

Maine Department of Transportation
Highway Program

**GEOTECHNICAL ENGINEERING REPORT
FOR THE RECONSTRUCTION of
ROUTE 109 in
WELLS, MAINE**

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York County

PIN 7998.10, 7998.20
Federal Project # NH-7998(10)E
Federal Project # NH-7998(20)E
October 21, 2010

Soils Report 2010-117

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 INTRODUCTION	1
2.0 PROJECT BACKGROUND	1
3.0 AS-BUILT INFORMATION	2
4.0 GEOLOGIC INFORMATION	2
5.0 SUBSURFACE CONDITIONS and EVALUATION	4
5.1 ROADWAY and SHOULDER BORINGS/TEST PITS	4
5.1.1 Surface	4
5.1.2 Base/Subbase	4
5.1.3 Subgrade	4
5.1.4 Shoulders	5
5.1.5 Bedrock	5
5.1.6 Organic Soils	6
5.1.7 Groundwater	6
5.2 FWD ANALYSIS	6
6.0 DESIGN CONSIDERATIONS	7
6.1 PAVEMENT STRUCTURE	8
6.1.1 Frost Penetration Estimates	8
6.1.2 Pavement Design Considerations	8
6.2 HIGHWAY SUBSURFACE DRAINAGE	8
6.3 FROST	8
7.0 HIGHWAY CONSTRUCTION CONSIDERATIONS	9
8.0 CLOSURE	9

APPENDICIES

Appendix A: GENERAL INFORMATION

Surficial Geology Map and Key

Soil Conservation Survey Map, Key, Other Information

Appendix B: SUBSURFACE EXPLORATIONS

Geotechnical Investigations Summary Sheet

Boring Logs

Test Pit Logs

FWD Logs

Appendix C: LABORATORY TEST RESULTS

Laboratory Testing Summary Sheet

Grain Size Analysis

Geology Test Reports

Appendix D: DESIGN

FWD Analysis

Resilient Modulus (Mr) Calculation

Frost Depth Information

Detail - *Frost Susceptible Soils over Ledge*

Appendix E: PLANS and SPECIAL PROVISIONS

As-Built Plans

Geoplans

1.0 INTRODUCTION

This report presents the results of the geotechnical investigations for the proposed reconstruction/rehabilitation of 7.37 km [4.58 mi] of State Route 109 in the Town of Wells.

PIN # 7998.10 begins 0.24 km [0.15 miles] north of Wells Maine Turnpike Exit #19 (RLM 1.70) and extends northerly 3.93 km [2.44 mi] to 0.08 km [0.05 mi] north of Meetinghouse Road (RLM 4.14). PIN # 7998.20 begins 1.08 km [0.05 mi] north of Meetinghouse Road (RLM 4.14) and extends northerly 3.44 km [2.14 mi] (RLM 6.28). This remainder of this report combines both PIN numbers and considered the two projects as one project, and considers the highway only and does not include any geotechnical investigations for any of the bridges that exist within the project limits.

The scope of work for this project is to reconstruct and rehabilitate the existing roadway to improve safety, ride quality, and drainage. This work will include full reconstruction and leaving the existing core of Route 109 and widening the existing shoulder. The new vertical and horizontal alignment will closely follow the existing alignments. There are also major improvements to the surface drainage where stormwater will be collected in full depth ditches or a closed drainage system where ditches are not feasible. Drainage of the pavement structure will be accomplished by daylighting of the base/subbase to ditches or by using underdrain pipe where daylighting is not possible. Subsurface drainage (lowering the groundwater table) will also be accomplished by ditching or underdrain pipe.

2.0 PROJECT BACKGROUND

This roadway is on the National Highway System (NHS) as is classified as a principal arterial. The a current AADT (2009) is 9500 vehicles from the start of the project to the intersection with Route 9A, 8770 vehicles (2009) from Route 9A north to Meetinghouse Road, and 8010 vehicles (2009) from Meetinghouse Road north to the end of the project. The AADT for the projected 20-year performance period (2029) is 12380, 11400, and 10410 vehicles respectively, with 9% being classified as heavy trucks. The mixed traffic converts to equivalent 18-kip single axel loads (at $P_{2.5}$) values of 435, 329, and 329 respectively. The ESAL's for the 20-year performance period calculate to 3,175,500, 2,401,700, and 2,401,700 respectively.

The existing roadway structure consists of 3.75 m [12'] travel lanes and 1.0 m [3'] unpaved shoulders. Inspections were done in the summer of 2002, and in February of 2003 to evaluate the existing pavement structure for frost related problems, pavement damage due to vehicle loading, and drainage problems.

During the summer of 2002, there was evidence of minor to severe pavement distress including cracking at the centerline joint, transverse (thermal) cracking, subsidence of the right edge of both of the travel lanes, alligator cracking, and block cracking. The roadway had a Maintenance Surface Treatment (sand mix) in 2007, so many of the distresses previously observed are no longer visible. MST's do not correct deficiencies but function to improve ride quality until the roadway is rehabilitated or reconstructed.

Frost problems were evident throughout the entire length of the project in 2003 and every winter since that time. The ride quality in the winter and early spring months is extremely rough with many substantial frost heaves occurring at cross-pipe locations and possibly at shallow bedrock locations. The general rough ride appears to be from tenting at crack locations. This tenting can be caused by the accumulation of water infiltrating into the cracks in the asphalt and freezing. The shoulders along most of the length of the project are heaved approximately 100 mm [4"] above the travel lanes in the winter months, and are very soft during the spring thaw.

Drainage ditches are shallow or non-existent for the length of the project. There are several locations where wetlands/cattails are immediately adjacent to the roadway. Wetland vegetation in drainage ditches typically indicates low soil permeability as well as poor flow/drainage conditions. After a substantial rain event, water tends to stand in any ditching.

A significant amount of bedrock outcrops can be seen along the roadside. These outcrops are located from the start of the project to the intersection with Rte. 9, and from Sawyer Road to just north of Meetinghouse Road.

3.0 AS-BUILT INFORMATION

As-built plans from the 1930's indicate that the original roadway was constructed with 3.0 m [10'] travel lanes and 1.0 m [3'] shoulders. The travel way structure consisted of 450 mm [18"] of gravel base and 75 mm [3"] of macadam for a wearing surface. A typical drawing showing a 300 mm [12"] stone base layer below the gravel base is shown on the plans, however the areas where this may have been placed are not shown on the as-built plan sheets/profiles. The pavement has been overlaid with hot mix asphalt (HMA) since the original construction, with the most recent overlays being placed in 1986 and 2007.

The shoulder pavement structure was constructed with 150 mm [6"] of gravel and 75 mm [3"] of gravel surface course. This type of construction creates a "bathtub" like pavement structure that traps water within the pavement if surrounding soils have a lower permeability than that of the pavement base materials.

The as-built plans show that a significant amount of bedrock, primarily on the southern end of the project. Bedrock was excavated at many locations for the original roadway construction. Bedrock excavation lines are shown on the profile drawings, but there is no evidence if these elevations are based on actual subsurface investigations or on interpolations. There are also several areas where substantial amounts of fill were placed to bring the existing ground to the design profile grade. As-built plans are located in Appendix F of this report.

4.0 GEOLOGIC INFORMATION

The source of geologic information for this report includes the Maine Geological Surficial Geology map for the North Berwick Quadrangle and the Soil Conservation Survey (SCS) for York County. These maps are located in Appendix A of this report.

The Surficial Geology map indicates that the predominant subgrade types along this project consist of a marine deposits (*Pm*, *Pmdi*, *Pmdo*, *Pmdi,Pmrs*), glacial till (*Pt*), and bedrock. Information on this map represents the surficial soils to a depth of approximately 1.5 m to 3.0 m [5' to 10'] below the ground surface.

Marine deposits (*Pm*, *Pmdi*, *Pmdo*, *Pmdi,Pmrs*) primarily consist of sand, silt, and clay size particles, and were either deposited or reworked in a marine water environment. Marine Deposits are anticipated at Stations 20+850 to 22+000, 22+400 to 23+100, and 26+930 to 27+330.

Glacial Till (*Pt*) deposits consist of a heterogeneous mixture of sand, silt, clay and various sizes of stones (cobbles to boulders). Till is deposited directly by glacial ice and usually overlies bedrock, but may overlie sand and gravel. Glacial till is anticipated at Stations 23+100 to 26+930 and 27+330 to 28+139.

Surficial Geology maps indicate that bedrock is shallow and exposed at many locations, but is primarily concentrated at the eastern end of the project. According to the surficial Geology map for this area, shallow bedrock is anticipated at Stations 20+865 to 21+500, and 23+100 to 25+200, and 27+400 to 28+000.

The SSC maps indicate that there are six soil units on this project. These soil units are: Adams (AdB, AdC), Brayton and Westbury (BsB), Colton (CoB, CoC), Hermon (HmB), Lyman (LnB, LyE), Naumburg (Na), and Raynham (Ra). Table 1 lists the soil classifications and features associated with each unit. Table 2 lists the Soil Conservation Survey soils units and the approximate locations of where they are anticipated to underlie Route 109.

Table 1: Summary of SCS Soil Classifications and Features for Rt. 109, Wells

SCS Soil Unit Symbol	AASHTO Classification	USCS Classification	Depth to Bedrock	Depth to H2O	Frost Potential
AdB, AdC	A-1, A-2, A-3, A-4	SM, SP-SM, SW-SM, SP	> 1.5 m [60"]	>1.8 m [6']	low
BsB	A-1, A-2, A-4	SM, GM, ML	> 1.5 m [60"]	0 – 0.46 m [0 -1.5']	high
CoB, CoC	A-1, A-2, A-3	SM, SP, GM, GP	> 1.5 m [60"]	>1.8 m [6']	low
CrB	A-1, A-2, A-3	SM, SP-SM, SW-SM	> 1.5 m [60"]	0.46 m – 0.60 m [1.5' – 2.0']	moderate
HmB	A-1, A-2, A-4	SM, SP-SM, GP-GM, GM	> 1.5 m [60"]	>1.8 m [6']	low
LnB, LyE	A-2, A-4	SM, ML, GM	0.25 m – 0.50 m [10" – 20"]	>1.8 m [6']	moderate
Na	A-1, A-2, A-3, A-4	SM, SP-SM, SW-SM	> 1.5 m [60"]	0 – 0.46 m [0 -1.5']	moderate
Ra	A-4	ML	> 1.5 m [60"]	0.15 m – 0.60 m [0.5 – 2.0']	high

Table 2: Approximate SCS Soil Unit Locations

SCS Soil Unit Symbol	Design Station
CoC, CoB	20+850 to 22+220
HmB, BsB	22+220 to 23+100
LnB, LyE, Ra	23+100 to 24+700
CrB, Na	24+700 to 26+700
AdB	26+700 to 27+500
CrB, Na	27+500 to 28+075

5.0 SUBSURFACE CONDITIONS and EVALUATION

The subsurface investigations program consisted of 47 borings: 32 in the roadway, 15 in the shoulder, and 5 test pits. Hot mix asphalt (HMA) cores were collected at 4 locations. Fifty soil samples were collected and tested in the MaineDOT laboratory in Bangor. A Falling Weight Deflectometer (FWD) analysis was performed in the right hand wheelpath of the eastbound lane. No information was collected in side roads. All boring logs and pavement core information are located in Appendix B in this report, lab test data is located in Appendix C, and boring location plans are located in Appendix E.

The existing asphalt pavement and subbase depth, subgrade type, existing groundwater levels, and the resilient modulus for pavement design are determined from the field information. Boring locations, offsets, explorations depths, and the above information is summarized in a spreadsheet titled *Geotechnical Investigations Summary* and is also included in Appendix xx.

5.1 ROADWAY and SHOULDER BORINGS/TEST PITS

5.1.1 Surface

The existing HMA depth ranges from 90 mm (3.5") to 240 mm (9.4"). A 40 mm [1.5"] to 100 mm (4") macadam layer was found at most boring locations. There is no evidence that the macadam was ever removed, however it could have disintegrated during the drilling process at locations where it was not encountered. It should be noted that a Maintenance Surface Treatment (MST) was placed after these investigations were completed, therefore the existing HMA thicknesses are greater than what is reported at the time of the investigations.

5.1.2 Base/Subbase

The existing subbase ranges from 300 mm [12"] to 1360 mm [53"], with an average of 575 mm [23"]. Laboratory results indicate that the existing subbase does not MaineDOT specifications. However, samples from test pits were collected so that a larger sample size could be tested. All test pit samples indicate that the existing subbase meets the gradation requirements of MaineDOT Standard Specification 703.06 Aggregate for Base and Subbase.

5.1.3 Subgrade

The subgrade consists predominately of sand and silt, with the proportions of each varying by location. The subgrade at several locations contains gravel size particles. Frost ratings range from 0 to IV, with 0 being non-frost susceptible and IV being highly frost

susceptible. The subgrade soils encountered in the borings is what was expected as per the information on the surficial geology and SCS maps.

Cobbles were encountered in FWD borings at stations 21+796, 22+396, 22+796, 23+196, 23+596, 23+998 and 24+405, and in boring HB-WELS-207 at station 22+500. Cobble sized particles encountered in the borings could indicate the locations of the stone base fill placed as part of the original roadway construction.

5.1.4 Shoulders

The borings indicate that there is 180 mm [7"] to 1400 mm [55"] of varying proportions of sand and silt on the existing shoulders that closely resembles the material placed as gravel base in the travel lane pavement structure. The original shoulder construction as indicated on the as-built plans was verified at most boring locations based on the subsurface information. Areas where the material is thicker than expected may be areas where fill was placed. Also, accumulation of sand on the shoulder that was placed for winter maintenance will skew the information.

5.1.5 Bedrock

Bedrock was encountered in several borings in the roadway and shoulder. Table 3 lists the locations bedrock was encountered in the subsurface investigations and the depth to refusal as measured below the existing ground surface.

Table 3: Refusal Summary from Borings

Boring No.	Station (m)	Offset (m)	Refusal Depth (bgs-m)
HB-WEL-202	20+940	2.5 L	0.91
HB-WEL-201	20+940	4.7 L	1.58
HB-WEL-204	21+180	2.5 L	0.98
HB-WEL-203	21+180	5 L	0.88
FWD 5202	22+194	4.3 L	2.35
HB-WEL-207	22+500	4.5 L	2.56
FWD 4200	23+196	2.5 L	2.35
FWD 4200A	23+196	4.4 L	1.71
HB-WEL-210	23+700	2.4 L	0.94
HB-WEL-209	23+700	4.3 L	0.82
FWD 3400	24+000	2.7 L	1.16
FWD 3000	24+405	2.4 L	0.98
FWD 3000A	24+405	4.5 L	1.04
FWD 2800	24+605	2.5 L	5.4
FWD 2200	25+216	2.7 L	0.79
HB-WEL-213	25+560	4.4 L	1.4

The highway design plans also illustrate where exposed bedrock exists as recorded during the survey. Locations as shown on the plans are Stations 20+920 to 20+960, 21+060 to 21+070, 21+145 to 21+220, 22+005, 24+230 to 24+250, 24+390 to 24+405

As-built plans located in Appendix E illustrate where bedrock was removed as part of the original construction project. Current design stations have been interpolated on to the as-

built plans for the reader's use, but may not be accurate due to landmark changes and slight shifts in the horizontal alignment since the time of the original construction.

5.1.6 Organic Soils

No organic soils were encountered in the investigations. The SCS map indicates that there are wet areas adjacent to the roadway. These wet areas are probably due to water perched over shallow bedrock.

5.1.6 Groundwater

Shallow groundwater was encountered at several roadway and shoulder boring locations. Table 4: Groundwater Data summarizes groundwater locations and depths below the ground surface at the time the investigations were completed. The groundwater table fluctuates seasonally and with yearly precipitation totals, therefore the actual groundwater levels at the time of construction may be different as stated in Table 4 and in this report.

Table 4: Groundwater Data

Boring No.	Station	Offset from Existing CL (ft)	Depth (bgs) to H2O (ft)
HB-WEL-207	22+500	4.5 L	1.22
HB-WEL-208	22+500	2.2 L	1.37
FWD 4600	22+796	2.7 L	2.14
FWD 3800	23+596	2.5 L	1.80
FWD 3402	23+998	2.7 L	1.60
FWD 2400	25+005	2.7 L	1.95
HB-WEL-215	26+500	3.8 L	1.98
FWD 601	26+814	2.8 L	2.00
FWD 100SB	27+315	2.4 L	2.53
HB-WEL-217	27+340	4.6 L	2.59

5.2 FWD ANALYSIS

Falling Weight Deflectometer (FWD) testing was completed by the MDOT field services crew. Existing HMA and base gravel depths were also collected immediately following the FWD field work. The FWD deflection and existing pavement structure information was processed and analyzed to determine pavement properties and to backcalculate the subgrade resilient modulus needed for the pavement design. The complete FWD analysis is located in Appendix D of this report

Through the FWD analysis and subsurface investigation information on past projects, MaineDOT has determined there is a correlation between the backcalculated resilient modulus values and certain soil properties and types. The resilient modulus values can indicate locations where the subgrade soils may be weak or wet (< 20,000 kPa [2900 psi]), may consist of stone base (40,000 to 55,000 kPa [5800 to 7975 psi]), or where shallow bedrock (>55,000 kPa [7975 psi]) may present. Values between 50,000 and 55,000 kPa [7250 and 7975 psi] can indicate the presence of deeper bedrock or stone base. Shallow bedrock is defined as bedrock located within 3.05 meters [10'] below the ground surface. The higher the modulus value, the closer the bedrock is to the surface.

The following tables list areas where stone base and shallow bedrock may be present based on the resilient modulus values from the FWD data only. No resilient modulus values less than 20,000 kPa [2900 psi] were encountered. FWD information collected for this project can be viewed in Appendix D at the end of this report.

Table 5: Possible Stone Base Locations from FWD Analysis

Design Station	Mr Value (kPa)
21+796	42,082
21+896	43,699
22+396	53,310
22+696	41,541
22+796	42,773
22+996	45,197
23+096	45,162
23+396	47,135
23+596	45,822
23+796	50,813
23+896	52,703
23+996	43,931
24+096	48,129
25+196	50,958
25+796	51,610
26+096	46,648
26+196	47,391
26+296	54,693
26+396	51,928
26+496	49,840
26+596	53,741
26+796	40,907
27+197	40,709

Table 6: Possible Shallow Bedrock Locations from FWD Analysis

Design Station	Mr Value (kPa)
24+296	61,107
24+396	95,441
24+596	66,351
24+896	55,448
25+096	59,082
25+296	61,719
25+896	79,813

6.0 DESIGN CONSIDERATIONS

Geotechnical design considerations for this proposed alignment include pavement structure depth as it pertains to frost penetration, recycling options, the resilient modulus input value for the pavement design, subsurface drainage in relation to pavement performance, and the effects of frost action on the pavement structure.

6.1 PAVEMENT STRUCTURE

6.1.1 Frost Penetration Estimates

The Design Freezing Index for this location is 1200. Total frost penetration for a snow-free pavement is 63" [1.6 m] for a granular base and granular subgrade. The estimated frost penetration beneath a 760 mm [30"] pavement structure with a granular base and a fine-grained subgrade is 43" [1.1 m]. A 760 mm [30"] total structure thickness (including existing and new material) is recommended to limit the effects of frost action on the pavement. Frost penetration estimating sheets are located in Appendix D in this report.

6.1.2 Pavement Design Considerations

Due to the severity of the distresses in the HMA layer, removal of all existing HMA and macadam is recommended. The existing HMA and macadam can be used as a recycled layer, such as Plant Mixed Recycled Asphalt Pavement (PMRAP), in the new pavement structure.

Since the proposed design will leave the existing core of the roadway and add new material for the widened shoulders, a 760 mm [30"] pavement section is recommended for the widened areas to ensure the existing core will drain properly.

Since there are only slight modifications proposed for the vertical alignment, the subgrade resilient modulus values as backcalculated from the FWD field analysis are applicable for the pavement structure design for this project. The 75th percentile of all the backcalculated values and as per Chapter 13 of the Highway Design Guide is 34,610 kPa [5020 psi]. 75th percentile calculations are located in Appendix D in this report.

6.2 HIGHWAY SUBSURFACE DRAINAGE

Highway drainage improvements including provisions to remove both surface and subsurface water are recommended for the entire project length. Long term pavement performance is highly dependent on removal of water from the pavement section. Water can enter the pavement structure through cracks in the surface, from adjacent unpaved areas, from groundwater fluctuations, and by capillary action. Water can be removed by either daylighting the pavement base/subbase aggregate to roadside ditches or by collecting water in an underdrain system. In areas with exceptionally high groundwater table elevations, underdrain can be used to lower the groundwater level in conjunction with ditches to remove surface stormwater.

6.3 FROST

If the new subgrade will be constructed on bedrock, it is anticipated that a differential frost heave will develop at the soil/bedrock interface with the existing subgrade soil types. To reduce frost heave development, granular transition zones as shown in the Special Details section (Appendix 2F) in Chapter 2 of the MaineDOT Highway Design Guide are recommended at these locations. This detail is located in Appendix D. Due to the location of underground utilities, fracture blasting of the bedrock at subgrade is not recommended.

7.0 HIGHWAY CONSTRUCTION CONSIDERATIONS

Construction of the widened areas, ditches and underdrain system should be completed prior to the removal of the existing HMA and macadam layer. Because no drainage provisions exist now, the roadway could become unstable when construction traffic loads are applied due to water being trapped under the existing HMA/macadam layer. Allowing the existing subbase and subgrade time to drain will significantly increase these soils strength and stability.

No weak subgrade soil areas were identified along this alignment. If weak subgrade sections are encountered during construction, the subgrade can be undercut 0.30 m (12") and replaced with gravel borrow (Item # 203.26), and/or a non-woven reinforcement geotextile (Item #620.54) can be placed on the subgrade surface.

Cobbles that were placed as stone fill may be encountered in the proposed subgrade at any location along the alignment. From the FWD analysis, the most probable locations are in the area of Stations 21+796, 22+396, 22+500, 22+796, 23+196, 23+596, 23+998 and 24+405. Large cobbles should be removed and replaced with gravel borrow to establish the proposed subgrade elevation.

Bedrock excavation will be needed to achieve highway subgrade elevations, drainage ditch construction, or closed-system drainage construction at various locations (as mentioned in Section 5.1.5 on this project. Bedrock is considered hard and will most probably require blasting for removal. Blasting work should be done in accordance with MaineDOT Standard and Supplemental Specifications.

8.0 CLOSURE

This report has been prepared for the use of the MaineDOT Highway Program solely for the Wells, Route 109 project and in accordance with generally accepted soil and foundation engineering practices.

The analysis and recommendations in this report are based on limited soil explorations at discreet locations along the proposed alignment. If the soil/subsurface conditions vary at the time of construction from what was encountered during the investigations, it may be necessary to re-evaluate the recommendations made in this report. If any changes in the nature, design, or location of the project occur, this report should be reviewed by a geotechnical engineer to assess the conclusions and recommendations in this report to be sure they are still valid.

Appendix A: General Information

- Surficial Geology Map and Key
- Soil Conservation Survey and Key

Wells Quadrangle, Maine

Surface geologic mapping by
Geoffrey W. Smith

Digital cartography by:
Robert A. Johnston

Robert G. Mardimney
State Geologist

Cartographic design and editing by:
Robert D. Tucker

Funding for the preparation of this map was provided by the Maine Geological Survey.

