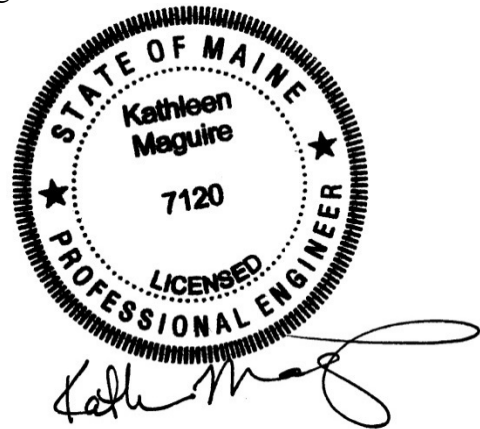


**MAINE DEPARTMENT OF TRANSPORTATION
HIGHWAY PROGRAM
GEOTECHNICAL SECTION
AUGUSTA, MAINE**

GEOTECHNICAL DATA REPORT

For the Rehabilitation of:
**STATE ROUTE 8/11
BELGRADE, MAINE**

Prepared by:
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Reviewed by:
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Kennebec County
WIN 12773.00

Soils Report 2017-52
Federal No. STP-1277(300)X

November 27, 2017

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1.0 INTRODUCTION

The purpose of this report is to document subsurface information collected and make geotechnical design and construction recommendations for the rehabilitation of an approximately 3.02-mile portion of State Route 8/11 in Belgrade. The project is needed to improve drainage, roadway structure, and safety. This report presents the results of a limited geotechnical investigation performed along the project site and the results of a limited laboratory testing program conducted on soils recovered during the geotechnical investigation. State Route 8/11 is a Highway Corridor Priority 3 road.

2.0 GEOLOGIC SETTING

The project begins approximately 0.05 miles northerly of Route 27 in Belgrade and extends northerly 3.02 miles on Route 8/11 as shown on Sheet 1 – Location Map.

According to the Maine Geologic Survey (MGS) map titled Surficial Geology Belgrade Quadrangle, Maine Open-File No. 05-45 (2005) the surficial soils along the project consist of till. These soils typically consist of a mixture of clay, silt, sand, pebbles, cobbles and boulders predominantly sandy containing some gravel.

According to the map titled Bedrock Geologic Map of Maine (1985) published by the MGS, the bedrock in the vicinity of the site consists of interbedded pelite and limestone and/or dolostone and of the Sangerville Formation on the northwest of Route 8/11 and limestone and/or dolostone of the Patch Mountain Member of the Sangerville Formation to the southwest of Route 8/11.

3.0 SUBSURFACE INVESTIGATION

Subsurface conditions along the project were explored by drilling a total of twenty-one (21) test borings and seventy-six (76) probes. The borings and probes were drilled between July 31 and August 3, 2012 by the MaineDOT drill crew using solid stem auger techniques. The boring depths ranged from approximately 3.1 to 10.0 feet below ground surface (bgs). The probe depths ranged from approximately 0.8 to 10.0 feet bgs. Five (5) of the borings and many of the probes encountered a shallow refusal surface. The exact nature of the refusal surface was not determined in the explorations. Boring locations are shown on the Sheets 2 through 26 Boring Location Plans. Boring Logs and the Auger Probe Summary Sheets are presented in Appendix A – Boring Logs.

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

A Northeast Transportation Training and Certification Program (NETTCP) Certified Subsurface Inspector logged the subsurface conditions encountered. The MaineDOT Geotechnical Team member selected the boring locations, drilling methods, designated type and depth of sampling, reviewed field logs for accuracy and identified laboratory testing requirements. The borings 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 borings to assist in soil classification. Laboratory testing consisted of sixteen (16) standard grain size analyses with natural water content. 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 – Boring Logs.

5.0 SUBSURFACE CONDITIONS

Subsurface conditions encountered at the test borings generally consisted of sand, gravelly sand, and silt overlying rock. Discontinuous silty sand and organic soils (peat) layers were encountered at isolated locations. The boring locations are shown on Sheets 2 through 26 - Boring Location Plans. The boring logs are in Appendix A – Boring Logs.

5.1 Sand and Gravelly Sand

The subsurface investigation found layers of sand and gravelly sand under the roadway pavement. The sand consisted of brown to dark brown, damp to moist, fine to coarse sand, some to trace silt, some to trace gravel. The gravelly sand consisted of dark brown, damp, gravelly sand, trace silt. The thickness of the sand and gravelly sand layer ranged from approximately 0.7 feet to greater than 5.0 feet. Grain size analyses conducted on ten (10) samples of the sand and gravelly sand resulted in the soil being classified as an A-2-4, A-1-b, or A-4 under the AASHTO Soil Classification System and an SM, SW, or SW-SM under the Unified Classification System. The measured natural water contents of the samples tested ranged from approximately 2 to 14 percent.

5.2 Silt or Sandy Silt

In some areas the sand and gravelly sand is underlain by a layer of silt or sandy silt. The silt consisted brown, dry to moist, silt, some clay, some sand, trace gravel and brown, damp to moist, sandy silt, trace gravel. The thickness of the silt or sandy silt ranged from approximately 0 to greater than 3.8 feet. Grain size analyses conducted on six (6) samples of the silt or sandy silt resulted in the soil being classified as an A-4 under the AASHTO Soil Classification System and an ML or CL-ML under the Unified Classification System. The measured natural water contents of the samples tested ranged from approximately 8 to 40 percent.

5.3 Organic Soils (Peat)

A thin layer of organic soils (peat) was observed in boring HB-BEL-120 at Station 155+00. The thickness of the peat was approximately 0.2 feet. No laboratory testing was done on the peat.

6.0 GEOTECHNICAL RECOMMENDATIONS

There are two (2) areas of geotechnical concern on this project:

- Shallow refusals
- Organic Soils (Peat)

6.1 Shallow Refusals

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

| Stations | Range of Approximate Depths to Weathered Rock (feet bgs) | Range of Approximate Depths to Refusal (feet bgs) |
|------------------|--|---|
| 48+50 to 59+00 | 2.0 to 4.2 | 2.3 to 4.7 |
| 61+00 to 67+00 | 1.9 to 4.8 | 2.3 to 5.0 |
| 90+50 to 96+00 | 1.8 to 4.1 | 2.3 to 4.4 |
| 136+00 to 147+50 | 0.8 to 3.9 | 1.2 to 5.0 |
| 164+50 to 165+50 | 3.2 | 3.0 to 5.0 |

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

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

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

6.2 Organic Soils (Peat)

A thin layer of organic soils (peat) was observed in boring HB-BEL-120 at Station 155+00. The thickness of the peat was approximately 0.2 feet. In this area, the road profile will be raised approximately 1 foot. These soils are highly compressible and permeable particularly during the early stages of loading.

Organic soils encountered in excavations for any structure during construction shall be removed and replaced with granular borrow. Based on the soils encountered in the boring, silt is present beneath the peat. The silt soils shall be excavated using a smooth-edged backhoe bucket to minimize disturbance to the layer. If a smooth-edged bucket is not used, all disturbed soils caused by the bucket teeth shall be removed by hand prior to placement of new materials. The use of heavy equipment on the silt shall be prohibited.

7.0 CLOSURE

This Geotechnical Data Report has been prepared for the use of the MaineDOT Highway Program for specific application to the proposed reconstruction of State Route 8/11 in Belgrade, Maine in accordance with generally accepted geotechnical and foundation engineering practices. No other intended use or warranty is expressed or implied.

MaineDOT conducted a limited number of soil explorations at discrete locations along the project and a limited number of laboratory tests. MaineDOT shall not be responsible for the Bidder's or Contractor's interpretations, estimates, or conclusions derived from the geotechnical information. Data provided may not be representative of the subsurface conditions between boring locations.

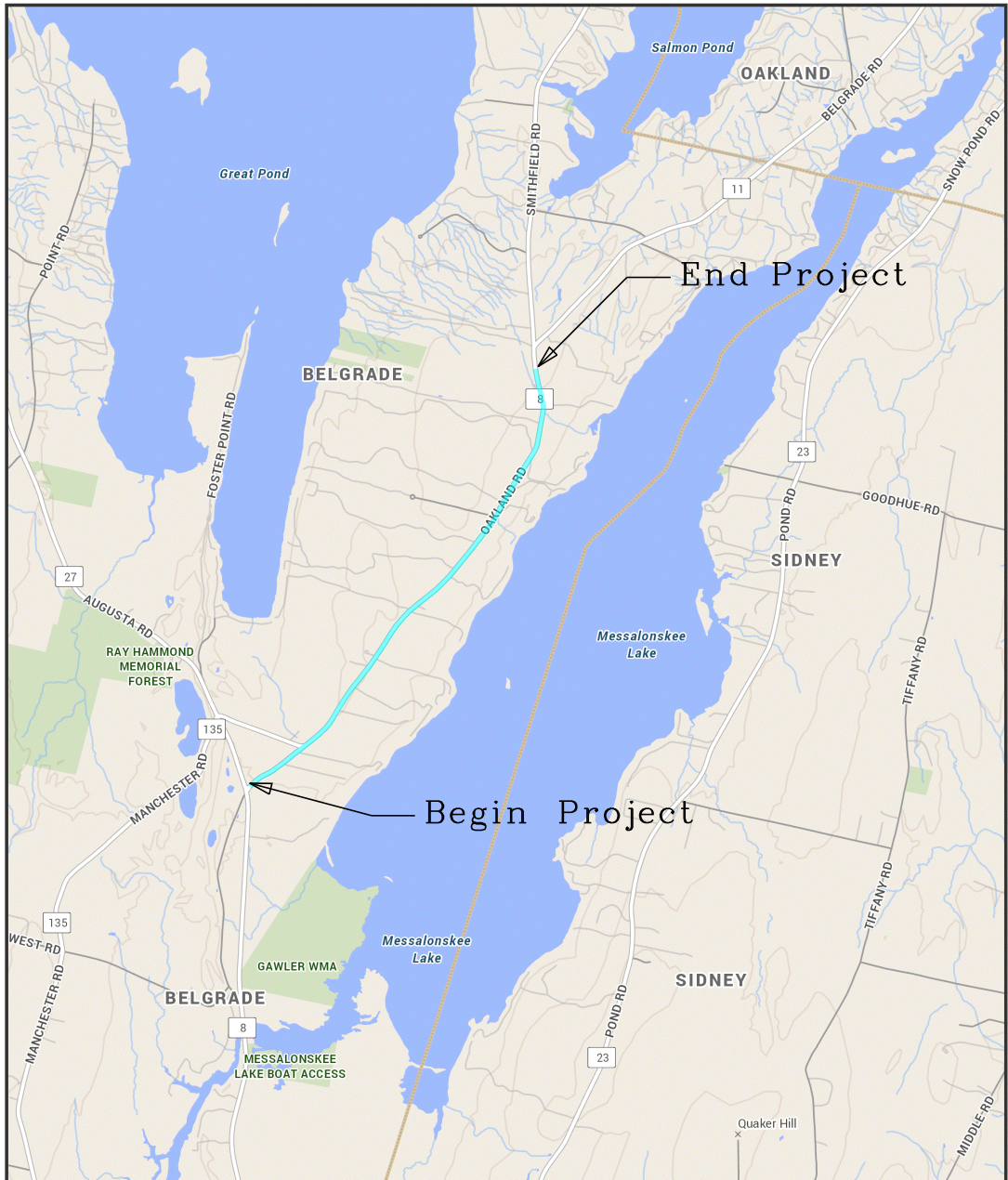
In the event that any changes in the nature, design, or location of the proposed project are planned, this report should be reviewed by a geotechnical engineer to assess the appropriateness of the conclusions and recommendations and to modify the recommendations as appropriate to reflect the changes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

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

Sheets



BELGRADE, MAINE

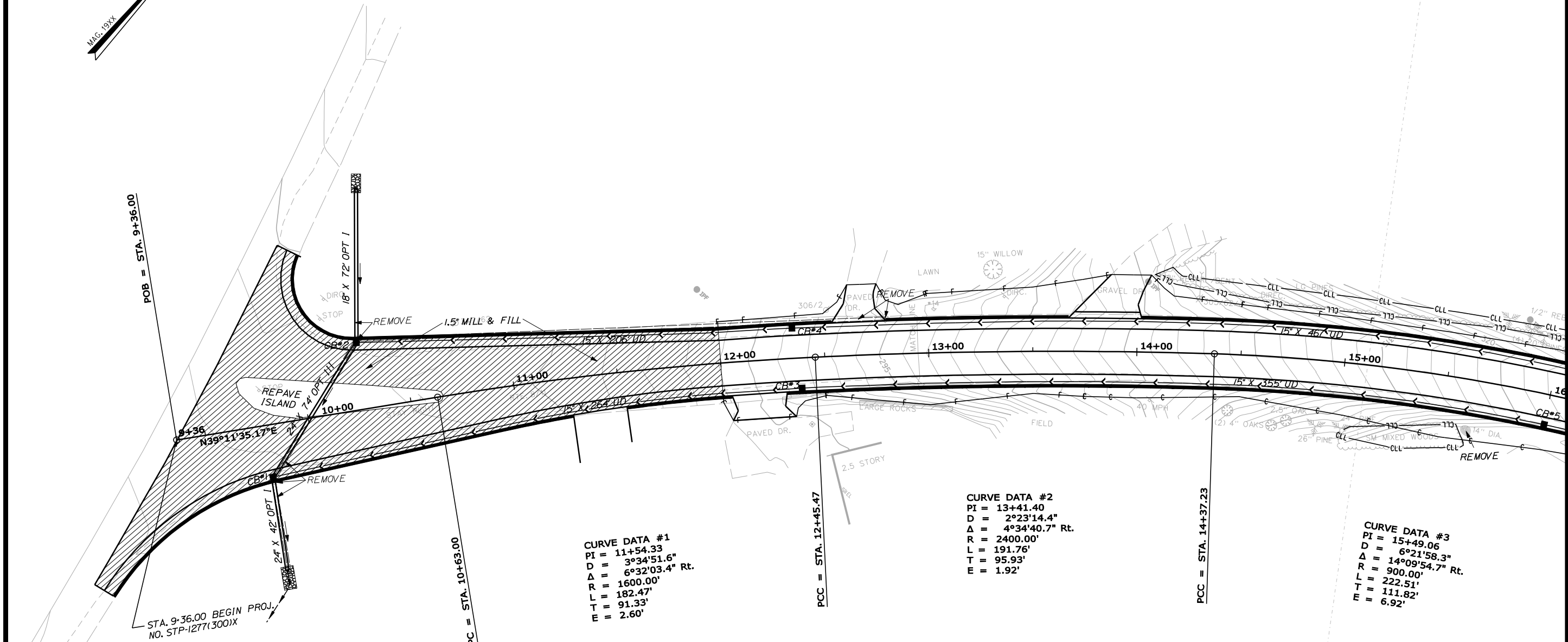
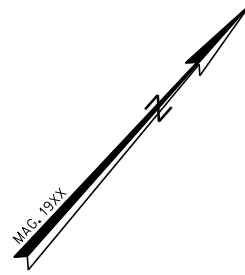


The Maine Department of Transportation provides this publication for information only. Reliance upon this information is at user risk. It is subject to revision and may be incomplete depending upon changing conditions. The Department assumes no liability if injuries or damages result from this information.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

0.9 Miles
1 inch = 1 miles

Date: 11/16/2017
Time: 7:17:36 AM

| | | |
|---|--|--|
| SHEET NUMBER 1 OF 26 | BELGRADE RTE. 8/11 KENNEBEC COUNTY | STATE OF MAINE DEPARTMENT OF TRANSPORTATION |
| | LOCATION MAP | STP-1277(300)X WIN 012773.00 HIGHWAY PLANS |



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 L = 191.76'
 T = 95.93'
 E = 1.92'

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 Δ = 14°09'54.7" Rt.
 R = 900.00'
 L = 222.51'
 T = 111.82'
 E = 6.92'

LEGEND

- HB- SOLID STEM AUGER W/DESCRIPTIONS
- P- PROBE

KEY

- R = Refusal of augers (actual nature of refusal surface unknown)
- NR = No Refusal surface encountered
- W = Weathered Rock, top of

