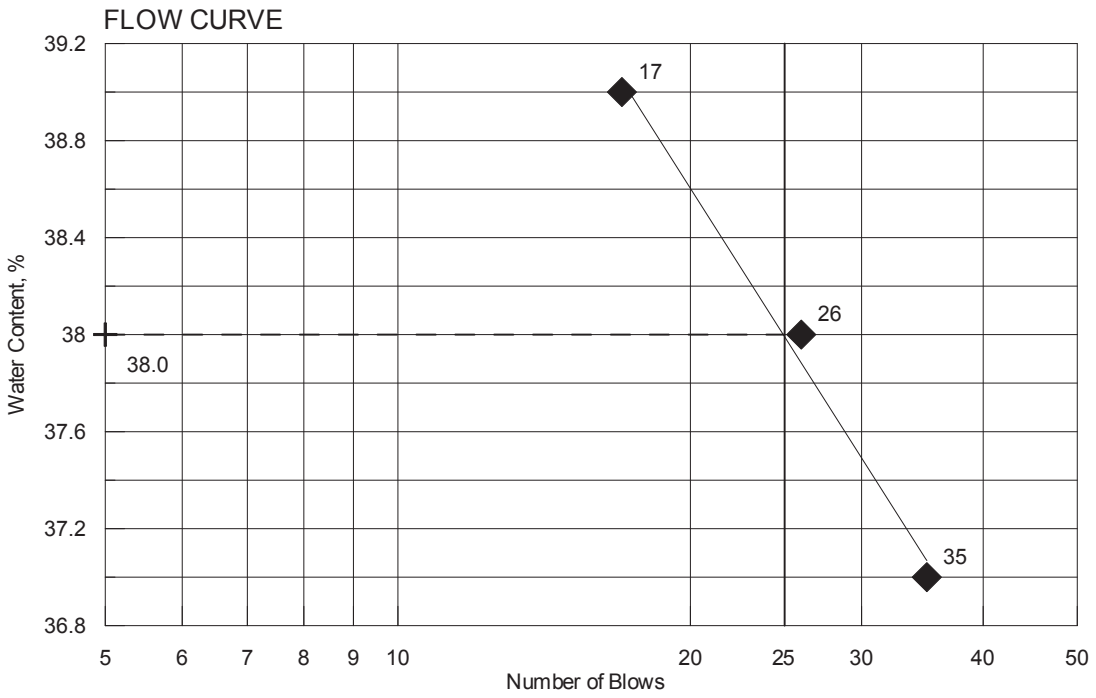


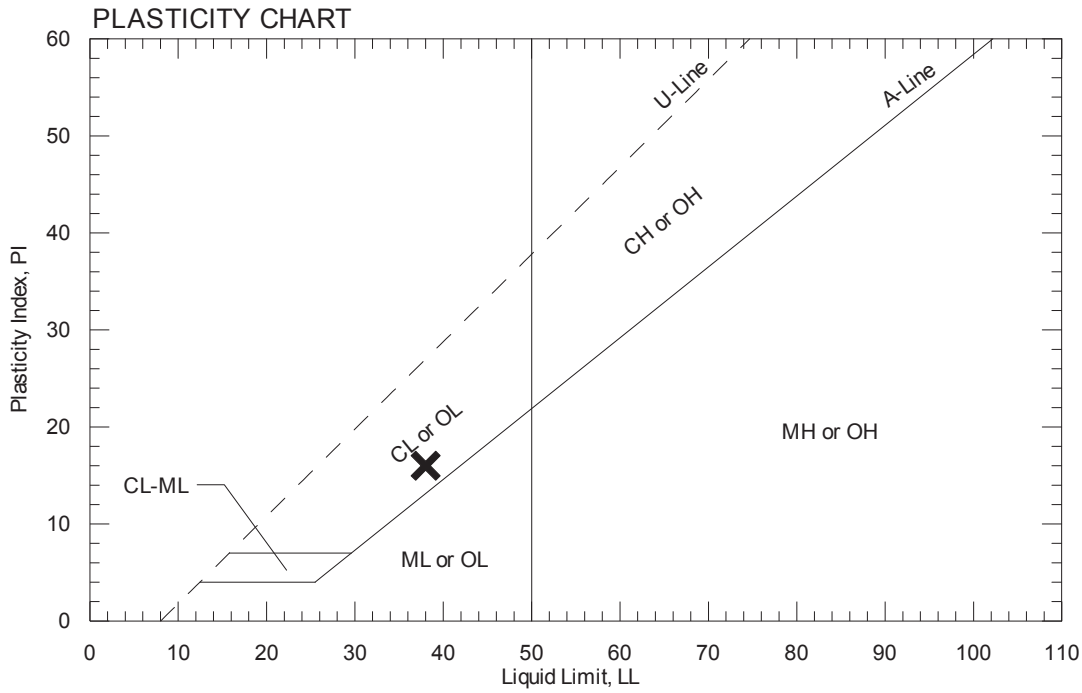
TOWN	Cherryfield, Milbridge	Reference No.	336679
WIN	020405.00	Water Content, %	29.7
Sampled	5/2/2018	Liquid Limit @ 25 blows (T 89), %	31
Boring No./Sample No.	HB-MICH-205/4D	Plastic Limit (T 90), %	23
Station	200+55	Plasticity Index (T 90), %	8
Depth	15.0-17.0	Tested By	BBURR