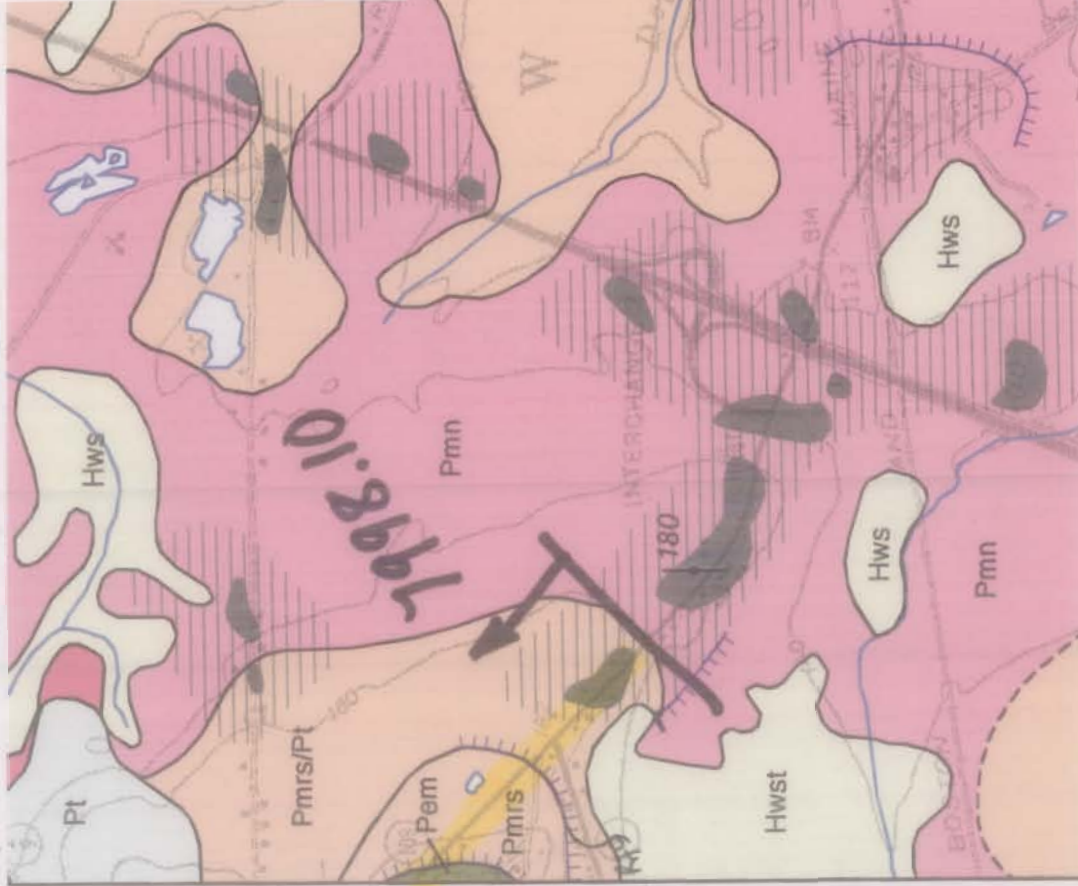


Maine Geological Survey

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Maine pages: <http://dohhs.maine.gov/dohhs/geology/index.htm>

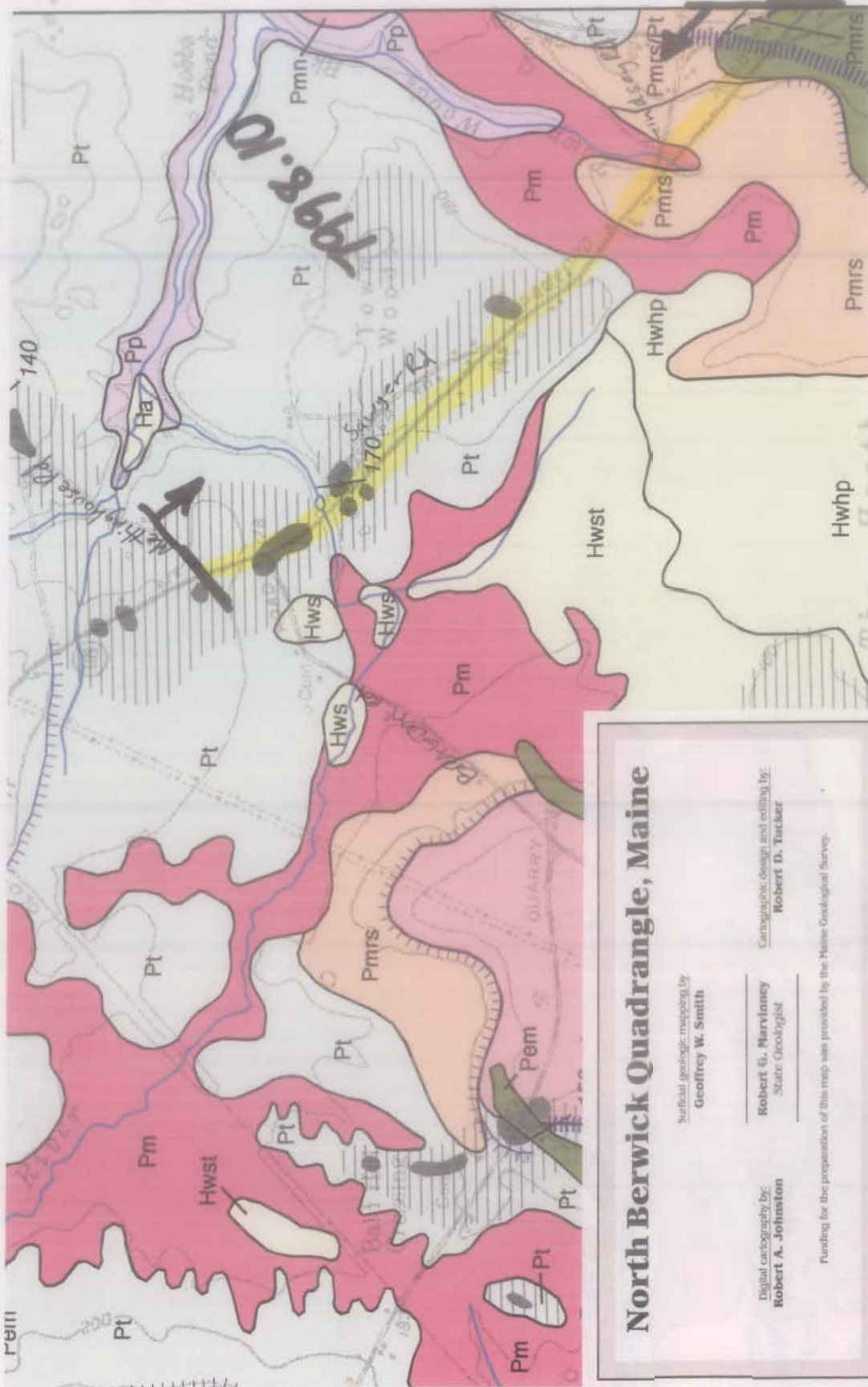
Open-File No. 99-104
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For additional information,
see Open-File Report 99-125.



P/N 7998.10

PIN 7998.10



North Berwick Quadrangle, Maine

Surficial geologic mapping by

Geoffrey W. Smith

Cartographic design and editing by:

Robert D. Tucker

Digital cartography by:

Robert A. Johnston

Funding for the preparation of this map was provided by the Maine Geological Survey.

Maine Geological Survey

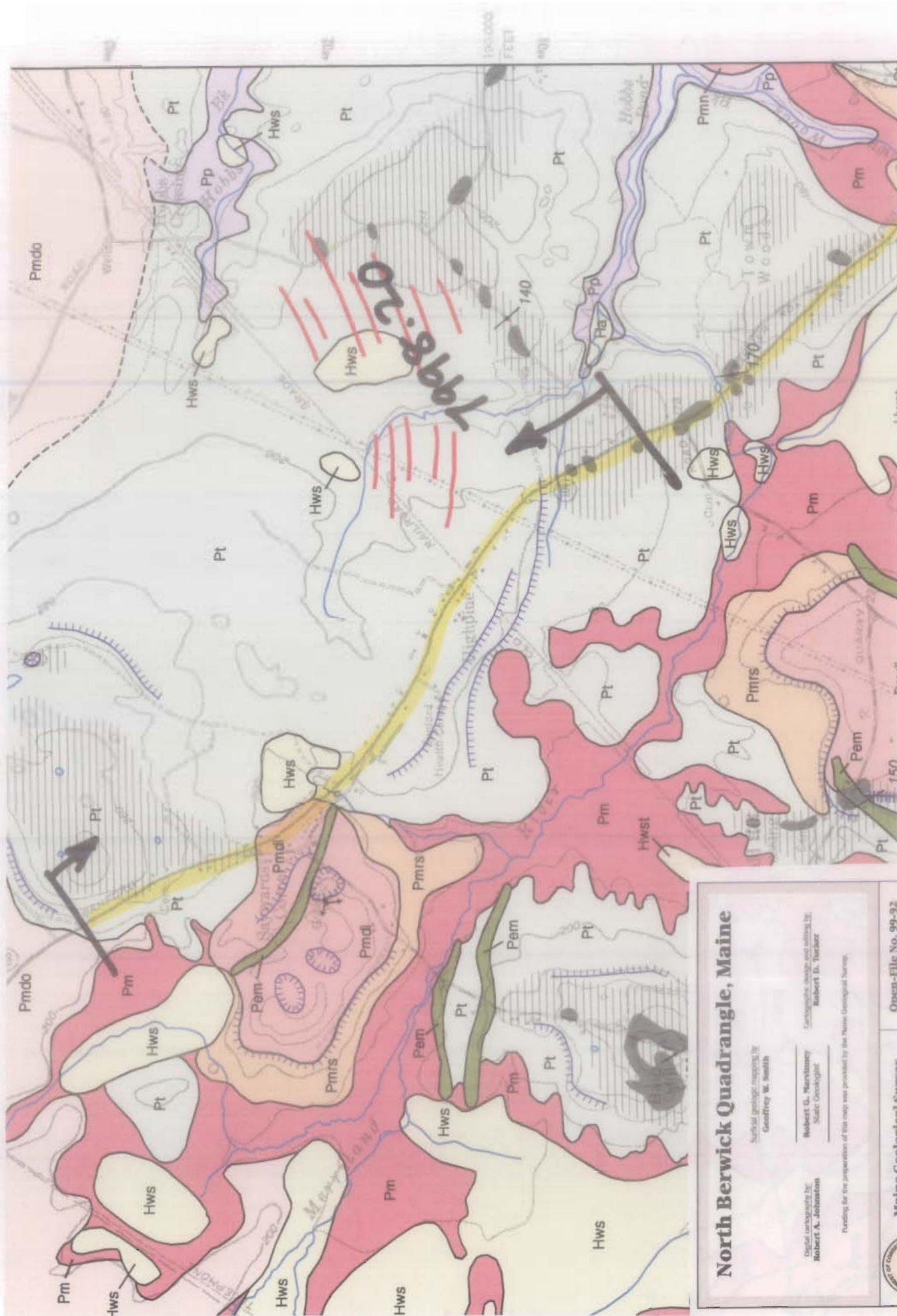
Address: 22 State House Station, Augusta, Maine 04333
Telephone: 207-287-2801 E-mail: mgsl@maine.gov
Home page: <http://www.maine.gov/maine/mgs.htm>

Open-File No. 99-92

1999

For additional information,
see Open-File Report 99-123.





North Berwick Quadrangle, Maine

Geoffrey W. Smith

Geoffrey W. Smith

Digital cartography by:
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Robert D. Turcher

Funding for the preparation of this study was provided by the Native Geological Survey.

Maine Geological Survey

Open-File No. 99-92

Address: 2.1 State House Station, Augusta, Maine 04333
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Home page: <http://www.maine.gov/doc/lrr/maine.html>

1999
For additional information,
see Open Film Request 99-113.



WELLS QUADRANGLE

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called boulders, sand and gravel, or clay, which overlie solid ledge (bedrock)). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

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5. Thompson, W. B., and Burns, H. W., Jr., 1985. Surficial geologic map of Maine. Maine Geological Survey, scale 1:500,000.
6. Thompson, W. B., Crossen, K. J., Burns, H. W., Jr., and Anderson, B. G. 1989. Glacimarine deltas of Maine and their relation to last Pleistocene-Holocene crustal movements, in Anderson, W. A., and Burns, H. W., Jr. (eds.), Neotectonics of Maine. Maine Geological Survey, Bulletin 40, p. 43-67.

Ha	Stream alluvium - Gray to brown fine sand and silt with some gravel. Comprises flood plains along present streams and rivers. Extent of alluvium approximates areas of potential flooding.	Prnd	Marine delta - Coarse sand and gravel grading to sand and silt. Flat to gently sloping, constructional surface formed by glacial streams discharging into late glacial sea. Deltas of marine sediments (Pnd) commonly grade into glacial-marine sediment (Pp, Pms).
He	Eolian deposits - Sand dunes resulting from wind erosion of modern beach sediments.	Pnd	End moraine - Coarse gravel and sand, some till and silt. Generally occurs within glacial-marine sediments (Pp, Pms) and is completely interstratified with them. Formed at or near the ice front during retreat of marine-based glacier. Sediments commonly display significant deformation. Typically 5 to 10 m thick.
Hwe	Wetland, swamp - Muck, peat, silt, and sand. Poorly drained areas, often with standing water.	Pp	Till - Gray to gray brown poorly sorted mixture of silt, sand, pebbles, cobbles, and boulders. Forms a blanket deposit over bedrock and is inferred to underlie younger sediments where not exposed at surface. Thin over topographic highs; thickens in topographic lows. May occur in and over end moraines (Pm). Averages 3 to 5 m in thickness.
Hwsm	Wetland, saltmarsh - Muck, peat, silt, and sand. Coastal settings subject to tidal fluctuation.	Pp	Bedrock - Rock units not distinguished. Individual outcrops not shown in large areas of poor access. Bold pattern indicates a zone where surficial materials are thin (less than 1 to 3 m) and bedrock exposures are common. Areas of bedrock exposure (gray areas) are mapped in part from aerial photographs.
Hms	Marine shoreline deposit, beach - Sand, some gravel, and minor silt. Coastal settings of active beach construction.	Pp	Artificial fill - Man-made landfill.
Pm	Marine deposits (undifferentiated) - Pp and/or Pms deposits mapped in areas of poor access or poor exposure, or where both units occur at areas too small to be mapped separately. Thickness variable within range described for Pp and Pms.	Pp	Contact - Boundary between map units (dashed where approximate).
Pms	Marine nearshore deposits - Areas of till that have been reworked by the sea during regressive phase of marine submergence. Till has had finer constituent (silt and sand) removed and redeposited as thin veneer over till. Bedrock commonly at shallow depth. Average thickness probably less than 3 m. Locally, this unit may include marine clay and sand, as well as isolated boulders.	Pp	End moraine - Ridge of sand and gravel or till deposited at margin of glacier. May be largely buried by younger sediments.
Pms	Marine regressive sand deposits - Massive to stratified and cross-stratified, well sorted brown to gray-brown sand. Generally with gradational basal contact to Pp. Thickness between 1 and 5 m. Deposited during regressive phase of marine submergence.	Pp	Asymmetry of glacial striation
Pp	Presumpscot Formation - Massive to laminated gray and blue-gray (weathering brown) silt and silty clay. Locally may contain boulders, sand, and gravel. Occurs as blanket deposit over bedrock and older glacial sediments. Variable thickness from less than 1 m to more than 50 m. Deposited during period of late-glacial marine submergence.	Pp	Scarp - Symbol indicates scarps formed by stream erosion, or by marine erosion during period of higher sea level. Ticks are on down-slope side of scarp line.
Pms	Marine shoreline deposit - Predominantly sand with minor gravel. Beach deposits formed during period of stillstand or regressive phase of marine submergence. Thickness generally less than 3 m in beach ridges.	Pp	Area of many large boulders

Marine basal locality

*NOTE: Wetland symbols followed by "r" indicate areas where peat deposits probably do not constitute a significant commercial resource, either because they are thin (< 1.5 m), or they have an ash content greater than 25 percent. Symbols followed by "p" indicate peat deposits that are thicker (generally > 1.5 m), with ash content less than 25 percent, and thus may be suitable for commercial applications.

NORTH BERWICK QUADRANGLE

Ha	Stream alluvium - Gray to brown fine sand and silt with some gravel. Comprises flood plains along present streams and rivers. Extent of alluvium approximates areas of potential flooding.
Hwfm	Freshwater marsh* - Poorly drained freshwater grassland.
Hwh	Wetland, heath* - Mosses, grasses and sedges are the dominant vegetation found here. Peat thickness varies considerably. Standing water is common.
Hws	Wetland, swamp* - Muck, peat, silt, and sand. Poorly drained areas, often with standing water.
Pm	Marine deposits (undifferentiated) - Pp and/or Pms deposits mapped in areas of poor access or poor exposure, or where both units occur as areas too small to be mapped separately. Thickness variable within maps described for Pp and Pms.
Pms	Marine nearshore deposits - Areas of fill that have been reworked by the sea during regressive phase of marine submergence. Till has had finer constituents (silt and sand) removed and redeposited as thin veneers over fill. Bedrock commonly at shallow depth. Average thickness probably less than 3 m. Locally, this unit may include marine clay and sand, as well as inshore boulders.
Pms	Marine regressive sand deposits - Massive to stratified and cross-stratified, well sorted brown to gray-brown sand. Generally with gradational basal contact to Pp. Thickness between 1 and 5 m. Deposited during regressive phase of marine submergence.
Pp	Presumpscot Formation - Massive to laminated gray and blue-gray (weathering brown) silt and silty clay. Locally may contain boulders, sand, and gravel. Occurs as blanket deposit over bedrock and older glacial sediments. Variable thickness from less than 1 m to more than 50 m. Deposited during period of late-glacial marine submergence.
Pmd	Marine delta - Coarse sand and gravel grading to sand and silt. Flat to gently sloping constructional surface formed by glacial streams discharging into late glacial sea. Heads of deltas are commonly kirtled (Pmd) and mark ice frontal positions. Sediments in distal portions of deltas (Pmdo) commonly grade into glacial marine sediments (Pp, Pms). Variable thickness from more than 30 m at delta head to less than 1 m at delta toe.
Pp	Ice-contact deposits (undifferentiated) - Coarse gravel and sand in areas not mapped as deltas or Pp. Primarily kirtled glacial errand deposits in the immediate vicinity of eskers (Pp). Average thickness probably between 10 and 15 m.
Pp	Esker - Coarse gravel and sand comprising distinct linear ridge forms, mostly in major valleys. Generally surrounded by Pp deposits and terminating in ice-contact deltas (Pmd). May be more than 10 m thick.
Pms	End moraine - Coarse gravel and sand, some till and silt. Generally occur with glacial marine sediments (Pp, Pms) and are completely interstratified with them. Formed at or near the ice front during retreat of marine-based glacier. Sediments commonly display significant deformation. Commonly 5 to 10 m thick.

Pp	Till - Gray to gray-brown poorly sorted mixture of silt, sand, pebbles, cobbles, and boulders. Forms a blanket deposit over bedrock, and is inferred to underlie younger sediments where not exposed at surface. Thin over topographic high; thickens in topographic lows. May occur in and over end moraines (Pm, Pms). Averages 3 to 5 m in thickness.
	Bedrock - Rock units not distinguished. Individual outcrop not shown in large areas of poor access. Ruled pattern indicates areas where surficial materials are thin (less than 1 to 2 m) and bedrock exposures are common. Areas of bedrock exposure (gray areas) are mapped in part from aerial photographs.
	Contact - boundary between map units (dashed where approximate).
	End moraine - ridge of sand and gravel or till deposited at margin of glacier. May be largely buried by younger sediments.
	Scarp - symbol indicates scarps formed by stream erosion, or by marine erosion during period of higher sea level, as well as constructional scarps on delta margin. Ticks are on down-slope side of scarp line.
	Kirtlehole
	Meltwater channel
	Glacially streamlined hill (drumlin)
	Ice margin position - Line shows approximate position of the glacier margin during ice retreat, based on positions of meltwater channels and/or moraine deposits.
	Asimuth of glacial striation
	Glacial marine delta - Number is surveyed elevation (in feet) of late-glacial sea level indicated by contact between delta topset and foreset beds (from Thompson and others, 1989), and W. Thompson / C. Kottel unpublished data).
	Asimuth of current gitta in glacial fluvial deposits

*NOTE: Wetland symbols followed by "r" indicate areas where peat deposits probably do not constitute a significant commercial resource, either because they are thin (< 1.5 m), or they have an ash content greater than 25 percent. Symbols followed by "p" indicate peat deposits that are thicker (generally > 1.5 m), with ash content less than 25 percent, and thus may be suitable for commercial applications.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie the solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill for other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful in the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of suitable landfill sites or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

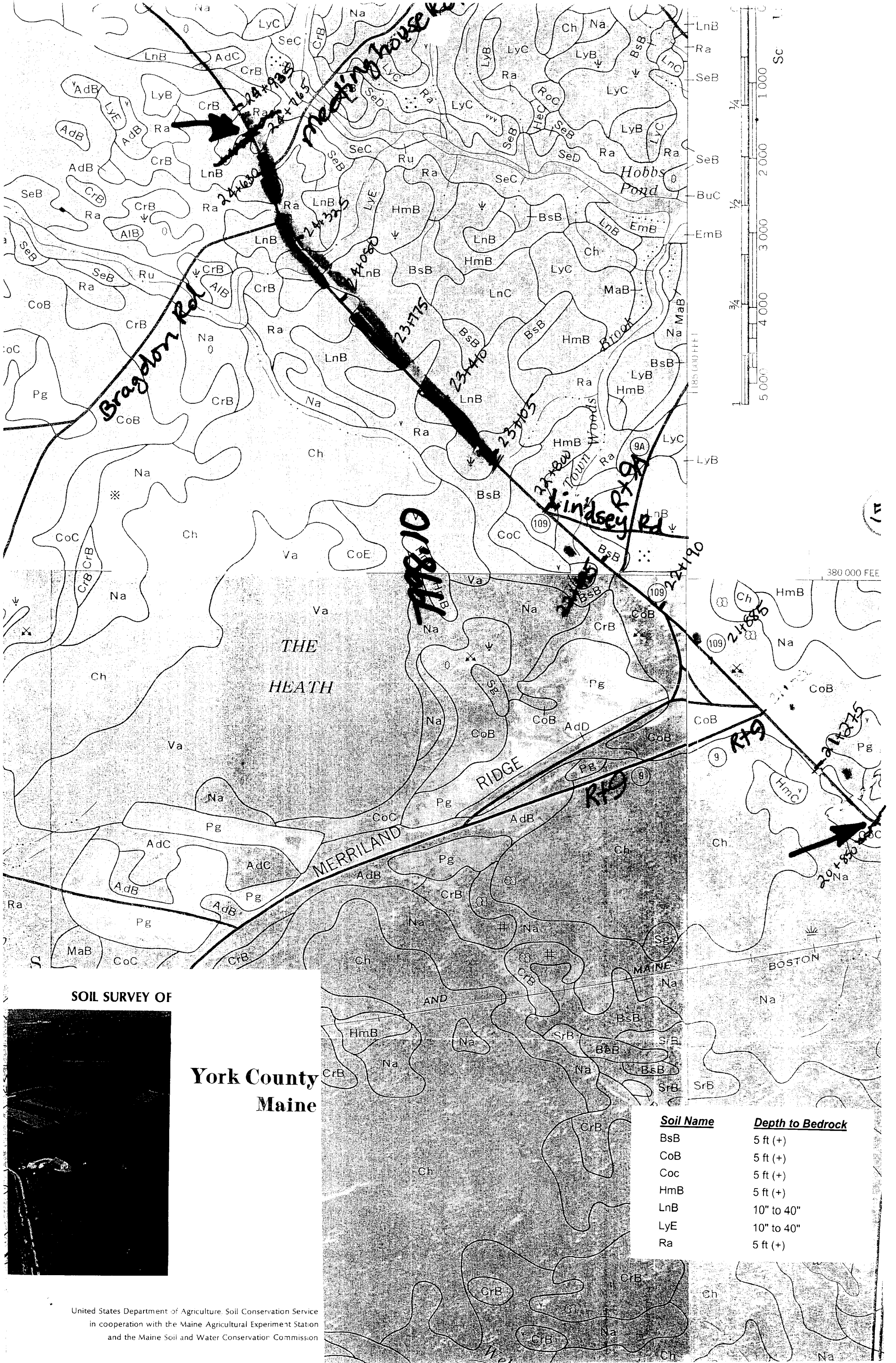
OTHER SOURCES OF INFORMATION

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- Smith, G. W., 1998. Surficial materials of the North Berwick quadrangle, Maine. Maine Geological Survey, Open-File Map 98-163.
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- Thompson, W. B., 1979. Surficial geology handbook for coastal Maine. Maine Geological Survey, 68 p. (out of print).
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- Thompson, W. B., Coates, K. J., Burns, H. W., Jr., and Anderson, J. G., 1989. Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene coastal movements. In Anderson, W. A., and Burns, H. W., Jr. (eds.), Neotectonics of Maine. Maine Geological Survey Bulletin 60, p. 43-67.