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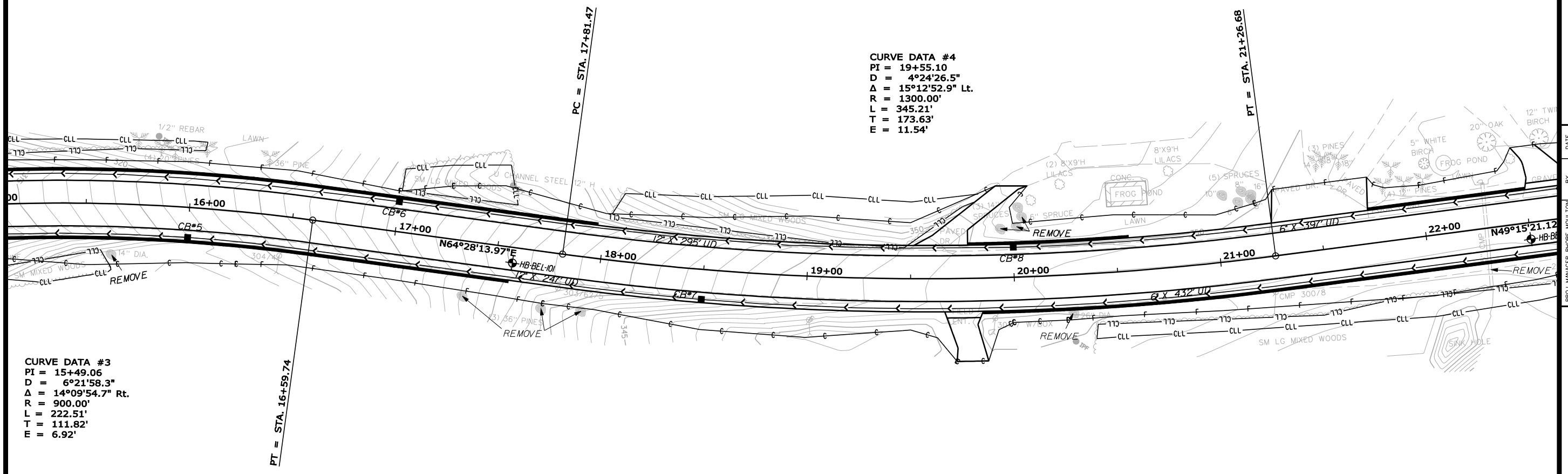
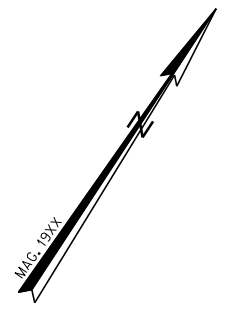
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Division: GEOTECH

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STATE OF MAINE
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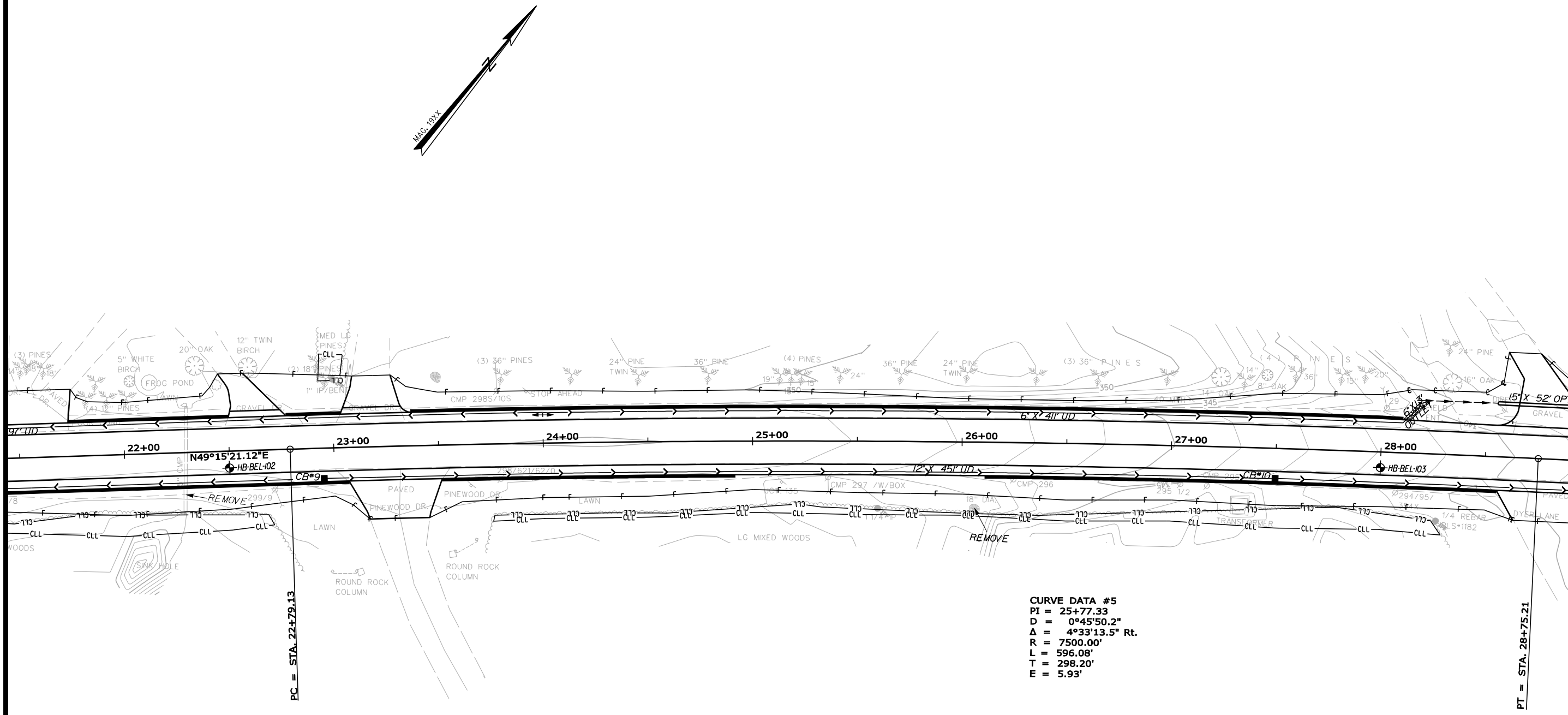
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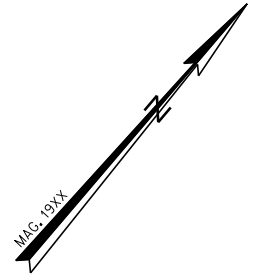
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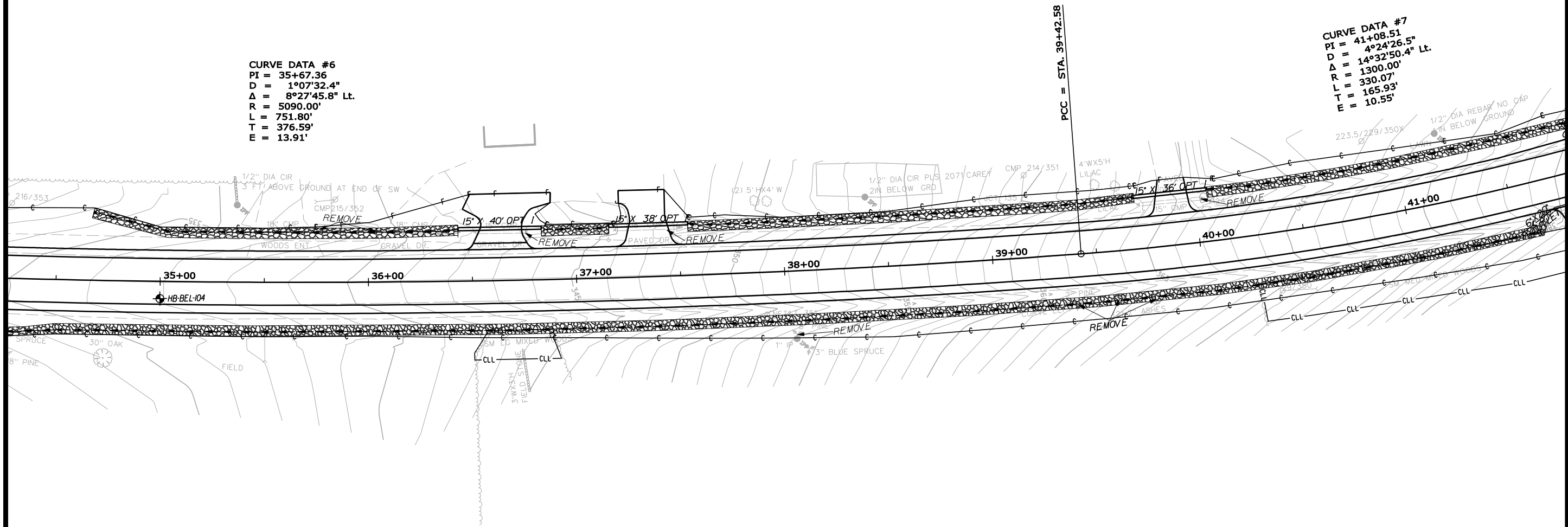
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 E = 10.55'



STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
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| DESIGN-DETAILED | C. HELMICK | | | |
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| DESIGNS-DETAILED | K. MAGUIRE | | | NOV 2017 |
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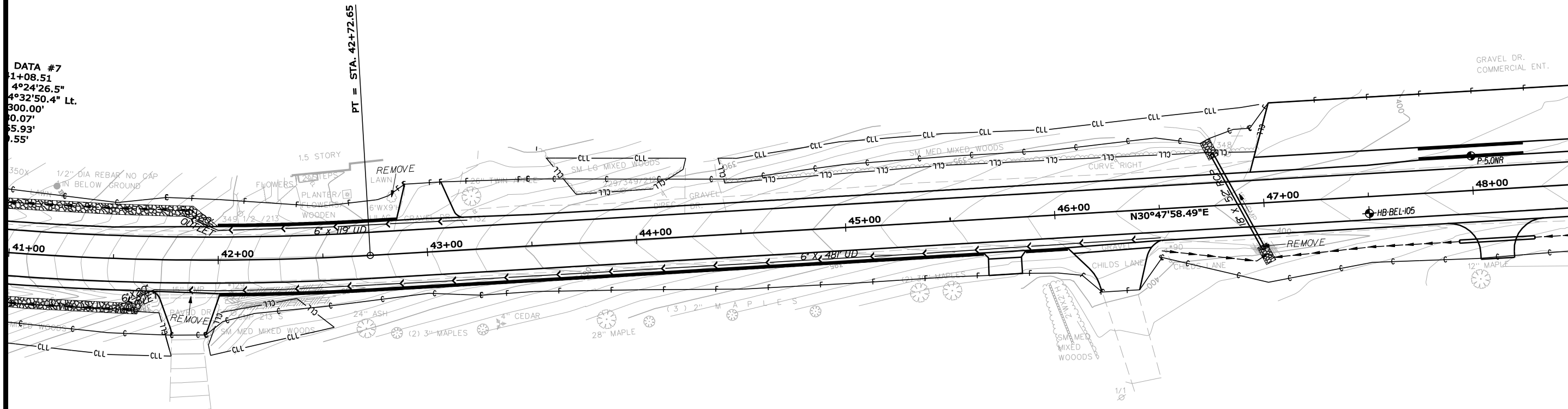
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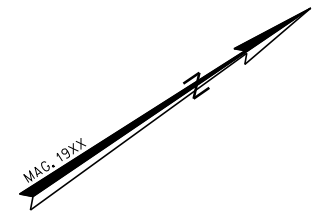
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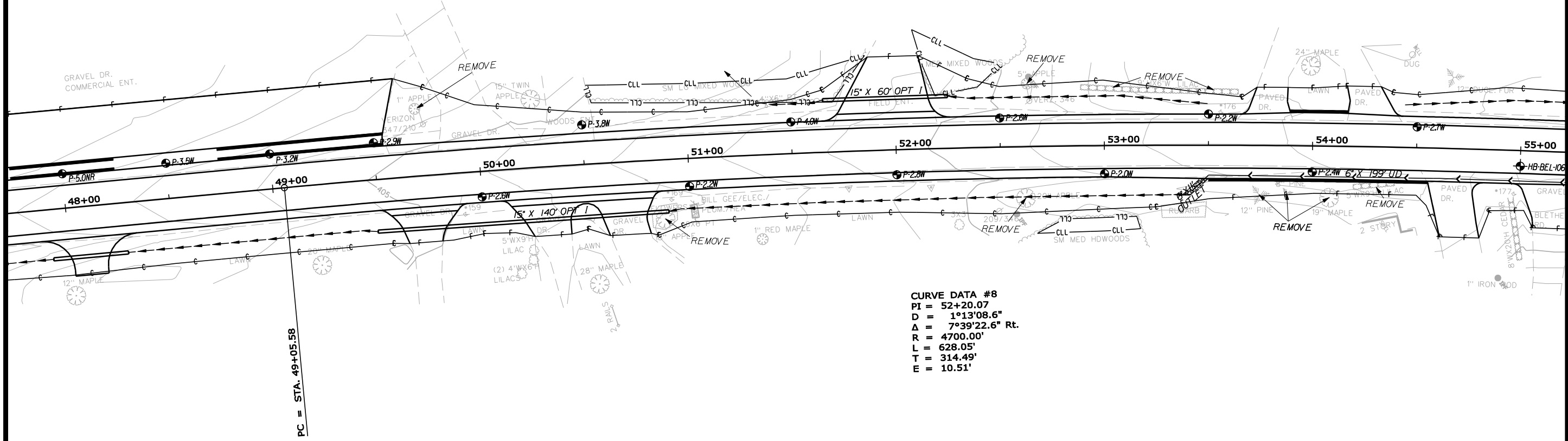
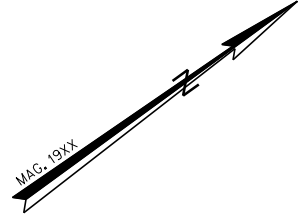


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| PHOENIX | NOV 2017 | C. HELMICK |
| DESIGN-REVIEWED | | T. WHITE |
| CHECKED-REVIEWED | | K. MAGUIRE |
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 BORING LOCATION PLANS

SHEET NUMBER
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 OF 26



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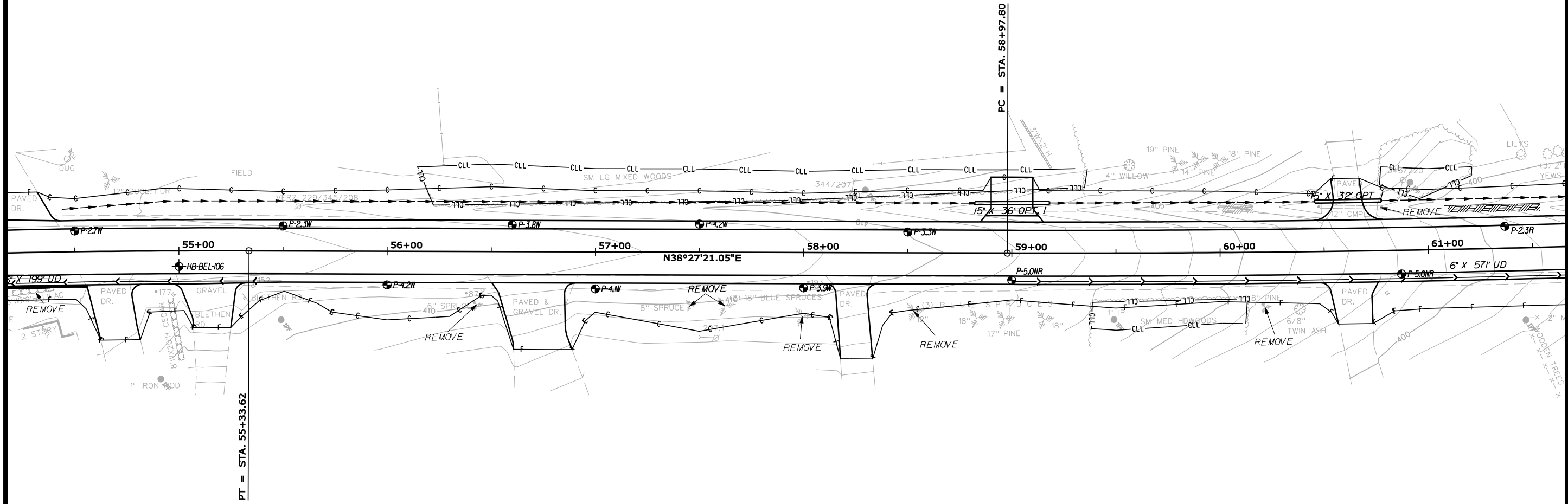
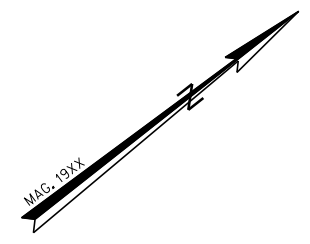
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| NOV 2017 | T. WHITE | C. HELMICK | DESIGN REVIEWED | |
| | | K. MAGUIRE | DESIGN DETAILED | |
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| C. HELWICK <td>NOV 2017 <td>[Signature]</td> <td></td> <td></td> </td> | NOV 2017 <td>[Signature]</td> <td></td> <td></td> | [Signature] | | |
| K. MAGUIRE <td></td> <td></td> <td></td> <td></td> | | | | |