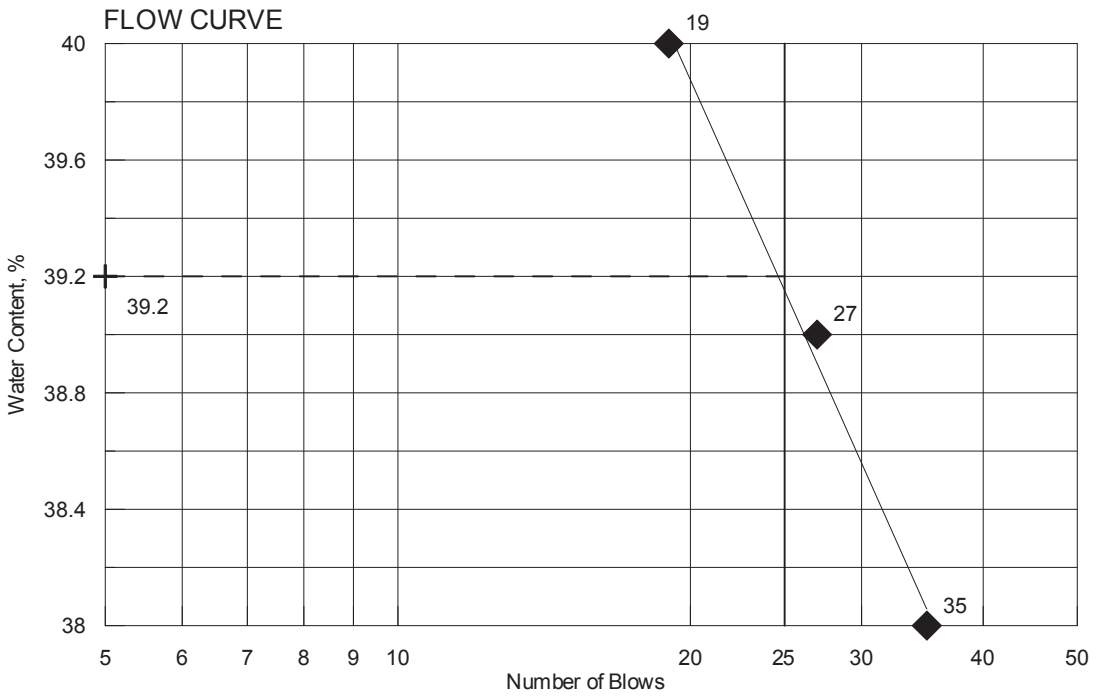


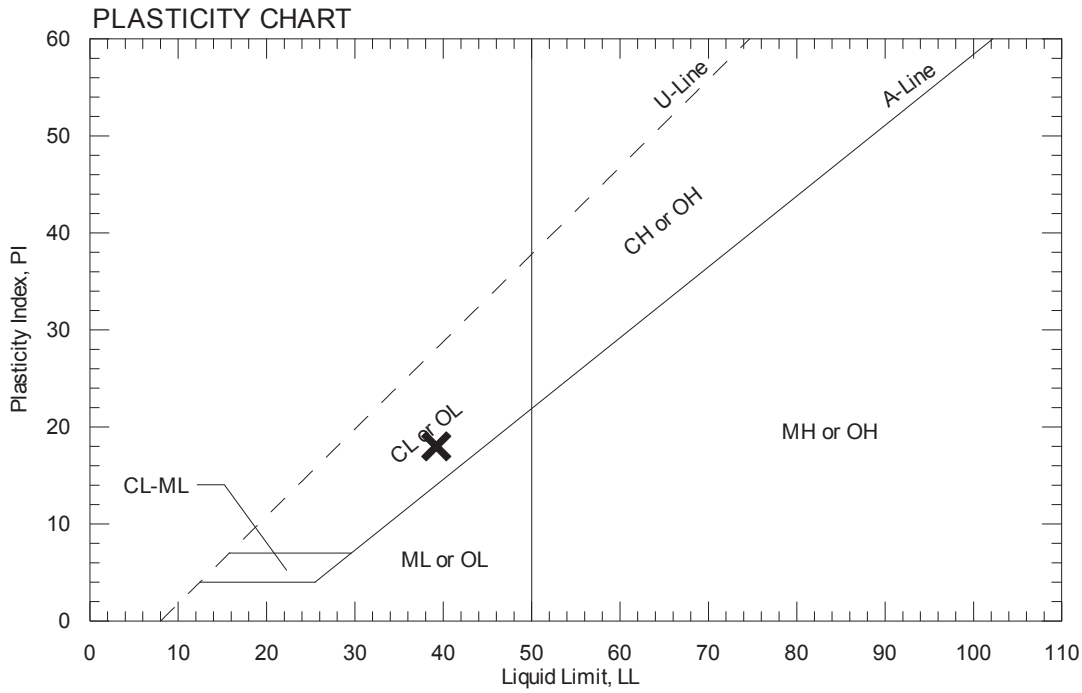
TOWN	Cherryfield, Milbridge	Reference No.	336680
WIN	020405.00	Water Content, %	27.4
Sampled	5/2/2018	Liquid Limit @ 25 blows (T 89), %	38
Boring No./Sample No.	HB-MICH-205/5D	Plastic Limit (T 90), %	22
Station	200+55	Plasticity Index (T 90), %	16
Depth	20.0-22.0	Tested By	BBURR



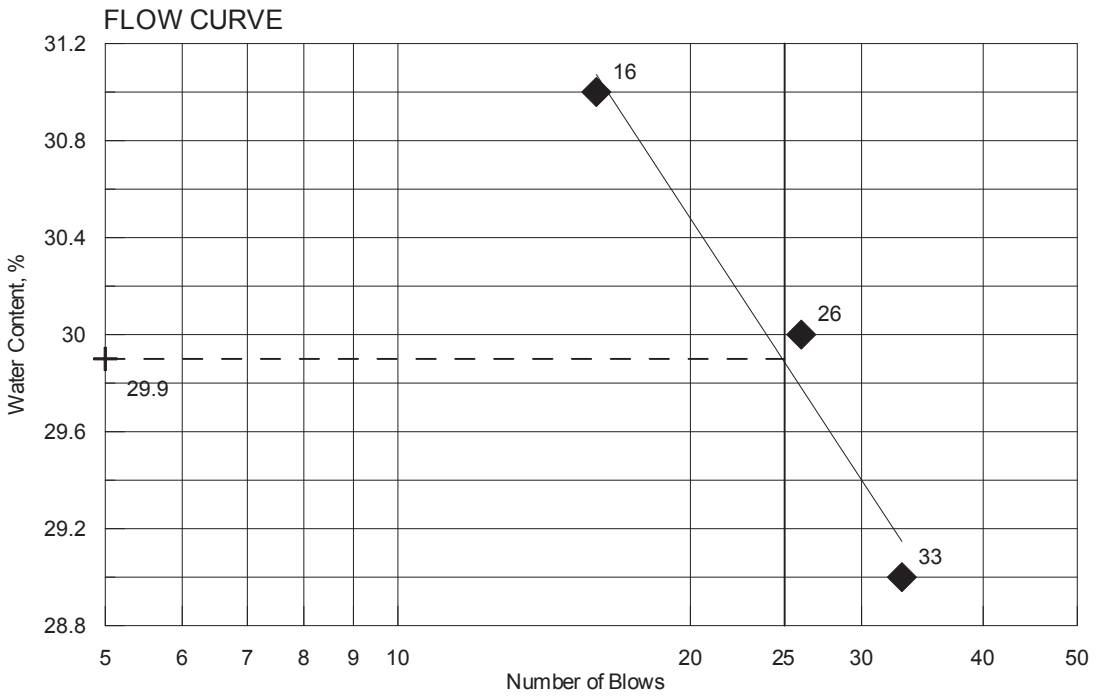


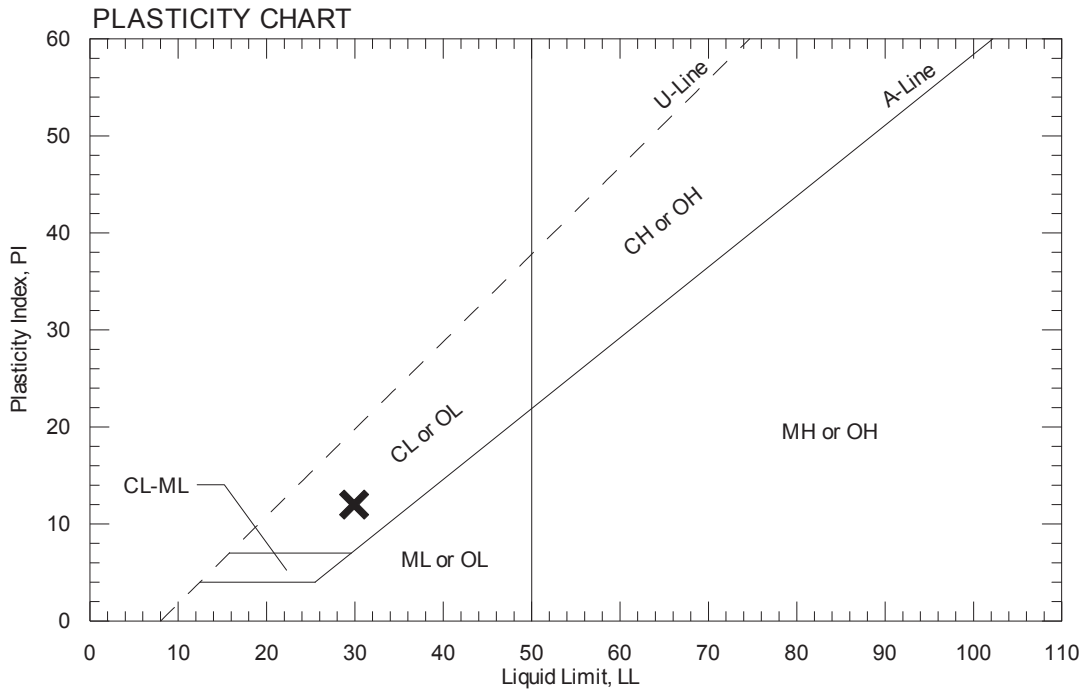
TOWN	Cherryfield, Milbridge	Reference No.	336700
WIN	020405.00	Water Content, %	32.7
Sampled	5/2/2018	Liquid Limit @ 25 blows (T 89), %	39
Boring No./Sample No.	HB-MICH-210/5D	Plastic Limit (T 90), %	21
Station	224+75	Plasticity Index (T 90), %	18
Depth	20.0-22.0	Tested By	BBURR