SOIL SURVEY OF

**York County
Maine**

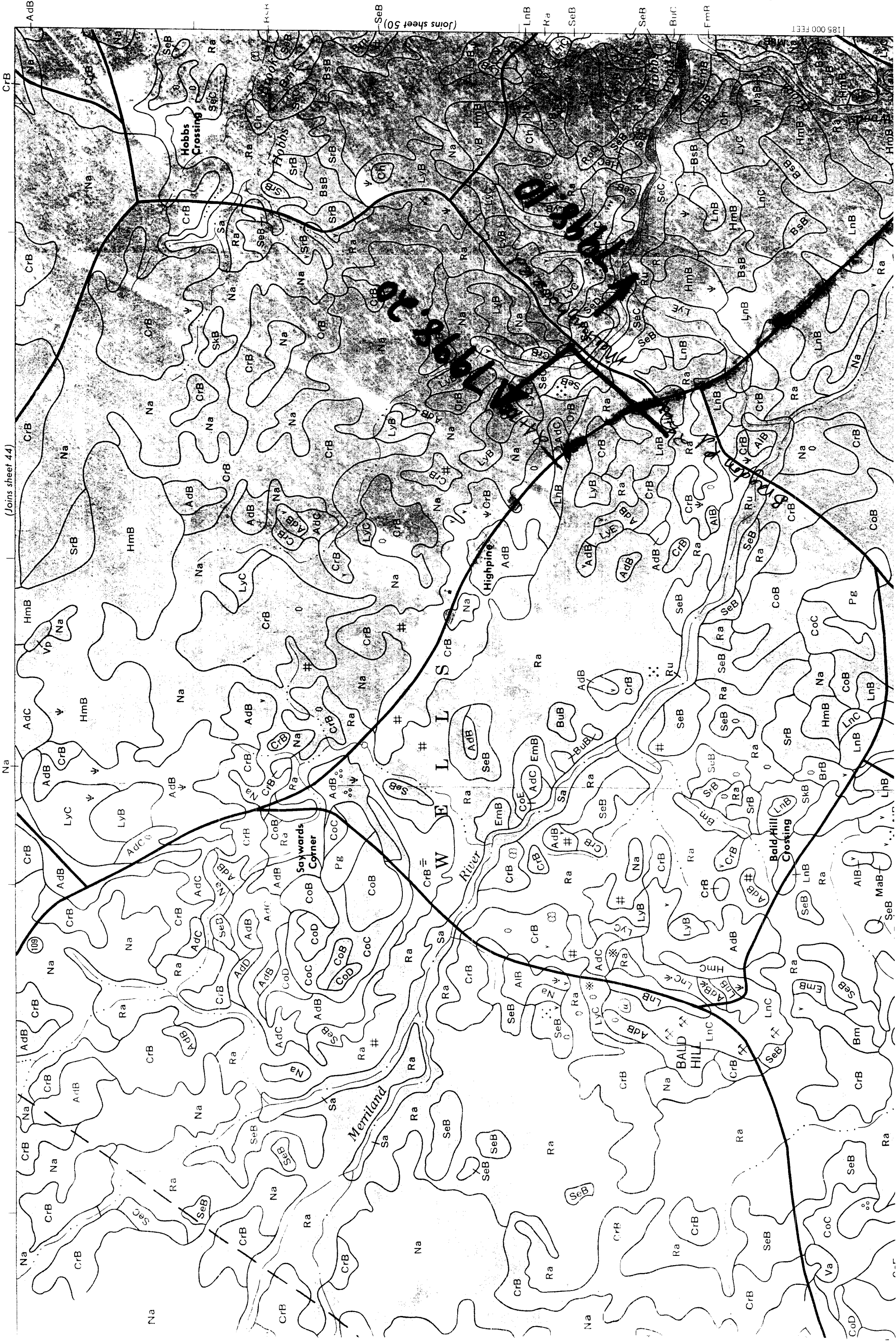




SOIL SURVEY OF

York County
Maine

Soil Name	Depth to Bedrock
BsB	5 ft (+)
CoB	5 ft (+)
Coc	5 ft (+)
HmB	5 ft (+)
LnB	10" to 40"
LyE	10" to 40"
Ra	5 ft (+)



Scale 1:20000



SOIL LEGEND

The first letter, always a capital, is the initial letter of the soil name.
The second letter is usually a small letter but is a capital letter if the unit is broadly defined. The third letter, A, B, C, D, or E, is the slope class.
Most symbols without a letter for slope class are for nearly level soils but four are for units containing miscellaneous areas. The number 2 shows that the soil is eroded.

SYMBOL	NAME	SYMBOL	NAME
AdB	Adams loamy sand, 0 to 8 percent slopes	LnC	Lyman fine sandy loam, 3 to 8 percent slopes
AdC	Adams loamy sand, 8 to 15 percent slopes	LnD	Lyman fine sandy loam, 15 to 25 percent slopes
AdD	Adams loamy sand, 15 to 40 percent slopes	LyB	Lyman fine sandy loam, 8 to 15 percent slopes
AgB	Adams-Urban land complex, 0 to 8 percent slopes	LyC	Lyman-Rock outcrop complex, 8 to 15 percent slopes
AlB	Allagash very fine sandy loam, 3 to 8 percent slopes	LyD	Lyman-Rock outcrop complex, 15 to 80 percent slopes
AlC	Allagash very fine sandy loam, 8 to 15 percent slopes		
Ba	Beaches	MaB	Madawaska fine sandy loam, 0 to 8 percent slopes
BcB	Becket fine sandy loam, 3 to 8 percent slopes	MrB	Marlow fine sandy loam, 3 to 8 percent slopes
BcC	Becket fine sandy loam, 8 to 15 percent slopes	MrC	Marlow fine sandy loam, 15 to 25 percent slopes
BcD	Becket fine sandy loam, 15 to 25 percent slopes	MrD	Marlow fine sandy loam, 25 to 40 percent slopes
BeB	Becket very stony fine sandy loam, 3 to 8 percent slopes	MvB	Marlow very stony fine sandy loam, 3 to 8 percent slopes
BeC	Becket very stony fine sandy loam, 8 to 15 percent slopes	MvC	Marlow very stony fine sandy loam, 15 to 25 percent slopes
BeD	Becket very stony fine sandy loam, 15 to 25 percent slopes	MvD	Marlow very stony fine sandy loam, 25 to 40 percent slopes
BrB	Bridleford mucky peat		
BrC	Brayton and Westbury fine sandy loams, 0 to 8 percent slopes	Na	Naumburg sand
BuB	Buxton silt loam, 3 to 8 percent slopes	On	Ondawa fine sandy loam
BuC	Buxton silt loam, 8 to 15 percent slopes	PeB	Peru fine sandy loam, 0 to 8 percent slopes
BuD	Buxton silt loam, 15 to 25 percent slopes	Pg	Pitts, gravel
Ch	Chocoma peat	Po	Podunk and Winooski soils
ClB	Clinton gravelly loamy coarse sand, 0 to 8 percent slopes	RnC	Rock outcrop-Lyman complex, 8 to 15 percent slopes
ClC	Clinton gravelly loamy coarse sand, 8 to 15 percent slopes	RoE	Rock outcrop-Lyman complex, 15 to 80 percent slopes
ClD	Clinton gravelly loamy coarse sand, 15 to 25 percent slopes	Ru	Runney loam
CoE	Croghan loamy sand, 0 to 8 percent slopes	Sa	Saco mucky silt loam
CuB	Croghan-Urban land complex, 0 to 8 percent slopes	Sc	Scantic silt loam
Dm	Dumps	SeB	Scioto silt loam, 3 to 8 percent slopes
EmB	Elmwood fine sandy loam, 0 to 8 percent slopes	SeC	Scioto silt loam, 8 to 15 percent slopes
EmC	Elmwood fine sandy loam, 8 to 15 percent slopes	SeD	Scioto silt loam, 15 to 25 percent slopes
HeB	Hermon fine sandy loam, 3 to 8 percent slopes	Sg	Seabago peat
HeC	Hermon fine sandy loam, 8 to 15 percent slopes	SkB	Skerry fine sandy loam, 0 to 8 percent slopes
HeD	Hermon fine sandy loam, 15 to 25 percent slopes	SkC	Skerry fine sandy loam, 8 to 15 percent slopes
HmB	Hermon very stony fine sandy loam, 3 to 8 percent slopes	SkD	Skerry very stony fine sandy loam, 0 to 8 percent slopes
HmC	Hermon very stony fine sandy loam, 8 to 15 percent slopes	Su	Sulfurhills, frequently flooded
HmD	Hermon extremely stony fine sandy loam, 15 to 25 percent slopes	UD	Udipsamments-Dune land complex
HnC	Hermon extremely stony fine sandy loam, 3 to 15 percent slopes	Ur	Urban land
HnE	Hermon extremely stony fine sandy loam, 15 to 60 percent slopes	USA	Urban land-Scantic complex, 0 to 3 percent slopes
		Va	Vassalboro peat
		Vp	Vassalboro peat, ponded
		Wa	Waskish peat

CONVENTIONAL AND SPECIAL
SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

National, state or province	---
County or parish	---
Minor civil division	---
Reservation (national forest or park, state forest or park, and large airport)	---
Land grant	---
Limit of soil survey (label)	---
Field sheet matchline & neatline	---

AD HOC BOUNDARY (label)

Small airport, airfield, park, oil field, cemetery, or flood pool	---
STATE COORDINATE TICK	---

LAND DIVISION CORNERS (sections and land grants)

Divided (median shown if scale permits)	---
Other roads	---
Trail	---

ROAD EMBLEMS & DESIGNATIONS

Interstate	---
Federal	---
State	---
County, farm or ranch	---

RAILROAD
ABANDONED
POWER TRANSMISSION LINE
(normally not shown)

PIPELINE (normally not shown)	---
FENCE (normally not shown)	---
LEVEES	---

Without road

With road

With railroad

DAMS

Large (to scale)

Medium or small

PITS

Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

Farmstead, house (omit in urban areas)	---
Church	---
School	---
Indian mound (label)	---
Located object (label)	---
Tank (label)	---
Wells, oil or gas	---
Windmill	---
Kitchen midden	---

WATER FEATURES

DRAINAGE

Perennial, double line	---
Perennial, single line	---
Intermittent	---
Drainage end	---
Canals or ditches	---
Double-line (label)	---
Drainage and/or irrigation	---

LAKES, PONDS AND RESERVOIRS

Perennial	---
Intermittent	---

MISCELLANEOUS WATER FEATURES

Marsh or swamp	---
Spring	---
Well, artesian	---
Well irrigation	---

SPECIAL SYMBOLS FOR
SOIL SURVEY
SOIL DELINEATIONS AND
SYMBOLS

ESCARPMENTS	---
Bedrock (points down slope)	---
Other than bedrock (points down slope)	---
SHORT STEEP SLOPE	---
GULLY	---

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

MISCELLANEOUS

Blowout	---
Clay spot	---
Gravelly spot	---
Gumbo, slick or scabby spot (sodic)	---
Dumps and other similar non soil areas	---
Prominent hill or peak	---
(includes sandstone and shale)	---
Saline spot	---
Severely eroded spot	---
Slide or slip (tips point upslope)	---
Stony spot, very stony spot	---
Glacial till spot	---

TABLE 14.--ENGINEERING INDEX PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth In	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
BeB, BeC, BeD----- Becket	0-2	Very stony fine sandy loam.	SM	A-2, A-4	10-20	85-95	80-90	55-75	30-50	---	---
	2-23	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	70-90	60-85	50-75	25-40	---	---
	23-60	Gravelly loamy sand, gravelly loamy fine sand, gravelly sandy loam.	SM, SP-SM, GM, GP-GM	A-2	5-15	60-85	55-75	25-70	10-30	---	---
Bm----- Biddeford	14-0	Mucky peat-----	Pt	A-8	---	---	---	---	---	---	---
	0-5	Silt loam, silty clay loam, silty clay.	ML, MH, OL	A-4, A-6, A-7	0	100	100	90-100	85-100	30-62	5-25
	5-36	Silty clay, silty clay loam, clay.	CL, CL-ML, MH, ML	A-6, A-7, A-4, A-5	0	100	100	95-100	90-100	25-54	5-20
	36-60	Silty clay loam, silty clay, clay.	CL, CL-ML, MH, ML	A-6, A-4	0	100	100	95-100	90-100	25-40	5-15
BrB*: Brayton-----	0-5	Fine sandy loam	SM, ML, OL	A-1, A-2, A-4	0-15	80-90	75-90	45-90	20-80	<15	NP-4
	5-11	Gravelly fine sandy loam, gravelly sandy loam, silt loam.	GM, ML, SM	A-2, A-4, A-1	0-15	55-95	50-90	30-90	15-80	<15	NP-4
	11-60	Gravelly fine sandy loam, very gravelly sandy loam, loam.	GM, SM, GM-GC, ML	A-2, A-4, A-1	0-15	45-75	40-90	25-85	10-70	<15	NP-4
Westbury-----	0-4	Fine sandy loam	SM, OL, ML	A-2, A-4, A-1	0-5	80-95	75-90	45-75	20-60	<15	NP-4
	4-23	Gravelly loam, silt loam, gravelly sandy loam.	SM, GM, ML	A-2, A-4, A-1	0-5	55-95	50-90	30-90	15-80	<15	NP-4
	23-36	Gravelly sandy loam, very gravelly fine sandy loam, loam.	SM, GM, GW-GM, ML	A-1, A-2, A-4	0-5	40-90	35-85	20-80	10-65	<15	NP-4
	36-60	Gravelly sandy loam, very gravelly fine sandy loam, loam.	GM, GW-GM, SM, ML	A-1, A-2, A-4	0-5	40-90	35-85	20-80	10-65	<15	NP-4
BsB*: Brayton-----	0-5	Very stony fine sandy loam.	GM, SM, ML, OL	A-4, A-1, A-2	5-20	55-80	50-75	30-75	15-70	<15	NP-4
	5-11	Gravelly fine sandy loam, gravelly sandy loam, silt loam.	GM, ML, SM	A-2, A-4, A-1	0-15	55-95	50-90	30-90	15-80	<15	NP-4
	11-60	Gravelly fine sandy loam, very gravelly sandy loam, loam.	GM, SM, ML, GW-GM	A-2, A-4, A-1	0-15	45-95	40-90	25-85	10-70	<15	NP-4

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>				<u>Pct</u>					<u>Pct</u>	
BuB*: Westbury-----	0-4	Very stony fine sandy loam.	SM, ML, GM	A-2, A-4, A-1	5-10	55-80	50-75	30-75	15-70	<15	NP-4
	4-23	Gravelly loam, silt loam, gravelly sandy loam.	SM, GM, ML	A-2, A-4, A-1	0-5	55-95	50-90	30-90	15-80	<15	NP-4
	23-36	Gravelly sandy loam, very gravelly fine sandy loam, loam.	SM, GM, GW-GM, ML	A-1, A-2, A-4	0-5	40-90	35-85	20-80	10-65	<15	NP-4
	36-60	Gravelly sandy loam, very gravelly fine sandy loam, loam.	GM, GW-GM, SM, ML	A-1, A-2, A-4	0-5	40-90	35-85	20-80	10-65	<15	NP-4
BuB, BuC, BuD----- Buxton	0-7	Silt loam-----	ML, MH	A-4, A-6, A-7, A-5	0	98-100	95-100	95-100	85-100	36-55	5-20
	7-19	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7, A-5	0	98-100	95-100	95-100	85-100	25-55	5-20
	19-60	Silty clay, silty clay loam, clay.	CL, CL-ML, ML	A-6, A-4	0	98-100	95-100	95-100	90-100	25-40	5-15
Ch----- Chocorua	0-32	Peat-----	Pt	A-8	0	---	---	---	---	---	---
	32-60	Gravelly sand, loamy sand, loamy fine sand.	SP, SM	A-1, A-3	0	100	60-100	30-80	0-30	---	NP
CoB, CoC, CoD, CoE----- Colton	0-10	Gravelly loamy coarse sand.	SM, SP, GW, GM	A-1, A-2, A-3	5-20	30-80	25-75	25-60	2-25	---	NP
	10-18	Gravelly loamy sand, very gravelly sand, cobbly sand.	SM, GM, SP, GP	A-1, A-2, A-3	5-20	30-80	25-75	20-50	2-20	---	NP
	18-60	Very gravelly sand, very cobbly sand.	GP, SP, GW, SW	A-1	10-45	20-55	15-50	10-30	0-5	---	NP
CrB----- Croghan	0-7	Loamy sand-----	SM, SP-SM, SW-SM	A-1, A-3, A-4, A-2	0	95-100	95-100	45-80	5-40	---	NP
	7-28	Sand, loamy sand, loamy fine sand.	SM, SP-SM, SW-SM	A-1, A-2, A-3, A-4	0	90-100	85-100	45-80	5-40	---	NP
	28-60	Sand, loamy sand	SM, SP-SM, SW-SM	A-1, A-2, A-3	0	90-100	85-100	45-75	5-30	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth In	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
CuB*: Croghan-----	0-7	Loamy sand-----	SM, SP-SM, SW-SM	A-1, A-3, A-4, A-2	0	95-100	95-100	45-80	5-40	---	NP
	7-28	Sand, loamy sand, loamy fine sand.	SM, SP-SM, SW-SM	A-1, A-2, A-3, A-4	0	90-100	85-100	45-80	5-40	---	NP
	28-60	Sand, loamy sand	SM, SP-SM, SW-SM	A-1, A-2, A-3	0	90-100	85-100	45-75	5-30	---	NP
Urban land.											
Dm*, Dumps											
EmB, EmC----- Elmwood	0-14	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	55-85	30-55	<30	NP
	14-20	Sandy loam, fine sandy loam, silt loam.	SM, ML	A-2, A-4	0	100	95-100	55-95	30-75	<30	NP
	20-60	Silty clay loam, clay loam, clay.	CL, CH	A-7, A-6	0	100	100	90-100	90-100	35-55	15-30
HeB, HeC, HeD----- Hermon	0-6	Fine sandy loam	SM	A-2, A-4	0-5	85-95	75-90	55-80	25-45	<40	NP-10
	6-19	Gravelly coarse sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	SM	A-1, A-2 A-4	20-35	70-90	50-75	30-60	15-40	<40	NP-10
	19-60	Gravelly loamy coarse sand, very gravelly loamy sand.	SP-SM, SM GP-GM GM	A-1, A-2 A-3	20-40	45-80	40-70	20-55	5-25	---	NP
HmB, HmC, HmD----- Hermon	0-4	Very stony fine sandy loam.	SM	A-1, A-2 A-4	5-35	70-95	50-90	30-80	15-45	<40	NP-10
	4-19	Gravelly coarse sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	SM	A-1, A-2 A-4	20-35	70-90	50-75	30-60	15-40	<40	NP-10
	19-60	Gravelly loamy coarse sand, very gravelly loamy sand.	SP-SM, SM GP-GM, GM	A-1, A-2 A-3	20-40	45-80	40-70	20-55	5-25	---	NP
HnC, HnE----- Hermon	0-4	Extremely stony fine sandy loam.	SM	A-1, A-2 A-4	20-50	70-95	50-90	30-80	15-45	<40	NP-10
	4-19	Gravelly coarse sandy loam, gravelly fine sandy loam, very gravelly sandy loam.	SM	A-1, A-2 A-4	20-35	70-90	50-75	30-60	15-40	<40	NP-10
	19-60	Gravelly loamy coarse sand, very gravelly loamy sand.	SP-SM, SM GP-GM, GM	A-1, A-2 A-3	20-40	45-80	40-70	20-55	5-25	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES AND CLASSIFICATIONS

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated.
NP = nonplastic]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AdB, AdC, AdD----- Adams	0-3	Loamy sand-----	SM, SP-SM	A-1, A-2, A-3, A-4	0	95-100	95-100	45-85	5-40	---	NP
	3-18	Loamy sand, sand, loamy fine sand.	SM, SP-SM	A-1, A-2, A-3, A-4	0	95-100	95-100	35-95	5-40	---	NP
	18-60	Sand, coarse sand.	SP-SM, SW-SM, SP	A-1, A-2, A-3	0-1	90-100	70-100	20-90	0-10	---	NP
AgB#: Adams-----	0-3	Loamy sand-----	SM, SP-SM	A-1, A-2, A-3, A-4	0	95-100	95-100	45-85	5-40	---	NP
	3-18	Loamy sand, sand, loamy fine sand.	SM, SP-SM	A-1, A-2, A-3, A-4	0	95-100	95-100	35-95	5-40	---	NP
	18-60	Sand, coarse sand.	SP-SM, SW-SM, SP	A-1, A-2, A-3	0-1	90-100	70-100	20-90	0-10	---	NP
in land. AlB, AlC----- Allagash	0-7	Very fine sandy loam.	SM, ML	A-4, A-5	0	95-100	95-100	65-100	40-90	<44	NP-9
	7-20	Fine sandy loam, loam.	SM, ML	A-2, A-4	0	95-100	75-100	50-95	30-75	---	NP
	20-38	Fine sand, loamy fine sand, sand.	SM, SP-SM	A-2, A-1, A-3	0	85-100	75-100	35-80	5-35	---	NP
	38-60	Stratified loamy fine sand to very gravelly sand.	SP, SM, SW	A-1, A-2, A-3	0-10	70-100	25-100	10-75	0-30	---	NP
Ba#. Beaches											
BcB, BcC, BcD----- Becket	0-6	Fine sandy loam	SM	A-2, A-4	0-15	85-95	55-90	35-75	20-50	---	---
	6-23	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	5-15	70-90	60-85	50-75	25-40	---	---
	23-60	Gravelly loamy sand, gravelly loamy fine sand, gravelly sandy loam.	SM, SP-SM, GM, GP-GM	A-2	5-15	60-85	55-75	25-70	10-30	---	---

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
LnB, LnC, LnD----- Lyman	0-4	Fine sandy loam	SM, ML	A-2, A-4	0-15	80-95	70-90	45-85	25-70	<30	NP-6
	4-18	Loam, gravelly sandy loam, very fine sandy loam.	SM, ML, GM	A-2, A-4	0-15	65-95	60-85	45-80	25-70	<30	NP-4
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
LyB*, LyC*, LyE*: Lyman-----	0-4	Fine sandy loam	SM, ML	A-2, A-4	0-15	80-95	70-90	45-85	25-70	<30	NP-6
	4-18	Loam, gravelly sandy loam, very fine sandy loam.	SM, ML, GM	A-2, A-4	0-15	65-95	60-85	45-80	25-70	<30	NP-4
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
MaB----- Madawaska	0-10	Fine sandy loam	SM, ML	A-4	0	100	85-100	65-95	35-75	---	NP
	10-23	Fine sandy loam, sandy loam.	SM, ML	A-4	0	100	85-100	65-95	35-75	---	NP
	23-60	Fine sand, sand, very fine sand.	SM, SP-SM	A-2, A-3 A-4	0	100	85-100	50-80	5-45	---	NP
MrB, MrC2, MrD2---- Marlow	0-9	Fine sandy loam	CL-ML, SM, ML	A-2, A-4	0-5	80-95	70-90	55-85	30-60	<30	NP-8
	9-29	Fine sandy loam, loam, gravelly sandy loam.	ML, CL-ML, SM, ML	A-2, A-4	0-15	70-95	60-90	50-85	30-60	<30	NP-8
	29-60	Fine sandy loam, loam, gravelly sandy loam.	CL-ML, SM ML	A-2, A-4	0-15	70-90	60-85	50-80	25-55	<30	NP-8
MvB, MvC, MvD----- Marlow	0-2	Very stony fine sandy loam.	CL-ML, SM ML	A-2, A-4	5-15	80-95	70-90	55-85	30-60	<30	NP-8
	2-29	Fine sandy loam, loam, gravelly sandy loam.	CL-ML, SM ML	A-2, A-4	5-15	70-95	60-90	50-85	30-60	<30	NP-8
	29-60	Fine sandy loam, loam, gravelly sandy loam.	CL-ML, SM ML	A-2, A-4	5-15	70-90	60-85	50-80	25-55	<30	NP-8
Na----- Naumburg	0-5	Sand-----	SM, SW-SM, SP-SM	A-2, A-4	0	95-100	95-100	50-85	5-45	---	NP
	5-28	Loamy fine sand, fine sand, sand.	SM, SW-SM, SP-SM	A-1, A-2, A-3	0	90-100	90-100	45-85	5-35	---	NP
	28-60	Sand, fine sand, loamy fine sand.	SM, SW-SM, SP-SM	A-1, A-2, A-3	0	90-100	90-100	45-80	5-35	---	NP
On----- Ondawa	0-9	Fine sandy loam	SM, ML	A-2, A-4	0	100	95-100	60-100	30-60	<40	NP
	9-30	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0	100	95-100	80-95	20-70	<40	NP
	30-60	Loamy fine sand, fine sand, sand.	SP, SM	A-2, A-3	0	90-100	80-100	70-90	0-35	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES AND CLASSIFICATIONS--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct						
PeB----- Peru	0-9	Fine sandy loam	SM, ML, CL-ML	A-2, A-4	0-10	80-95	70-90	50-85	25-60	<30	NP-8
	9-20	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC, SM-SC	A-2, A-4	0-15	75-95	65-95	60-85	30-65	<30	NP-8
	20-60	Fine sandy loam, loam, gravelly sandy loam.	SM, ML, SC, SM-SC	A-2, A-4	0-15	70-90	60-90	55-85	20-60	<30	NP-8
Pg*. Pits											
Po*: Podunk-----	0-8	Silt loam-----	SM, ML	A-2, A-4	0	100	95-100	60-100	30-90	---	NP
	8-25	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0	100	95-100	60-95	30-75	---	NP
	25-60	Loamy fine sand, loamy sand, gravelly coarse sand.	SP-SM, SM	A-2, A-1, A-3	0	65-100	55-100	35-85	5-25	---	NP
Winooski-----	0-11	Very fine sandy loam.	ML, SM	A-4	0	100	95-100	90-100	40-90	<30	NP
	11-60	Silt loam, very fine sandy loam, loamy very fine sand.	ML, SM	A-4	0	100	95-100	90-100	40-90	<30	NP
Ra----- Raynham	0-6	Silt loam-----	ML	A-4	0	100	95-100	80-100	55-95	20-35	NP-10
	6-36	Silt loam, silt, very fine sandy loam.	ML	A-4	0	100	95-100	80-100	55-95	20-35	NP-10
	36-60	Silt loam, silt, very fine sandy loam, silty clay loam.	ML	A-4	0	100	95-100	80-100	55-95	20-35	NP-10
RoC*, RoE*: Rock outcrop.											
Lyman-----	0-2	Fine sandy loam	SM, ML	A-2, A-4	0-15	80-95	70-90	45-85	25-70	<30	NP-6
	2-18	Loam, gravelly sandy loam, very fine sandy loam.	SM, ML, GM	A-2, A-4	0-15	65-95	60-85	45-80	25-70	<30	NP-4
	18	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ru----- Rumney	0-9	Loam-----	ML, SM	A-4	0	100	85-100	70-100	40-85	<40	NP
	9-25	Fine sandy loam, sandy loam, loam.	SM, ML	A-2, A-4	0	100	85-100	50-95	25-75	<40	NP
	25-60	Stratified loamy fine sand to gravelly sand.	SP-SM, SM	A-1, A-2, A-3	0	80-100	55-95	25-70	5-30	<40	NP
Sa----- Saco	0-13	Mucky silt loam	ML, OL	A-4	0	100	100	95-100	70-95	<40	NP-10
	13-24	Silt loam, very fine sandy loam.	ML	A-4	0	100	90-100	80-100	55-95	<40	NP-10
	24-44	Silt loam, very fine sandy loam.	ML	A-4	0	100	90-100	80-100	50-95	<25	NP-5
	44-60	Coarse sand, gravelly sand.	SP, SM	A-1, A-2, A-3	0	80-100	50-85	35-70	0-15	---	NP