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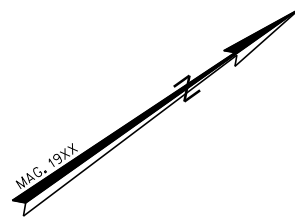
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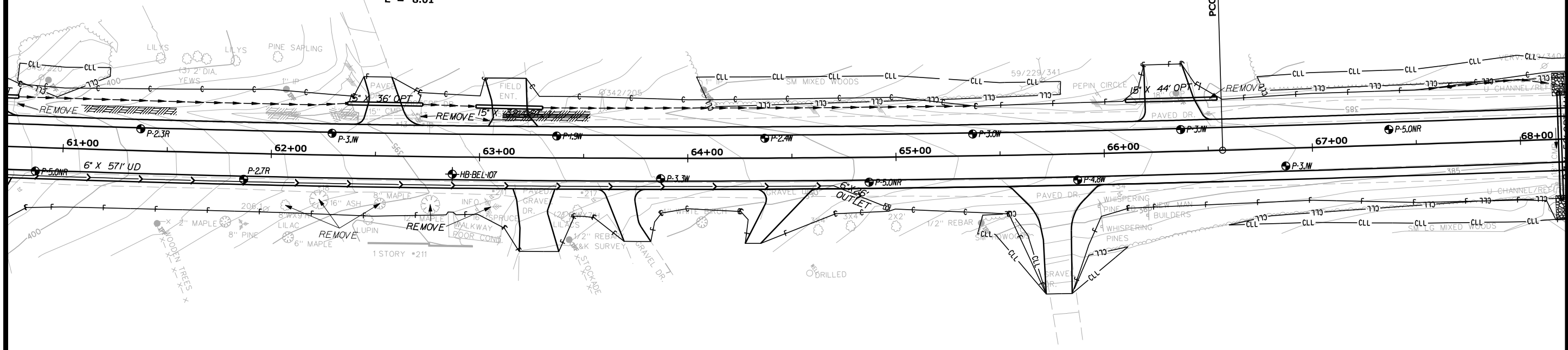
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Division: GEOTECH

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 E = 8.01'



CURV
 PI =
 D =
 Δ =
 R =
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 T =
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STATE OF MAINE
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 HIGHWAY PLANS

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| NOV 2017 | C. HELWICK | T. WHITE | | |
| | K. MAGUIRE | | | |
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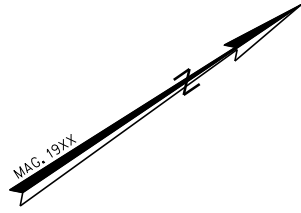
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 OF 26

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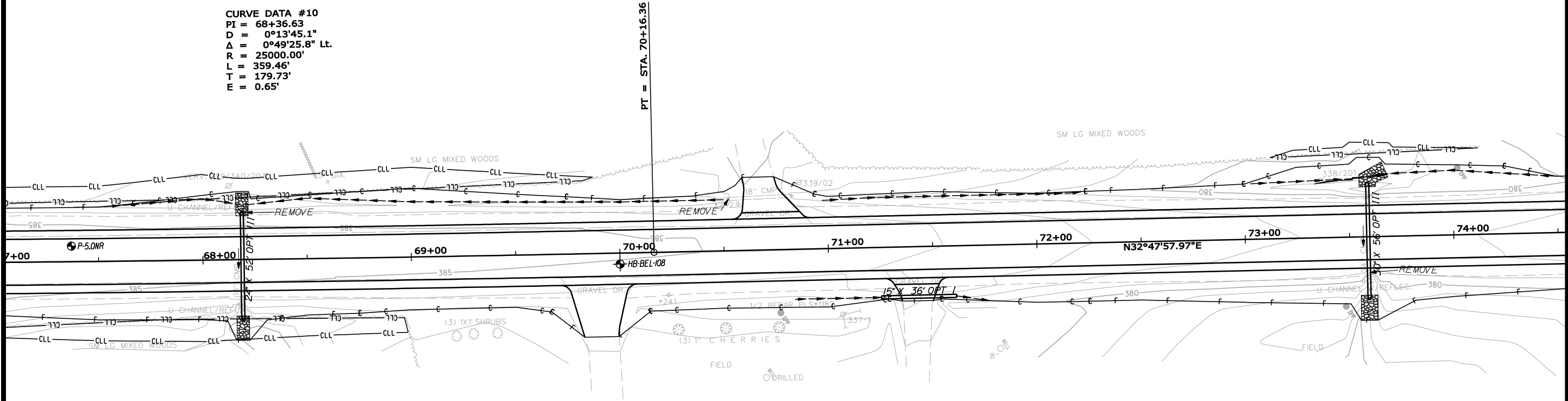
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 L = 359.46'
 T = 179.73'
 E = 0.65'

PT = STA. 70+16.36



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

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HIGHWAY PLANS

| PROJ. MANAGER | RHODE | MOULTON | BY | DATE |
|------------------|------------|---------|----------|-----------|
| DESIGN-DETAILED | C. HELWICK | | | |
| CHECKED-REVIEWED | | | | |
| DESIGNS-DETAILED | K. MAGUIRE | | T. WHITE | NOV. 2017 |
| DESIGNS-DETAILED | | | | |
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| REVISIONS 2 | | | | |
| REVISIONS 3 | | | | |
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| FIELD CHANGES | | | | |

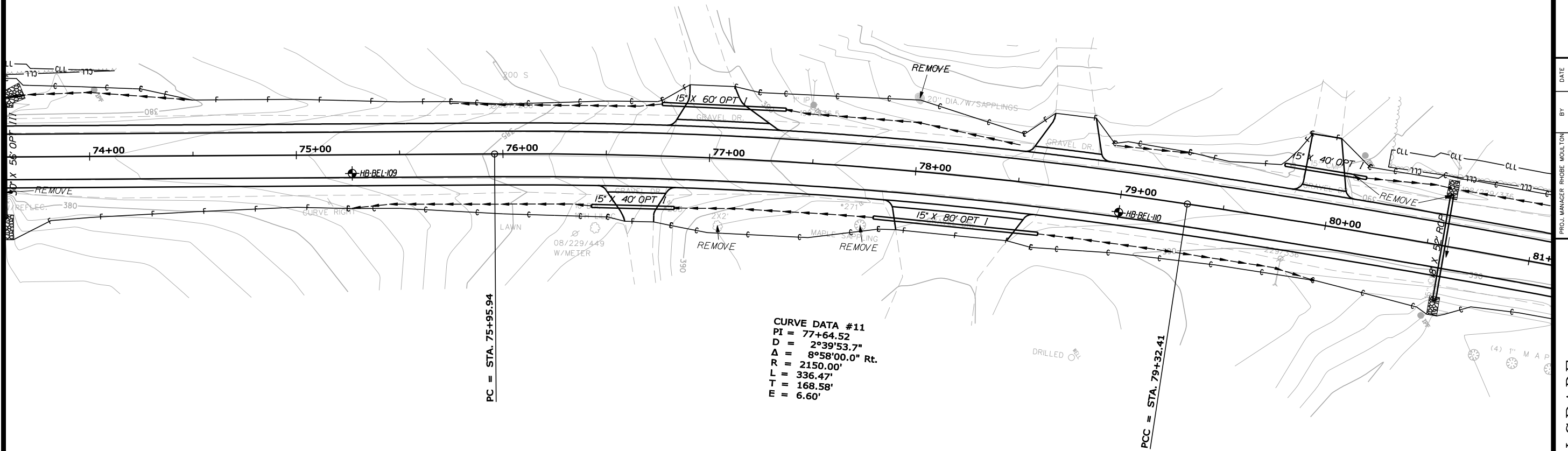
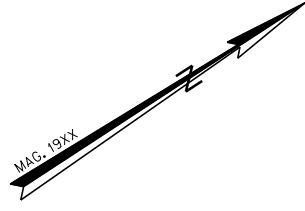
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BORING LOCATION PLANS

SHEET NUMBER

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OF 26

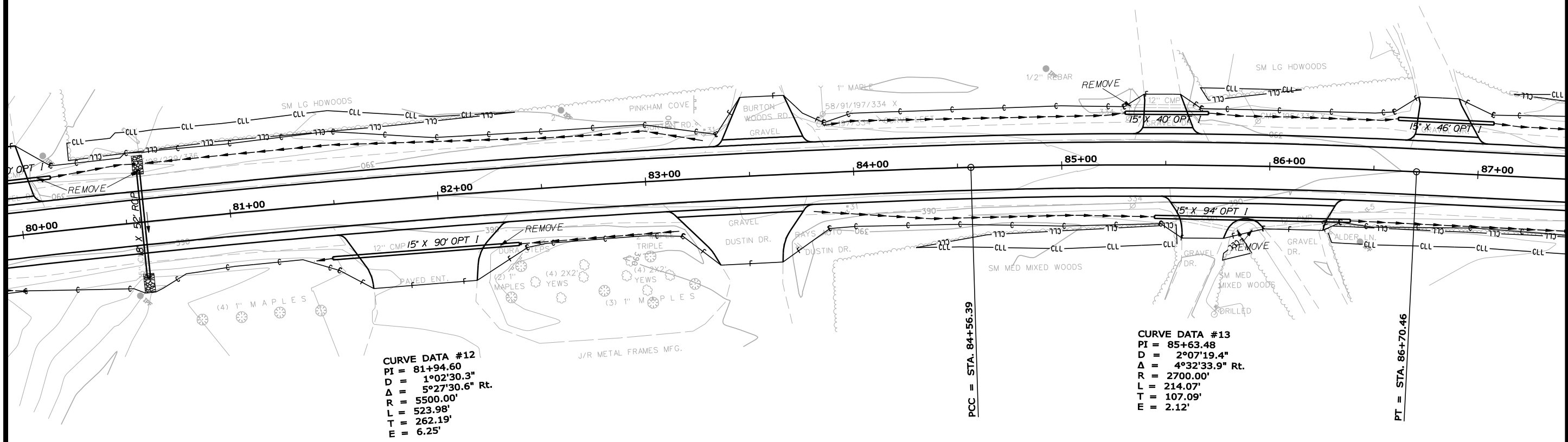
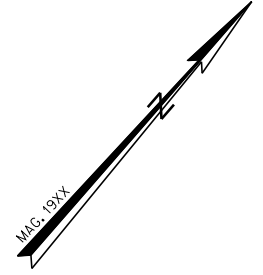


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 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| PROJ. MANAGER | DATE | BY | DATE |
|------------------|------|------------|-----------|
| RHOBE MOULTON | | | |
| DESIGN-DETAILED | | C. HELWICK | |
| CHECKED-REVIEWED | | T. WHITE | NOV. 2017 |
| DESIGNS-DETAILED | | K. MAGUIRE | |
| DESIGNS-DETAILED | | | |
| REVISIONS 1 | | | |
| REVISIONS 2 | | | |
| REVISIONS 3 | | | |
| REVISIONS 4 | | | |
| FIELD CHANGES | | | |

BELGRADE
 RTE. 8 \ 11
 BORING LOCATION PLANS

SHEET NUMBER
 12
 OF 26



CURVE DATA #12
 PI = 81+94.60
 D = 1°02'30.3"
 Δ = 5°27'30.6" Rt.
 R = 5500.00'
 L = 523.98'
 T = 262.19'
 E = 6.25'

CURVE DATA #13
 PI = 85+63.48
 D = 2°07'19.4"
 Δ = 4°32'33.9" Rt.
 R = 2700.00'
 L = 214.07'
 T = 107.09'
 E = 2.12'

PCC = STA. 84+56.39

PT = STA. 86+70.46

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| PROJ. MANAGER | DATE | BY | DATE |
|-----------------|------|------------------|------|
| RHODE MOULTON | | C. HELWICK | |
| DESIGN-DETAILED | | CHECKED-REVIEWED | |
| | | DESIGNS-DETAILED | |
| | | DESIGNS-DETAILED | |
| | | REVISIONS 1 | |
| | | REVISIONS 2 | |
| | | REVISIONS 3 | |
| | | REVISIONS 4 | |
| | | FIELD CHANGES | |

BELGRADE
 RTE. 8\11
 BORING LOCATION PLANS

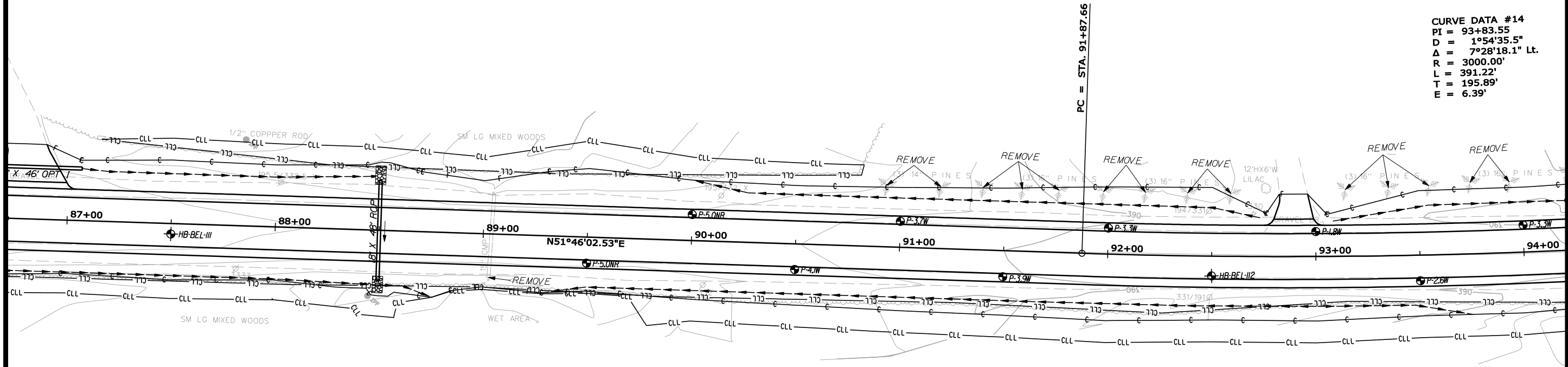
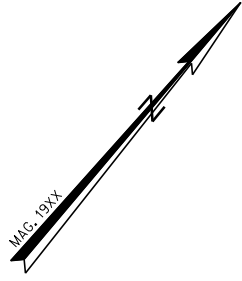
SHEET NUMBER
13
 OF 26

Date: 11/16/2017

Username: Terry.White

Division: GEOTECH

Filename: ...\\00\geotech\msto\013_BLP13.dgn



CURVE DATA #14
 PI = 93+83.55
 D = 1°54'35.5"
 Δ = 7°28'18.1" Lt.
 R = 3000.00'
 L = 391.22'
 T = 195.89'
 E = 6.39'

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| DATE | BY | SIGNATURE | P.E. NUMBER | DATE |
|----------|----------|-------------|-------------|------|
| NOV 2017 | T. WHITE | [Signature] | | |
| | | | | |
| | | | | |
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| | | | | |