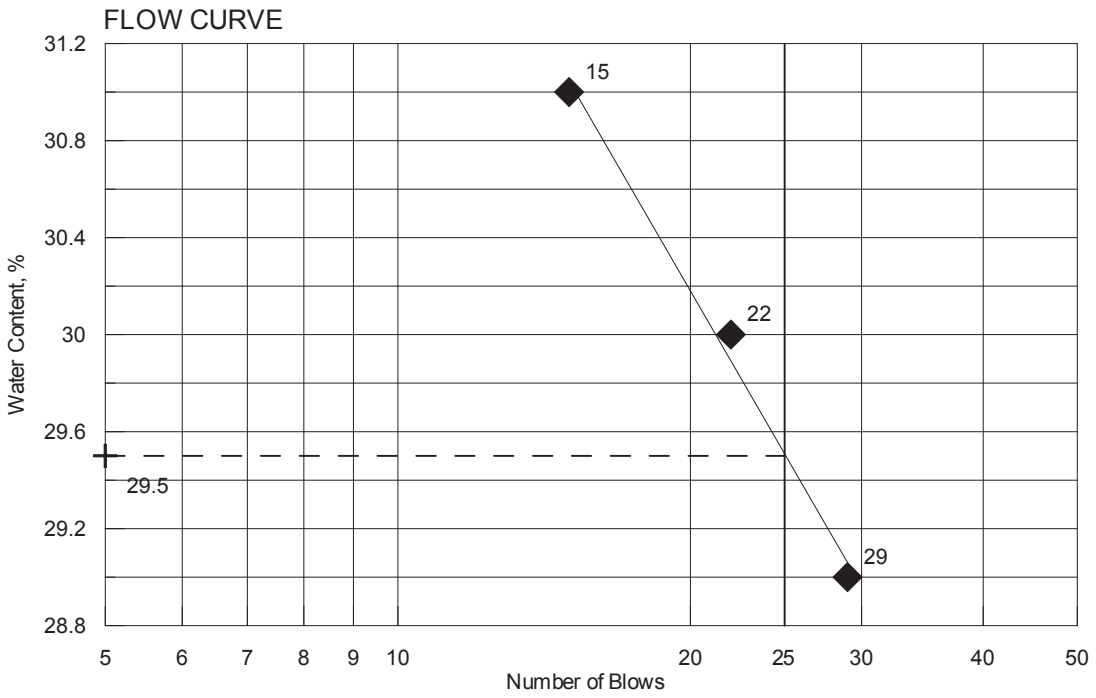


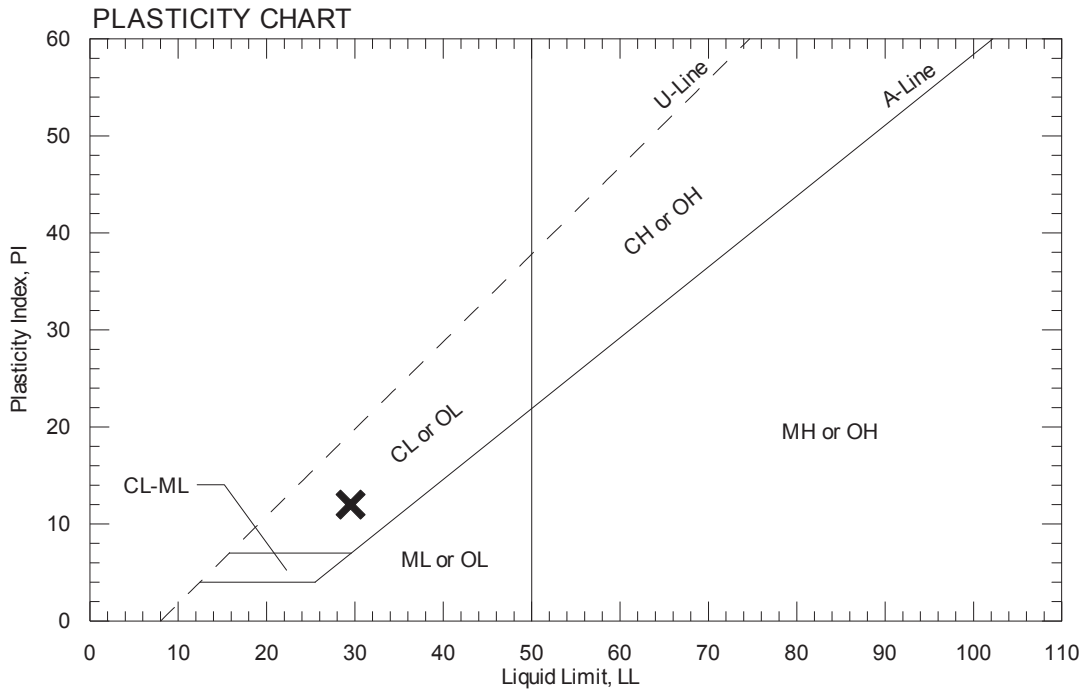
TOWN	Cherryfield, Milbridge	Reference No.	296335
WIN	020405.00	Water Content, %	23.8
Sampled	5/1/2018	Liquid Limit @ 25 blows (T 89), %	30
Boring No./Sample No.	HB-MICH-215/2D	Plastic Limit (T 90), %	18
Station	352+15	Plasticity Index (T 90), %	12
Depth	5.0-7.0	Tested By	BBURR





TOWN	Cherryfield, Milbridge	Reference No.	296336
WIN	020405.00	Water Content, %	24.2
Sampled	5/1/2018	Liquid Limit @ 25 blows (T 89), %	30
Boring No./Sample No.	HB-MICH-215/3D	Plastic Limit (T 90), %	18
Station	352+15	Plasticity Index (T 90), %	12
Depth	10.0-12.0	Tested By	BBURR





Appendix C

Calculations

Bearing Resistance - Existing Soils:

Part 1 - Service Limit State

Nominal and factored Bearing Resistance - Box Culvert on Silt

Presumptive Bearing Resistance for Service Limit State ONLY

Reference: AASHTO LRFD Bridge Design Specifications 9th Edition 2020
Table C10.6.2.6.1-1 Presumptive Bearing Resistances for Spread Footings at the Service Limit State Modified after US Department of Navy (1982)

Type of Bearing Material: Silt (CL)

Based on N-values, soils are stiff near the bearing elevation

Density In Place: medium stiff to stiff

Bearing Resistance: Ordinary Range (ksf) 2 to 6

Recommended Value of Use: $q_{nom} := 3 \cdot ksf$

Resistance factor at the **service limit state** = 1.0 (LRFD Article 10.5.5.1) $\phi_{service\_bc} := 1.0$

$q_{factored\_service\_bc} := q_{nom} \cdot \phi_{service\_bc}$ $q_{factored\_service\_bc} = 3 \cdot ksf$

Note: This bearing resistance is settlement limited (1 inch) and applies only at the service limit state.

Part 2 - Strength Limit State

Nominal and factored Bearing Resistance - Box Culvert on Silt

Reference: AASHTO LRFD Bridge Design Specifications 9th Edition 2020 - Article 10.6.3.1

Assumptions:

1. The box will be founded at ~ Elev 44.7 feet

   Bottom of Construction will be 2 feet below box invert $D_{footing} := 2.0 \cdot ft$

2. Assumed parameters for fill soils:

   Saturated unit weight: $\gamma_s := 125 \cdot pcf$

   Internal friction angle: $\phi_{ns} := 32 \cdot deg$

   Undrained shear strength: $c_{ns} := 0 \cdot psf$

3. Box Culvert parameters

   Width of box culvert, B $B_{box} := 13 \cdot ft$

   Length of box culvert, L $L_{box} := 136 \cdot ft$

Nominal Bearing Resistance per LRFD Equation 10.6.3.1.2a-1

$$q_n = cN_{cm} + \gamma D_f N_{qm} C_{wq} + 0.5\gamma B N_{\gamma m} C_{w\gamma}$$

Bearing Capacity Factors - LRFD Table 10.6.3.1.2a-1

For ϕ=32 deg $N_c := 35.5$ $N_q := 23.2$ $N_\gamma := 30.2$

Shape Correction Factors LRFD Table 10.6.3.1.2a.-3

for ϕ=32 degrees

$$s_c := 1 + \left(\frac{B_{box}}{L_{box}}\right)\left(\frac{N_q}{N_c}\right) \qquad s_c = 1.06$$

$$s_\gamma := 1 - 0.4\left(\frac{B_{box}}{L_{box}}\right) \qquad s_\gamma = 0.9618$$

$$s_q := 1 + \left(\frac{B_{box}}{L_{box}} \cdot \tan(\phi_{ns})\right) \qquad s_q = 1.06$$

Load Inclination Factors:
Assume all are 1.0 (LRFD Article C10.6.3.1.2a)

$i_c := 1.0$ $i_q := 1.0$ $i_\gamma := 1.0$

Depth Correction Factor $d_q := 1 + 2 \cdot \tan(\phi_{ns}) \cdot (1 - \sin(\phi_{ns}))^2 \cdot \tan\left(\frac{D_{footing}}{B_{box}}\right)^{-1}$ $d_q = 2.7809$ LRFD Eq. 10.6.3.1.2a-10

$N_{cm} := N_c \cdot s_c \cdot i_c$ $N_{cm} = 37.7176$ LRFD Eq. 10.6.3.1.2a-2

$N_{qm} := N_q \cdot s_q \cdot d_q \cdot i_q$ $N_{qm} = 68.37$ LRFD Eq. 10.6.3.1.2a-3

$N_{\gamma m} := N_\gamma \cdot s_\gamma \cdot i_\gamma$ $N_{\gamma m} = 29.05$ LRFD Eq. 10.6.3.1.2a-4

Coefficients for Groundwater Depths LRFD Table 10.6.3.1.2a-2

Depth the water table: $D_w := 0 \cdot ft$ $C_{wq} := 0.5$ $C_{w\gamma} := 0.5$

$$q_{nominal} := c_{ns} \cdot N_{cm} + \gamma_s \cdot D_{footing} \cdot N_{qm} \cdot C_{wq} + 0.5(\gamma_s) B_{box} \cdot N_{\gamma m} \cdot C_{w\gamma}$$

$q_{nominal} = 20.3 \cdot ksf$

Factored Bearing Resistance for Strength Limit State

Resistance Factor: $\phi_b := 0.45$ LRFD Table 10.5.5.2.2-1

$q_{factored} := q_{nominal} \cdot \phi_b$

$q_{factored} = 9.2 \cdot ksf$

Recommend a limiting factored bearing resistance of 9.0 ksf for the Strength Limit State.