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density G/cm ³	Permeability In/hr	Available water capacity In/in	Soil reaction pH	Shrink-swell potential	Erosion factors		Organic matter Pct
								K	T	
dB, AdC, AdD----- Adams	0-3	0-5	1.10-1.40	6.0-20	0.05-0.10	4.5-5.5	Low-----	0.17	5	1-4
	3-18	0-5	1.25-1.55	6.0-20	0.04-0.08	4.5-5.5	Low-----	0.17		
	18-60	0-5	1.45-1.65	>20	0.03-0.04	4.5-6.0	Low-----	0.17		
gB*:----- Adams	0-3	0-5	1.10-1.40	6.0-20	0.05-0.10	4.5-5.5	Low-----	0.17	5	1-4
	3-18	0-5	1.25-1.55	6.0-20	0.04-0.08	4.5-5.5	Low-----	0.17		
	18-60	0-5	1.45-1.65	>20	0.03-0.04	4.5-6.0	Low-----	0.17		
Urban land.										
lB, AlC----- Allagash	0-7	3-13	0.95-1.25	2.0-6.0	0.16-0.22	4.5-6.5	Low-----	0.28	3	2-8
	7-20	2-12	1.20-1.50	2.0-6.0	0.08-0.24	4.5-6.5	Low-----	0.28		
	20-38	2-5	1.35-1.65	6.0-20	0.06-0.18	4.5-6.5	Low-----	0.28		
	38-60	1-4	1.40-1.70	6.0-20	0.01-0.10	4.5-6.5	Low-----	0.28		
3a*. Beaches										
3cB, BcC, BcD----- Becket	0-6	3-8	0.90-1.20	0.6-2.0	0.10-0.23	4.5-6.5	Low-----	0.20	3	3-7
	6-23	3-8	1.20-1.50	0.6-2.0	0.05-0.16	5.1-6.5	Low-----	0.28		
	23-60	1-4	1.65-1.80	0.06-0.6	0.03-0.09	5.1-6.5	Low-----	0.17		
BeB, BeC, BeD----- Be	0-2	3-8	0.90-1.20	0.6-2.0	0.10-0.23	4.5-6.5	Low-----	0.20	3	---
	2-23	3-8	1.20-1.50	0.6-2.0	0.05-0.16	5.0-6.5	Low-----	0.28		
	23-60	1-4	1.65-1.80	0.06-0.6	0.03-0.09	5.0-6.5	Low-----	0.17		
Bm----- Biddeford	14-0	---	0.10-0.30	2.0-6.0	0.20-0.43	5.1-6.5	---	---	---	---
	0-5	20-50	0.90-1.20	0.2-0.6	0.24-0.34	5.1-7.3	Low-----	---		
	5-36	35-55	1.60-1.80	<0.2	0.13-0.23	5.6-7.8	Moderate-----	---		
	36-60	35-55	1.70-1.95	<0.2	0.06-0.16	6.1-7.8	Moderate-----	---		
BrB*:----- Brayton	0-5	6-12	0.90-1.20	0.6-6.0	0.10-0.20	4.5-6.5	Low-----	0.28	3	2-8
	5-11	6-12	1.40-1.70	0.6-6.0	0.08-0.17	4.5-6.5	Low-----	0.24		
	11-60	6-12	1.70-2.00	<0.2	0.01-0.05	5.6-7.3	Low-----	0.24		
Westbury-----	0-4	3-12	0.90-1.20	0.6-2.0	0.08-0.16	3.6-6.0	Low-----	0.24	3	2-8
	4-23	3-12	1.40-1.70	0.6-2.0	0.07-0.15	3.6-6.0	Low-----	0.24		
	23-36	3-12	1.70-2.00	0.06-0.2	0.02-0.06	4.5-6.0	Low-----	0.24		
	36-60	3-12	1.70-2.00	0.06-0.2	0.02-0.06	5.1-7.3	Low-----	0.24		
BsB*:----- Brayton	0-5	6-12	0.90-1.20	0.6-6.0	0.08-0.17	4.5-6.5	Low-----	0.24	3	---
	5-11	6-12	1.40-1.70	0.6-6.0	0.08-0.17	4.5-6.5	Low-----	0.24		
	11-60	6-12	1.70-2.00	<0.2	0.01-0.05	5.6-7.3	Low-----	0.24		
Westbury-----	0-4	3-12	0.90-1.20	0.6-2.0	0.08-0.16	3.6-6.0	Low-----	0.24	3	2-8
	4-23	3-12	1.40-1.70	0.6-2.0	0.07-0.15	3.6-6.0	Low-----	0.24		
	23-36	3-12	1.70-2.00	0.06-0.2	0.02-0.06	4.5-6.0	Low-----	0.24		
	36-60	3-12	1.70-2.00	0.06-0.2	0.02-0.06	5.1-7.3	Low-----	0.24		
BuB, BuC, BuD----- Buxton	0-7	15-30	0.90-1.20	0.2-2.0	0.18-0.28	4.5-6.5	Low-----	0.28	3	4-7
	7-19	20-40	1.20-1.55	0.2-0.6	0.13-0.23	4.5-6.5	Low-----	0.49		
	19-60	35-55	1.75-1.95	<0.2	0.06-0.16	5.6-7.3	Moderate-----	0.49		
Ch----- Chocorua	0-32	---	<0.30	0.6-6.0	0.20-0.25	3.6-4.5	---	---	---	---
	32-60	---	<0.30	>6.0	0.01-0.11	4.5-6.0	---	---		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density G/cm ³	Permeability In/hr	Available water capacity In/in	Soil reaction pH	Shrink-swell potential	Erosion factors		Organic matter Pct
								K	T	
CoB, CoC, CoD, CoE----- Colton	0-10 10-18 18-60	1-5 1-5 0-3	1.10-1.40 1.25-1.55 1.45-1.65	>6.0 >6.0 >20	0.03-0.07 0.02-0.05 0.01-0.02	3.6-5.0 4.5-5.5 4.5-6.0	Low----- Low----- Low-----	0.17 0.17 0.17	3	3-7
CrB----- Croghan	0-7 7-28 28-60	0-5 0-5 0-5	1.20-1.50 1.20-1.50 1.20-1.50	6.0-20 >20 >20	0.05-0.09 0.03-0.07 0.03-0.06	4.5-6.0 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	0.17 0.17 0.17	5	2-9
CuB*: Croghan-----	0-7 7-28 28-60	0-5 0-5 0-5	1.20-1.50 1.20-1.50 1.20-1.50	6.0-20 >20 >20	0.05-0.09 0.03-0.07 0.03-0.06	4.5-6.0 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	0.17 0.17 0.17	5	---
Urban land.										
Dm*. Dumps										
EmB, EmC----- Elmwood	0-14 14-20 20-60	5-10 5-12 35-55	1.00-1.30 1.15-1.45 1.50-1.80	2.0-6.0 2.0-6.0 <0.2	0.13-0.20 0.13-0.22 0.12-0.18	4.5-6.0 5.6-6.5 6.1-7.3	Low----- Low----- Moderate----	0.32 0.32 0.49	3	3-7
HeB, HeC, HeD---- Hermon	0-6 6-19 19-60	2-6 2-7 1-4	0.95-1.20 1.00-1.30 1.50-1.80	6.0-20 6.0-20 6.0-20	0.10-0.20 0.07-0.14 0.01-0.10	3.6-5.5 3.6-6.0 5.1-6.0	Low----- Low----- Low-----	0.17 0.17 0.17	3	3-7
HmB, HmC, HmD---- Hermon <i>HmB</i>	0-4 4-19 19-60	2-6 2-7 1-4	0.95-1.20 1.00-1.30 1.50-1.80	6.0-20 6.0-20 6.0-20	0.10-0.20 0.07-0.14 0.01-0.10	3.6-5.5 3.6-6.0 5.1-6.0	Low----- Low----- Low-----	0.17 0.17 0.17	3	---
HnC, HnE----- Hermon	0-4 4-19 19-60	2-6 2-7 1-4	0.95-1.20 1.00-1.30 1.50-1.80	6.0-20 6.0-20 6.0-20	0.08-0.18 0.07-0.14 0.01-0.10	3.6-5.5 3.6-6.0 5.1-6.0	Low----- Low----- Low-----	0.17 0.17 0.17	3	---
LnB, LnC, LnD---- Lyman	0-4 4-18 18	2-10 2-10 ---	0.90-1.20 1.20-1.40 ---	2.0-6.0 2.0-6.0 ---	0.11-0.20 0.07-0.16 ---	3.6-6.0 3.6-6.0 ---	Low----- Low----- ---	0.20 0.20 ---	2	1-4
LyB*, LyC*, LyE*: Lyman-----	0-4 4-18 18	2-10 2-10 ---	0.90-1.20 1.20-1.40 ---	2.0-6.0 2.0-6.0 ---	0.11-0.20 0.07-0.16 ---	3.6-6.0 3.6-6.0 ---	Low----- Low----- ---	0.20 0.20 ---	2	1-4
Rock outcrop.										
MaB----- Madawaska	0-10 10-23 23-60	3-13 2-12 0-5	0.95-1.25 1.20-1.50 1.35-1.65	2.0-6.0 2.0-6.0 6.0-20	0.11-0.25 0.09-0.18 0.02-0.08	4.5-6.0 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	0.28 0.28 0.28	3	3-9
MrB, MrC2, MrD2-- Marlow	0-9 9-29 29-60	5-12 5-12 5-12	0.90-1.20 1.20-1.50 1.70-2.00	0.6-6.0 0.6-6.0 0.06-0.6	0.10-0.23 0.06-0.20 0.05-0.12	4.5-6.0 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	0.24 0.43 0.17	3	3-8
MvB, MvC, MvD---- Marlow	0-2 2-29 29-60	5-12 5-12 5-12	0.90-1.20 1.20-1.50 1.70-2.00	0.6-6.0 0.6-6.0 0.06-6.0	0.10-0.23 0.06-0.20 0.05-0.12	4.5-6.0 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	0.24 0.43 0.17	3	---
Na----- Naumburg	0-5 5-28 28-60	0-5 0-5 0-5	1.10-1.40 1.25-1.55 1.45-1.65	2.0-6.0 6.0-20 6.0-20	0.05-0.09 0.06-0.08 0.04-0.06	3.6-5.5 3.6-5.5 4.5-6.5	Low----- Low----- Low-----	0.17 0.17 0.17	5	2-7
On----- Ondawa	0-9 9-30 30-60	0-10 0-10 0-5	1.10-1.40 1.20-1.50 1.20-1.50	2.0-6.0 2.0-6.0 2.0-20	0.12-0.26 0.12-0.22 0.01-0.13	4.5-6.5 4.5-6.5 4.5-6.5	Low----- Low----- Low-----	----- ----- -----	---	3-7

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Moist bulk density G/cm ³	Permeability In/hr	Available water capacity In/in	Soil reaction pH	Shrink-swell potential	Erosion factors		Organic matter Pct
								K	T	
PdB----- Peru	0-9 9-20 20-60	5-12 5-12 5-12	0.90-1.20 1.20-1.50 1.70-2.00	0.6-2.0 0.6-2.0 0.06-0.6	0.10-0.23 0.06-0.20 0.05-0.12	4.5-5.5 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	0.24 0.43 0.17	3	3-8
Pg*. Pits										
Po*: Podunk-----	0-8 8-18 18-25	0-10 0-10 0-5	1.10-1.40 1.20-1.50 1.20-1.50	0.6-6.0 2.0-6.0 2.0-20	0.11-0.24 0.09-0.18 0.01-0.13	4.5-6.5 4.5-6.5 4.5-6.5	Low----- Low----- Low-----	----- ----- -----	---	3-9
Winooski-----	0-11 11-60	1-10 1-10	1.10-1.40 1.20-1.50	0.6-6.0 0.6-6.0	0.15-0.30 0.13-0.26	4.5-7.3 4.5-7.3	Low----- Low-----	0.49 0.49	3	3-9
Ra----- Raynham	0-6 6-36 36-60	2-15 2-15 5-30	1.10-1.40 1.20-1.50 1.30-1.60	0.6-2.0 0.2-2.0 0.06-0.2	0.20-0.25 0.18-0.22 0.18-0.22	5.1-7.3 5.1-7.3 5.6-7.8	Low----- Low----- Low-----	0.49 0.64 0.64	3	3-9
RoC*, RoE*: Rock outcrop.										
Lyman-----	0-2 2-18 18	2-10 2-10 ---	0.90-1.20 1.20-1.40 ---	2.0-6.0 2.0-6.0 ---	0.11-0.20 0.07-0.16 ---	3.6-6.0 3.6-6.0 ---	Low----- Low----- ---	0.20 0.20 ---	2	---
Ru----- Rumney	0-9 9-25 25-60	0-10 0-10 0-5	1.10-1.40 1.20-1.50 1.20-1.50	2.0-6.0 2.0-6.0 >6.0	0.15-0.27 0.11-0.19 0.01-0.13	4.5-6.5 4.5-6.5 4.5-6.5	Low----- Low----- Low-----	----- ----- -----	---	4-9
a----- Saco	0-13 13-24 24-44 44-60	1-10 1-10 1-10 0-5	<0.90 1.00-1.30 1.20-1.50 1.20-1.50	0.6-2.0 0.6-2.0 0.6-2.0 >6.0	0.20-0.30 0.15-0.26 0.10-0.26 0.01-0.13	5.1-6.5 5.1-6.5 5.6-7.3 5.6-7.3	Low----- Low----- Low----- Low-----	----- 0.64 0.64 0.17	---	---
Sc----- Scantic	0-14 14-36 36-60	10-40 20-60 35-60	1.05-1.22 1.15-1.75 1.50-1.75	0.2-2.0 <0.2 <0.2	0.24-0.34 0.13-0.23 0.06-0.16	5.1-7.3 5.1-7.3 5.6-7.3	Low----- Moderate----- Moderate-----	0.28 0.49 0.49	3	4-7
SeB, SeC, SeD----- Seio	0-7 7-26 26-60	2-15 2-15 0-5	1.20-1.50 1.20-1.50 1.45-1.65	0.6-2.0 0.6-2.0 2.0-20.0	0.18-0.21 0.17-0.20 0.02-0.19	4.5-6.0 4.5-6.0 5.1-7.8	Low----- Low----- Low-----	0.49 0.64 0.17	3	2-8
Sg----- Sebago	0-66	---	0.10-0.30	2.0-6.0	0.20-0.40	3.5-4.5	-----	-----	---	---
SkB, SkC----- Skerry	0-5 5-33 33-60	3-8 3-8 1-4	0.90-1.20 1.20-1.50 1.65-1.80	0.6-2.0 0.6-2.0 0.06-0.6	0.10-0.23 0.06-0.16 0.03-0.09	4.5-6.0 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	0.24 0.28 0.17	3	3-7
SrB, SrC----- Skerry	0-2 2-33 33-60	3-8 3-8 1-4	0.90-1.20 1.20-1.50 1.65-1.80	0.6-2.0 0.6-2.0 0.06-0.6	0.10-0.23 0.06-0.16 0.03-0.09	4.5-6.0 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	0.24 0.28 0.17	3	---
SU*. Sulphhemists										
UD*: Udipsamments.										
Dune land.										
Ur*. Urban land										
UsA*: pan land.										

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES

[The definitions of "flooding" and "water table" in the Glossary explain terms such as "rare," "brief," "apparent," and "perched." The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock	Risk of corrosion		
		Frequency	Duration	Months	Depth	Kind	Months		Potential frost action	Uncoated steel	Concrete
AdB, AdC, AdD----- Adams	A	None-----	---	---	>6.0	---	---	In	Low-----	Low-----	High.
AgB*: Adams----- Urban land.	A	None-----	---	---	>6.0	---	---	>60	Low-----	Low-----	High.
AlB, AlC----- Allagash	B	None-----	---	---	>6.0	---	---	>60	Low-----	Low-----	High.
Ba*: Beaches-----											
BcB, BcC, BcD----- Becket	C	None-----	---	---	2.0-3.0	Perched	Nov-Mar	>60	Moderate----	Low-----	Moderate.
BeB, BeC, BeD----- Becket	C	None-----	---	---	2.0-3.0	Perched	Nov-Mar	>60	Moderate----	Low-----	Moderate.
Bm----- Biddeford	D	None-----	---	---	+1-0.5	Perched	Nov-Aug	>60	High-----	High-----	Moderate.
BrB*: Brayton-----	C	None-----	---	---	0.0-1.5	Perched	Nov-May	>60	High-----	High-----	Moderate.
Westbury-----	C	None-----	---	---	0.5-1.5	Perched	Nov-May	>60	High-----	Moderate	High.
BsB*: Brayton-----	C	None-----	---	---	0.0-1.5	Perched	Nov-May	>60	High-----	High-----	Moderate.
Westbury-----	C	None-----	---	---	0.5-1.5	Perched	Nov-May	>60	High-----	Moderate	High.
BuB, BuC, BuD----- Buxton	C	None-----	---	---	1.0-3.0	Perched	Nov-May	>60	High-----	High-----	Moderate.
Ch----- Chocorua	D	Common-----	Very long	Nov-May	0-0.5	Apparent	Jan-Dec	>60	High-----	Moderate	High.
CoB, CoC, CoD, CoE----- Colton	A	None-----	---	---	>6.0	---	---	>60	Low-----	Low-----	High.
CrB----- Croghan	B	None-----	---	---	1.5-2.0	Apparent	Nov-May	>60	Moderate----	Low-----	High.
CuB*: Croghan----- Urban land.	B	None-----	---	---	1.5-2.0	Apparent	Nov-May	>60	Moderate----	Low-----	High.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	In		Uncoated steel	Concrete
Dm*, Dumps												
EmB, EmC, Elmwood	C	None	---	---	1.0-3.0	Perched	Nov-May	>60		High	Moderate	Moderate
HeB, HeC, HeD, HmB, HmC, HmD, HnC, HnE, Hermon	A	None	---	---	>6.0	---	---	>60		Low	Low	High
LnB, LnC, LnD, Lyman	C	None	---	---	>6.0	---	---	10-20		Moderate	Low	High
LyB*, LyC*, LyE*, Lyman	C	None	---	---	>6.0	---	---	10-20		Moderate	Low	High
Rock outcrop.												
MaB, Madawaska	B	None	---	---	1.0-3.0	Apparent	Nov-May	>60		Moderate	Moderate	High
MrB, MrC2, MrD2, MvB, MvC, MvD, Marlow	C	None	---	---	2.0-3.0	Perched	Nov-Mar	>60		Moderate	Low	Moderate
Na, Naumburg	C	None	---	---	0-1.5	Apparent	Nov-May	>60		Moderate	High	High
On, Ondawa	B	Common	Brief	Nov-Apr	3.0-6.0	Apparent	Nov-May	>60		Moderate	Low	Moderate
PeB, Peru	C	None	---	---	1.5-3.0	Perched	Nov-Mar	>60		High	Moderate	Moderate
Pg*, Pits												
Po*, Podunk	B	Occasional	Brief	Oct-Apr	1.5-3.0	Apparent	Oct-Apr	>60		Moderate	Moderate	Moderate
Winooski	B	Occasional	Brief	Nov-May	1.0-3.0	Apparent	Oct-Apr	>60		High	Moderate	Moderate
Ra, Raynham	C	None	---	---	0.5-2.0	Apparent	Nov-Jun	>60		High	High	Moderate
RoC*, RoE*, Rock outcrop.												
Lyman	C	None	---	---	>6.0	---	---	10-20		Moderate	Low	High
Ru, Rumney	C	Frequent	Brief	Nov-May	0-1.5	Apparent	Nov-Jun	>60		High	High	High