BELGRADE
 RTE. 8 \ 11
 BORING LOCATION PLANS

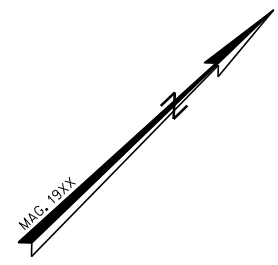
SHEET NUMBER
14
 OF 26

Date: 11/16/2017

Username: Terry.White

Division: GEOTECH

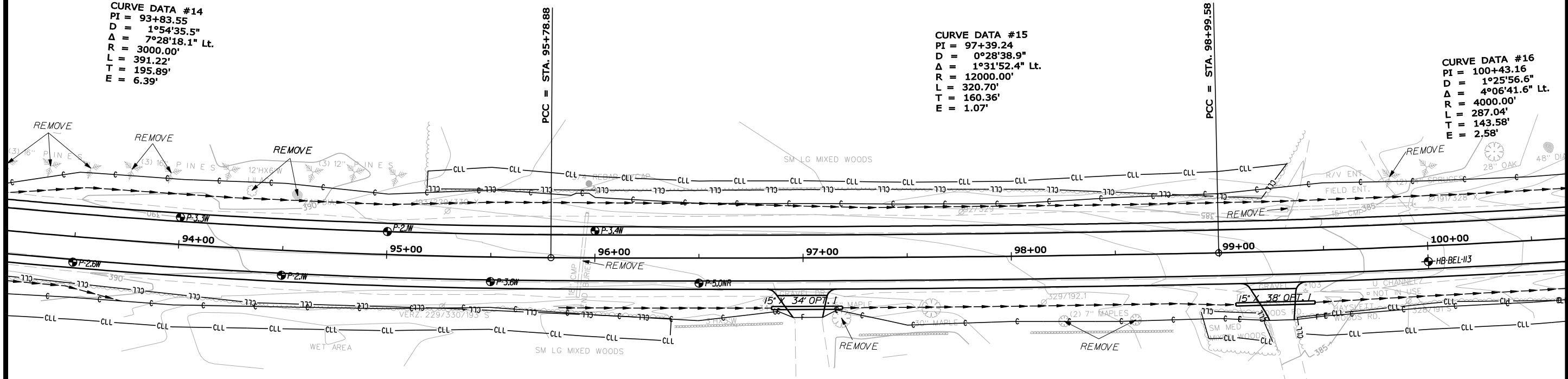
Filename: ...\\00\geotech\msto\014_BLP14.dgn



CURVE DATA #14
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 D = 1°54'35.5"
 Δ = 7°28'18.1" Lt.
 R = 3000.00'
 L = 391.22'
 T = 195.89'
 E = 6.39'

CURVE DATA #15
 PI = 97+39.24
 D = 0°28'38.9"
 Δ = 1°31'52.4" Lt.
 R = 12000.00'
 L = 320.70'
 T = 160.36'
 E = 1.07'

CURVE DATA #16
 PI = 100+43.16
 D = 1°25'56.6"
 Δ = 4°06'41.6" Lt.
 R = 4000.00'
 L = 287.04'
 T = 143.58'
 E = 2.58'



STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| DATE | SIGNATURE | P.E. NUMBER | DATE |
|----------|-----------|-------------|------|
| NOV 2017 | T. WHITE | | |
| | | | |
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| | | | |

BELGRADE
 RTE. 8 \ 11
 BORING LOCATION PLANS

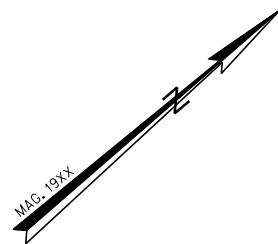
SHEET NUMBER
15
 OF 26

Date: 11/16/2017

Username: Terry.White

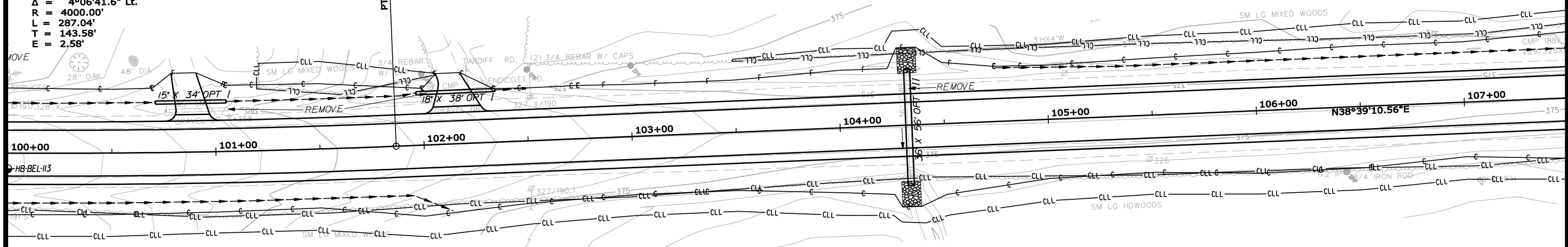
Division: GEOTECH

Filename: ... \00\geotech\msto\015_BLP15.dgn



CURVE DATA #16
 PI = 100+43.16
 D = 1°25'56.6"
 Δ = 4°06'41.6" Lt.
 R = 4000.00'
 L = 287.04'
 T = 143.58'
 E = 2.58'

PT = STA. 101+86.62



STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| PROJ. MANAGER | DATE | BY |
|------------------|------------|-----------|
| RHODE MOULTON | | |
| DESIGN-DETAILED | C. HELMICK | |
| CHECKED-REVIEWED | | |
| DESIGNS-DETAILED | K. MAGUIRE | NOV. 2017 |
| DESIGNS-DETAILED | | |
| REVISIONS 1 | | |
| REVISIONS 2 | | |
| REVISIONS 3 | | |
| REVISIONS 4 | | |
| FIELD CHANGES | | |

BELGRADE
 RTE. 8\11
 BORING LOCATION PLANS

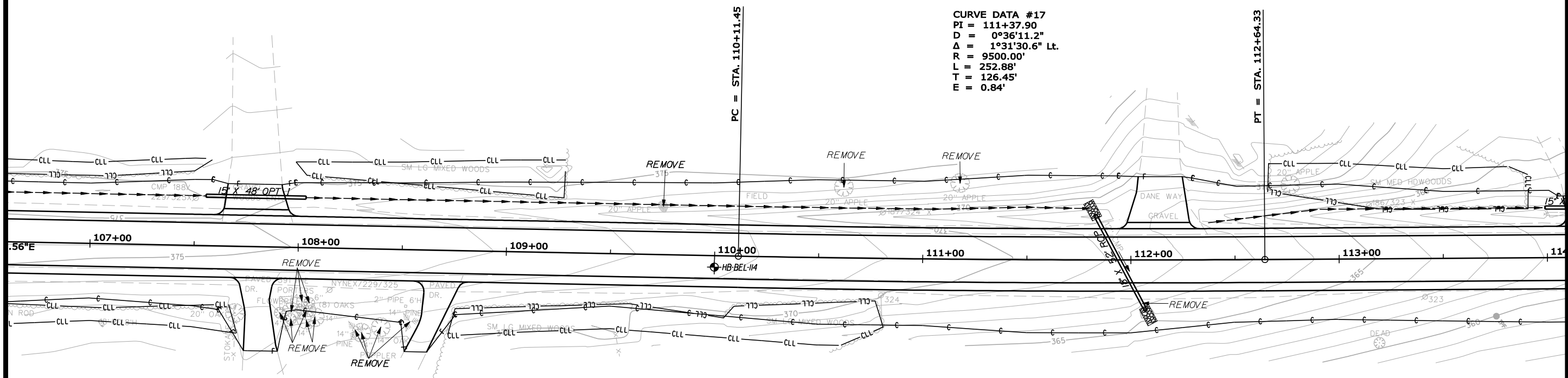
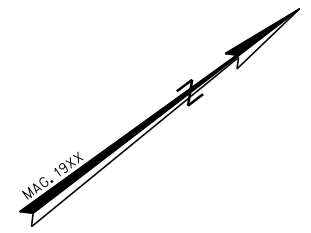
SHEET NUMBER
16
 OF 26

Date: 11/16/2017

Username: Terry.White

Division: GEOTECH

Filename: ... \00\geotech\msto\016_BLP16.dgn



CURVE DATA #17
 PI = 111+37.90
 D = 0°36'11.2"
 Δ = 1°31'30.6" Lt.
 R = 9500.00'
 L = 252.88'
 T = 126.45'
 E = 0.84'

PC = STA. 110+11.45

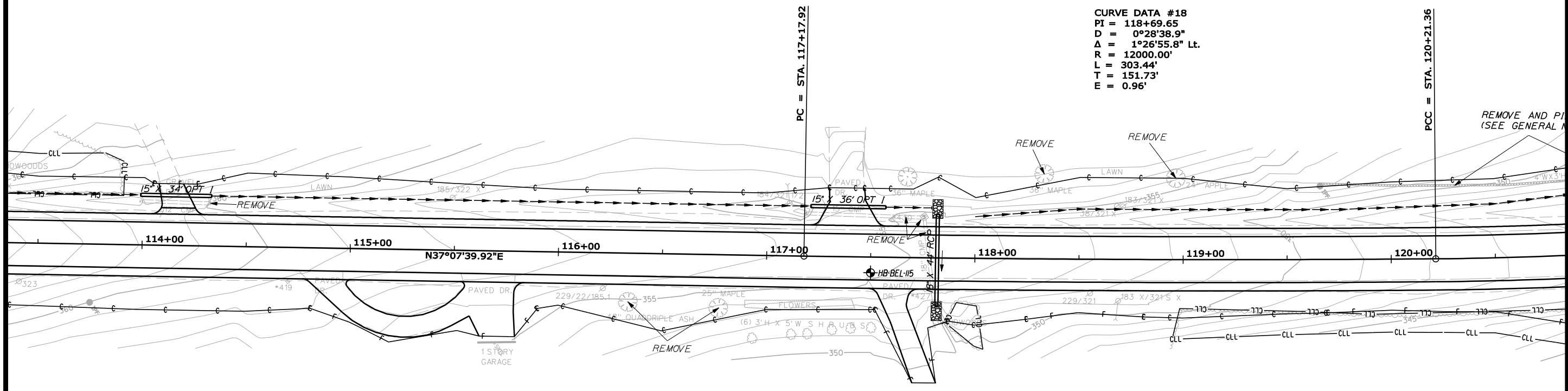
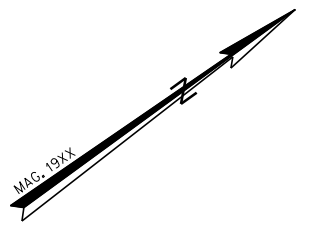
PT = STA. 112+64.33

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| PROJ. MANAGER | DATE | BY |
|------------------|----------|------------|
| RHOBE MOULTON | | |
| DESIGN-DETAILED | | C. HELMICK |
| CHECKED-REVIEWED | | T. WHITE |
| DESIGN-DETAILED | NOV 2017 | |
| DESIGN-DETAILED | | |
| REVISIONS 1 | | |
| REVISIONS 2 | | |
| REVISIONS 3 | | |
| REVISIONS 4 | | |
| FIELD CHANGES | | |

BELGRADE
 RTE. 8 \ 11
 BORING LOCATION PLANS

SHEET NUMBER
17
 OF 26

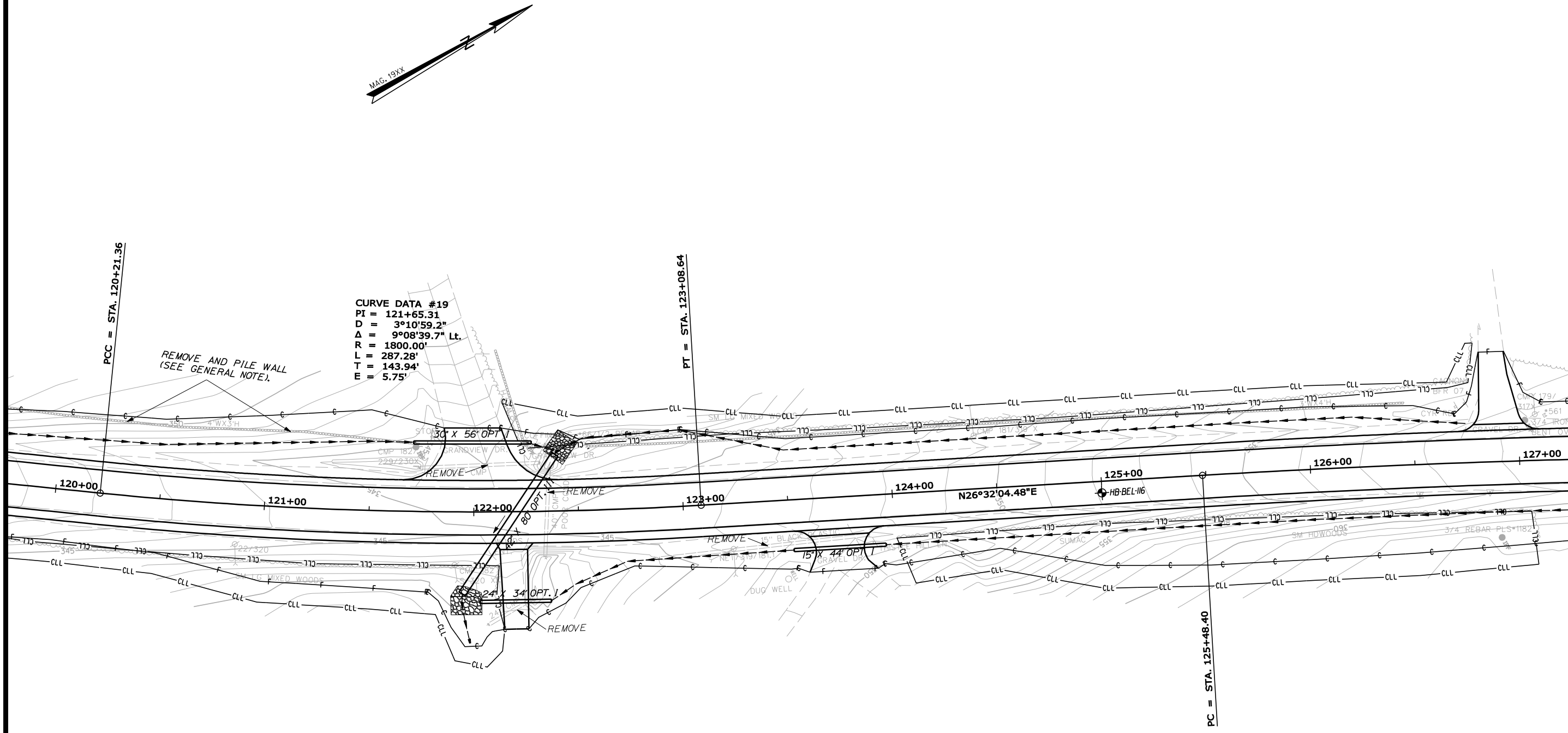


STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
STP-1277(300)X
WIN
012773.00
HIGHWAY PLANS

| PROJ. MANAGER | RHODE MOULTON | BY | DATE |
|------------------|---------------|----------|-----------|
| DESIGN-DETAILED | C. HELMICK | | |
| CHECKED-REVIEWED | C. HELMICK | | |
| DESIGN-DETAILED | K. MAGUIRE | T. WHITE | NOV. 2017 |
| DESIGN-DETAILED | | | |
| REVISIONS 1 | | | |
| REVISIONS 2 | | | |
| REVISIONS 3 | | | |
| REVISIONS 4 | | | |
| FIELD CHANGES | | | |