Modulus of Subgrade Reaction:

Reference: Foundation Analysis and Design 5th Edition JE Bowles Section 9-6

Width of box culvert, B $B_{box} = 13\ ft$

Length of box culvert, L $L_{box} = 136\ ft$

Thickness of box culvert, t $t_{box} := 12 \cdot in$ assumed

Depth of box, D $D_{box} := 19.3 \cdot ft$

Bearing Resistance: $q_{factored\_service\_bc} = 3 \cdot ksf$ Calculated above

Modulus of Elasticity: Site soils at bearing elevation are Silt. Use values for Silt (stiff)
From Bowles Table 2-8 Modulus Es for Silt, ranges from 40 - 420 ksf

Use Modulus of Elasticity, Es . $E_s := 200 \cdot ksf$

Poisson's Ratio: Site conditions at bearing elevation are Silt. Use values for Silt.
From Bowles Table 2-7 Poisson's Ration μ for Silt ranges from 0.3 - 0.35

Use Possion's Ratio, μ . $\mu := 0.33$

$$E_{prime\_s} := \frac{1 - \mu^2}{E_s} \qquad E_{prime\_s} = 0.004456 \cdot \frac{ft^2}{kip}$$

Analyze corner:

Take H as 5*B as recommended in Bowles Chapter 5

$$H_{inf} := \frac{5 \cdot B_{box}}{B_{box}} \qquad H_{inf} = 5$$ N in Table 5-2

$$\frac{L_{box}}{B_{box}} = 10.4615$$ M in Table 5-2

From Table 5-2 for N=5 and M=10.5

$I_1 := 0.534$

$I_2 := 0.140$ by interpolation

Determine Steinbrenner influence factor - Bowles Section 5-6:

$$I_s := I_1 + \left[\frac{1 - (2 \cdot \mu)}{1 - \mu}\right] \cdot I_2 \qquad I_s = 0.605$$

Determine Influence factor for footing depth - Bowles Figure 5-7

Depth ratio: $\frac{D_{box}}{B_{box}} = 1.4846$ $\frac{L_{box}}{B_{box}} = 10.4615$ $\mu = 0.33$ $I_F := 0.74$

Calculate modulus of subgrade reaction - Bowles Eq. 9-7

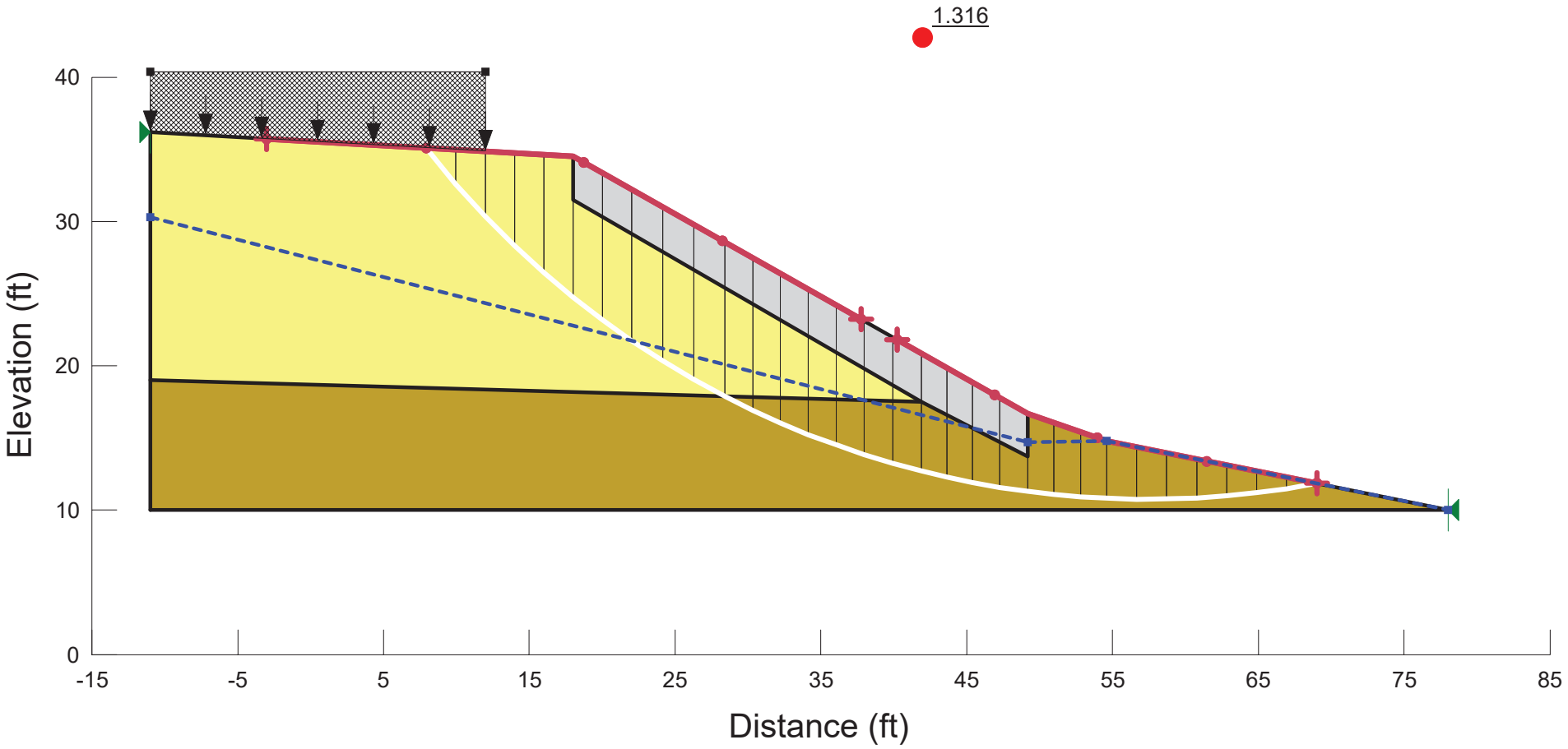
$$k_s := \frac{1}{B_{box} \cdot E_{prime\_s} \cdot I_s \cdot I_F}$$ Bowles Eq. 9-7

$k_s = 22 \cdot pci$

Recommend Modulus of Subgrade Reaction of 20 pci

Appendix D

Slope Stability Analyses



Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	120	0	34
	Riprap	Mohr-Coulomb	145	0	42
	Till	Mohr-Coulomb	125	0	36