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
BsB*: Brayton-----	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, large stones.	Moderate: wetness.
Westbury-----	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, frost action.	Moderate: wetness, large stones.
BuB----- Buxton	Severe: too clayey, wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: frost action, low strength.	Moderate: wetness.
BuC----- Buxton	Severe: too clayey, wetness.	Severe: wetness, frost action.	Severe: wetness.	Severe: slope, wetness.	Severe: frost action, low strength.	Moderate: slope, wetness.
BuD----- Buxton	Severe: slope, too clayey, wetness.	Severe: slope, wetness, frost action.	Severe: wetness, slope.	Severe: slope, wetness.	Severe: slope, frost action, low strength.	Severe: slope.
Ch----- Chocorua	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, floods.
CoB----- Colton	Severe: small stones.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: small stones, droughty.
 CoC Colton	Severe: small stones.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, slope.
CoD, CoE----- Colton	Severe: slope, small stones.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CrB----- Croghan	Severe: wetness, cutbanks cave.	Moderate: wetness, frost action.	Severe: wetness.	Moderate: slope, wetness, frost action.	Moderate: frost action.	Severe: too sandy.
CuB*: Croghan-----	Severe: wetness, cutbanks cave.	Moderate: wetness, frost action.	Severe: wetness.	Moderate: slope, wetness, frost action.	Moderate: frost action.	Severe: too sandy.
Urban land.						
Dm*. Dumps						
EmB----- Elmwood	Severe: wetness, too clayey.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action, low strength.	Slight.
EmC----- Elmwood	Severe: wetness, too clayey.	Severe: frost action.	Severe: wetness.	Severe: slope, frost action.	Severe: frost action, low strength.	Moderate: slope.
HeB----- Hermon	Moderate: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
HeC-----  on	Moderate: slope, cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HcD----- Hermon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HdB----- Hermon	Moderate: large stones, cutbanks cave.	Moderate: large stones.	Moderate: large stones.	Moderate: large stones, slope.	Slight-----	Moderate: large stones.
HnC----- Hermon	Moderate: large stones, slope.	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: slope.	Moderate: slope.	Moderate: slope, large stones.
HnD----- Hermon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HnC----- Hermon	Severe: large stones.	Severe: large stones.	Severe: large stones.	Severe: slope, large stones.	Moderate: slope, large stones.	Severe: large stones.
HnE----- Hermon	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope, large stones.	Severe: slope.	Severe: slope, large stones.
LnB----- Lyman	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
LnC----- Lyman	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
Lyman----- Lyman	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
LyB*: Lyman----- Rock outcrop.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.
LyC*: Lyman----- Rock outcrop.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
LyE*: Lyman----- Rock outcrop.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
MaB----- Madawaska	Severe: wetness, cutbanks cave.	Moderate: wetness, frost action.	Severe: wetness.	Moderate: slope, wetness, frost action.	Moderate: frost action.	Slight.
MrB----- Marlow	Moderate: wetness.	Moderate: frost action.	Moderate: wetness.	Moderate: frost action, slope.	Moderate: frost action.	Slight.
MrC2----- Marlow	Moderate: wetness, slope.	Moderate: frost action, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: frost action, slope.	Moderate: slope.
MrC----- Marlow	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MvB----- Marlow	Moderate: large stones, wetness.	Moderate: frost action.	Moderate: large stones, wetness.	Moderate: frost action, slope.	Moderate: frost action.	Moderate: large stones.
MvC----- Marlow	Moderate: slope, wetness.	Moderate: frost action, slope.	Moderate: slope, wetness.	Severe: slope.	Moderate: frost action, slope.	Moderate: large stones, slope.
MvD----- Marlow	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Na----- Naumburg	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
On----- Ondawa	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Severe: floods.	Moderate: floods.
PeB----- Peru	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.
Pg*. Pits						
Po*: Podunk-----	Severe: floods, wetness.	Severe: floods.	Severe: floods, wetness.	Severe: floods.	Severe: floods.	Severe: floods.
Winooski-----	Severe: floods, wetness.	Severe: floods, frost action.	Severe: floods, wetness.	Severe: floods, frost action.	Moderate: floods.	Moderate: floods.
Ra----- Raynham	Severe: wetness.	Severe: frost action, wetness.	Severe: wetness.	Severe: frost action, wetness.	Severe: frost action, wetness.	Moderate: wetness.
RoC*: Rock outcrop.						
Lyman-----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock.	Severe: depth to rock.
RoE*: Rock outcrop.						
Lyman-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.
Ru----- Rumney	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
Sa----- Saco	Severe: floods, wetness, cutbanks cave.	Severe: floods, wetness, frost action.	Severe: floods, wetness.	Severe: floods, wetness, frost action.	Severe: floods, wetness, frost action.	Severe: floods, wetness.
Sc----- Scantic	Severe: wetness, too clayey.	Severe: wetness, frost action.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness, low strength, frost action.	Severe: wetness.
SB----- Scio	Severe: wetness.	Severe: frost action.	Severe: wetness.	Severe: frost action.	Severe: frost action.	Slight.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and "poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AdB, AdC----- Adams	Good-----	Good-----	Unsuited: excess fines.	Poor: too sandy.
AdD----- Adams	Fair: slope.	Good-----	Unsuited: excess fines.	Poor: slope, too sandy.
AgB*: Adams-----	Good-----	Good-----	Unsuited: excess fines.	Poor: too sandy.
Urban land.				
AlB----- Allagash	Good-----	Good-----	Unsuited: excess fines.	Good.
AlC----- Allagash	Good-----	Good-----	Unsuited: excess fines.	Fair: slope.
Ba*. Beaches				
BcB, BcC----- Becket	Fair: frost action.	Poor: excess fines.	Poor: excess fines.	Poor: small stones.
BcD----- Becket	Fair: frost action, slope.	Poor: excess fines.	Poor: excess fines.	Poor: slope, small stones.
BeB, BeC----- Becket	Fair: frost action.	Poor: excess fines.	Poor: excess fines.	Poor: large stones.
BeD----- Becket	Fair: slope, frost action.	Poor: excess fines.	Poor: excess fines.	Poor: large stones, slope.
Bm----- Biddeford	Poor: wetness, low strength.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness, thin layer, too clayey.
BrB*: Brayton-----	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: small stones, wetness.
Westbury-----	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: small stones.
BsB*: Brayton-----	Poor: wetness, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones, wetness.
Westbury-----	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
BuB----- Buxton	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: too clayey.
BuC----- Buxton	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: slope, too clayey.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BuD----- Buxton	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
Ch----- Chocorua	Poor: wetness, excess humus.	Unsuited: excess humus.	Unsuited: excess humus.	Poor: wetness, excess humus.
CoB, CoC----- Colton	Good-----	Good-----	Good-----	Poor: small stones.
CoD----- Colton	Fair: slope.	Good-----	Good-----	Poor: slope, small stones.
CoE----- Colton	Poor: slope.	Good-----	Good-----	Poor: slope, small stones.
CrB----- Croghan	Good-----	Good-----	Unsuited: excess fines.	Poor: too sandy.
CuB*: Croghan-----	Good-----	Good-----	Unsuited: excess fines.	Poor: too sandy.
Urban land.				
Dm*. Dumps				
EmB----- Elmwood	Poor: frost action, low strength.	Poor: excess fines, thin layer.	Unsuited: excess fines.	Good.
hC----- Elmwood	Poor: frost action, low strength.	Poor: excess fines, thin layer.	Unsuited: excess fines.	Fair: slope.
HeB----- Hermon	Good-----	Poor: excess fines.	Poor: excess fines.	Fair: small stones.
HeC----- Hermon	Good-----	Poor: excess fines.	Poor: excess fines.	Fair: slope, small stones.
HeD----- Hermon	Fair: slope.	Poor: excess fines.	Poor: excess fines.	Poor: slope.
HmB, HmC----- Hermon	Good-----	Poor: excess fines, large stones.	Poor: excess fines, large stones.	Poor: large stones, small stones.
HmD----- Hermon	Fair: slope.	Poor: excess fines, large stones.	Poor: excess fines, large stones.	Poor: slope.
HnC----- Hermon	Fair: large stones.	Poor: excess fines, large stones.	Poor: excess fines, large stones.	Poor: large stones, small stones.
HnE----- Hermon	Poor: slope.	Poor: excess fines, large stones.	Poor: excess fines, large stones.	Poor: slope.
LnB, LnC----- Lyman	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines, thin layer.	Poor: thin layer, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
LnD----- Lyman	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines, thin layer.	Poor: slope, thin layer, area reclaim.
LyB*, LyC*: Lyman-----	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines, thin layer.	Poor: thin layer, area reclaim.
Rock outcrop.				
LyE*: Lyman-----	Poor: slope, thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines, thin layer.	Poor: slope, thin layer, area reclaim.
Rock outcrop.				
MaB----- Madawaska	Good-----	Fair: excess fines.	Unsuited: excess fines.	Good.
MrB, MrC2----- Marlow	Fair: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: small stones.
MrD2----- Marlow	Fair: frost action, slope.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: slope.
MvB, MvC----- Marlow	Fair: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones.
MvD----- Marlow	Fair: slope, frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: large stones, slope.
Na----- Naumburg	Poor: wetness, area reclaim.	Fair: excess fines.	Unsuited: excess fines.	Poor: wetness, too sandy.
On----- Ondawa	Fair: low strength.	Poor: excess fines.	Unsuited: excess fines.	Good.
PeB----- Peru	Poor: frost action.	Unsuited: excess fines.	Unsuited: excess fines.	Fair: small stones.
Pg*. Pits				
Po*: Podunk-----	Fair: frost action.	Fair: excess fines.	Unsuited: excess fines.	Good.
Winooski-----	Poor: frost action.	Poor: excess fines.	Unsuited: excess fines.	Good.
Ra----- Raynham	Poor: frost action, wetness.	Unsuited: excess fines.	Unsuited: excess fines.	Poor: wetness.
RoC*: Rock outcrop.				
Lyman-----	Poor: thin layer, area reclaim.	Unsuited: excess fines, thin layer.	Unsuited: excess fines, thin layer.	Poor: thin layer, area reclaim.

See footnote at end of table.

Appendix B: Subsurface Explorations

- Geotechnical Investigations Summary
- Boring Logs
- Test Pit Logs
- FWD Logs

PRELIMINARY GEOTECHNICAL INVESTIGATIONS SUMMARY

WELLS: RTE.109

NOTE: HB-WEL-206 has 2 pavement layers---2nd layer begins at depth of 0.88 m

Boring No.	Station (m)	As-Built Station (ft)	Offset (m)	Exploration Depth (m)	Depth to water (m)	Pavement Thickness				Subgrade Type	Refusal Depth (m)
						HMA (mm)	Macadam (mm)	Subbase (mm)	Total (mm)		
HB-WEL-202	20+940	92+53	2.5 L	0.91		90	50	610	750	BEDROCK	0.91
TP-WEL-101	20+940	92+53	3.5 L	0.60		110	80	410	600		
HB-WEL-204	21+180	100+40	2.5 L	0.98		100	40	840	980	BEDROCK	0.98
HB-WEL-206	21+420	108+28	2.5 L	1.52		150	50	680	880	SAND/GRAVEL/SILT	
HB-WEL-206	21+420	108+28	2.5 L			30		390	420		
FWD 5600	21+796	120+61	2.4 L	2.90		150		600	750	SAND/GRAVEL/SILT	
FWD 5000	22+396	140+30	2.5 L	2.90		110		660	770	SAND/GRAVEL/SILT	
HB-WEL-208	22+500	143+71	2.2 L	1.52	1.37	100	50	520	670	SAND/GRAVEL/SILT	
TP-WEL-102	22+500	143+71	2.7 L	0.57		220	60	290	570		
FWD 4600	22+796	153+42	2.7 L	2.90	2.14	130		630	760		
FWD 4200	23+196	166+54	2.5 L	2.35		90		670	760	SAND/SILT	2.35
FWD 3800	23+596	179+67	2.5 L	2.90	1.80	160		600	760	SAND/GRAVEL/SILT	
HB-WEL-210	23+700	183+08	2.4 L	0.94		140	40	400	580	SAND/GRAVEL/SILT	0.94
FWD 3402	23+998	192+86	2.7 L	2.90	1.60	210		560	770	SAND/GRAVEL/SILT	
FWD 3400	24+000	192+92	2.7 L	1.16		200		570	770	SAND/GRAVEL/SILT	1.16
FWD 3000	24+405	206+21	2.4 L	0.98		200		570	770	SAND/GRAVEL/SILT	0.98
HB-WEL-212	24+500	209+33	2.5 L	1.52		140	50	720	910	SAND/GRAVEL/SILT	
TP-WEL-103	24+500	209+33	3.4 L	0.55		150	100	300	550		
FWD 2800	24+605	212+77	2.5 L	5.40		220		540	760	SAND/GRAVEL/SILT	5.4
FWD 2600	24+805	219+33	2.6 L	2.90		240		530	770	SAND/GRAVEL/SILT	
FWD 2400	25+005	225+89	2.7 L	2.90	1.95	130		630	760	SAND/GRAVEL/SILT	
FWD 2200	25+216	232+82	2.7 L	0.79		170		630	800	BEDROCK	0.79
FWD 2002	25+425	239+67	2.6 L	2.90		180		580	760	SAND/GRAVEL/SILT	
HB-WEL-214	25+560	244+10	2.4 L	1.52		100	60	1360	1520	SAND/GRAVEL/SILT	
FWD 1601	25+814	252+44	2.3 L	2.90		210		560	770	SAND/GRAVEL/SILT	
FWD 1400	26+015	259+03	2.2 L	2.90		200		560	760	SAND/GRAVEL/SILT	
FWD 1200	26+215	265+59	1.9 L	2.90		180		580	760	SAND/GRAVEL/SILT	
FWD 1000	26+415	272+15	2.5 L	2.90		240		520	760	SAND/GRAVEL/SILT	
HB-WEL-216	26+500	274+94	2.4 L	1.52		110	60	740	910	SAND/GRAVEL/SILT	
TP-WEL-104	26+500	274+94	3.0 L			110	90	330	530		
FWD 800	26+615	278+71	2.9 L	2.90		90		670	760	SAND/GRAVEL/SILT	
FWD 601	26+814	285+24	2.8 L	2.90	2.00	90		870	960	SILT/SAND	
FWD 400	27+015	291+84	2.6 L	2.90		220		260	480	SILT/SAND	
FWD 200	27+215	298+40	2.7 L	2.90		100		660	760	SAND/SILT	
FWD 100SB	27+315	301+68	2.4 L	2.90	2.53	90		520	610	SAND/GRAVEL/SILT	
HB-WEL-218	27+340	302+50	2.3 L	1.52		130	40	500	670	SAND/GRAVEL/SILT	
TP-WEL-105	27+340	302+50	3.1 L	0.76		100	100	560	760		

Shoulders

Boring No.	Station (m)	As-Built Station (ft)	Offset (m)	Exploration Depth (m)	Depth to water (m)	Pavement Thickness				Subgrade Type	Refusal Depth (m)
						HMA (mm)	Macadam (mm)	Subbase/Fill (mm)	Total (mm)		
HB-WEL-201	20+940	92+53	4.7 L	1.58				0.58			1.58
HB-WEL-203	21+180	100+40	5 L	0.88		50.00		0.83			0.88
HB-WEL-205	21+420	108+28	5.6 L	3.05				0.94			
FWD 5202	22+194	133+67	4.3 L	2.35		70.00					2.35
FWD 5000A	22+396	140+30	4.1 L	2.90							
HB-WEL-207	22+500	143+71	4.5 L	2.56	1.22			0.27			2.56
FWD 4200A	23+196	166+54	4.4 L	1.71							1.71
HB-WEL-209	23+700	183+08	4.3 L	0.82				0.18			0.82
FWD 3000A	24+405	206+21	4.5 L	1.04		90.00					1.04
HB-WEL-211	24+500	209+33	5.4 L	3.05				0.73			
FWD 2002A	25+425	239+67	4.2 L	2.90							
HB-WEL-213	25+560	244+10	4.4 L	1.40				1.40			1.4
HB-WEL-213A	25+562	244+17	5.6 L	3.05				1.37			
HB-WEL-215	26+500	274+94	3.8 L	3.05	1.98			0.55			
HB-WEL-217	27+340	302+50	4.6 L	3.05	2.59			0.24			

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-201 PIN: 7998.10			
Driller: MDOT		Elevation (m): 50.20		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: OFF FLIGHTS							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: N/A							
Date Start/Finish: 12/17/02-12/17/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 20+940, 4.7 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0	S1					SSA			Brown, dry, silty fine to coarse SAND, some gravel, liittle silt (Fill).	G#128034 A-1-b, SM WC=6.1%	
	S2						49.62				Light brown, dry, fine to coarse SAND, some gravel and silt.
1.2											
							48.61				
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
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-WEL-201	

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-202 PIN: 7998.10			
Driller: MDOT		Elevation (m): 50.20		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: STANDARD SPLIT SPOON							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: 63.5kg/760 mm							
Date Start/Finish: 12/17/02-12/17/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 20+940, 2.5 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0						SSA	50.10		PAVEMENT.	G#128036 A-1-b, SP-SM WC=4.3%	
	1D	61.0/30.5	0.30 - 0.91	24/11/17/50	28		50.06 49.89		MACADAM.		
								Brown, dry, medium dense, sandy GRAVEL, trace silt, (Fill).			
								Brown, dry, medium dense, fine to coarse SAND, little gravel, trace silt.			
								Bottom of Exploration at 0.91 m below ground surface. REFUSAL			
1.2											
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
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-WEL-202			

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-203 PIN: 7998.10		
Driller: MDOT		Elevation (m): 52.60		Auger ID/OD: 125 mm						
Operator: C.MANN		Datum: NGVD		Sampler: OFF FLIGHTS						
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: N/A						
Date Start/Finish: 12/18/02-12/18/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A						
Boring Location: 21+180, 5.0 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED						
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _U = Insitu Field Vane Shear Strength (kPa) T _V = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _U (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test						
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log		
0	S3					SSA	52.55		PAVEMENT.	G#128037 A-1-a, SW-SM WC=6.4%
									Brown, dry, gravelly SAND, little silt (Fill).	
							51.72			
1.2									Bottom of Exploration at 0.88 m below ground surface. REFUSAL	
2.4										
3.6										
4.8										
6										
7.2										
8.4										
9.6										
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-WEL-203	

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-204 PIN: 7998.10			
Driller: MDOT		Elevation (m): 52.80		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: STANDARD SPLIT SPOON							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: 63.5kg/760 mm							
Date Start/Finish: 12/17/02-12/17/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 21+180, 2.5 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0	PC					SSA	52.70		PAVEMENT. Pavement core taken. MACADAM. Brown, dry, very dense, SAND, some gravel, trace silt, (Fill). Bottom of Exploration at 0.98 m below ground surface. REFUSAL	G#128038 A-1-b, SW-SM WC=4.6%	
	1D	61.0/35.6	0.30 - 0.91	27/35/34/17	+50		52.66				
							52.50				
	2D	7.0/5.1	0.91 - 0.98	50(75)	---		51.83				
1.2											
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
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-WEL-204			

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-205 PIN: 7998.10					
Driller: MDOT		Elevation (m): 55.20		Auger ID/OD: 125 mm									
Operator: C.MANN		Datum: NGVD		Sampler: OFF FLIGHTS									
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: N/A									
Date Start/Finish: 12/17/02-12/17/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A									
Boring Location: 21+420, 5.6 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED									
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test									
Sample Information										Visual Description and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.	
Depth (m)	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log					
0	S4					SSA			Brown, dry, silty fine to coarse SAND, some gravel, little silt. (Fill).	G#128039 A-1-b, SW-SM WC=9.4%			
							54.25		Brown, damp, silty fine to coarse SAND, trace gravel.				
1.2							53.22		Light brown, dry, fine to medium SAND, trace coarse sand, gravel and silt.				
2.4							52.15		Bottom of Exploration at 3.05 m below ground surface. NO REFUSAL				
3.6													
4.8													
6													
7.2													
8.4													
9.6													
Remarks:													
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 1 of 1			
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.										Boring No.: HB-WEL-205			

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-206 PIN: 7998.10									
Driller: MDOT				Elevation (m): 55.40				Auger ID/OD: 125 mm									
Operator: C.MANN				Datum: NGVD				Sampler: STANDARD SPLIT SPOON									
Logged By: G.LIDSTONE				Rig Type: CME 45C				Hammer Wt./Fall: 63.5kg/760 mm									
Date Start/Finish: 12/17/02-12/17/02				Drilling Method: SOLID STEM AUGER				Core Barrel: N/A									
Boring Location: 21+420, 2.5 LT.				Casing ID/OD: N/A				Water Level*: NONE OBSERVED									
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger				Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing				Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test									
Sample Information												Visual Description and Remarks				Laboratory Testing Results/ AASHTO and Unified Class.	
Depth (m)	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log									
0						SSA	55.25		PAVEMENT.								
	1D/AB	61.0/22.9	0.30 - 0.91	27/29/38/47	+50		55.20		MACADAM.				G#128040				
									Brown, dry, very dense, SAND, some gravel, little silt. (Fill). (1D/A) 0.30-0.88 m bgs.				A-1-b, SW-SM WC=4.0%				
	2D/AB	61.0/33.0	0.91 - 1.52	26/22/20/19	42		54.52		(1D/B) 0.88-0.91 m bgs.				G#12804				
1.2							54.49		Old Pavement.				A-2-4, SM WC=7.9%				
							54.27		(2D/A) 0.91-1.19 m bgs.								
							53.88		Light brown, dry, dense, silty fine to coarse SAND, some gravel, (Fill?).								
									(2D/B) 1.19-1.52 m bgs.								
2.4									Brown, dry, dense, fine to coarse SAND, some silt, little gravel.								
									Bottom of Exploration at 1.52 m below ground surface. NO REFUSAL								
3.6																	
4.8																	
6																	
7.2																	
8.4																	
9.6																	
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-WEL-206					

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-207 PIN: 7998.10			
Driller: MDOT		Elevation (m): 58.90		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: OFF FLIGHTS							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: N/A							
Date Start/Finish: 12/18/02-12/18/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 22+500, 4.5 LT.		Casing ID/OD: N/A		Water Level*: 1.22 m BGS.							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0	S5					SSA	58.63		Brown, dry, SAND, little gravel, trace silt. (Fill).	G#128042 A-1-b, SW-SM WC=9.0% G#128043 A-2-4, SM WC=13.0%	
	S6								0.27		Brown, damp, fine to coarse SAND, some silt, little gravel.
1.2	S7						57.68		1.22		Similar to above, but wet.
2.4							56.92		1.98		Similar to above, with cobbles.
							56.34		2.56		Bottom of Exploration at 2.56 m below ground surface. REFUSAL
3.6											
4.8											
6											
7.2											
8.4											
9.6											
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-WEL-207			

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-208 PIN: 7998.10			
Driller: MDOT		Elevation (m): 59.00		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: STANDARD SPLIT SPOON							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: 63.5kg/760 mm							
Date Start/Finish: 12/17/02-12/17/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 22+500, 2.2 LT.		Casing ID/OD: N/A		Water Level*: 1.37 m BGS.							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information							Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.		
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)				
0	PC					SSA	58.90		PAVEMENT. Pavement core taken.	A-1-b, SW-SM WC=5.5% G#128045 A-1-b, SW-SM WC=10.1% G#128046 A-1-a, SW-SM WC=6.3%	
	1D/AB	61.0/27.9	0.30 - 0.91	11/10/7/6	17		58.85		MACADAM.		
							58.33		Brown, dry, dense, SAND, some gravel, little silt. (Fill). (1D/A) 0.30-0.67 m bgs.		
	2D/AC	61.0/30.5	0.91 - 1.52	8/23/43/23	+50		57.93		(1D/B) 0.67-0.91 m bgs.		
1.2							57.63		Brown, damp, dense, gravelly SAND, little silt. (2D/A) 0.91-1.07 m bgs.		
							57.48		(2D/B) 1.07-1.37 m bgs.		
									Brown, dry, very dense, gravelly SAND, trace silt.		
2.4									(2D/C) 1.37-1.52 m bgs.		
									Grey, wet, very dense, sandy GRAVEL, trace silt.		
									Bottom of Exploration at 1.52 m below ground surface. NO REFUSAL		
3.6											
4.8											
6											
7.2											
8.4											
9.6											
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.								Page 1 of 1			
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.								Boring No.: HB-WEL-208			

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-211 PIN: 7998.10			
Driller: MDOT		Elevation (m): 54.70		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: OFF FLIGHTS							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: N/A							
Date Start/Finish: 12/18/02-12/18/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 24+500, 5.4 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0	S8					SSA			Brown, damp, gravelly SAND, trace silt, (Fill).	G#128049 A-1-b, SW-SM WC=6.3%	
							53.97		Brown, damp, fine to coarse SAND, some silt, trace gravel.	G#128891 A-2-4, SM WC=12.9%	
1.2	S9										
							53.02		Light brown, damp, fine sandy SILT.	G#128892 A-4, CL-ML WC=16.5%	
2.4	S10										
							51.65				
3.6									Bottom of Exploration at 3.05 m below ground surface. NO REFUSAL		
4.8											
6											
7.2											
8.4											
9.6											
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-WEL-211	

Maine Department of Transportation				Project: ROUTE 109				Boring No.: HB-WEL-212			
Soil/Rock Exploration Log				Location: WELLS, MAINE				PIN: 7998.10			
METRIC UNITS											
Driller:		MDOT		Elevation (m):		54.90		Auger ID/OD:		125 mm	
Operator:		C.MANN		Datum:		NGVD		Sampler:		STANDARD SPLIT SPOON	
Logged By:		G.LIDSTONE		Rig Type:		CME 45C		Hammer Wt./Fall:		63.5kg/760 mm	
Date Start/Finish:		12/18/02-12/18/02		Drilling Method:		SOLID STEM AUGER		Core Barrel:		N/A	
Boring Location:		24+500, 2.5 LT.		Casing ID/OD:		N/A		Water Level*:		NONE OBSERVED	
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger				Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing				Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test			
Sample Information											
Depth (m)	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log	Visual Description and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
0	PC					SSA	54.76		PAVEMENT. Pavement core taken.		G#128893 A-1-b, SW-SM WC=4.0%
	1D	61.0/35.6	0.30 - 0.91	18/25/30/20	+50		54.71		MACADAM.	-0.14	
									Brown, dry, very dense, gravelly SAND, trace silt, (Fill).	-0.19	
	2D	61.0/7.6	0.91 - 1.52	10/9/8/7	17		53.99		Brown, dry, medium dense, silty fine to coarse SAND, little gravel.	-0.91	
1.2							53.38		Bottom of Exploration at 1.52 m below ground surface. NO REFUSAL	-1.52	
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
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-WEL-212											

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-213 PIN: 7998.10		
Driller: MDOT		Elevation (m): 65.70		Auger ID/OD: 125 mm						
Operator: C.MANN		Datum: NGVD		Sampler: OFF FLIGHTS						
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: N/A						
Date Start/Finish: 12/19/02-12/19/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A						
Boring Location: 25+560, 4.4 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED						
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test						
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log		
0	S11					SSA	64.30		Brown, dry, SAND, some gravel, trace silt. (Fill).	G#128894 A-1-b, SW-SM WC=5.0%
1.2										
									Bottom of Exploration at 1.40 m below ground surface. REFUSAL	
2.4										
3.6										
4.8										
6										
7.2										
8.4										
9.6										
Remarks: Station 25+566, 4.0 LT. exposed top of old concrete wall.										
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.									Page 1 of 1	
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.									Boring No.: HB-WEL-213	

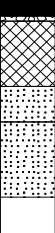
Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-213A PIN: 7998.10					
Driller: MDOT		Elevation (m): 65.60		Auger ID/OD: 125 mm									
Operator: C.MANN		Datum: NGVD		Sampler: OFF FLIGHTS									
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: N/A									
Date Start/Finish: 12/19/02-12/19/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A									
Boring Location: 25+562, 5.6 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED									
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test									
Sample Information										Visual Description and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.	
Depth (m)	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log					
0						SSA			Brown, dry, sandy GRAVEL, trace silt, (Fill). (Similar to HB-WEL-213).				
1.2	S12						64.23						
2.4									Brown, dry, silty fine to medium SAND, trace coarse sand, trace gravel.				
3.6							62.55						
4.8									Bottom of Exploration at 3.05 m below ground surface. NO REFUSAL				
6													
7.2													
8.4													
9.6													
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-WEL-213A													

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-214 PIN: 7998.10			
Driller: MDOT		Elevation (m): 65.70		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: STANDARD SPLIT SPOON							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: 63.5kg/760 mm							
Date Start/Finish: 12/19/02-12/19/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 25+560, 2.4 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information							Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.		
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)				
0						SSA	65.60	PAVEMENT. MACADAM.	G#128895 A-1-b, SW-SM WC=5.4%		
	1D	61.0/33.0	0.30 - 0.91	13/9/11/13	20		65.54				
								Brown, dry, medium dense, gravelly SAND, trace silt, (Fill).			
	2D	61.0/20.3	0.91 - 1.52	17/16/10/5	26						
1.2								Bottom of Exploration at 1.52 m below ground surface. NO REFUSAL			
							64.18				
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
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-WEL-214			