BELGRADE
RTE. 8 \ 11
BORING LOCATION PLANS

SHEET NUMBER
18
OF 26

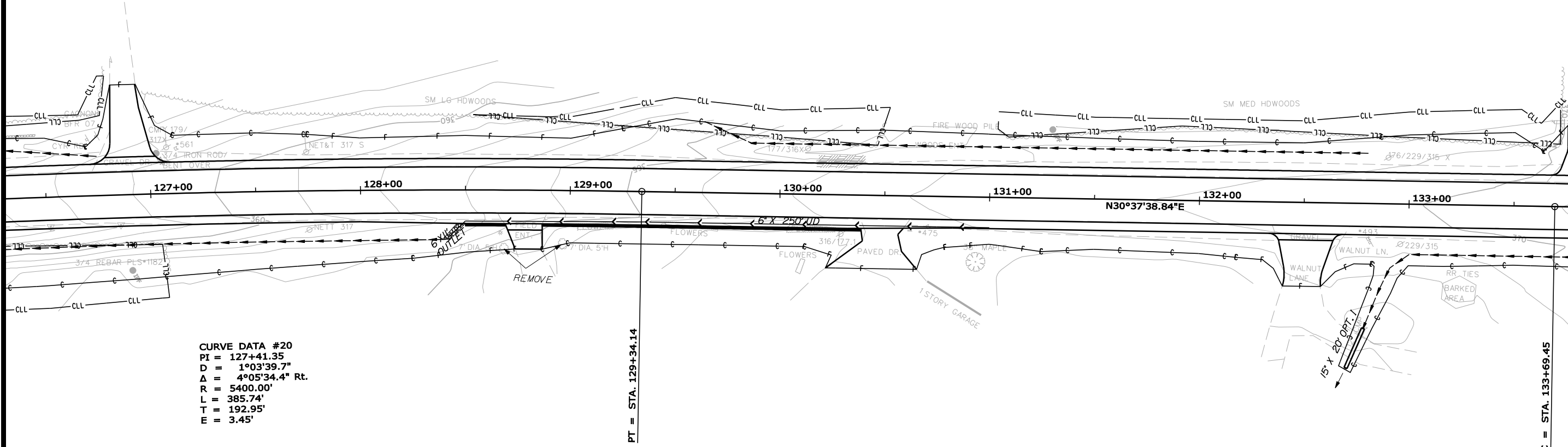
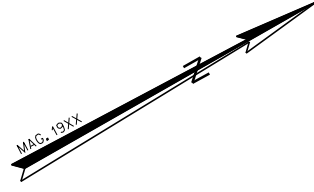


STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN
 012773.00
 HIGHWAY PLANS

| DATE | BY | REVISION |
|----------|----------|------------------|
| NOV 2017 | T. WHITE | DESIGN DETAILED |
| | | CHECKED-REVIEWED |
| | | DESIGN DETAILED |
| | | DESIGN DETAILED |
| | | REVISIONS 1 |
| | | REVISIONS 2 |
| | | REVISIONS 3 |
| | | REVISIONS 4 |
| | | FIELD CHANGES |

BELGRADE
 RTE. 8 \ 11
 BORING LOCATION PLANS

SHEET NUMBER
19
 OF 26



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
STP-1277(300)X
WIN
012773.00
HIGHWAY PLANS

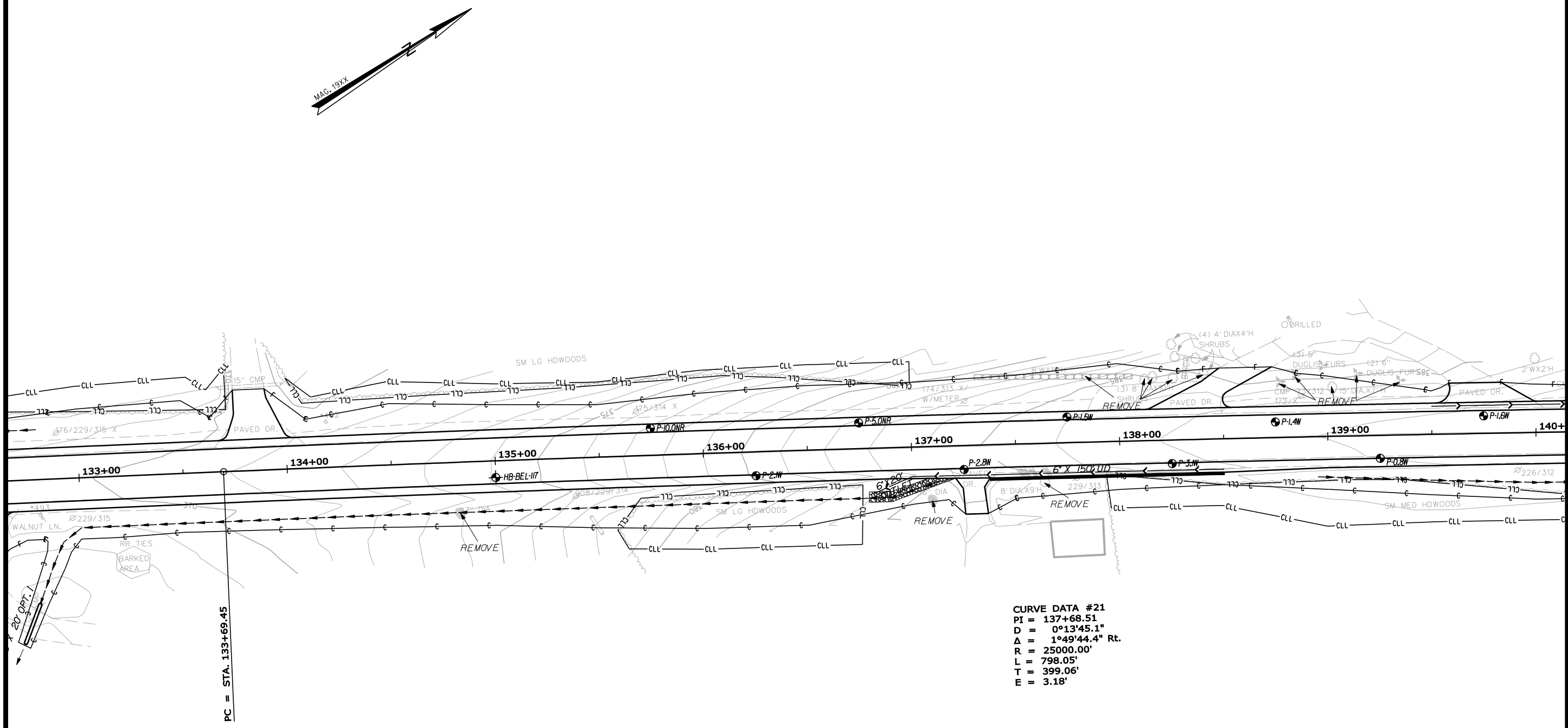
| DESIGN | CHECKED | DESIGNED | DATE |
|----------|----------|----------|------|
| DESIGNED | REVIEWED | DATE | |
| DESIGNED | REVIEWED | DATE | |
| DESIGNED | REVIEWED | DATE | |
| DESIGNED | REVIEWED | DATE | |
| DESIGNED | REVIEWED | DATE | |

PROJ. MANAGER RHODE MOULTON
BY C. HELMICK
CHECKED K. MAGUIRE
DESIGNED T. WHITE
NOV. 2017

SIGNATURE
P.E. NUMBER
DATE

BELGRADE
RTE. 8 \ 11
BORING LOCATION PLANS

SHEET NUMBER
20
OF 26



STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| DATE | BY | SIGNATURE | P.E. NUMBER | DATE |
|----------|----------|-----------|-------------|------|
| NOV 2017 | T. WHITE | | | |
| | | | | |
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BELGRADE
 RTE. 8 \ 11
 BORING LOCATION PLANS

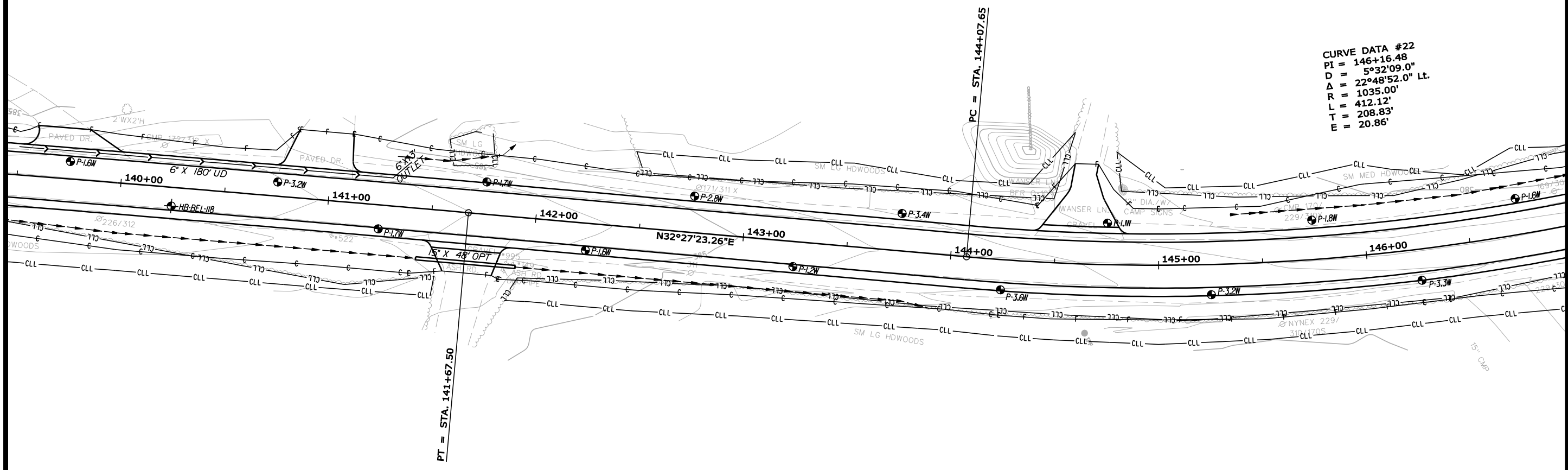
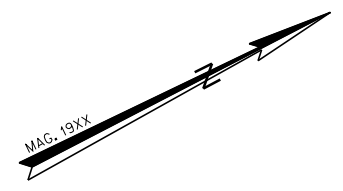
SHEET NUMBER
21
 OF 26

Date: 11/16/2017

Username: Terry.White

Division: GEOTECH

Filename: ... \00\geotech\msto\021_BLP21.dgn



CURVE DATA #22
 PI = 146+16.48
 D = 5°32'09.0"
 Δ = 22°48'52.0" Lt.
 R = 1035.00'
 L = 412.12'
 T = 208.83'
 E = 20.86'

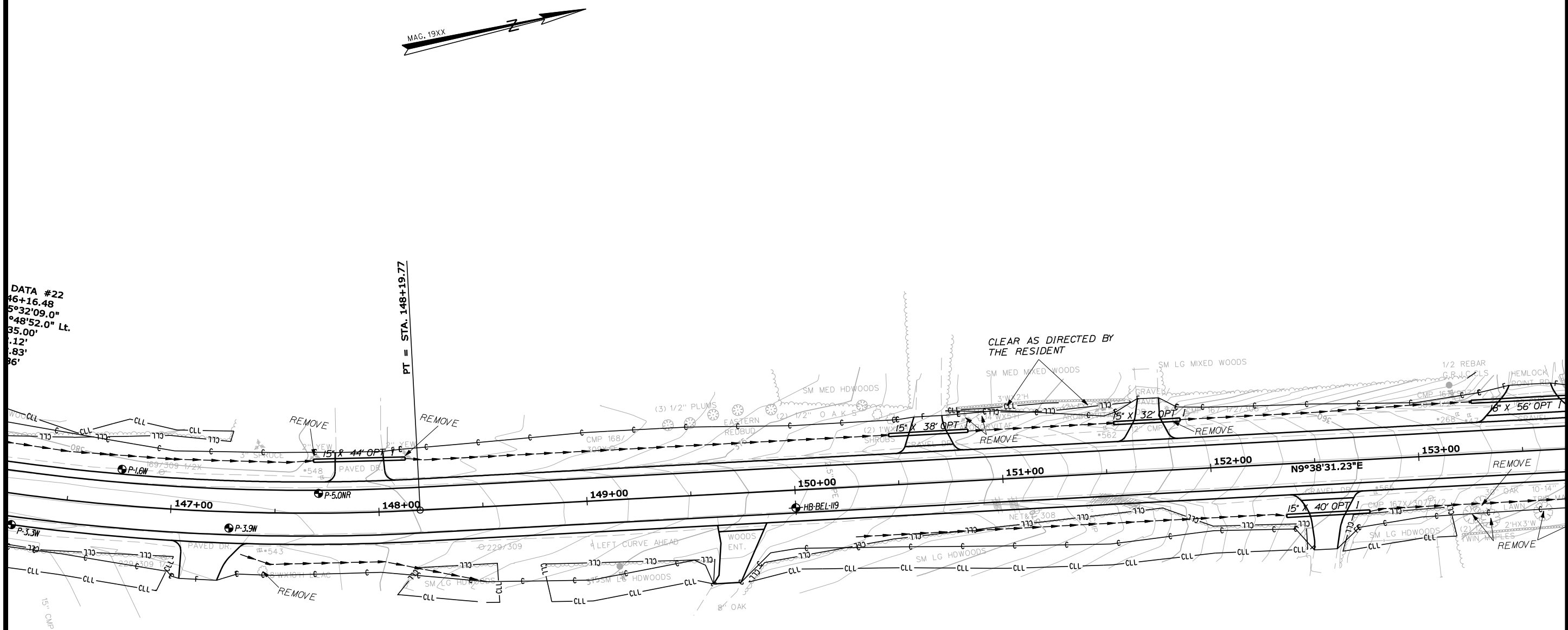
STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN
 012773.00
 HIGHWAY PLANS

| DATE | BY | SIGNATURE | P.E. NUMBER | DATE |
|----------|----------|-----------|-------------|------|
| NOV 2017 | T. WHITE | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

BELGRADE
 RTE. 8 \ 11
 BORING LOCATION PLANS

SHEET NUMBER
 22
 OF 26

Filename: ... \00\geotech\msto\022_BLP22.dgn Division: GEOTECH Username: Terry.White Date: 11/16/2017



DATA #22
 46+16.48
 5°32'09.0"
 48'52.0" Lt.
 35.00'
 1.12'
 .83'
 86'

PT = STA. 148+19.77

CLEAR AS DIRECTED BY THE RESIDENT

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| DATE | BY | SIGNATURE | P.E. NUMBER | DATE |
|----------|----------|-----------|-------------|------|
| NOV 2017 | T. WHITE | | | |
| | | | | |
| | | | | |
| | | | | |