Method: Spencer

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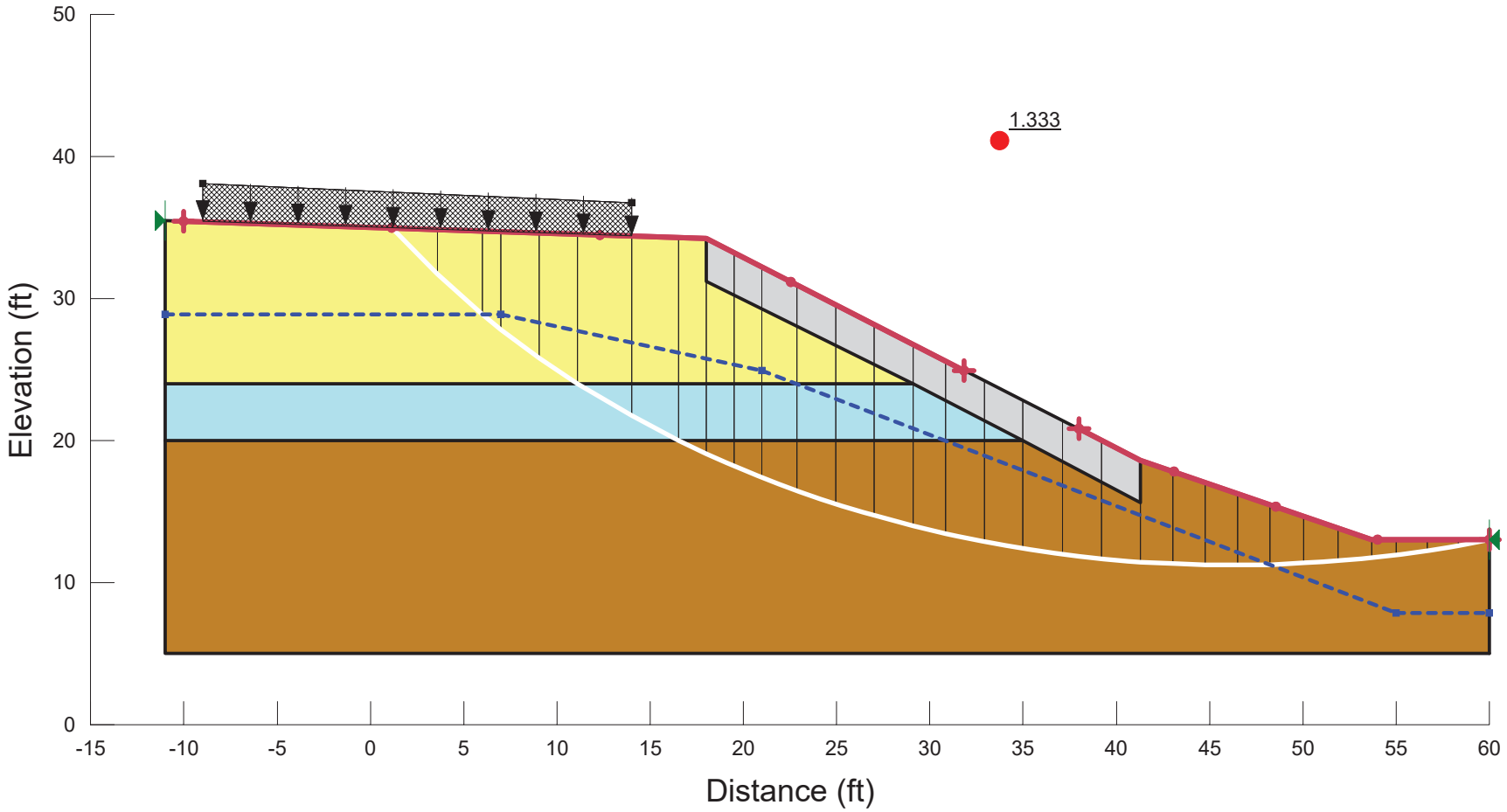

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Undrained Shear Strength (psf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	120		0	35
	Riprap	Mohr-Coulomb	140		0	42
	Silt	Undrained (Phi=0)	115	750		
	Till	Mohr-Coulomb	125		0	36

Method: Spencer
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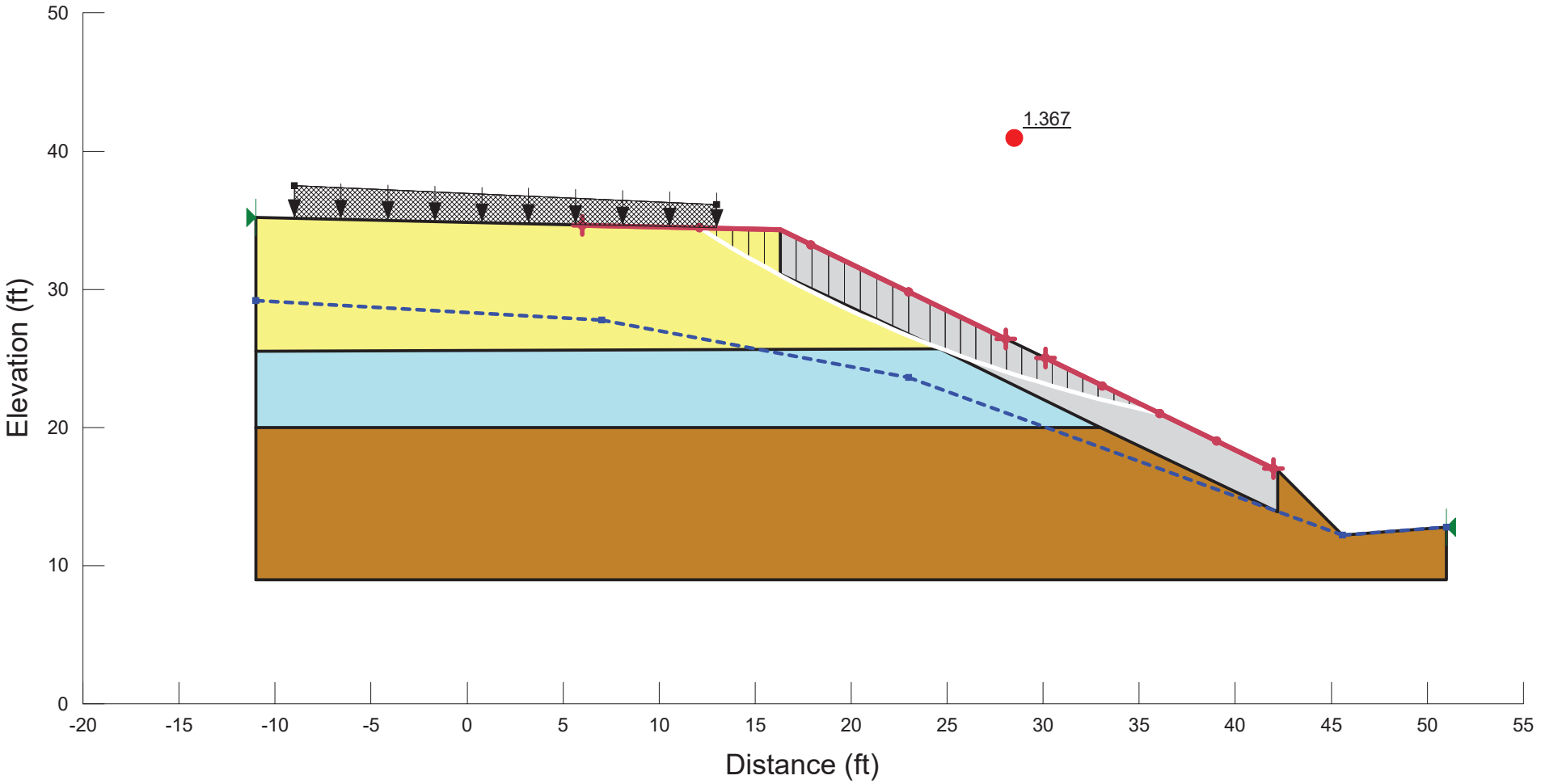

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	120	0	34
	Riprap	Mohr-Coulomb	145	10	42
	Silt	Mohr-Coulomb	115	750	0
	Till	Mohr-Coulomb	125	0	36