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-215 PIN: 7998.10			
Driller: MDOT		Elevation (m): 64.10		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: OFF FLIGHTS							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: N/A							
Date Start/Finish: 12/18/02-12/18/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 26+500, 3.8 LT.		Casing ID/OD: N/A		Water Level*: 1.98 m BGS.							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0	S13					SSA	63.55		Brown, damp, SAND, some gravel, trace silt. (Fill).	G#128896 A-1-b, SW-SM WC=8.7% G#128897 A-2-4, SM WC=8.3%	
	S14										Brown, damp, fine to coarse SAND, some silt, little gravel.
1.2							62.12				
2.4							61.05		Similar to above, but wet.		
3.6									Bottom of Exploration at 3.05 m below ground surface. NO REFUSAL		
4.8											
6											
7.2											
8.4											
9.6											
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-WEL-215	

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-216 PIN: 7998.10			
Driller: MDOT		Elevation (m): 64.10		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: STANDARD SPLIT SPOON							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: 63.5kg/760 mm							
Date Start/Finish: 12/18/02-12/18/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 26+500, 2.4 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information							Visual Description and Remarks	Laboratory Testing Results/AASHTO and Unified Class.		
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)				
0						SSA	63.99	PAVEMENT.	G#128898		
	1D	61.0/33.0	0.30 - 0.91	17/23/25/26	48		63.93				
								MACADAM.	A-1-b, SW-SM WC=3.7%		
								Brown, dry, dense, SAND, some gravel, trace silt. (Fill).			
	2D/AB	61.0/35.6	0.91 - 1.52	20/25/24/26	49		63.19	(2D/A) 0.91-1.28 m bgs.	G#128899		
1.2							62.82	Brown, dry, dense, fine to coarse SAND, little gravel, trace silt.	A-1-b, SW-SM WC=4.0%		
							62.58	(2D/B) 1.28-1.52 m bgs.			
								Brown, damp, dense, silty fine to medium SAND, trace coarse sand.			
2.4								Bottom of Exploration at 1.52 m below ground surface.			
								NO REFUSAL			
3.6											
4.8											
6											
7.2											
8.4											
9.6											
Remarks: Pavement core taken at 26+508, 2.4 LT.											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.								Page 1 of 1			
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.								Boring No.: HB-WEL-216			

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-217 PIN: 7998.10			
Driller: MDOT		Elevation (m): 65.90		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: OFF FLIGHTS							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: N/A							
Date Start/Finish: 12/19/02-12/19/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 27+340, 4.6 LT.		Casing ID/OD: N/A		Water Level*: 2.59 m BGS.							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0						SSA			Brown, dry, sandy GRAVEL, trace silt, (Fill), (Frost).	G#133046 A-3, SP-SM WC=5.1%	
	S15						65.66		Brown, dry, SAND, trace silt and gravel.		
										G#133047 A-2-4, SM WC=7.4%	
	S16						65.05		Brown, dry, SAND, little silt, trace gravel.		
1.2											
	S17						64.07		Brown, moist, silty fine SAND.		
2.4											
							63.31		Similar to above, but wet.		
							62.85				
3.6									Bottom of Exploration at 3.05 m below ground surface. NO REFUSAL		
4.8											
6											
7.2											
8.4											
9.6											
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-WEL-217	

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: HB-WEL-218 PIN: 7998.10			
Driller: MDOT		Elevation (m): 66.00		Auger ID/OD: 125 mm							
Operator: C.MANN		Datum: NGVD		Sampler: STANDARD SPLIT SPOON							
Logged By: G.LIDSTONE		Rig Type: CME 45C		Hammer Wt./Fall: 63.5kg/760 mm							
Date Start/Finish: 12/19/02-12/19/02		Drilling Method: SOLID STEM AUGER		Core Barrel: N/A							
Boring Location: 27+340, 2.3 LT.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information							Visual Description and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)				Graphic Log
0						SSA	65.87		PAVEMENT.	G#128500 WC=4.2% A-1-a, GW-GM G#133048 A-3, SP WC=4.4% G#133049 A-3, SP-SM WC=7.6%	
	1D/AB	61.0/38.1	0.30 - 0.91	12/18/14/13	32		65.83		MACADAM.		
							65.33		Brown, dry, dense, sandy GRAVEL, trace silt, (Fill). (1D/A) 0.30-0.67 m bgs.		
	2D	61.0/38.1	0.91 - 1.52	10/9/13/12	22		65.06		(1D/B) 0.67-0.91 m bgs.		
1.2									Brown, dry, medium dense, SAND, trace silt and gravel.		
							64.48		Brown, dry, medium dense, SAND, trace silt and gravel.		
									Bottom of Exploration at 1.52 m below ground surface. NO REFUSAL		
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.								Page 1 of 1			
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.								Boring No.: HB-WEL-218			

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: TP-WEL-101 PIN: 7998.10			
Driller: MDOT		Elevation (m): 50.20		Auger ID/OD: N/A							
Operator: N/A		Datum: NGVD		Sampler: N/A							
Logged By: K. GROSS		Rig Type: N/A		Hammer Wt./Fall: N/A							
Date Start/Finish: 12/3/03-12/3/03		Drilling Method: BACKHOE		Core Barrel: N/A							
Boring Location: 20+940, 3.5 Lt.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0						TP	50.09		ASPHALT PAVEMENT.	G#176180 A-1-b, SW WC=4.2%	
							50.01		MACADAM.		
							49.60		Brown, damp, sandy GRAVEL, trace silt.		
									Bottom of Exploration at 0.60 m below ground surface.		
1.2											
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
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.: TP-WEL-101		

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: TP-WEL-102 PIN: 7998.10			
Driller: MDOT		Elevation (m): 56.70		Auger ID/OD: N/A							
Operator: N/A		Datum: NGVD		Sampler: N/A							
Logged By: K. GROSS		Rig Type: N/A		Hammer Wt./Fall: N/A							
Date Start/Finish: 12/3/03-12/3/03		Drilling Method: BACKHOE		Core Barrel: N/A							
Boring Location: 22+500, 2.7 Lt.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0						TP	56.48		ASPHALT PAVEMENT.	G#176179 A-1-b, SW WC=3.3%	
							56.42		MACADAM.		
							56.13		Brown, damp, sandy GRAVEL, trace silt.		
									Bottom of Exploration at 0.57 m below ground surface.		
1.2											
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.									Page 1 of 1		
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.									Boring No.: TP-WEL-102		

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: TP-WEL-103 PIN: 7998.10			
Driller: MDOT		Elevation (m): 54.89		Auger ID/OD: N/A							
Operator: N/A		Datum: NGVD		Sampler: N/A							
Logged By: K. GROSS		Rig Type: N/A		Hammer Wt./Fall: N/A							
Date Start/Finish: 12/3/03-12/3/03		Drilling Method: BACKHOE		Core Barrel: N/A							
Boring Location: 24+500, 3.4 Lt.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0						TP	54.74		ASPHALT PAVEMENT.	G#176178 A-1-b, SW-SM WC=3.2%	
							54.64		MACADAM.		
							54.35		Brown, damp, sandy GRAVEL, trace silt.		
1.2									Bottom of Exploration at 0.55 m below ground surface.		
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
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.: TP-WEL-103		

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: TP-WEL-104 PIN: 7998.10			
Driller: MDOT		Elevation (m): 64.10		Auger ID/OD: N/A							
Operator: N/A		Datum: NGVD		Sampler: N/A							
Logged By: K. GROSS		Rig Type: N/A		Hammer Wt./Fall: N/A							
Date Start/Finish: 12/3/03-12/3/03		Drilling Method: BACKHOE		Core Barrel: N/A							
Boring Location: 26+500, 3.0 Lt.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks		Laboratory Testing Results/ AASHTO and Unified Class.
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0						TP	63.99		ASPHALT PAVEMENT.		G#176177 A-1-b, SW-SM WC=4.1%
							63.90		MACADAM.	-0.11	
							63.57		Brown, damp, sandy GRAVEL, trace silt.	-0.20	
										-0.53	
									Bottom of Exploration at 0.53 m below ground surface.		
1.2											
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
Remarks:											
Stratification lines represent approximate boundaries between soil types; transitions may be gradual.										Page 1 of 1	
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.										Boring No.: TP-WEL-104	

Maine Department of Transportation Soil/Rock Exploration Log METRIC UNITS				Project: ROUTE 109 Location: WELLS, MAINE				Boring No.: TP-WEL-105 PIN: 7998.10			
Driller: MDOT		Elevation (m): 66.00		Auger ID/OD: N/A							
Operator: N/A		Datum: NGVD		Sampler: N/A							
Logged By: K. GROSS		Rig Type: N/A		Hammer Wt./Fall: N/A							
Date Start/Finish: 12/3/03-12/3/03		Drilling Method: BACKHOE		Core Barrel: N/A							
Boring Location: 27+340, 3.1 Lt.		Casing ID/OD: N/A		Water Level*: NONE OBSERVED							
Definitions: D = Split Spoon Sample MD = Unsuccessful Split Spoon Sample attempt U = Thin Wall Tube Sample R = Rock Core Sample V = Insitu Vane Shear Test SSA = Solid Stem Auger		Definitions: S _u = Insitu Field Vane Shear Strength (kPa) T _v = Pocket Torvane Shear Strength (kPa) q _p = Unconfined Compressive Strength (Pa) S _u (lab) = Lab Vane Shear Strength (kPa) WOH = weight of 64 kg hammer WOR = weight of rods WOC = weight of casing		Definitions: WC = water content, percent LL = Liquid Limit PL = Plastic Limit PI = Plasticity Index G = Grain Size Analysis C = Consolidation Test							
Depth (m)	Sample Information								Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.	
	Sample No.	Pen/Rec (cm)	Sample Depth (m)	Blows (150 mm) Shear Strength (kPa) or RQD (%)	N-value	Casing Blows	Elevation (m)	Graphic Log			
0						TP	65.90		ASPHALT PAVEMENT. MACADAM. Brown, damp, sandy GRAVEL, trace silt. Bottom of Exploration at 0.76 m below ground surface.	G#176176 A-1-b, SW-SM WC=4.8%	
							65.80				
							65.24				
1.2											
2.4											
3.6											
4.8											
6											
7.2											
8.4											
9.6											
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.: TP-WEL-105		

Station (meters)	Offset (meters)	Depth (meters)	Sample Number	Description and Remarks
FWD 100 SB		Power Auger 0.00 - 92 mm		8/29/00 Pavement
27+315, 2.4 Lt.		92 mm - 0.61	1	Brown silty sandy gravel (fill)
		0.61 - 1.52	2	Brown fine to coarse sand with some fine gravel, some silt
		1.52 - 2.74	3	Brown fine sand
El. 65.5 m		2.74 - 2.90	4	Brown mottled clayey silt
		2.53		Water
		2.90		No refusal
FWD 200		Power Auger 0.00 - 97 mm		8/29/00 Pavement
27+215, 2.7 Lt.		97 mm - 0.61		Brown silty sandy gravel (fill)
		0.61 - 1.83		Brown silty fine to coarse sand
		1.83 - 2.13		Gray clayey silt with some fine sand
El. 63.3 m		2.13 - 2.90		Brown mottled clayey silt
		2.90		No refusal / No water
FWD 400		Power Auger 0.00 - 220 mm		8/29/00 Pavement
27+015, 2.6 Lt.		220 mm - 0.48		Brown silty sandy gravel (fill)
		0.48 - 1.07		Brown fine sandy silt with some clay
		1.07 - 1.83		Brown silty fine sand
El. 60.9 m		1.83 - 2.90		Brown fine sand
		2.90		No refusal / No water
FWD 601		Power Auger 0.00 - 85 mm		8/29/00 Pavement
26+814, 2.8 Lt.		85 mm - 0.95		Brown silty sandy gravel (fill)
		0.95 - 1.52		Brown sandy silt with some clay
		1.52 - 2.90		Gray silty fine sand
El. 60.1 m		2.0		Water
		2.90		No refusal
FWD 800		Power Auger 0.00 - 90 mm		8/29/00 Pavement
26+615, 2.9 Lt.		90 mm - 0.58		Brown silty sandy gravel (fill)
		0.58 - 2.90		Brown silty fine to medium sand with some coarse sand and fine gravel
El. 63.3 m		2.90		No refusal / No water
FWD 1000		Power Auger 0.00 - 243 mm		8/29/00 Pavement
26+415, 2.5 Lt.		243 mm - 0.76	5	Brown silty sandy gravel (fill)
		0.76 - 1.83	6	Brown fine to medium sand with some coarse sand, some silt
		1.83 - 2.90		Brown silty fine sand
El. 64.6 m		2.90		No refusal / No water
FWD 1200		Power Auger 0.00 - 178 mm		8/30/00 Pavement
26+215, 1.9 Lt.		178 mm - 0.52		Brown silty sandy gravel (fill)
		0.52 - 0.76		Brown silty fine sand
		0.76 - 2.43		Brown silty fine to medium sand with some coarse sand, some fine gravel
El. 65.3 m		2.43 - 2.90		Brown silty fine sand
		2.90		No refusal / No water

Station (meters)	Offset (meters)	Depth (meters)	Sample Number	Description and Remarks
FWD 1400		Power Auger 0.00 - 198 mm		8/30/00 Pavement
26+015, 2.2 Lt.		198 mm - 0.55		Brown silty sandy gravel (fill)
		0.55 - 1.83		Brown silty fine to medium sand with some coarse sand, some fine gravel
		1.83 - 2.59		Brown silty fine sand
El. 64.3 m		2.59 - 2.90		Brown fine to coarse sand with gravel
		1.82		Water
		2.90		No refusal
FWD 1601		Power Auger 0.00 - 205 mm		8/30/00 Pavement
25+814, 2.3 Lt.		205 mm - 0.52		Brown silty sandy gravel (fill)
		0.52 - 1.83		Brown silty fine to medium sand with some coarse sand, some fine gravel
		1.83 - 2.90		Brown silty fine to medium sand with gravel, occasional cobbles (till)
El. 65.4 m		2.90		No refusal / No water
Skipped 1800 m at RR Overpass				
FWD 2002		Power Auger 0.00 - 178 mm		8/30/00 Pavement
25+425, 2.6 Lt.		178 mm - 0.46		Brown silty sandy gravel (fill)
		0.46 - 0.98		Brown silty fine to medium sand with some coarse sand, some fine gravel
		0.98 - 1.37		Dark brown silty fine sand
El. 64.1 m		1.37 - 2.90		Brown silty fine sand with trace fine gravel
		2.90		No refusal / No water
FWD 2002 A		Power Auger 0.00 - 0.37		8/30/00
		0.37 - 0.98		Brown silty sandy gravel (fill) - shoulder
25+425, 4.2 Lt.		0.98 - 1.37		Brown silty fine to medium sand with some coarse sand, some fine gravel
		1.37 - 2.90		Dark brown silty fine sand
El. 64.0 m		2.90		Brown silty fine sand with trace fine gravel
				No refusal / No water
FWD 2200		Power Auger 0.00 - 165 mm		8/30/00 Pavement
25+216, 2.7 Lt.		165 mm - 0.55		Brown silty sandy gravel (fill)
		0.55 - 0.79		Brown silty fine to medium sand
El. 62.0 m		0.79		Refusal / No water
FWD 2400		Power Auger 0.00 - 125 mm		8/30/00 Pavement
25+005, 2.7 Lt.		125 mm - 260 mm		Penetrated gravel
		260 mm - 0.61		Brown silty sandy gravel (fill)
		0.61 - 1.37		Brown silty fine to medium sand with some fine gravel
El. 55.9 m		1.37 - 1.68		Brown silty fine to medium sand
		1.68 - 1.98	7	Brown organic silt with some sand (peat)
		1.98 - 2.90	8	Brown silty fine to coarse sand with some clay
		1.95		Water
		2.90		No refusal

Station (meters)	Offset (meters)	Depth (meters)	Sample Number	Description and Remarks
FWD 2600		Power Auger 0.00 - 235 mm		8/30/00 Pavement
24+805, 2.6 Lt.		235 mm - 0.76		Brown silty sandy gravel (fill)
		0.76 - 2.13		Brown silty fine to medium sand with some coarse sand, some fine gravel
		2.13 - 2.90		Brown silty fine sand with some clay
El. 56.3 m		2.90		No refusal / No water
FWD 2800		Power Auger 0.00 - 220 mm		8/30/00 Pavement
24+605, 2.5 Lt.		220 mm - 1.6		Brown silty sandy gravel with cobbles (fill)
		1.6 - 5.4		Brown silty fine to medium sand with some coarse sand, some fine gravel
El. 56.0 m		5.4		Refusal / No water
FWD 3000		Power Auger 0.00 - 195 mm		8/30/00 Pavement
24+405, 2.4 Lt.		195 mm - 0.58	9	Brown silty sandy gravel (fill)
		0.58 - 0.98	10	Brown silty fine to medium sand with cobbles, some fine gravel
El. 54.7 m		0.98		Refusal / No water
FWD 3000 A		Power Auger 0.00 - 85 mm		8/30/00 Pavement - shoulder
24+405, 4.5 Lt.		85 mm - 0.52		Brown silty sandy gravel (fill)
		0.52 - 1.04		Brown silty fine to medium sand with cobbles, some fine gravel
El. 54.6 m		1.04		Refusal / No water
FWD 3400		Power Auger 0.00 - 195 mm		8/30/00 Pavement
24+000, 2.7 Lt.		195 mm - 1.16		Brown silty sandy gravel (fill)
		1.16		Refusal (boulder?) / No water
El. 53.6 m				
FWD 3402		Power Auger 0.00 - 205 mm		8/30/00 Pavement
23+998, 2.7 Lt.		205 mm - 1.13		Brown silty sandy gravel (fill)
		1.13 - 1.52		Brown silty fine to medium sand with cobbles, some fine gravel
		1.52 - 2.90	11	Brown/gray mottled clayey silt
El. 53.6 m		1.6		Water
		2.90		No refusal
FWD 3800		Power Auger 0.00 - 160 mm		8/30/00 Pavement
23+596, 2.5 Lt.		160 mm - 0.91		Brown silty sandy gravel (fill)
		0.91 - 1.68		Brown silty sandy gravel with cobbles
		1.68 - 2.53		Brown silty fine to medium sand
El. 57.7 m		2.53 - 2.90		Brown/gray mottled clayey silt
		1.8		Water
		2.90		No refusal
FWD 4200		Power Auger 0.00 - 90 mm		8/30/00 Pavement
23+196, 2.5 Lt.		90 mm - 170 mm		Penetrated gravel
		170 mm - 0.91	13	Brown silty fine to coarse sand with gravel (fill)
		0.91 - 1.58	14	Brown silty fine sand
El. 55.8 m		1.58 - 2.35		Brown sandy silt with gravel, cobbles (till)
		2.35		Refusal / No water

Station (meters)	Offset (meters)	Depth (meters)	Sample Number	Description and Remarks
FWD 4200 A		Power Auger 0.00 - 0.91		8/30/00 Brown silty fine to coarse sand with gravel, cobbles (fill) - shoulder
23+196, 4.4 Lt.		0.91 - 1.46		Brown silty fine sand
		1.46 - 1.55		Brown sandy silt with gravel, cobbles (till)
		1.55 - 1.71		Grind into rock
El. 55.8 m		1.71		Refusal / No water
FWD 4600		Power Auger 0.00 - 125 mm		8/30/00 Pavement
22+796, 2.7 Lt.		125 mm - 195 mm		Penetrated gravel
		195 mm - 1.04		Brown silty fine to coarse sand with gravel (fill)
		1.04 - 1.43		Dark brown sandy silt with trace clay
El. 55.9 m		1.43 - 2.14		Brown sandy silt with gravel, cobbles
		2.14 - 2.90		Brown silty fine to coarse sand with gravel
		2.90		Water No refusal
FWD 5000		Power Auger 0.00 - 105 mm		8/30/00 Pavement
22+396, 2.5 Lt.		105 mm - 205 mm		Penetrated gravel
		205 mm - 0.55	15	Brown silty fine to coarse sand with gravel (fill)
El. 63.6 m		0.55 - 2.44	16	Brown sandy silt with gravel, cobbles
		2.44 - 2.90	17	Brown silty fine to coarse sand
		2.90		No refusal / No water
FWD 5000 A		Power Auger 0.00 - 0.46		8/30/00 Brown silty fine to coarse sand with gravel (fill) - shoulder
22+396, 4.1 Lt.		0.46 - 2.44		Brown sandy silt with gravel, cobbles
		2.44 - 2.90		Brown silty fine to coarse sand
El. 61.3 m		2.90		No refusal / No water
FWD 5202		Power Auger 0.00 - 65 mm		8/30/00 Pavement
22+194, 4.3 Lt.		65 mm - 0.75		Brown silty sandy gravel (fill)
		0.75 - 2.35		Brown silty fine to coarse sand with gravel
El. 65.3 m		2.35		Refusal / No water
FWD 5600		Power Auger 0.00 - 152 mm		8/30/00 Pavement
21+796, 2.4 Lt.		152 mm - 255 mm		Penetrated gravel
		255 mm - 2.60		Brown sandy silt with gravel, cobbles
El. 60.2 m		2.60 - 2.90		Brown silty fine to coarse sand
		2.90		No refusal / No water

Appendix C: Laboratory Test Results

- Laboratory Testing Summary Sheet
- Grain Size Analysis
- Geology Test Reports

State of Maine - Department of Transportation
Laboratory Testing Summary Sheet

Town(s): Wells

Project Number: 7998.10

Boring & Sample Identification Number	Station (Meter)	Offset (Meter)	Depth (Meter)	Reference Number	G.S.D.C. Sheet	W.C.	L.L.	P.I.	Classification		
									Unified	AASHTO	Frost
HB-WEL-201, S1	20+940	4.7 LT.	0.0-0.58	128034	1	6.1			SM	A-1-b	II
HB-WEL-201, S2	20+940	4.7 LT.	0.58-1.58	128035	1	3.8			SM	A-1-b	II
HB-WEL-202, 1D	20+940	2.5 LT.	0.30-0.91	128036	1	4.3			SP-SM	A-1-b	0
HB-WEL-203, S3	21+180	5.0 LT.	0.05-0.88	128037	1	6.4			SW-SM	A-1-a	0
HB-WEL-204, 1D	21+180	2.5 LT.	0.30-0.91	128038	1	4.6			SW-SM	A-1-b	0
HB-WEL-205, S4	21+420	5.6 LT.	0.0-0.94	128039	1	9.4			SW-SM	A-1-b	0
HB-WEL-206, 1D/A	21+420	2.5 LT.	0.30-0.88	128040	2	4.0			SW-SM	A-1-b	0
HB-WEL-206, 2D/B	21+420	2.5 LT.	1.19-1.52	128041	2	7.9			SM	A-2-4	II
HB-WEL-207, S5	22+500	4.5 LT.	0.0-0.27	128042	2	9.0			SW-SM	A-1-b	0
HB-WEL-207, S6	22+500	4.5 LT.	0.27-1.22	128043	2	13.0			SM	A-2-4	II
HB-WEL-208, 1D/A	22+500	2.2 LT.	0.30-0.67	128044	3	5.5			SW-SM	A-1-b	0
HB-WEL-208, 1D/B	22+500	2.2 LT.	0.67-0.91	128045	3	10.1			SW-SM	A-1-b	0
HB-WEL-208, 2D/B	22+500	2.2 LT.	1.07-1.37	128046	3	6.3			SW-SM	A-1-a	0
HB-WEL-210, 1D/A	23+700	2.4 LT.	0.30-0.58	128047	3	2.6			SM	A-1-b	II
HB-WEL-210, 1D/B	23+700	2.4 LT.	0.58-0.91	128048	3	10.8			SW-SM	A-1-b	0
HB-WEL-211, S8	24+500	5.4 LT.	0.0-0.73	128049	4	6.3			SW-SM	A-1-b	0
HB-WEL-211, S9	24+500	5.4 LT.	0.73-1.68	128891	4	12.9			SM	A-2-4	II
HB-WEL-211, S10	24+500	5.4 LT.	1.68-3.05	128892	4	16.5			CL-ML	A-4	IV
HB-WEL-212, 1D	24+500	2.5 LT.	0.30-0.91	128893	4	4.0			SW-SM	A-1-b	0
HB-WEL-213, S11	25+560	4.4 LT.	0.0-1.40	128894	4	5.0			SW-SM	A-1-b	0
HB-WEL-214, 1D	25+560	2.4 LT.	0.30-0.91	128895	4	5.4			SW-SM	A-1-b	0
HB-WEL-215, S13	26+500	3.8 LT.	0.0-0.55	128896	5	8.7			SW-SM	A-1-b	0
HB-WEL-215, S14	26+500	3.8 LT.	0.55-1.98	128897	5	8.3			SM	A-2-4	II
HB-WEL-216, 1D	26+500	2.4 LT.	0.30-0.91	128898	5	3.7			SW-SM	A-1-b	0
HB-WEL-216, 2D/A	26+500	2.4 LT.	0.91-1.28	128899	5	4.0			SW-SM	A-1-b	0
HB-WEL-217, S15	27+340	4.6 LT.	0.24-0.85	133046	6	5.1			SP-SM	A-3	0
HB-WEL-217, S16	27+340	4.6 LT.	0.85-1.83	133047	6	7.4			SM	A-2-4	II
HB-WEL-218, 1D/A	27+340	2.3 LT.	0.30-0.67	128500	6	4.2			GW-GM	A-1-a	0
HB-WEL-218, 1D/B	27+340	2.3 LT.	0.67-0.91	133048	6	4.4			SP	A-3	0
HB-WEL-218, 2D	27+340	2.3 LT.	0.91-1.52	133049	6	7.6			SP-SM	A-3	0
TP-WEL-101	20+940	3.5 Lt.	0.19-0.60	176180	7	4.2			SW	A-1-b	0
TP-WEL-102	22+500	2.7 Lt.	0.28-0.57	176179	7	3.3			SW	A-1-b	0
TP-WEL-103	24+500	3.4 Lt.	0.25-0.55	176178	7	3.2			SW-SM	A-1-b	0
TP-WEL-104	26+500	3.0 Lt.	0.20-0.53	176177	7	4.1			SW-SM	A-1-b	0
TP-WEL-105	27+340	3.1 Lt.	0.20-0.76	176176	7	4.8			SW-SM	A-1-b	0

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

The "Frost Susceptibility Rating" is based upon the MDOT and Corps of Engineers Classification Systems.