BELGRADE
 RTE. 8 \ 11
 BORING LOCATION PLANS

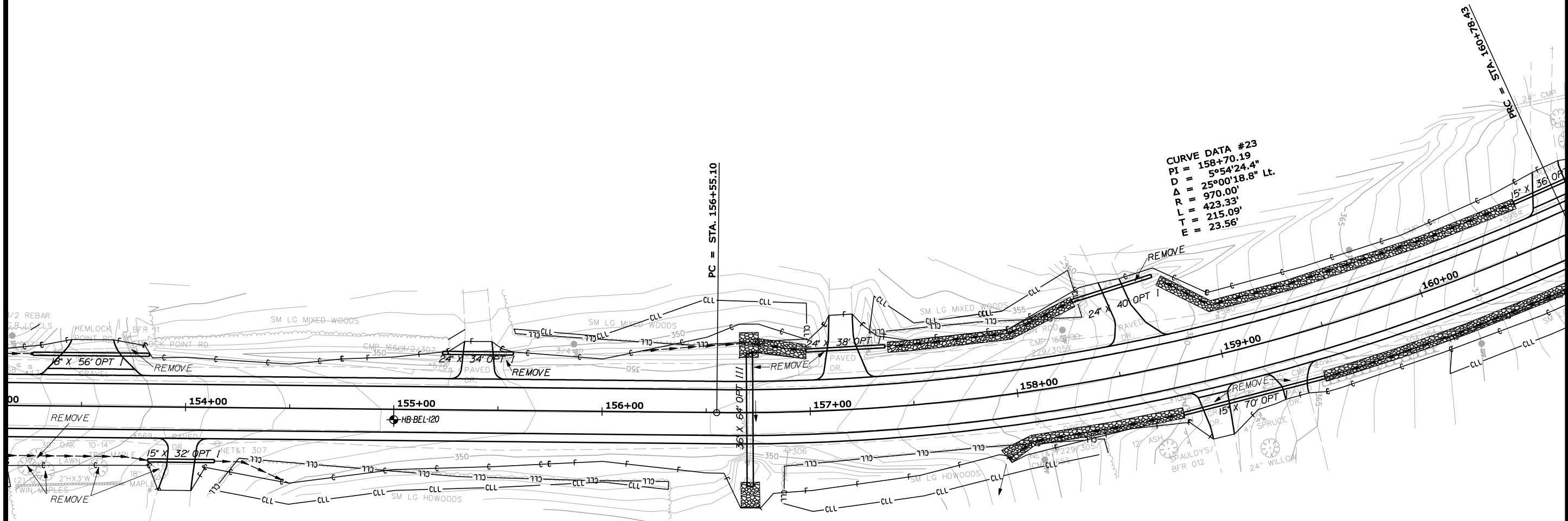
SHEET NUMBER
 23
 OF 26

Date: 11/16/2017

Username: Terry.White

Division: GEOTECH

Filename: ... \00\geotech\msto\023_BLP23.dgn



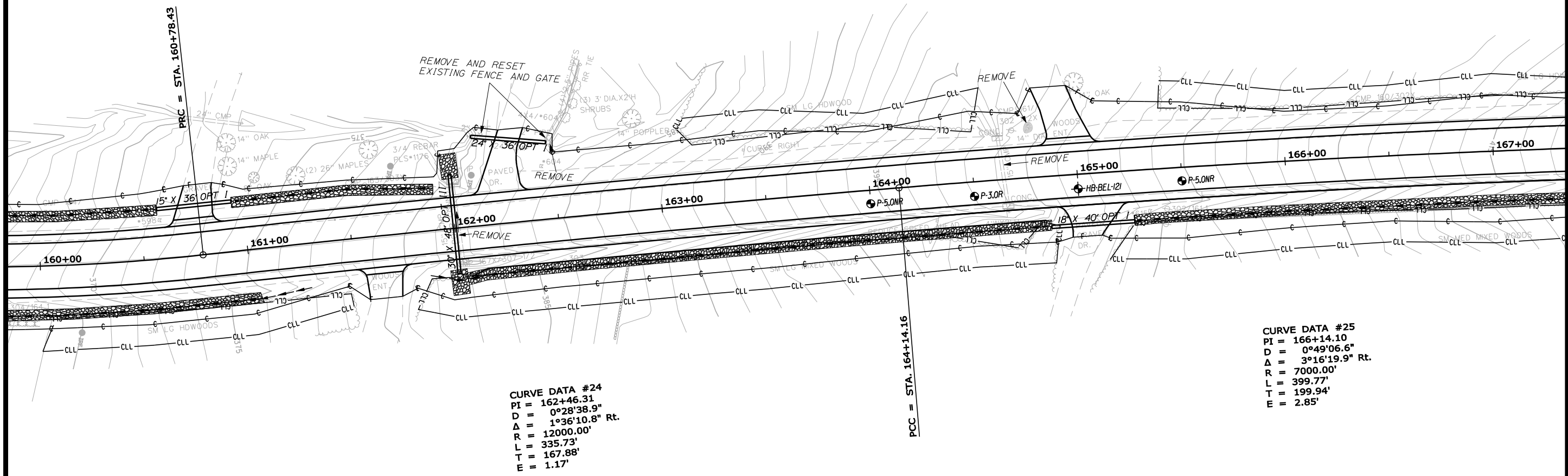
CURVE DATA #23
 PI = 158+70.19
 D = 5°54'24.4"
 Δ = 25°00'18.8" Lt.
 R = 970.00'
 L = 423.33'
 T = 215.09'
 E = 23.56'

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| PROJ. MANAGER | RHODE MOULTON | BY | DATE |
|------------------|---------------|----------|------|
| DESIGN-DETAILED | C. HELMICK | | |
| CHECKED-REVIEWED | T. WHITE | NOV 2017 | |
| DESIGNS-DETAILED | K. MAGUIRE | | |
| REVISIONS 1 | | | |
| REVISIONS 2 | | | |
| REVISIONS 3 | | | |
| REVISIONS 4 | | | |
| FIELD CHANGES | | | |

BELGRADE
 RTE. 8 \ 11
 BORING LOCATION PLANS

SHEET NUMBER
24
 OF 26

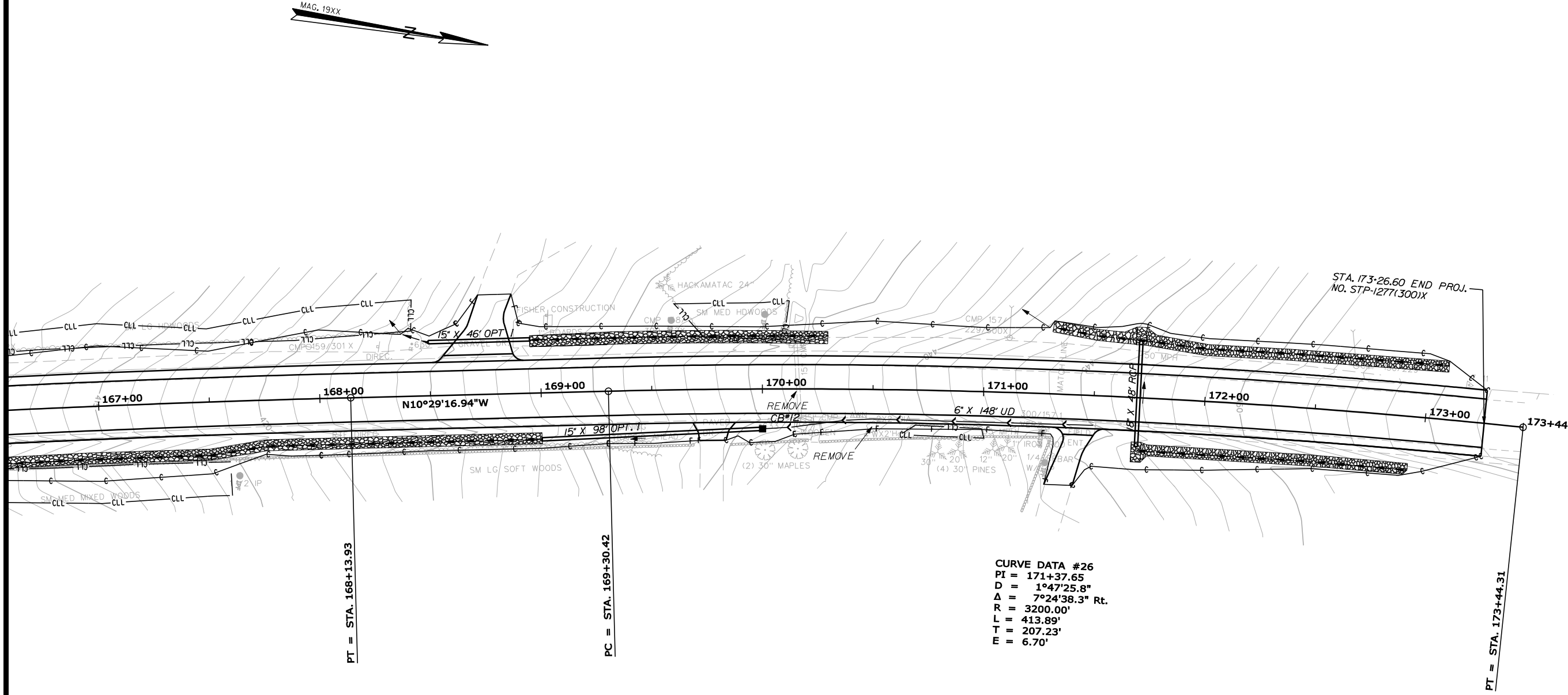


STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| PROJ. MANAGER | RHODE MOULTON | BY | DATE |
|------------------|---------------|----------|-----------|
| DESIGN-DETAILED | C. HELMICK | | |
| CHECKED-REVIEWED | K. MAGUIRE | T. WHITE | NOV. 2017 |
| DESIGN-DETAILED | | | |
| REVISIONS 1 | | | |
| REVISIONS 2 | | | |
| REVISIONS 3 | | | |
| REVISIONS 4 | | | |
| FIELD CHANGES | | | |

BELGRADE
 RTE. 8\11
 BORING LOCATION PLANS

SHEET NUMBER
 25
 OF 26



CURVE DATA #26
 PI = 171+37.65
 D = 1°47'25.8"
 Δ = 7°24'38.3" Rt.
 R = 3200.00'
 L = 413.89'
 T = 207.23'
 E = 6.70'

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 STP-1277(300)X
 WIN 012773.00
 HIGHWAY PLANS

| PROJ. MANAGER | RHODE | MOULTON | BY | DATE |
|------------------|------------|---------|----|-----------|
| DESIGN-DETAILED | C. HELMICK | | | |
| CHECKED-REVIEWED | T. WHITE | | | NOV. 2017 |
| DESIGNS-DETAILED | K. MAGUIRE | | | |
| REVISIONS 1 | | | | |
| REVISIONS 2 | | | | |
| REVISIONS 3 | | | | |
| REVISIONS 4 | | | | |
| FIELD CHANGES | | | | |

BELGRADE
 RTE. 8\11
 BORING LOCATION PLANS

SHEET NUMBER
26
 OF 26

Appendix A

Boring Logs

| UNIFIED SOIL CLASSIFICATION SYSTEM | | | | MODIFIED BURMISTER SYSTEM | | | | |
|--|--|---|---|---|---|---|--|--|
| MAJOR DIVISIONS | | GROUP SYMBOLS | TYPICAL NAMES | Descriptive Term | Portion of Total (%) | | | |
| COARSE-GRAINED SOILS (more than half of material is larger than No. 200 sieve size) | GRAVELS (more than half of coarse fraction is larger than No. 4 sieve size) | CLEAN GRAVELS | GW Well-graded gravels, gravel-sand mixtures, little or no fines. | trace little some adjective (e.g. sandy, clayey) | 0 - 10 11 - 20 21 - 35 36 - 50 | | | |
| | | (little or no fines) | GP Poorly-graded gravels, gravel sand mixtures, little or no fines. | | | | | |
| | SANDS (more than half of coarse fraction is smaller than No. 4 sieve size) | GRAVEL WITH FINES (Appreciable amount of fines) | GM Silty gravels, gravel-sand-silt mixtures. | | | TERMS DESCRIBING DENSITY/CONSISTENCY | | |
| | | CLEAN SANDS (little or no fines) | SW Well-graded sands, gravelly sands, little or no fines | | | 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). | | |
| | | | SP Poorly-graded sands, gravelly sand, little or no fines. | | | Density of Cohesionless Soils | | |
| | | SANDS WITH FINES (Appreciable amount of fines) | SM Silty sands, sand-silt mixtures | | | Standard Penetration Resistance N-Value (blows per foot) | | |
| SC Clayey sands, sand-clay mixtures. | 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 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. | 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. | | | | | |
| | | CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. | Consistency of Cohesive soils | | | | | |
| | | OL Organic silts and organic silty clays of low plasticity. | Approximate Undrained Shear Strength (psf) | | | | | |
| | SILTS AND CLAYS (liquid limit greater than 50) | MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. | SPT N-Value (blows per foot) | | | | | |
| | | CH Inorganic clays of high plasticity, fat clays. | Field Guidelines | | | | | |
| | | OH Organic clays of medium to high plasticity, organic silts. | 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 | | | | | |
| HIGHLY ORGANIC SOILS | Pt Peat and other highly organic soils. | Rock Quality Designation (RQD): | | | | | | |
| Desired Soil Observations (in this order, if applicable): | | | | Desired Rock 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 | | | | RQD (%) = $\frac{\text{sum of the lengths of intact pieces of core} * > 4 \text{ inches}}{\text{length of core advance}}$ *Minimum NQ rock core (1.88 in. OD of core) | | | | |
| Maine Department of Transportation Geotechnical Section Key to Soil and Rock Descriptions and Terms Field Identification Information | | | | Sample Container Labeling Requirements: | | | | |
| | | | | Color (Munsell color chart) Texture (aphanitic, fine-grained, etc.) Rock Type (granite, schist, sandstone, etc.) Hardness (very hard, hard, mod. hard, etc.) Weathering (fresh, very slight, slight, moderate, mod. severe, severe, etc.) Geologic discontinuities/jointing: -dip (horiz - 0-5 deg., low angle - 5-35 deg., mod. dipping - 35-55 deg., steep - 55-85 deg., vertical - 85-90 deg.) -spacing (very close - <2 inch, close - 2-12 inch, mod. close - 1-3 feet, wide - 3-10 feet, very wide >10 feet) -tightness (tight, open, or healed) -infilling (grain size, color, etc.) Formation (Waterville, Ellsworth, Cape Elizabeth, etc.) RQD and correlation to rock mass quality (very poor, poor, etc.) ref: ASTM D6032 and AASHTO Standard Specification for Highway Bridges, 17th Ed. Table 4.4.8.1.2A Recovery (inch/inch and percentage) Rock Core Rate (X.X ft - Y.Y ft (min:sec)) | | | | |
| | | | | 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: A 3.02 mile portion of Route 8 Location: Belgrade, Maine | Boring No.: <u>HB-BEL-104</u> WIN: <u>12773.00</u> |
|--|--|---|

| | | |
|------------------------------------|-----------------------------------|-----------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 337.0 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 7/31/06-7/31/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 35+00, 8.3 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

Definitions: D = Spilt Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person
S = Sample off Auger Flights R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)
MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf)
U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value
MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf)
V = Field Vane Shear Test, PP= Pocket Penetrometer WOR/C = Weight of Rods or Casing 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 | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|---|---------|--------------|-----|-----------------|-------------|--|--|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | SSA | 336.2 | | 9.6" HMA | 0.8 |
| | S5 | | 1.6 - 5.0 | | | | | 335.4 | | Brown, damp, fine to coarse SAND, some silt, trace gravel. | 1.6 |
| | | | | | | | | | | Brown, moist, fine to coarse SAND, some silt, trace gravel. | |
| 5 | | | | | | | | 332.0 | | Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL | 5.0 |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|-------------------------------|
| Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS | Project: A 3.02 mile portion of Route 8 | Boring No.: HB-BEL-105 |
| | Location: Belgrade, Maine | WIN: 12773.00 |

| | | |
|---|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 401.3 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 7/31/06-7/31/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 47+50, 8.0 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

Definitions: D = Spilt Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person
 S = Sample off Auger Flights R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf)
 U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value
 MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf)
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing 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 | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/ AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|--|---------|--------------|-------|-----------------|-------------|---|---|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (/6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | 401.2 | | | | |
| | S6 | | 1.2 - 5.0 | | | | 400.8 | | 0.1 | | |
| | | | | | | | 400.1 | | 0.5 | G#207014 A-4, ML WC=7.6% | |
| | | | | | | | | | 1.2 | | |
| 5 | | | | | | | 396.3 | | 5.0 | Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|---|
| Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS | Project: A 3.02 mile portion of Route 8 Location: Belgrade, Maine | Boring No.: HB-BEL-106 WIN: 12773.00 |
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| | | |
|---|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 413.4 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 7/31/06-7/31/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 55+00, 7.5 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

Definitions: D = Spilt Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person
 S = Sample off Auger Flights R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf)
 U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value
 MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf)
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing 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 | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|---|---------|--------------|-----|-----------------|--|---|--|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | S7 | | 0.8 - 1.3 | | | | SSA | 413.2 | | G#207015 A-1-b, SW WC=3.0% G#207016 A-4, ML WC=35.3% | |
| | S8 | | 1.3 - 3.3 | | | | | 412.8 | | | |
| | | | | | | | | 412.6 | | | |
| | | | | | | | | 412.1 | | | |
| | | | | | | | | 410.1 | | | |
| 5 | | | | | | | | 409.0 | Bottom of Exploration at 4.4 feet below ground surface. REFUSAL | | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|---|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 394.6 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/1/06-8/1/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 62+87, 8.3 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