Method: Spencer

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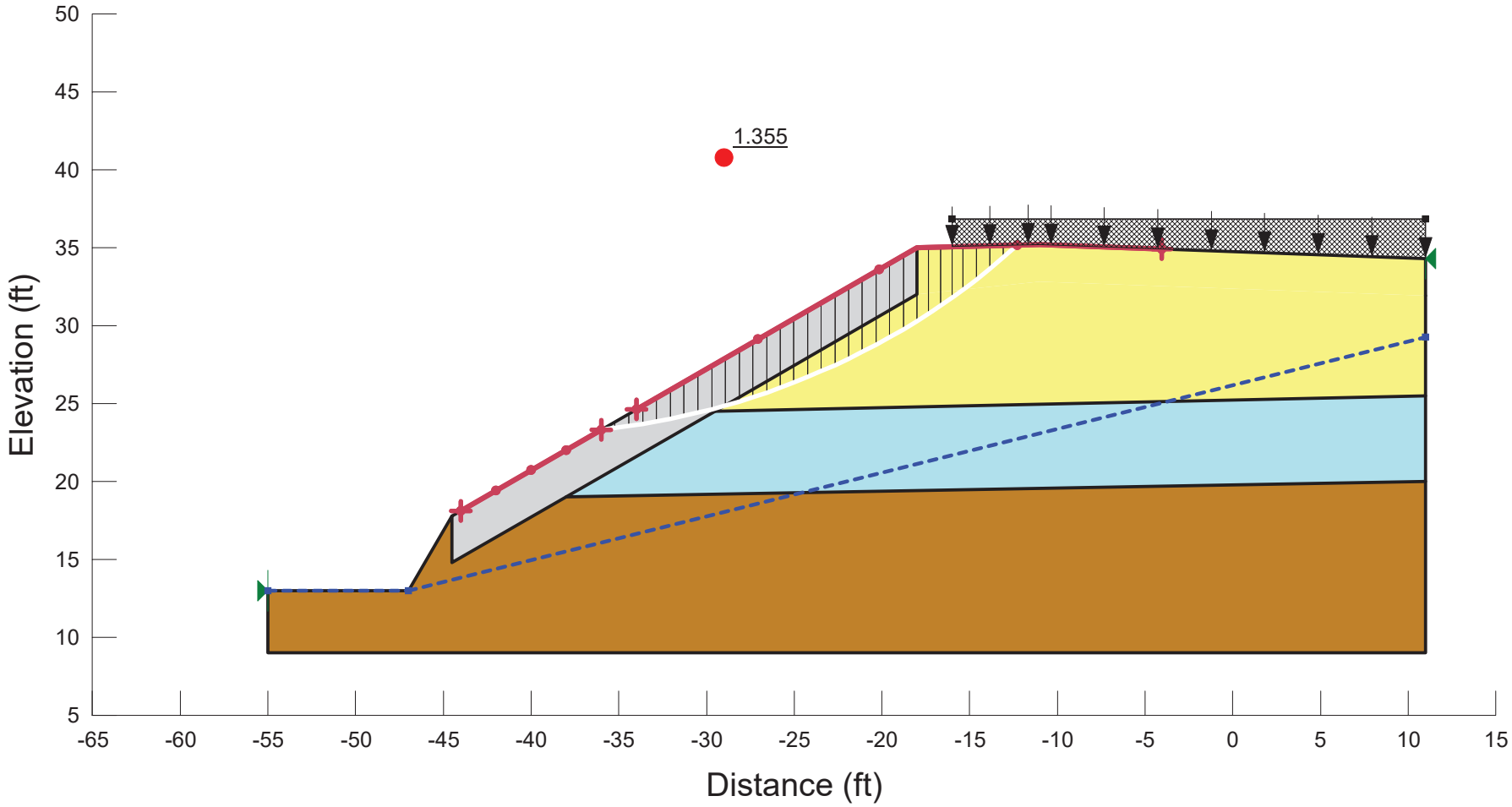
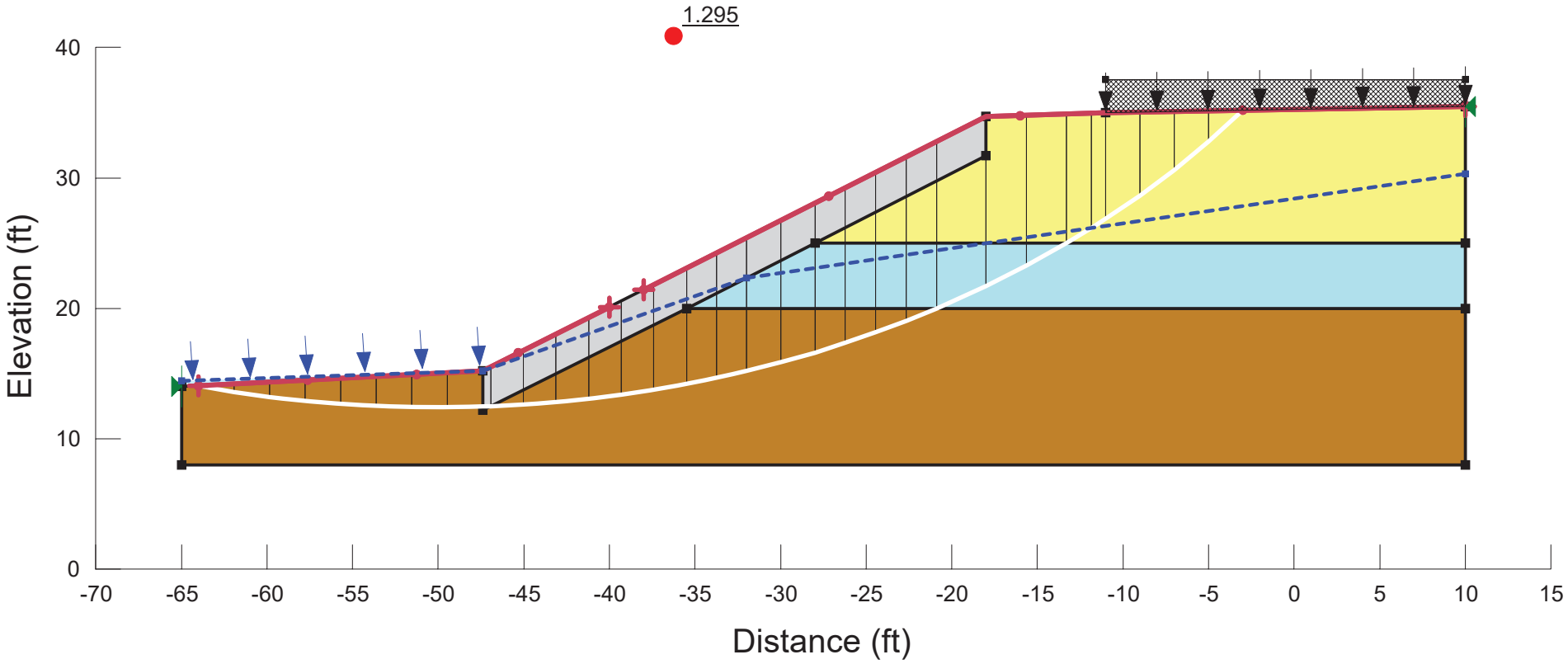


Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	125	0	34
	Riprap	Mohr-Coulomb	145	0	42
	Silt/Peat	Mohr-Coulomb	115	750	0
	Till	Mohr-Coulomb	125	0	36

Method: Spencer

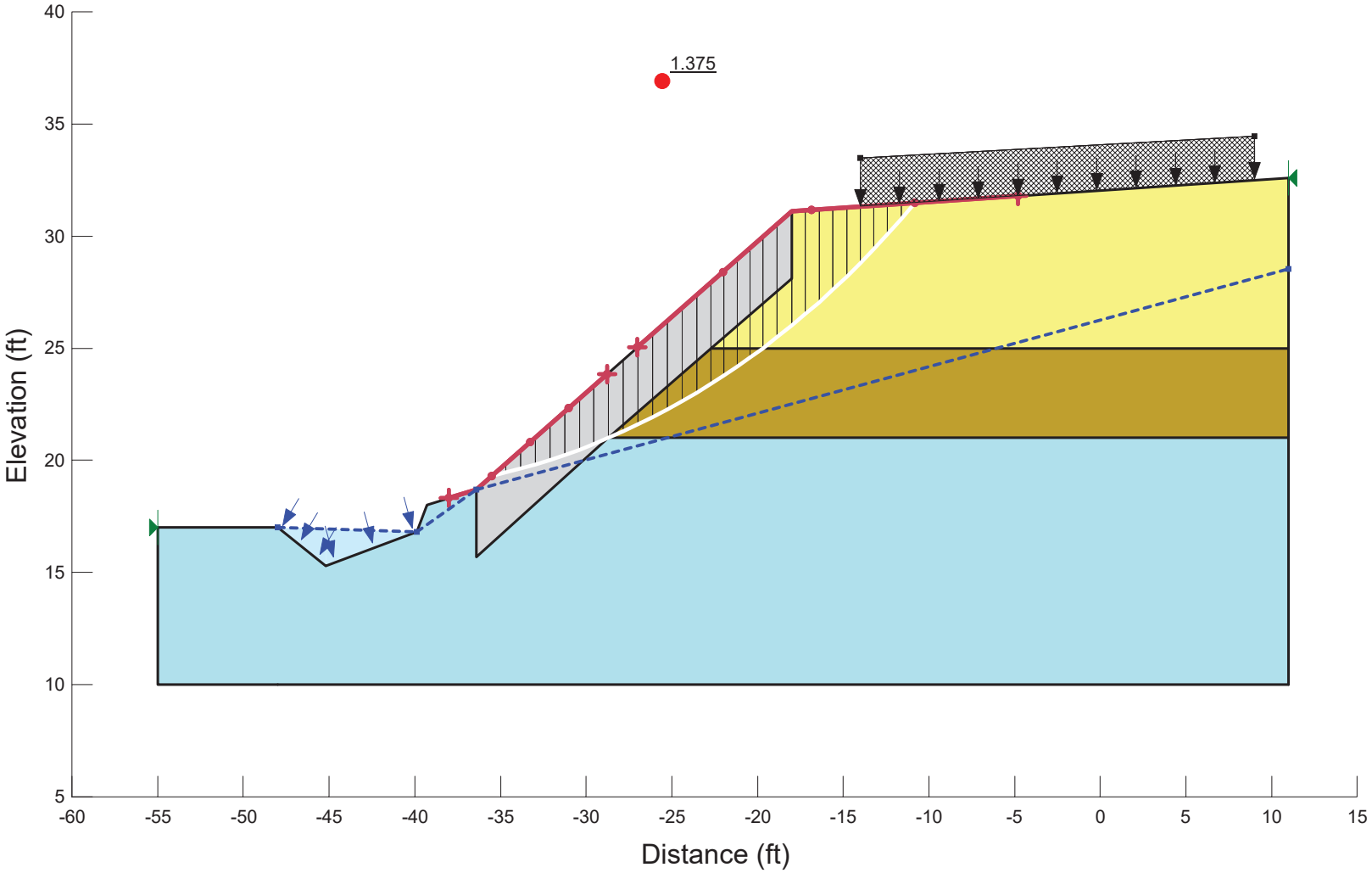
File Name: 210+19.82 Left.gsz



Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	120	0	34
	Riprap	Mohr-Coulomb	145	10	42
	Silt	Mohr-Coulomb	115	750	0
	Till	Mohr-Coulomb	130	0	36