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

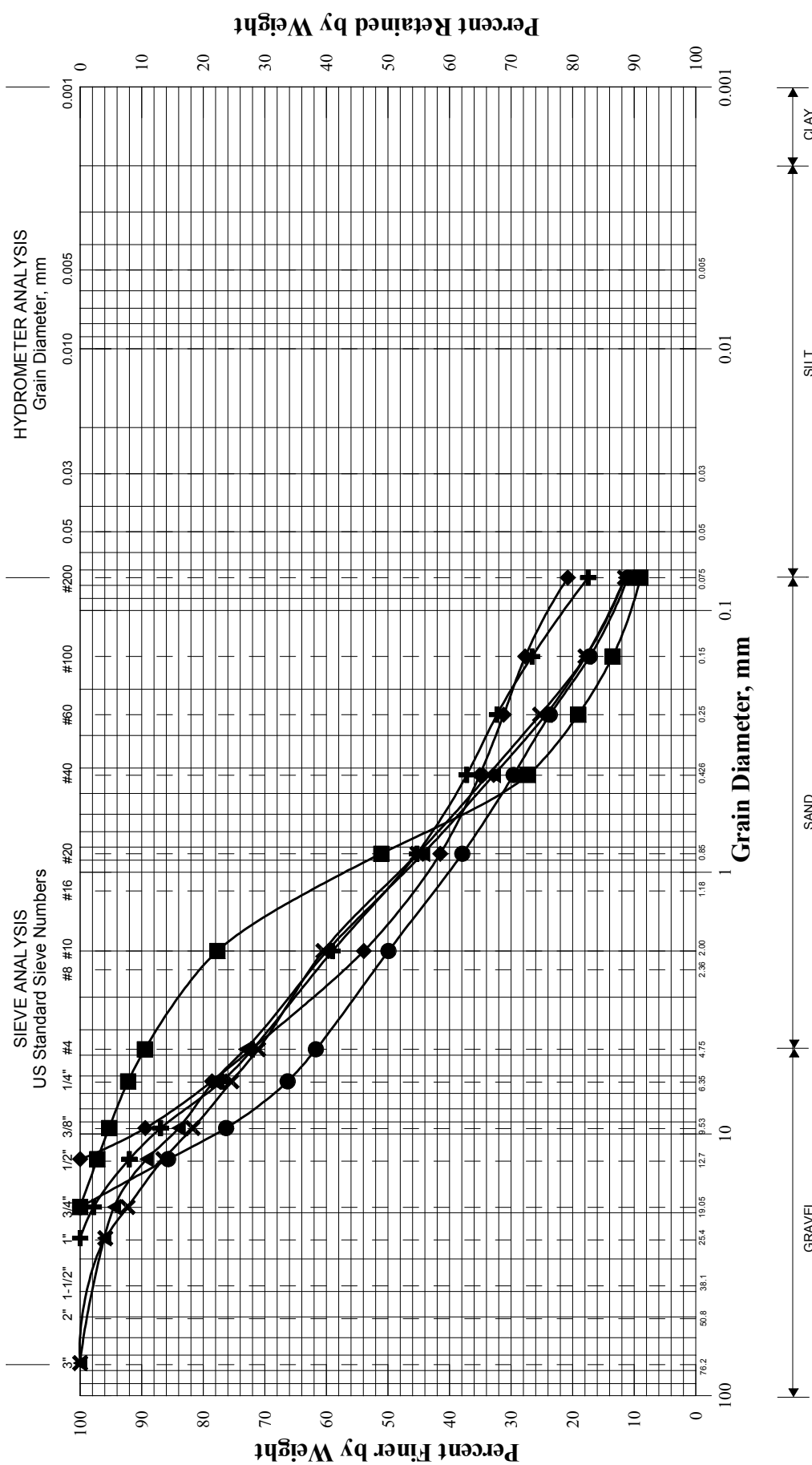
LL = Liquid limit as determined by AASHTO T 89-96 and/or ASTM D 4318-98

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

Project Number: 7998.10

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

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

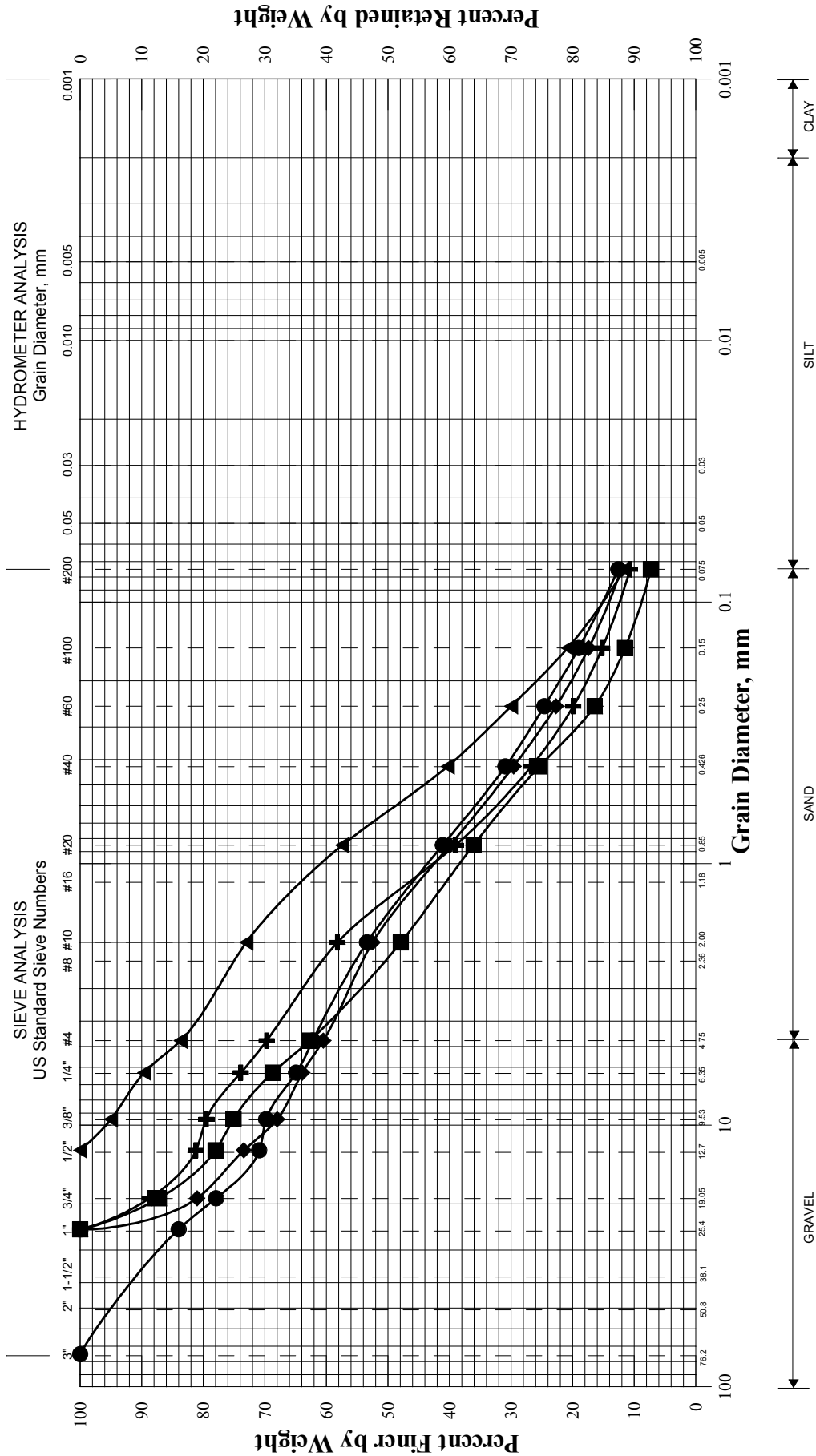


UNIFIED CLASSIFICATION

	Boring No.	Sample No.	Depth (m)	Description	w%	LL	PL	PI
+	HB-WEL-201	S1	0.0-0.58	SAND, some gravel, little silt.	6.1			
◆	HB-WEL-201	S2	0.58-1.58	SAND, some gravel, some silt.	3.8			
■	HB-WEL-202	1D	0.30-0.91	SAND, little gravel, trace silt.	4.3			
●	HB-WEL-203	S3	0.05-0.88	Gravelly SAND, little silt.	6.4			
▲	HB-WEL-204	1D	0.30-0.91	SAND, some gravel, little silt.	4.6			
X	HB-WEL-205	S4	0.0-0.94	SAND, some gravel, little silt.	9.4			

PIN: 7998.10
Town: Wells
Reported by: T. White
Date: 1/10/03

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

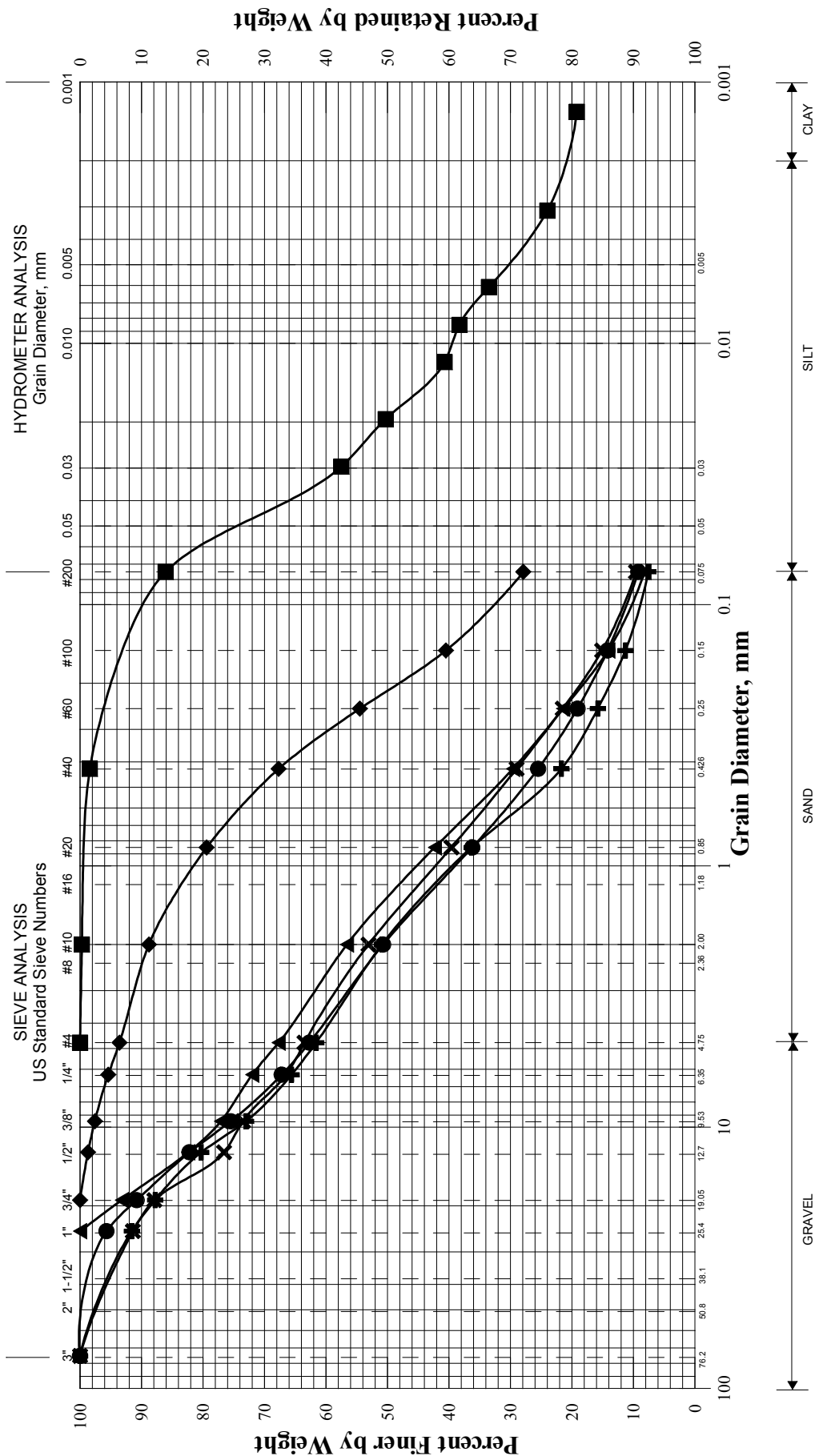


UNIFIED CLASSIFICATION

	Boring No.	Sample No.	Depth (m)	Description	w%	LL	PL	PI
+	HB-WEL-208	1D/A	0.30-0.67	SAND, some gravel, little silt.	5.5			
◆	HB-WEL-208	1D/B	0.67-0.91	Gravelly SAND, little silt.	10.1			
■	HB-WEL-208	2D/B	1.07-1.37	Gravelly SAND, trace silt.	6.3			
●	HB-WEL-210	1D/A	0.30-0.58	Gravelly SAND, little silt.	2.6			
▲	HB-WEL-210	1D/B	0.58-0.91	SAND, little gravel, little silt.	10.8			
×	----							

PIN: 7998.10
Town: Wells
Reported by: T. White
Date: 1/13/03

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

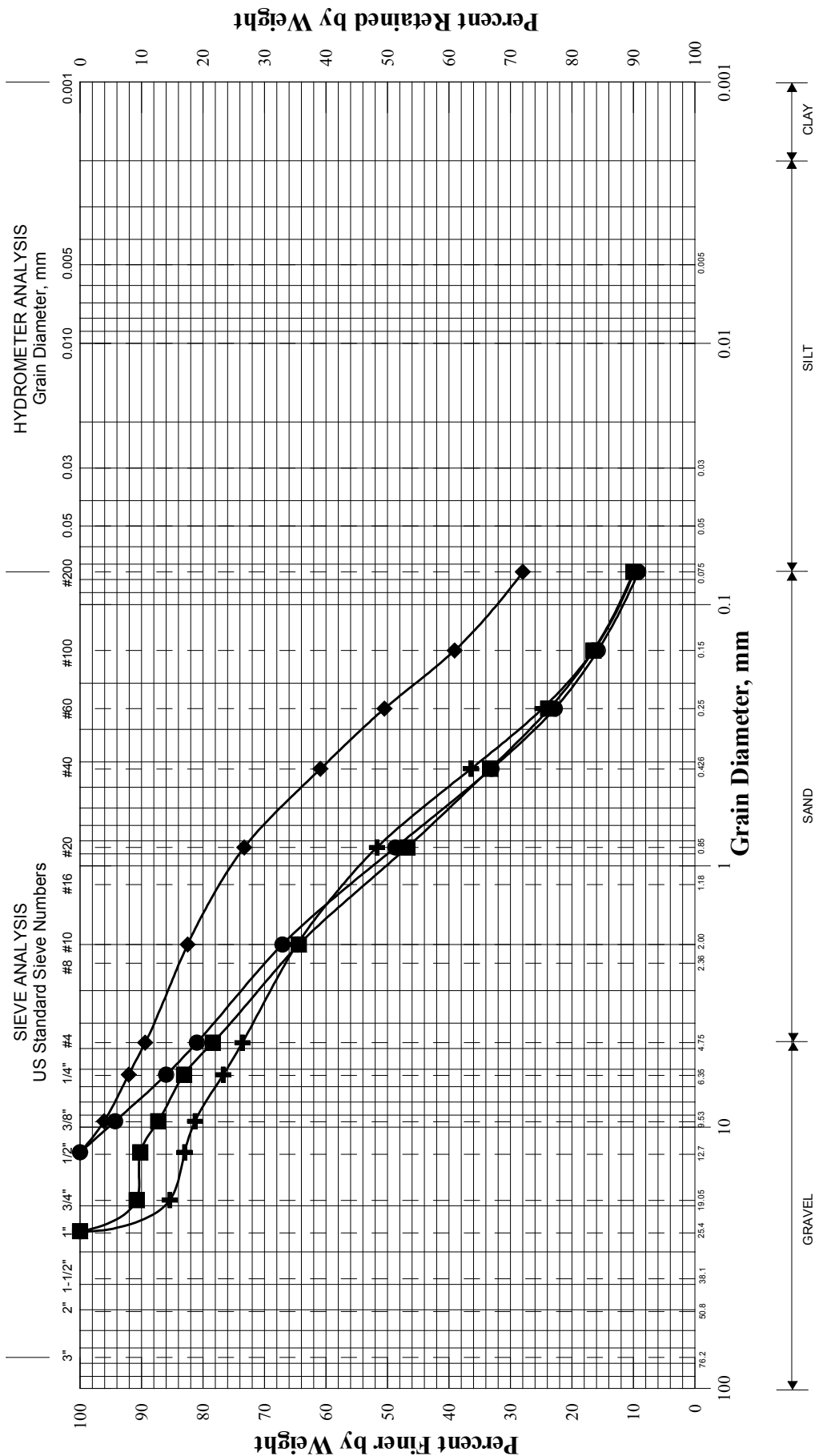


UNIFIED CLASSIFICATION

	Boring No.	Sample No.	Depth (m)	Description	w%	LL	PL	PI
+	HB-WEL-211	S8	0.0-0.73	Gravelly SAND, trace silt.	6.3			
◆	HB-WEL-211	S9	0.73-1.68	SAND, some silt, trace gravel.	12.9			
■	HB-WEL-211	S10	1.68-3.05	SILT, some clay, little sand.	16.5			
●	HB-WEL-212	1D	0.30-0.91	Gravelly SAND, trace silt.	4.0			
▲	HB-WEL-213	S11	0.0-1.40	SAND, some gravel, trace silt.	5.0			
×	HB-WEL-214	1D	0.30-0.91	Gravelly SAND, trace silt.	5.4			

PIN: 7998.10
Town: Wells
Reported by: T. White
Date: 1/13/03

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

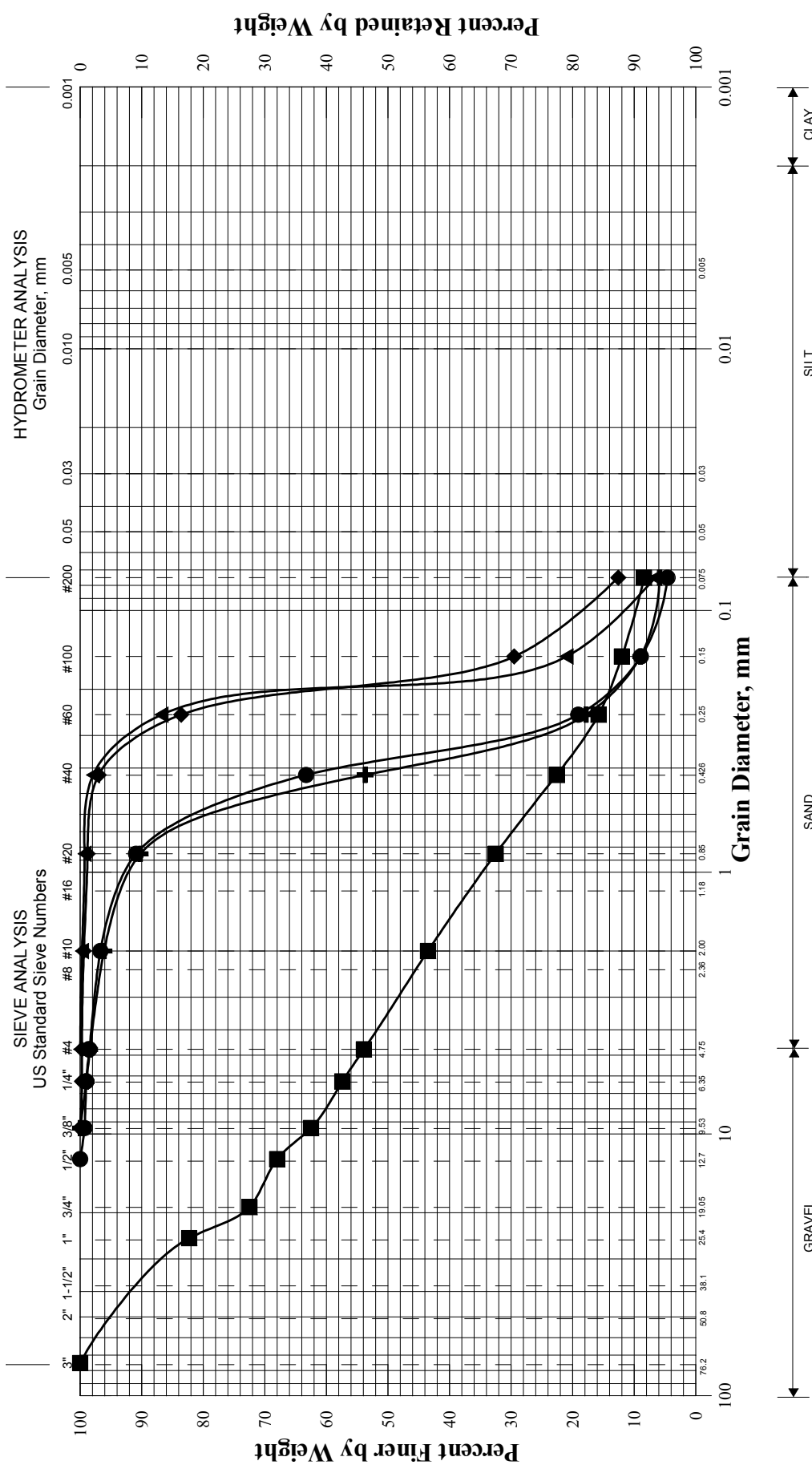


UNIFIED CLASSIFICATION

	Boring No.	Sample No.	Depth (m)	Description	w%	LL	PL	PI
+	HB-WEL-215	S13	0.0-0.55	SAND, some gravel, trace silt.	8.7			
◆	HB-WEL-215	S14	0.55-1.98	SAND, some silt, little gravel.	8.3			
■	HB-WEL-216	1D	0.30-0.91	SAND, some gravel, trace silt.	3.7			
●	HB-WEL-216	2D/A	0.91-1.28	SAND, little gravel, trace silt.	4.0			
▲	----							
×	----							