Definitions: D = Spilt Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person
 S = Sample off Auger Flights R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf)
 U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value
 MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf)
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing 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 | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|---|---------|--------------|-----|-----------------|-------------|--|--|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | S9 | | 0.9 - 1.7 | | | | SSA | 393.7 | | 10.8" HMA | |
| | | | | | | | | 392.9 | | Dark brown, damp, Gravelly SAND, trace silt, (Fill). | G#207017 A-1-b, SW WC=1.5% |
| | | | | | | | | 391.8 | | Brown, moist, fine to coarse SAND, some silt, trace gravel. | |
| | | | | | | | | 391.6 | | Weathered ROCK | |
| 5 | | | | | | | | | | Bottom of Exploration at 3.0 feet below ground surface. REFUSAL | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|-------------------------------|
| Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS | Project: A 3.02 mile portion of Route 8 | Boring No.: HB-BEL-108 |
| | Location: Belgrade, Maine | WIN: 12773.00 |

| | | |
|---|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 384.9 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/2/06-8/2/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 70+00, 5.3 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

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

MU = Unsuccessful Thin Wall Tube Sample Attempt
 R = Rock Core Sample
 SSA = Solid Stem Auger
 HSA = Hollow Stem Auger
 RC = Roller Cone
 WOH = Weight of 140lb. Hammer
 WOR/C = Weight of Rods or Casing

WO1P = Weight of 1 Person
 S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 S_u(lab) = Lab Vane Undrained Shear Strength (psf)
 q_p = Unconfined Compressive Strength (ksf)
 N-value = Raw Field SPT N-value
 T_v = Pocket Torvane Shear Strength (psf)
 WC = Water Content, percent = Similar or Equal too

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

| Depth (ft.) | Sample Information | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/ AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|--|---------|--------------|-----|-----------------|-------------|--|---|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (/6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | SSA | 384.3 | | 7.8" HMA | |
| | | | | | | | | 384.1 | | Unbound Pavement | 0.7 |
| | | | | | | | | 383.3 | | Dark brown, damp, Gravelly SAND, trace silt, (Fill). | 0.8 |
| | | | | | | | | | | Brown, moist, fine to coarse SAND, some silt, trace gravel. | 1.6 |
| | | | | | | | | 381.4 | | Brown, moist, SILT, some clay, some sand, trace gravel. | 3.5 |
| 5 | | | | | | | | 379.9 | | Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL | 5.0 |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|---|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 383.3 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/2/06-8/2/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 75+27, 9.0 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

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

| Depth (ft.) | Sample Information | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|---|---------|--------------|-----|-----------------|-------------|--|--|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | S10 | | 0.8 - 2.1 | | | | SSA | 382.6 | | 9" HMA | |
| | | | | | | | | 381.2 | | Dark brown, damp, fine to coarse SAND, some gravel, little silt, (Fill). Cobble from 1.1-1.6 ft bgs. | 0.8 2.1 |
| | S11 | | 2.1 - 3.2 | | | | | 380.1 | | Brown, damp, Silty fine to coarse SAND, trace gravel. | G#207019 A-4, SM WC=13.4% |
| | | | | | | | | 378.3 | | Brown, moist, SILT, some clay, some sand, trace gravel. | |
| 5 | | | | | | | | | | Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|-------------------------------|
| Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS | Project: A 3.02 mile portion of Route 8 | Boring No.: HB-BEL-110 |
| | Location: Belgrade, Maine | WIN: 12773.00 |

| | | |
|---|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 391.4 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/2/06-8/2/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 79+00, 8.7 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

Definitions: D = Spilt Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person
 S = Sample off Auger Flights R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf)
 U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value
 MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf)
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing 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 | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|---|---------|--------------|-------|-----------------|--|--------------------------------|--|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | 390.6 | | 9.6" HMA | | |
| | | | | | | | 389.7 | | Dark brown, damp, Gravelly SAND, trace silt, (Fill). | 0.8 | |
| | | | | | | | | | Brown, dry, SILT, some fine to medium sand, trace gravel, (Till). | 1.7 | |
| 5 | | | | | | | | | Occasional cobbles | | |
| 10 | | | | | | | 381.4 | | Bottom of Exploration at 10.0 feet below ground surface. NO REFUSAL | 10.0 | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|---|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 389.3 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/2/06-8/2/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 87+50, 5.0 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

Definitions: D = Spilt Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person
 S = Sample off Auger Flights R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_u(lab) = Lab Vane Undrained Shear Strength (psf)
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf)
 U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value
 MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf)
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing 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 | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/ AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|--|---------|--------------|-----|-----------------|---|--------------------------------|---|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (/6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | SSA | 388.8 | 6.6" HMA | | |
| | | | | | | | | 387.5 | Dark brown, damp, Gravelly SAND, trace silt, (Fill). | 0.6- | |
| | S12 | | 2.6 - 5.0 | | | | | 386.7 | Brown, moist, SILT, some clay, some sand, trace gravel. | 1.8- | |
| | | | | | | | | | Grey, moist, Sandy SILT, trace gravel. | 2.6- | G#207020 A-4, ML WC=13.4% |
| 5 | | | | | | | | 384.3 | Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL | 5.0- | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|---|
| Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS | Project: A 3.02 mile portion of Route 8 Location: Belgrade, Maine | Boring No.: HB-BEL-113 WIN: 12773.00 |
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|--|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 384.2 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/2/06-8/2/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 100+00, 7.5 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

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

| Depth (ft.) | Sample Information | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|---|---------|--------------|-----|-----------------|--|--------------------------------|--|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | SSA | 383.5 | 8.4" HMA | | |
| | S13 | | 1.3 - 3.7 | | | | | 383.3 | Unbound Pavement | 0.7- | G#207014 A-4, SM WC=11.8% |
| | | | | | | | | 382.9 | Dark brown, damp, Gravelly SAND, trace silt, (Fill). | 1.0- | |
| | | | | | | | | | Brown, moist, Silty SAND, trace gravel. | 1.3- | |
| | | | | | | | | 380.5 | Brown, dry, SILT, some sand, trace gravel, (Till). | 3.7- | |
| 5 | | | | | | | | 379.2 | Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL | 5.0- | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|-------------------------------|
| Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS | Project: A 3.02 mile portion of Route 8 | Boring No.: HB-BEL-114 |
| | Location: Belgrade, Maine | WIN: 12773.00 |

| | | |
|--|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 372.2 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/2/06-8/2/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 110+00, 5.5 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

Definitions: D = Spilt Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person
 S = Sample off Auger Flights R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_u(lab) = Lab Vane Undrained Shear Strength (psf)
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf)
 U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value
 MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf)
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing 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 | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|---|---------|--------------|-----|-----------------|-------------|--|--|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | SSA | 371.5 | | | |
| | | | | | | | | 371.3 | | 0.7 | |
| | | | | | | | | 370.5 | | 0.9 | |
| | | | | | | | | 369.7 | | 1.7 | |
| | | | | | | | | | | 2.5 | |
| 5 | | | | | | | | 367.2 | 5.0 | Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 374.1 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/3/06-8/3/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 135+00, 8.0 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

Definitions: D = Spilt Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person
 S = Sample off Auger Flights R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf)
 U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value
 MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf)
 V = Field Vane Shear Test, PP= Pocket Penetrometer WOR/C = Weight of Rods or Casing 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 | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/ AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|--|---------|--------------|-----|-----------------|---|--------------------------------|---|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (/6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | SSA | 373.3 | 9.6" HMA | | |
| | | | | | | | | 372.7 | Dark brown, damp, Gravelly SAND, trace silt, (Fill). | | |
| | S16 | | 2.3 - 5.0 | | | | | 371.8 | Brown, moist, fine to coarse SAND, some silt, trace gravel. | | |
| | | | | | | | | | Brown, moist, SILT, some sand, trace gravel. | | G#207024 A-4, ML WC=39.9% |
| 5 | | | | | | | | 369.1 | Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL | | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|---|
| Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS | Project: A 3.02 mile portion of Route 8 Location: Belgrade, Maine | Boring No.: HB-BEL-118 WIN: 12773.00 |
|--|--|---|

| | | |
|--|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 388.5 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/3/06-8/3/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 140+25, 9.0 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

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

| Depth (ft.) | Sample Information | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|---|---------|--------------|-------|-----------------|---|--------------------------------|--|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | SSA | 388.0 | | | |
| | | | | | | | 387.8 | | | | |
| | | | | | | | 387.5 | | | | |
| | | | | | | | 386.8 | | | | |
| | | | | | | | 386.4 | | | | |
| 5 | | | | | | | | | Bottom of Exploration at 2.1 feet below ground surface. REFUSAL | | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|-------------------------------|
| Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS | Project: A 3.02 mile portion of Route 8 | Boring No.: HB-BEL-119 |
| | Location: Belgrade, Maine | WIN: 12773.00 |

| | | |
|--|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 374.1 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/3/06-8/3/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 150+00, 8.5 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

Definitions: D = Spilt Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person
S = Sample off Auger Flights R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)
MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf)
U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value
MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf)
V = Field Vane Shear Test, PP= Pocket Penetrometer WOR/C = Weight of Rods or Casing 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 | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/ AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|--|---------|--------------|-------|-----------------|---|--------------------------------|---|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (/6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | SSA | 373.5 | | | |
| | | | | | | | 373.1 | 0.6 | | | |
| | | | | | | | 372.5 | 1.0 | | | |
| | | | | | | | | 1.6 | | | |
| 5 | | | | | | | | 369.1 | Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL | 5.0 | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 351.9 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/3/06-8/3/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 155+00, 5.0 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

Definitions: D = Spilt Spoon Sample MU = Unsuccessful Thin Wall Tube Sample Attempt WO1P = Weight of 1 Person
 S = Sample off Auger Flights R = Rock Core Sample S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
 B = Bucket Sample off Auger Flights SSA = Solid Stem Auger S_{u(lab)} = Lab Vane Undrained Shear Strength (psf)
 MD = Unsuccessful Split Spoon Sample Attempt HSA = Hollow Stem Auger q_p = Unconfined Compressive Strength (ksf)
 U = Thin Wall Tube Sample RC = Roller Cone N-value = Raw Field SPT N-value
 MV = Unsuccessful Field Vane Shear Test Attempt WOH = Weight of 140lb. Hammer T_v = Pocket Torvane Shear Strength (psf)
 V = Field Vane Shear Test, PP = Pocket Penetrometer WOR/C = Weight of Rods or Casing 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 | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|---|---------|--------------|-----|-----------------|--|--------------------------------|--|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | SSA | 351.2 | 9" HMA | | |
| | | | | | | | | 350.4 | Dark brown, damp, Gravelly SAND, trace silt, (Fill). | 0.8 | |
| | | | | | | | | | Brown, moist, fine to coarse SAND, some silt, trace gravel. | 1.5 | |
| | | | | | | | | | Cobble from 3.0-3.5 ft bgs. | | |
| | | | | | | | | 347.7 | PEAT | 4.2 | |
| 5 | | | | | | | | 347.5 | Brown, moist, SILT, some clay, some fine sand, trace gravel. | 4.4 | |
| | | | | | | | | 346.9 | Bottom of Exploration at 5.0 feet below ground surface. NO REFUSAL | 5.0 | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

| | | |
|--|--|---|
| Maine Department of Transportation Soil/Rock Exploration Log US CUSTOMARY UNITS | Project: A 3.02 mile portion of Route 8 Location: Belgrade, Maine | Boring No.: HB-BEL-121 WIN: 12773.00 |
|--|--|---|

| | | |
|--|--|------------------------------------|
| Drilling Contractor: MaineDOT | Elevation (ft.): 401.4 | Auger ID/OD: 5" Dia. |
| Operator: E. Giguere | Datum: NAVD88 | Sampler: Off Flights |
| Logged By: G. Lidstone | Rig Type: CME 45C | Hammer Wt./Fall: N/A |
| Date Start/Finish: 8/3/06-8/3/06 | Drilling Method: Solid Stem Auger | Core Barrel: N/A |
| Boring Location: 165+00, 7.0 ft Rt. | Casing ID/OD: N/A | Water Level*: None Observed |

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

| Depth (ft.) | Sample Information | | | | | | | Elevation (ft.) | Graphic Log | Visual Description and Remarks | Laboratory Testing Results/AASHTO and Unified Class. |
|-------------|--------------------|-----------------|--------------------|---|---------|--------------|-----|-----------------|--|--------------------------------|--|
| | Sample No. | Pen./Rec. (in.) | Sample Depth (ft.) | Blows (6 in.) Shear Strength (psf) or RQD (%) | N-value | Casing Blows | | | | | |
| 0 | | | | | | | SSA | 400.6 | | | |
| | | | | | | | | 400.4 | | | |
| | | | | | | | | 400.1 | | | |
| | | | | | | | | 398.2 | | | |
| | | | | | | | | | | | |
| 5 | | | | | | | | 396.4 | Bottom of Exploration at 5.0 feet below ground surface. REFUSAL | | |
| 10 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |

Remarks:

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

Town(s): Belgrade

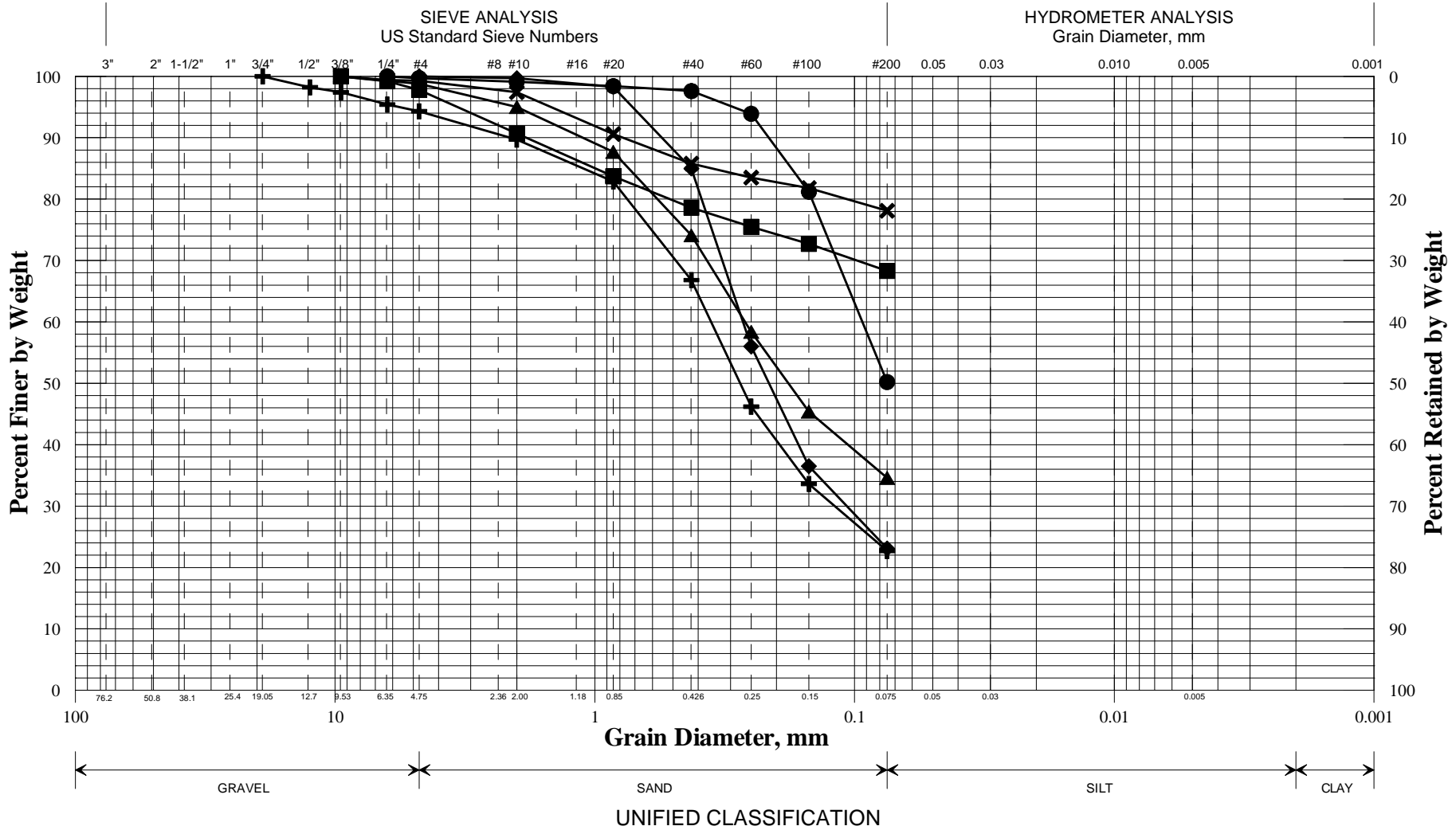
Project Number: 12773.00

| Station (Feet) | Offset (Feet) | Weathered Rock (Feet) | Refusal (Feet) | No Refusal (Feet) | Bottom of Boring Elev. (Ft.) | Comments / Date 7/31,8/1-3/06 |
|----------------|---------------|-----------------------|----------------|-------------------|------------------------------|----------------------------------|
| 48+00 | 16.6 Lt. | | | 5.0 | 396.5 | |
| 48+50 | 17.0 Lt. | 3.5 | 3.8 | | 398.7 | |
| 49+00 | 16.8 Lt. | 3.2 | 3.5 | | 399.9 | |
| 49+50 | 17.7 Lt. | 2.9 | 3.0 | | 401.0 | |
| 50+00 | 12.3 Rt. | 2.6 | 2.9 | | 402.7 | |
| 50+50 | 19.0 Lt. | 3.8 | 4.0 | | 402.0 | |
| 51+00 | 13.5 Rt. | 2.2 | 2.6 | | 404.6 | |
| 51+50 | 15.2 Lt. | 4.0 | 4.2 | | 403.8 | |
| 52+00 | 12.0 Rt. | 2.8 | 3.0 | | 406.2 | |
| 52+50 | 14.0 Lt. | 2.6 | 3.0 | | 407.4 | |
| 53+00 | 13.5 Rt. | 2.0 | 2.3 | | 408.8 | |
| 53+50 | 15.0 Lt. | 2.2 | 2.7 | | 409.7 | |
| 54+00 | 12.5 Rt. | 2.4 | 2.7 | | 410.2 | |
| 54+50 | 10.0 Lt. | 2.7 | 3.1 | | 410.4 | |
| 55+50 | 12.0 Lt. | 2.3 | 2.5 | | 410.4 | |
| 56+00 | 16.2 Rt. | 4.2 | 4.4 | | 407.6 | |
| 56+60 | 12.8 Lt. | 3.8 | 4.2 | | 407.7 | overhead wires at 56+50 |
| 57+00 | 17.8 Rt. | 4.1 | 4.5 | | 406.5 | |
| 57+50 | 13.5 Lt. | 4.2 | 4.7 | | 406.5 | |
| 58+00 | 17.0 Rt. | 3.9 | 4.3 | | 406.2 | |
| 58+50 | 10.0 Lt. | 3.3 | 3.5 | | 406.5 | |
| 59+00 | 13.0 Rt. | | | 5.0 | 403.6 | |
| 60+87 | 11.4 Rt. | | | 5.0 | 396.9 | |
| 61+37 | 10.5 Lt. | | 2.3 | | 397.1 | |
| 61+09 - 61+54 | 21.0 Lt. | | | | | Bedrock in ditch |
| 61+87 | 12.5 Rt. | | 2.7 | | 395.1 | |
| 62+29 | 10.5 Lt. | 3.1 | 3.4 | | 392.4 | Water depth at 2.7' bgs. |
| 63+37 | 10.5 Lt. | 1.9 | 2.4 | | 390.4 | |
| 63+11 - 63+52 | 19-21.0 Lt. | | | | | Outcrop |
| 63+87 | 9.8 Rt. | 3.3 | 3.7 | | 387.7 | |
| 64+37 | 9.5 Lt. | 2.4 | 2.9 | | 387.6 | |
| 64+87 | 12.0 Rt. | | | 5.0 | 384.8 | |
| 65+37 | 10.5 Lt. | 3.0 | 3.4 | | 385.0 | Water depth at 2.5' bgs. |
| 65+87 | 12.5 Rt. | 4.8 | 5.0 | | 382.6 | Water depth at 4.3' bgs. |
| 66+37 | 10.5 Lt. | 3.1 | 3.4 | | 383.0 | |
| 66+87 | 8.5 Rt. | 3.1 | 3.3 | | 382.7 | |
| 67+37 | 7.5 Lt. | | | 5.0 | 380.6 | |
| 89+50 | 12.5 Rt. | | | 5.0 | 383.2 | |
| 90+00 | 12.5 Lt. | | | 5.0 | 383.3 | |
| 90+50 | 12.3 Rt. | 4.1 | 4.4 | | 384.3 | |
| 91+00 | 12.5 Lt. | 3.7 | 3.9 | | 385.3 | |
| 91+50 | 12.5 Rt. | 3.9 | 4.3 | | 385.5 | |
| 92+00 | 12.5 Lt. | 3.3 | 3.5 | | 386.6 | |
| 93+00 | 12.0 Lt. | 1.8 | 2.1 | | 388.3 | |

Appendix B

Laboratory Test Results

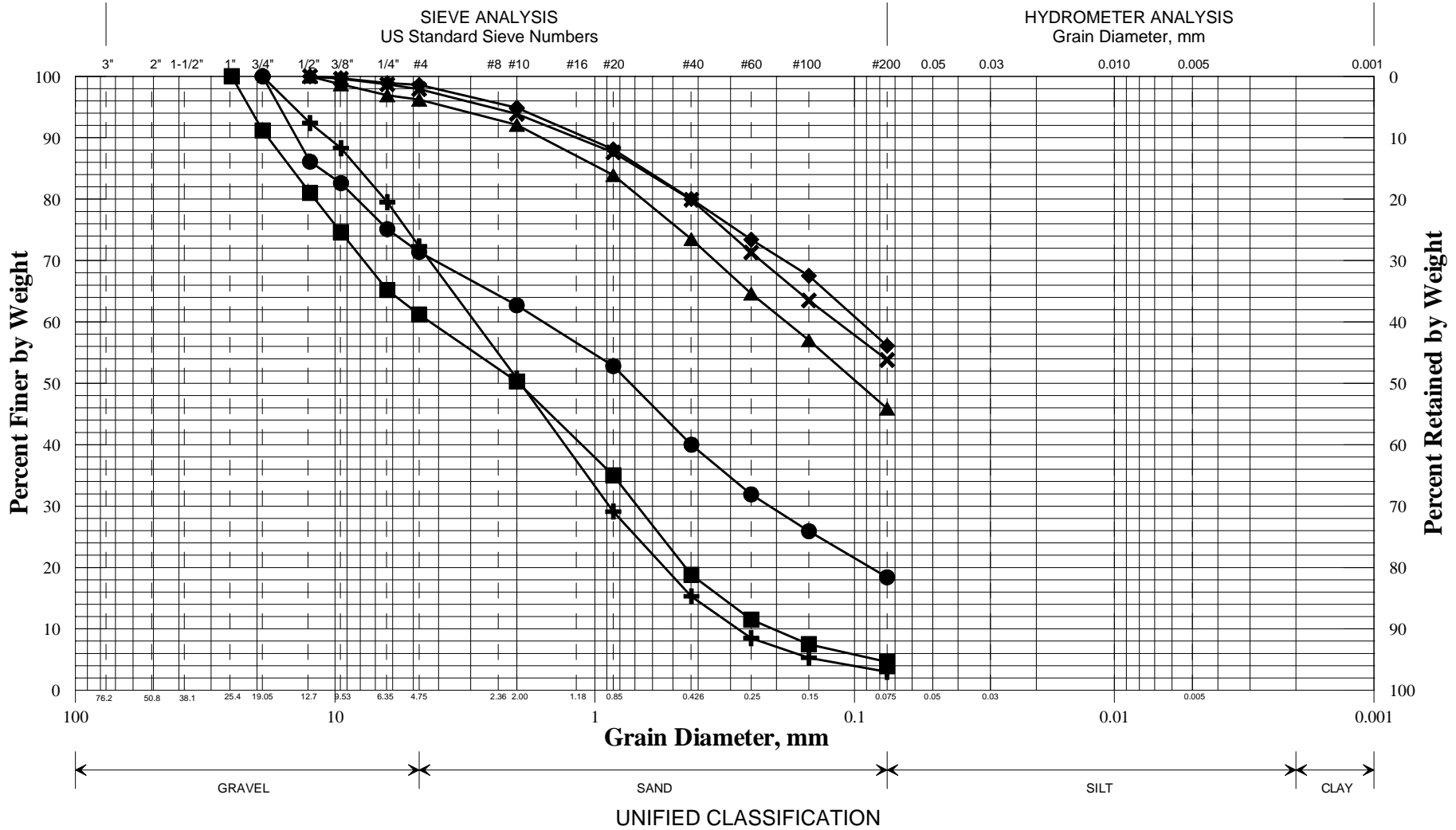
**State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE**



| | Boring/Sample No. | Station | Offset, ft | Depth, ft | Description | W, % | LL | PL | PI |
|---|-------------------|---------|------------|-----------|--|------|----|----|----|
| + | HB-BEL-101/S1 | 17+58 | 7.5 RT | 0.55-2.5 | SAND, some silt, trace gravel. | 3.9 | | | |
| ◆ | HB-BEL-101/S2 | 17+58 | 7.5 RT | 2.5-5.0 | SAND, some silt, trace gravel. | 12.4 | | | |
| ■ | HB-BEL-103/S3 | 28+00 | 7.5 RT | 1.5-2.7 | SILT with clay, some sand, trace gravel. | 19.2 | | | |
| ● | HB-BEL-103/S4 | 28+00 | 7.5 RT | 2.7-5.0 | Sandy SILT, trace gravel. | 9.6 | | | |
| ▲ | HB-BEL-104/S5 | 35+00 | 8.3 RT | 1.6-5.0 | SAND, some silt, trace gravel. | 13.5 | | | |
| × | HB-BEL-105/S6 | 47+50 | 8.0 RT | 1.2-5.0 | SILT, some sand, trace gravel. | 7.6 | | | |

| | |
|------------------|----------|
| WIN | |
| 012773.00 | |
| Town | |
| Belgrade | |
| Reported by/Date | |
| WHITE, TERRY A | 9/1/2006 |

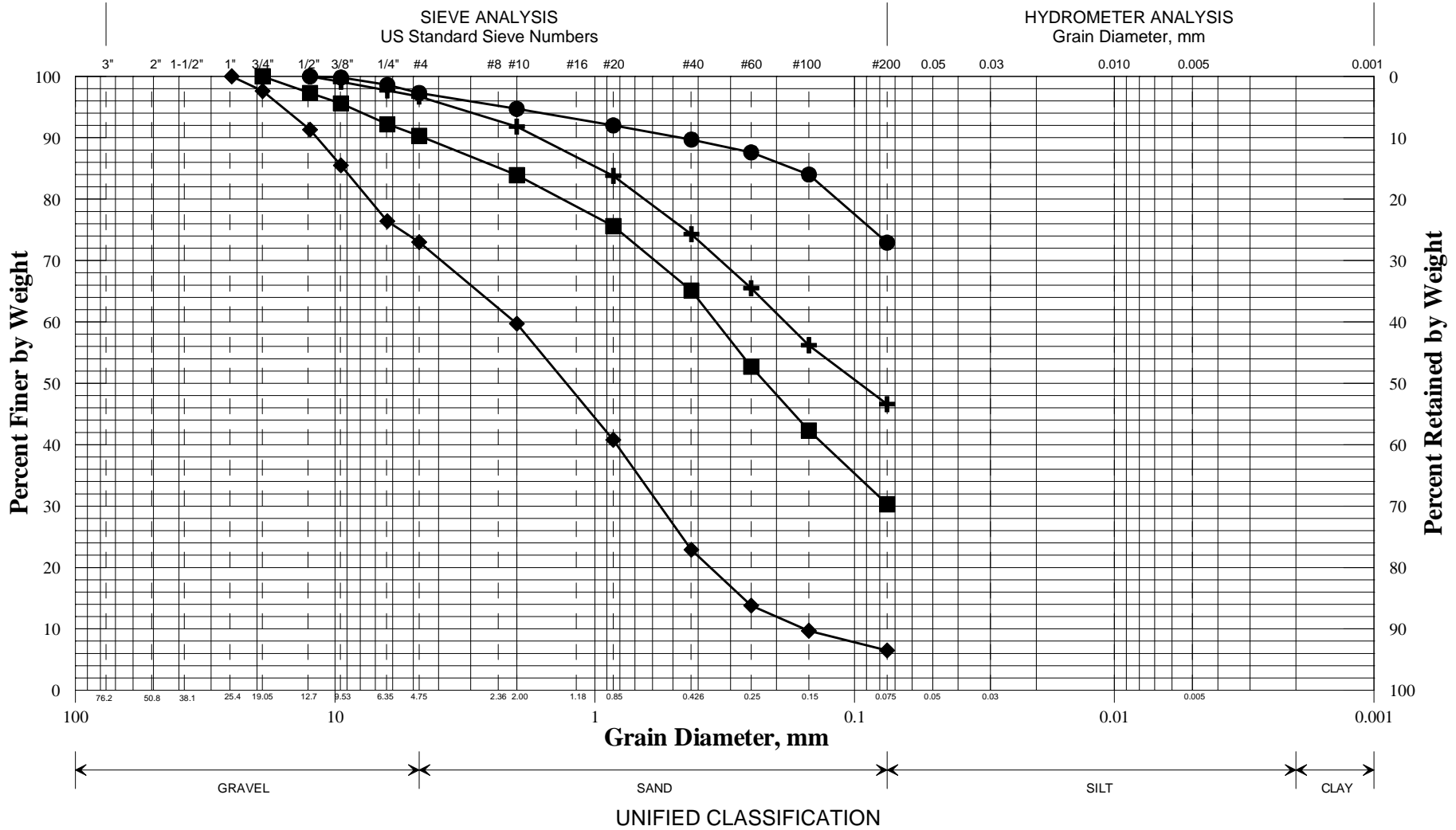
**State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE**



| | Boring/Sample No. | Station | Offset, ft | Depth, ft | Description | W, % | LL | PL | PI |
|---|-------------------|---------|------------|-----------|-------------------------------------|------|----|----|----|
| + | HB-BEL-106/S7 | 55+00 | 7.5 RT | 0.80-1.3 | SAND, some gravel, trace silt. | 3.0 | | | |
| ◆ | HB-BEL-106/S8 | 55+00 | 7.5 RT | 1.3-3.3 | Sandy SILT, trace gravel. | 35.3 | | | |
| ■ | HB-BEL-107/S9 | 62+87 | 8.5 RT | 0.90-1.7 | Gravelly SAND, trace silt. | 1.5 | | | |
| ● | HB-BEL-109/S10 | 75+27 | 9.0 RT | 0.75-1.1 | SAND, some gravel, little silt. | 3.3 | | | |
| ▲ | HB-BEL-109/S11 | 75+27 | 9.0 RT | 2.1-3.2 | Silty SAND, trace gravel. | 13.4 | | | |
| × | HB-BEL-111/S12 | 87+50 | 5.0 RT | 2.6-5.0 | Sandy SILT with clay, trace gravel. | 13.4 | | | |

| | |
|------------------|----------|
| WIN | |
| 012773.00 | |
| Town | |
| Belgrade | |
| Reported by/Date | |
| WHITE, TERRY A | 9/1/2006 |

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



| | Boring/Sample No. | Station | Offset, ft | Depth, ft | Description | W, % | LL | PL | PI |
|---|-------------------|---------|------------|-----------|--------------------------------|------|----|----|----|
| + | HB-BEL-113/S13 | 100+00 | 7.5 RT | 1.3-3.7 | Silty SAND, trace gravel. | 11.8 | | | |
| ◆ | HB-BEL-115/S14 | 117+50 | 7.5 RT | 3.6-4.2 | SAND, some gravel, trace silt. | 14.1 | | | |
| ■ | HB-BEL-116/S15 | 125+00 | 5.5 RT | 2.7-5.0 | SAND, some silt, trace gravel. | 8.5 | | | |
| ● | HB-BEL-117/S16 | 135+00 | 8.0 RT | 2.3-5.0 | SILT, some sand, trace gravel. | 39.9 | | | |
| ▲ | | | | | | | | | |
| x | | | | | | | | | |

| | |
|------------------|----------|
| WIN | |
| 012773.00 | |
| Town | |
| Belgrade | |
| Reported by/Date | |
| WHITE, TERRY A | 9/1/2006 |