Method: Spencer

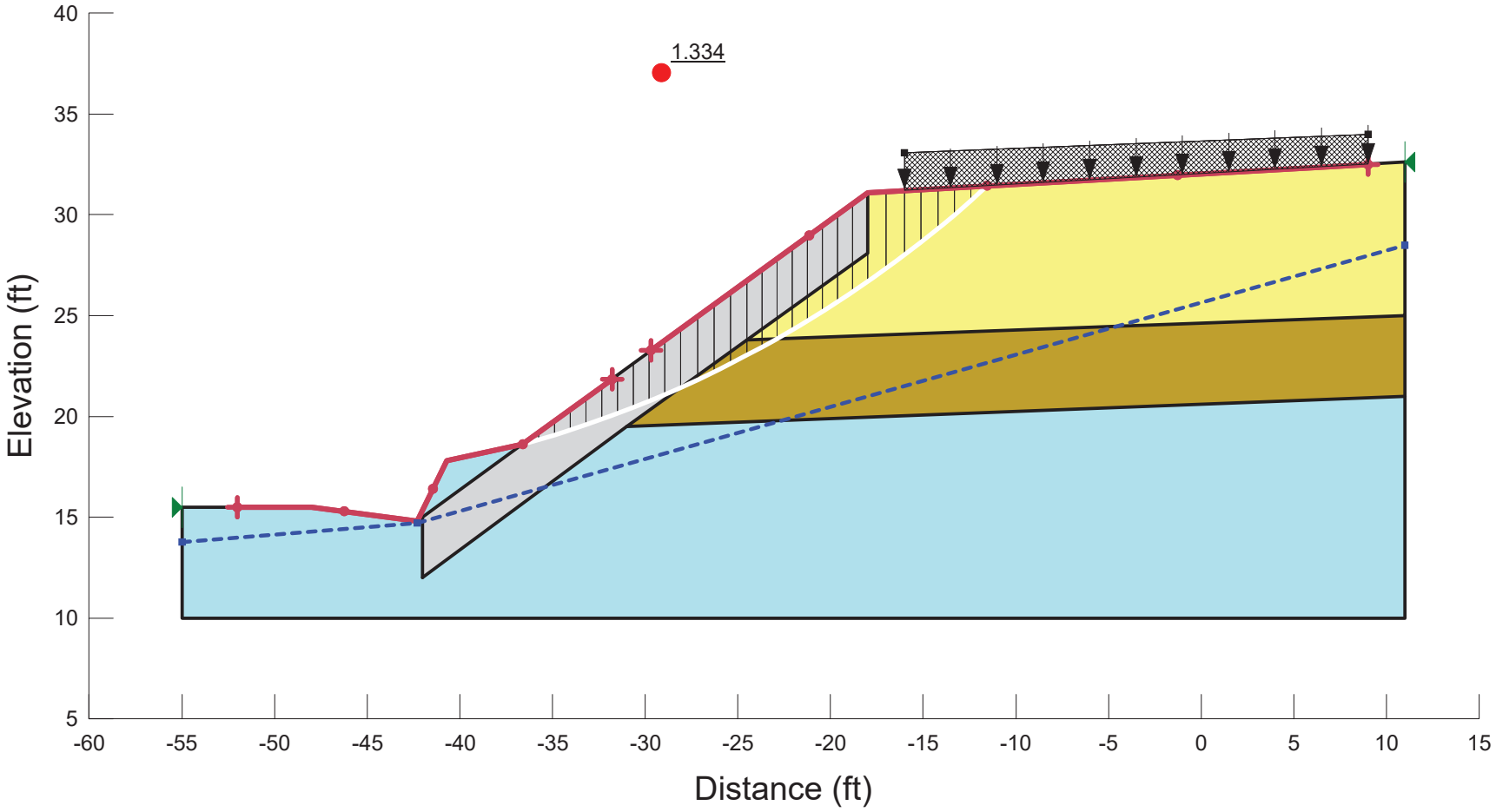
File Name: 210+50 Left.gsz



Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	120	0	34
	Riprap	Mohr-Coulomb	145	10	42
	Sand	Mohr-Coulomb	125	0	34
	Silt	Mohr-Coulomb	115	750	0

Method: Spencer

File Name: 225+00 Left.gsz



Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	120	0	34
	Riprap	Mohr-Coulomb	145	0	42
	Sand	Mohr-Coulomb	125	0	36
	Silt	Mohr-Coulomb	115	750	0

Method: Spencer
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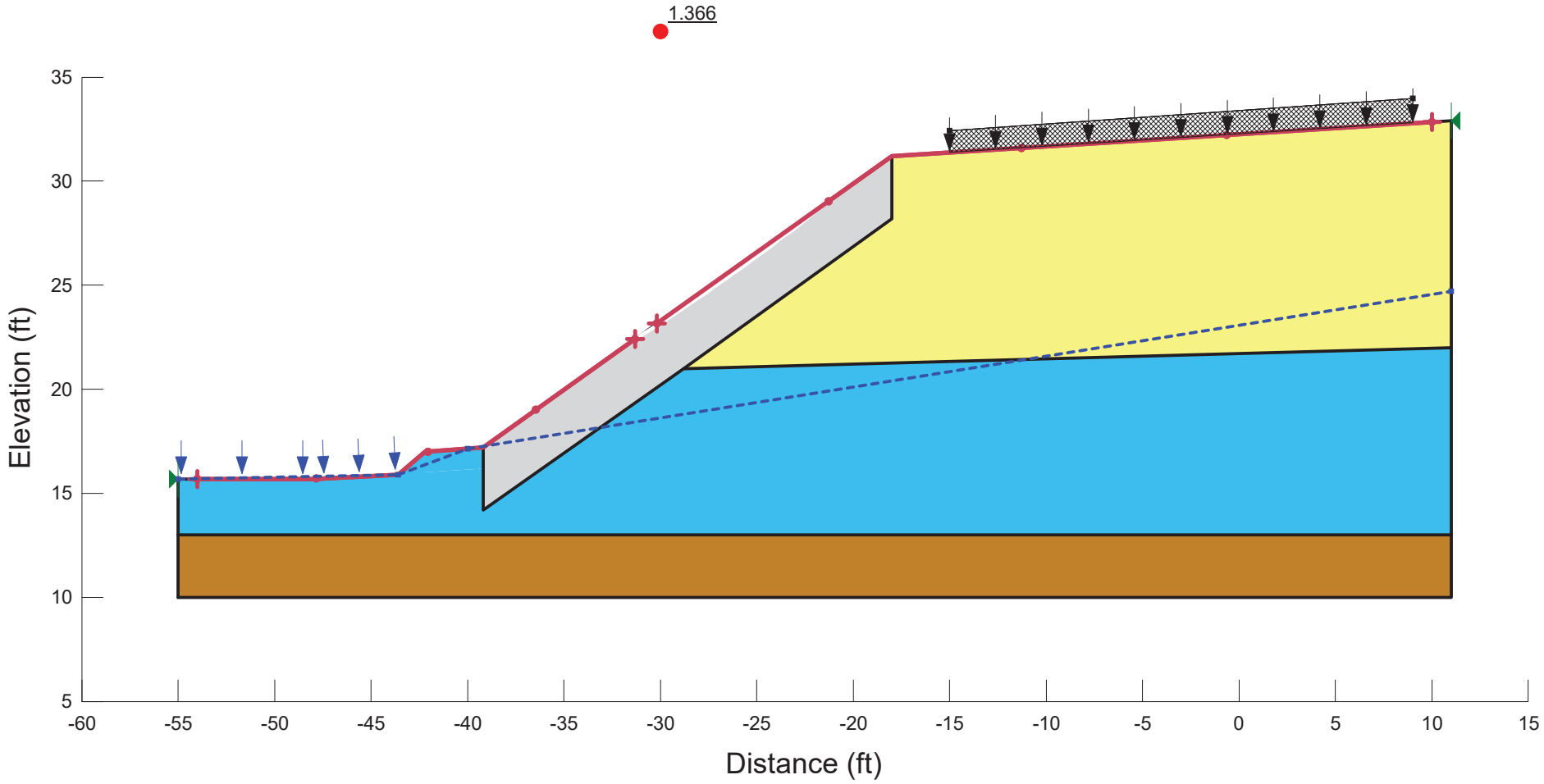

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Fill	Mohr-Coulomb	120	0	34
	Riprap	Mohr-Coulomb	145	0	42
	Silt	Mohr-Coulomb	115	750	0
	Till	Mohr-Coulomb	125	0	36

Method: Spencer

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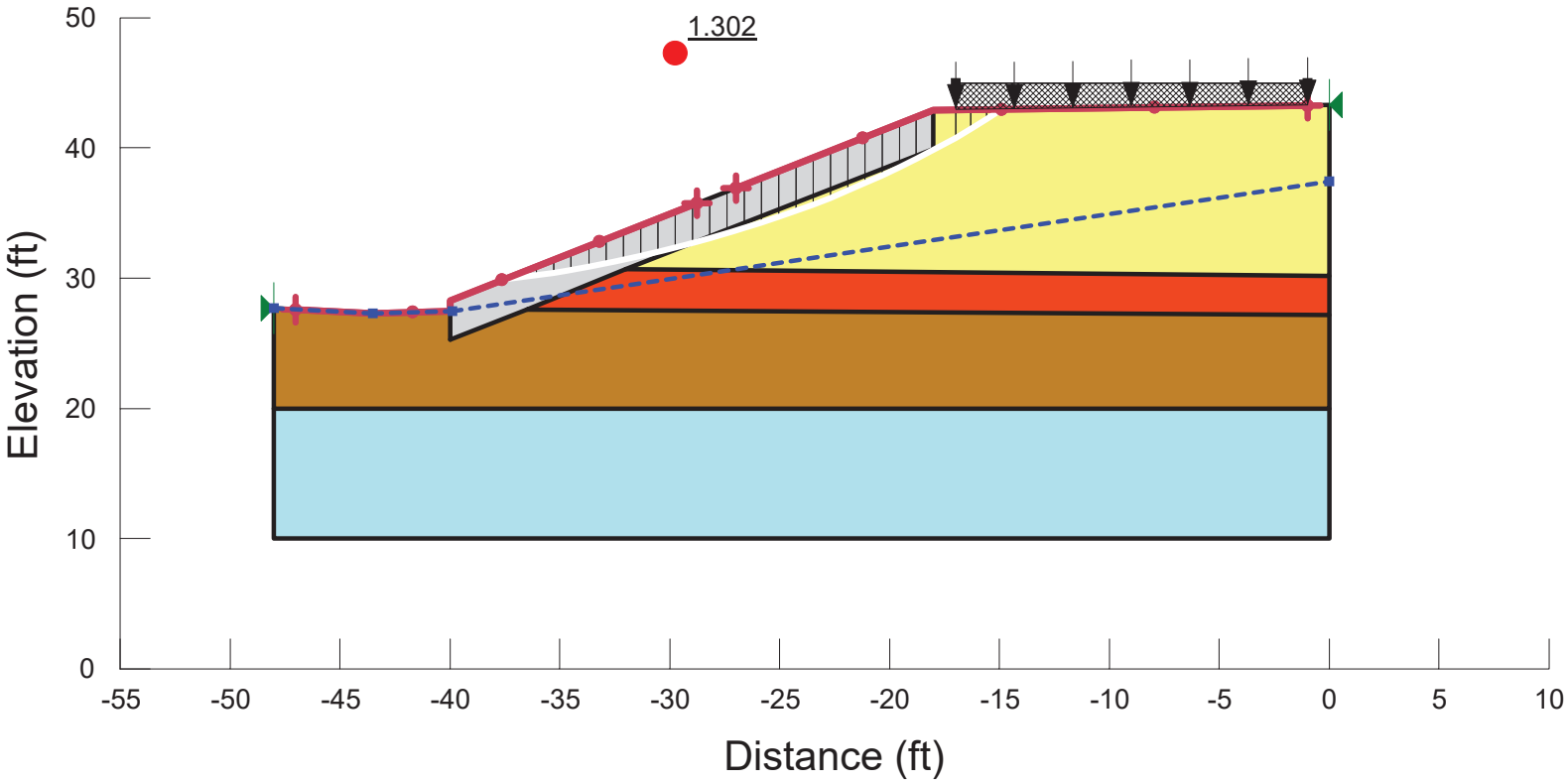

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill	Mohr-Coulomb	120	0	35
	Pipe	High Strength	110		
	Riprap	Mohr-Coulomb	145	0	45
	Sand	Mohr-Coulomb	125	0	36

Method: Spencer

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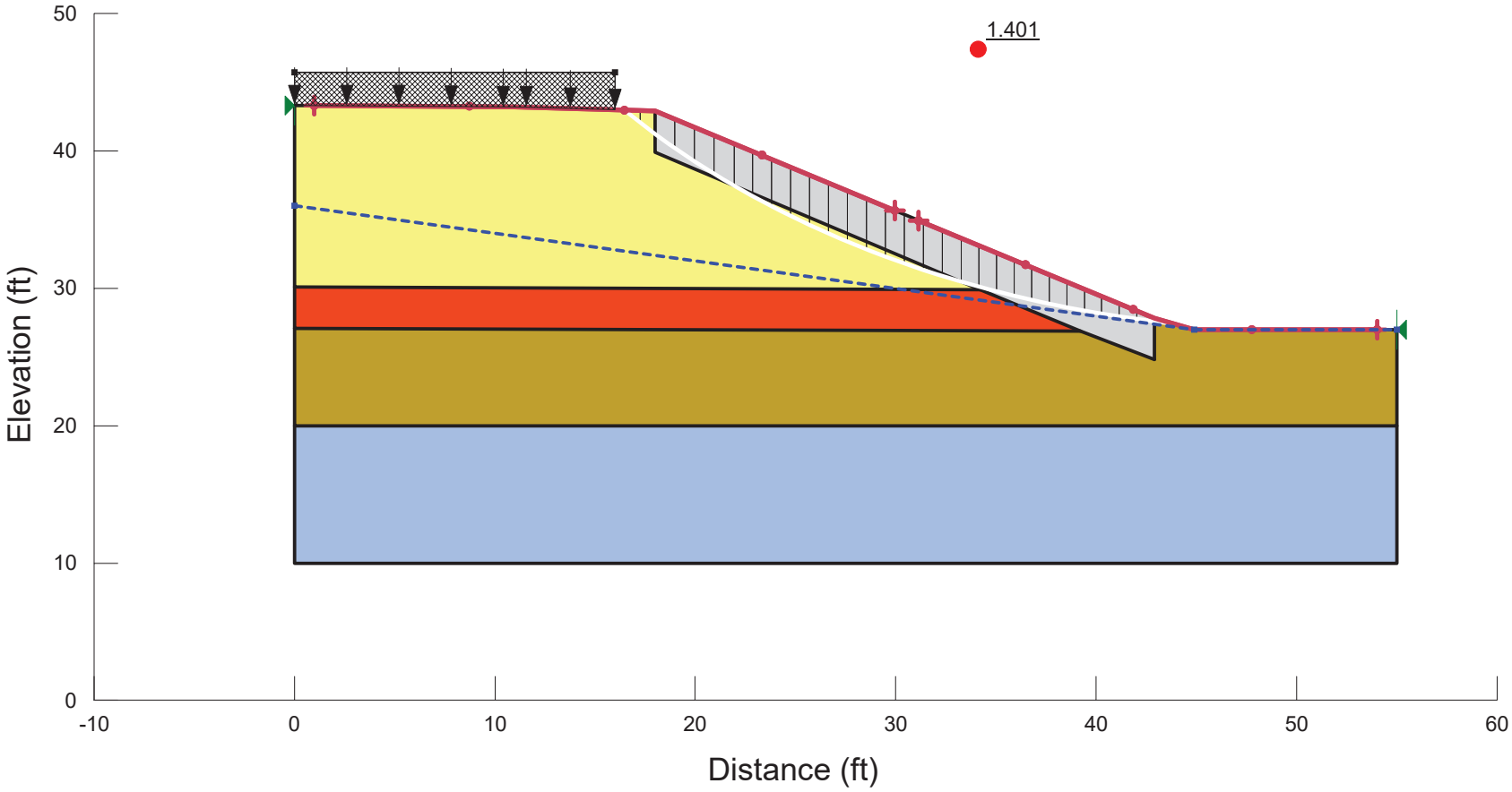

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	Bedrock	Bedrock (Impenetrable)			
	Fill	Mohr-Coulomb	120	0	34
	Pipe	High Strength	110		
	Riprap	Mohr-Coulomb	145	0	42
	Sand	Mohr-Coulomb	125	0	34

Method: Spencer

File Name: 246+82 Right.gsz