PIN: 7998.10
Town: Wells
Reported by: T. White
Date: 1/13/03

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE

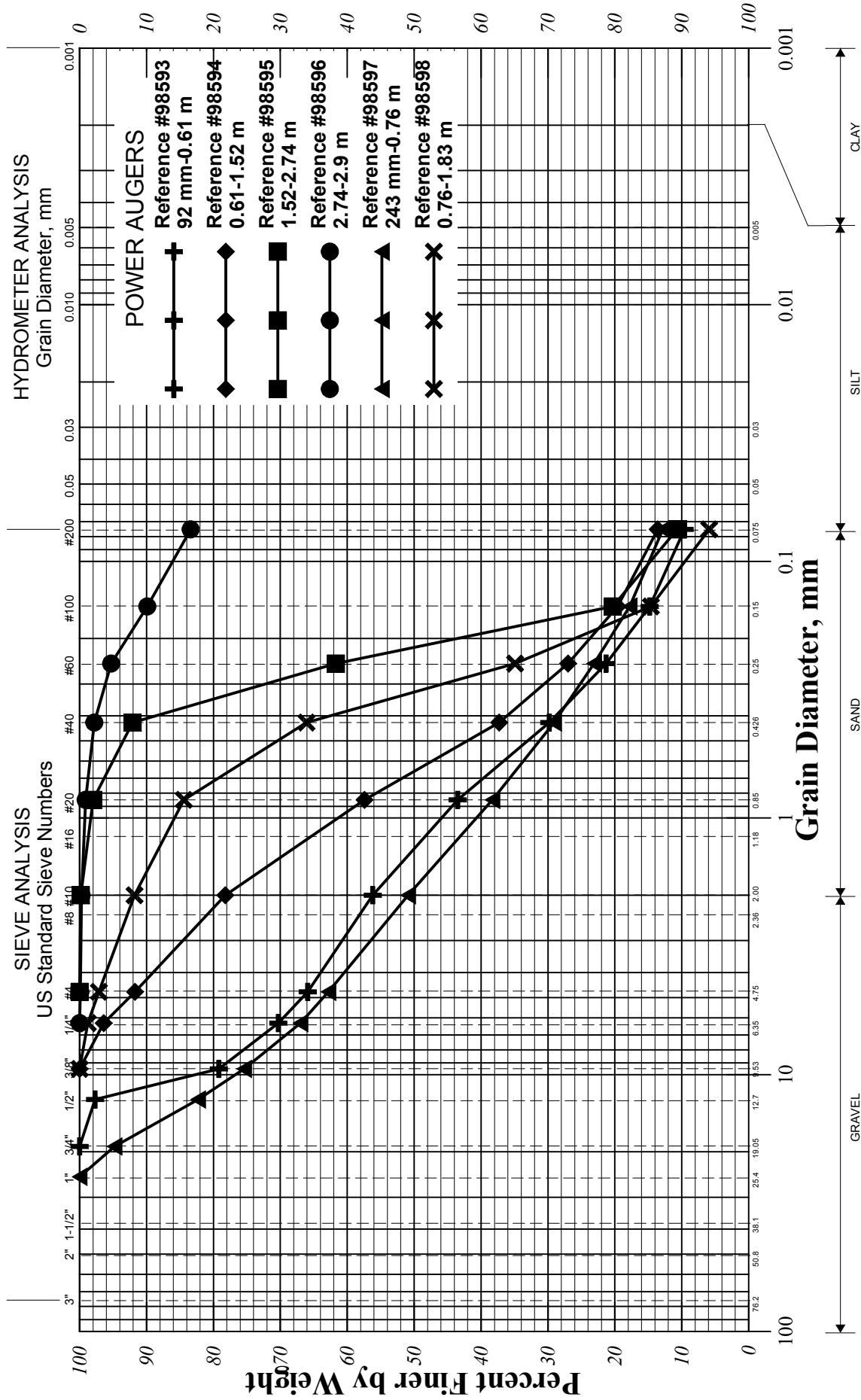


UNIFIED CLASSIFICATION

	Boring No.	Sample No.	Depth (m)	Description	w%	LL	PL	PI
+	HB-WEL-217	S15	0.24-0.85	SAND, trace silt, trace gravel.	5.1			
◆	HB-WEL-217	S16	0.85-1.83	SAND, little silt, trace gravel.	7.4			
■	HB-WEL-218	1D/A	0.30-0.67	SANDY GRAVEL, trace silt.	4.2			
●	HB-WEL-218	1D/B	0.67-0.91	SAND, trace silt, trace gravel.	4.4			
▲	HB-WEL-218	2D	0.91-1.52	SAND, trace silt, trace gravel.	7.6			
×	----							

PIN: 7998.10
Town: Wells
Reported by: T. White
Date: 1/13/03

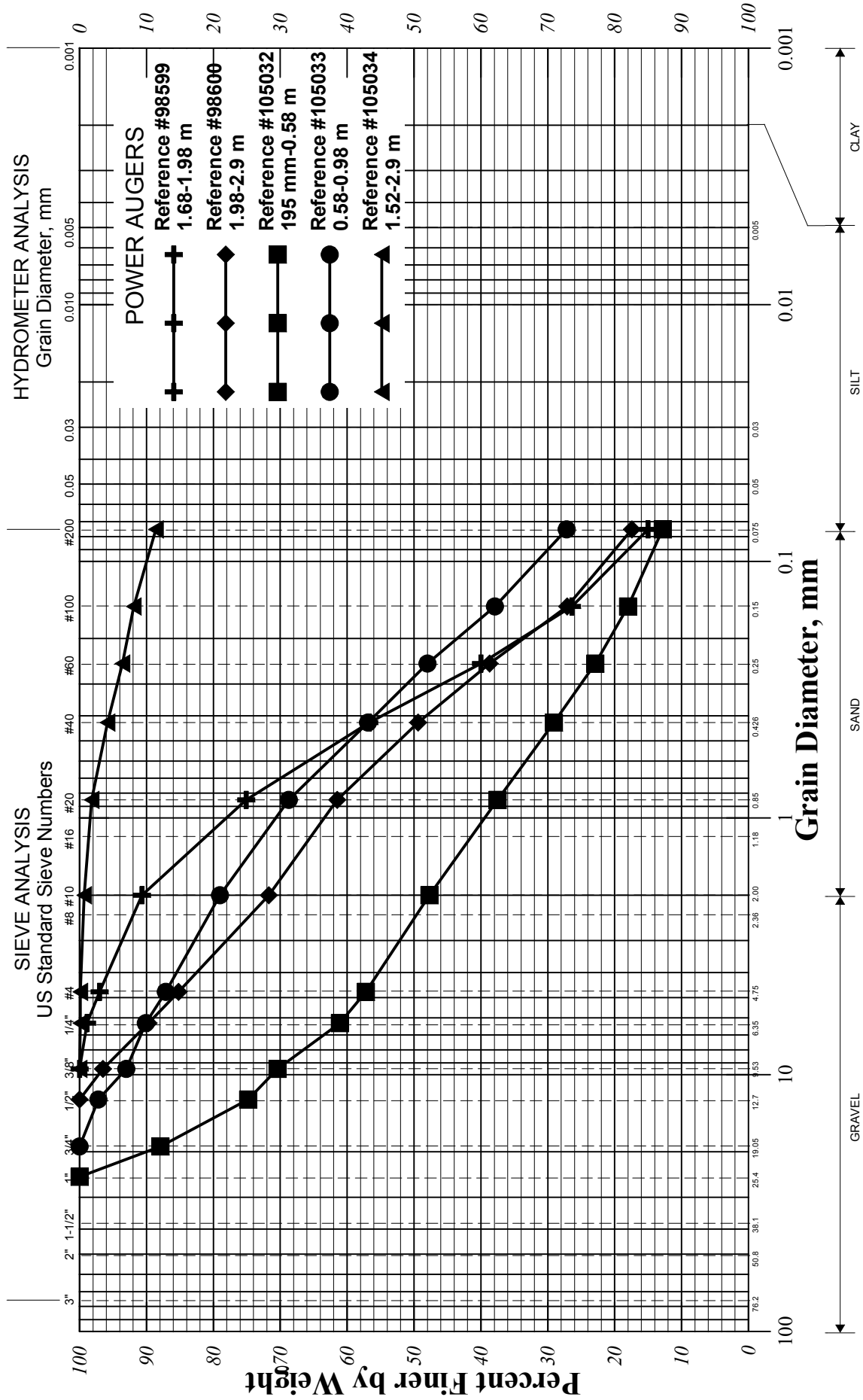
State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



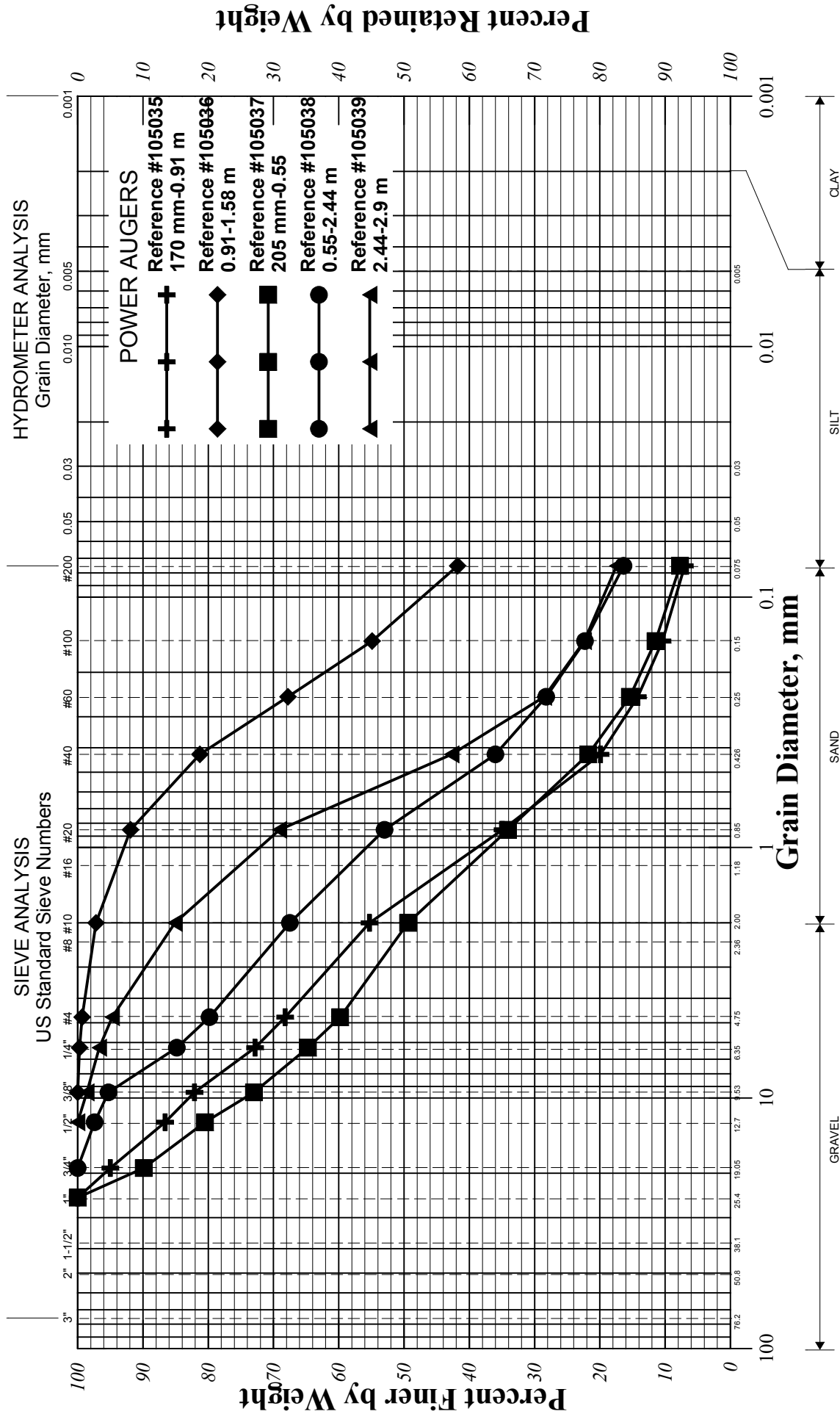
PIN: 7998.10
Town: Wells

Reported by: T.White
Date: 7/9/01

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



AASHTO CLASSIFICATION

Reported by: T.White
Date: 7/10/01

PIN: 7998.10
Town: Wells



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128034** Boring No./Sample No. **HB-WEL-201/S1** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/17/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **20+940** Offset, m: **4.7** LT Dbfg, m: **0.0-0.58**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	97.8
½ in. [12.5 mm]	92.0
⅜ in. [9.5 mm]	86.9
¼ in. [6.3 mm]	77.0
No. 4 [4.75 mm]	72.0
No. 10 [2.00 mm]	59.0
No. 20 [0.850 mm]	45.3
No. 40 [0.425 mm]	37.2
No. 60 [0.250 mm]	32.3
No. 100 [0.150 mm]	26.6
No. 200 [0.075 mm]	17.5

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

6.1

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128035** Boring No./Sample No. **HB-WEL-201/S2** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/17/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **20+940** Offset, m: **4.7** LT Dbfg, m: **0.58-1.58**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	100.0
⅜ in. [9.5 mm]	89.4
¼ in. [6.3 mm]	78.6
No. 4 [4.75 mm]	72.2
No. 10 [2.00 mm]	53.9
No. 20 [0.850 mm]	41.5
No. 40 [0.425 mm]	35.1
No. 60 [0.250 mm]	31.2
No. 100 [0.150 mm]	27.7
No. 200 [0.075 mm]	20.8

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

3.8

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128036** Boring No./Sample No. **HB-WEL-202/1D** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/17/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **20+940** Offset, m: **2.5** LT Dbfg, m: **0.30-0.91**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	100.0
½ in. [12.5 mm]	97.2
⅜ in. [9.5 mm]	95.3
¼ in. [6.3 mm]	92.2
No. 4 [4.75 mm]	89.5
No. 10 [2.00 mm]	77.7
No. 20 [0.850 mm]	51.1
No. 40 [0.425 mm]	27.3
No. 60 [0.250 mm]	19.1
No. 100 [0.150 mm]	13.5
No. 200 [0.075 mm]	9.0

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimming, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

4.3

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/14/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128037** Boring No./Sample No. **HB-WEL-203/S3** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **21+180** Offset, m: **5.0** LT Dbfg, m: **0.05-0.88**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	100.0
½ in. [12.5 mm]	85.7
⅜ in. [9.5 mm]	76.3
¼ in. [6.3 mm]	66.3
No. 4 [4.75 mm]	61.7
No. 10 [2.00 mm]	49.9
No. 20 [0.850 mm]	37.9
No. 40 [0.425 mm]	29.6
No. 60 [0.250 mm]	23.7
No. 100 [0.150 mm]	17.2
No. 200 [0.075 mm]	11.0

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

6.4

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128038** Boring No./Sample No. **HB-WEL-204/1D** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **21+180** Offset, m: **2.5** LT Dbfg, m: **0.30-0.91**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	96.1
¾ in. [19.0 mm]	94.5
½ in. [12.5 mm]	89.2
⅜ in. [9.5 mm]	84.0
¼ in. [6.3 mm]	78.3
No. 4 [4.75 mm]	73.2
No. 10 [2.00 mm]	59.9
No. 20 [0.850 mm]	44.3
No. 40 [0.425 mm]	32.8
No. 60 [0.250 mm]	24.4
No. 100 [0.150 mm]	17.9
No. 200 [0.075 mm]	11.5

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

4.6

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/17/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128039** Boring No./Sample No. **HB-WEL-205/S4** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **21+420** Offset, m: **5.6** LT Dbfg, m: **0.0-0.94**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	95.9
¾ in. [19.0 mm]	92.3
½ in. [12.5 mm]	86.5
⅜ in. [9.5 mm]	81.7
¼ in. [6.3 mm]	75.4
No. 4 [4.75 mm]	71.1
No. 10 [2.00 mm]	60.5
No. 20 [0.850 mm]	45.2
No. 40 [0.425 mm]	33.7
No. 60 [0.250 mm]	25.3
No. 100 [0.150 mm]	17.9
No. 200 [0.075 mm]	11.5

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H2O, %

Water Content (T 265), %

9.4

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128040** Boring No./Sample No. **HB-WEL-206/1D(A)** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/17/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **21+420** Offset, m: **2.5** LT Dbfg, m: **0.30-0.88**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	91.1
½ in. [12.5 mm]	83.7
⅜ in. [9.5 mm]	81.3
¼ in. [6.3 mm]	77.0
No. 4 [4.75 mm]	73.4
No. 10 [2.00 mm]	60.3
No. 20 [0.850 mm]	42.5
No. 40 [0.425 mm]	29.5
No. 60 [0.250 mm]	22.9
No. 100 [0.150 mm]	17.2
No. 200 [0.075 mm]	11.4

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimming, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H2O, %

Water Content (T 265), %

4.0

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/8/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128041** Boring No./Sample No. **HB-WEL-206/2D(B)** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/17/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **21+420** Offset, m: **2.5** LT Dbfg, m: **1.19-1.52**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	
⅜ in. [9.5 mm]	100.0
¼ in. [6.3 mm]	97.9
No. 4 [4.75 mm]	97.0
No. 10 [2.00 mm]	90.5
No. 20 [0.850 mm]	77.3
No. 40 [0.425 mm]	62.5
No. 60 [0.250 mm]	48.0
No. 100 [0.150 mm]	34.1
No. 200 [0.075 mm]	20.0

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

7.9

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128042** Boring No./Sample No. **HB-WEL-207/S5** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **22+500** Offset, m: **4.5** LT Dbfg, m: **0.0-0.27**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	97.0
½ in. [12.5 mm]	95.2
⅜ in. [9.5 mm]	93.6
¼ in. [6.3 mm]	88.4
No. 4 [4.75 mm]	84.2
No. 10 [2.00 mm]	69.8
No. 20 [0.850 mm]	51.4
No. 40 [0.425 mm]	35.5
No. 60 [0.250 mm]	24.4
No. 100 [0.150 mm]	16.0
No. 200 [0.075 mm]	9.9

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimming, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

9.0

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

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GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128043** Boring No./Sample No. **HB-WEL-207/S6** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **22+500** Offset, m: **4.5** LT Dbfg, m: **0.27-1.22**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	100.0
½ in. [12.5 mm]	100.0
⅜ in. [9.5 mm]	97.0
¼ in. [6.3 mm]	90.6
No. 4 [4.75 mm]	87.2
No. 10 [2.00 mm]	79.9
No. 20 [0.850 mm]	70.0
No. 40 [0.425 mm]	57.3
No. 60 [0.250 mm]	45.2
No. 100 [0.150 mm]	34.9
No. 200 [0.075 mm]	25.2

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

13.0

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128044** Boring No./Sample No. **HB-WEL-208/1D(A)** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/17/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **22+500** Offset, m: **2.2** LT Dbfg, m: **0.30-0.67**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	88.7
½ in. [12.5 mm]	81.2
⅜ in. [9.5 mm]	79.5
¼ in. [6.3 mm]	73.9
No. 4 [4.75 mm]	69.7
No. 10 [2.00 mm]	58.2
No. 20 [0.850 mm]	39.0
No. 40 [0.425 mm]	26.7
No. 60 [0.250 mm]	19.9
No. 100 [0.150 mm]	15.2
No. 200 [0.075 mm]	10.7

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

5.5

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/8/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128045** Boring No./Sample No. **HB-WEL-208/1D(B)** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/17/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **22+500** Offset, m: **2.2** LT Dbfg, m: **0.67-0.91**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	81.0
½ in. [12.5 mm]	73.4
⅜ in. [9.5 mm]	68.0
¼ in. [6.3 mm]	63.9
No. 4 [4.75 mm]	60.5
No. 10 [2.00 mm]	52.5
No. 20 [0.850 mm]	39.9
No. 40 [0.425 mm]	29.6
No. 60 [0.250 mm]	22.7
No. 100 [0.150 mm]	17.4
No. 200 [0.075 mm]	12.1

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

10.1

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/14/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128046** Boring No./Sample No. **HB-WEL-208/2D(B)** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/17/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **22+500** Offset, m: **2.2** LT Dbfg, m: **1.07-1.37**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	87.2
½ in. [12.5 mm]	78.0
⅜ in. [9.5 mm]	75.1
¼ in. [6.3 mm]	68.7
No. 4 [4.75 mm]	62.7
No. 10 [2.00 mm]	47.9
No. 20 [0.850 mm]	36.1
No. 40 [0.425 mm]	25.4
No. 60 [0.250 mm]	16.4
No. 100 [0.150 mm]	11.5
No. 200 [0.075 mm]	7.3

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

6.3

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128047** Boring No./Sample No. **HB-WEL-210/1D(A)** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/17/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **23+700** Offset, m: **2.4** LT Dbfg, m: **0.30-0.58**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	84.0
¾ in. [19.0 mm]	77.9
½ in. [12.5 mm]	70.9
⅜ in. [9.5 mm]	69.8
¼ in. [6.3 mm]	64.9
No. 4 [4.75 mm]	62.2
No. 10 [2.00 mm]	53.4
No. 20 [0.850 mm]	41.1
No. 40 [0.425 mm]	30.9
No. 60 [0.250 mm]	24.6
No. 100 [0.150 mm]	19.0
No. 200 [0.075 mm]	12.6

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H2O, %

Water Content (T 265), %

2.6

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

Brown sandy gravel

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/16/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128048** Boring No./Sample No. **HB-WEL-210/1D(B)** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/17/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **23+700** Offset, m: **2.4** LT Dbfg, m: **0.58-0.91**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	100.0
⅜ in. [9.5 mm]	95.0
¼ in. [6.3 mm]	89.6
No. 4 [4.75 mm]	83.7
No. 10 [2.00 mm]	73.0
No. 20 [0.850 mm]	57.4
No. 40 [0.425 mm]	40.3
No. 60 [0.250 mm]	30.0
No. 100 [0.150 mm]	20.8
No. 200 [0.075 mm]	11.6

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

10.8

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/21/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128892** Boring No./Sample No. **HB-WEL-211/S10** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/19/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **24+500** Offset, m: **5.4** LT Dbfg, m: **1.68-3.05**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 88)

Wash Method

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	
⅜ in. [9.5 mm]	
¼ in. [6.3 mm]	
No. 4 [4.75 mm]	100.0
No. 10 [2.00 mm]	99.7
No. 20 [0.850 mm]	
No. 40 [0.425 mm]	98.4
No. 60 [0.250 mm]	
No. 100 [0.150 mm]	
No. 200 [0.075 mm]	86.1
[0.0296 mm]	57.5
[0.0195 mm]	50.3
[0.0118 mm]	40.7
[0.0085 mm]	38.3
[0.0061 mm]	33.5
[0.0031 mm]	24.0
[0.0013 mm]	19.2

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

Specific Gravity, Corrected to
20°C (T 100)**2.67**

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

16.5

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/22/2003**

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GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128049** Boring No./Sample No. **HB-WEL-211/S8** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **24+500** Offset, m: **5.4** LT Dbfg, m: **0.0-0.73**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	91.6
¾ in. [19.0 mm]	87.8
½ in. [12.5 mm]	80.3
⅜ in. [9.5 mm]	73.0
¼ in. [6.3 mm]	65.6
No. 4 [4.75 mm]	61.6
No. 10 [2.00 mm]	50.9
No. 20 [0.850 mm]	36.3
No. 40 [0.425 mm]	21.7
No. 60 [0.250 mm]	15.8
No. 100 [0.150 mm]	11.3
No. 200 [0.075 mm]	7.6

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

6.3

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

Brown Sandy Gravel

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/16/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128891** Boring No./Sample No. **HB-WEL-211/S9** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **24+500** Offset, m: **5.4** LT Dbfg, m: **0.73-1.68**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	100.0
½ in. [12.5 mm]	98.7
⅜ in. [9.5 mm]	97.6
¼ in. [6.3 mm]	95.4
No. 4 [4.75 mm]	93.6
No. 10 [2.00 mm]	88.8
No. 20 [0.850 mm]	79.4
No. 40 [0.425 mm]	67.7
No. 60 [0.250 mm]	54.5
No. 100 [0.150 mm]	40.5
No. 200 [0.075 mm]	27.9

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimming, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

12.9

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/21/2003**

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GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128893** Boring No./Sample No. **HB-WEL-212/1D** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **24+500** Offset, m: **2.5** LT Dbfg, m: **0.30-0.91**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	95.7
¾ in. [19.0 mm]	90.8
½ in. [12.5 mm]	82.2
⅜ in. [9.5 mm]	75.5
¼ in. [6.3 mm]	67.2
No. 4 [4.75 mm]	62.7
No. 10 [2.00 mm]	50.7
No. 20 [0.850 mm]	36.2
No. 40 [0.425 mm]	25.5
No. 60 [0.250 mm]	19.1
No. 100 [0.150 mm]	14.2
No. 200 [0.075 mm]	9.2

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

4.0

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

Brown sandy gravel

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/16/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128894** Boring No./Sample No. **HB-WEL-213/S11** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/19/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **25+560** Offset, m: **4.4** LT Dbfg, m: **0.0-1.4**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	93.2
½ in. [12.5 mm]	82.4
⅜ in. [9.5 mm]	77.1
¼ in. [6.3 mm]	72.0
No. 4 [4.75 mm]	67.7
No. 10 [2.00 mm]	56.6
No. 20 [0.850 mm]	42.3
No. 40 [0.425 mm]	29.6
No. 60 [0.250 mm]	21.4
No. 100 [0.150 mm]	14.1
No. 200 [0.075 mm]	8.2

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H2O, %

Water Content (T 265), %

5.0

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/21/2003**

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GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128895** Boring No./Sample No. **HB-WEL-214/1D** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/19/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **25+560** Offset, m: **2.4** LT Dbfg, m: **0.30-0.91**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	91.4
¾ in. [19.0 mm]	87.9
½ in. [12.5 mm]	76.6
⅜ in. [9.5 mm]	73.5
¼ in. [6.3 mm]	66.5
No. 4 [4.75 mm]	63.5
No. 10 [2.00 mm]	53.1
No. 20 [0.850 mm]	39.6
No. 40 [0.425 mm]	29.0
No. 60 [0.250 mm]	21.5
No. 100 [0.150 mm]	15.1
No. 200 [0.075 mm]	9.6

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H2O, %

Water Content (T 265), %

5.4

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128896** Boring No./Sample No. **HB-WEL-215/S13** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **26+500** Offset, m: **3.8** LT Dbfg, m: **0.0-0.55**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	85.4
½ in. [12.5 mm]	83.0
⅜ in. [9.5 mm]	81.3
¼ in. [6.3 mm]	76.7
No. 4 [4.75 mm]	73.6
No. 10 [2.00 mm]	64.7
No. 20 [0.850 mm]	51.7
No. 40 [0.425 mm]	36.4
No. 60 [0.250 mm]	24.8
No. 100 [0.150 mm]	16.5
No. 200 [0.075 mm]	9.9

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

8.7

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/21/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128897** Boring No./Sample No. **HB-WEL-215/S14** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **26+500** Offset, m: **3.8** LT Dbfg, m: **0.55-1.98**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	100.0
⅜ in. [9.5 mm]	96.1
¼ in. [6.3 mm]	92.1
No. 4 [4.75 mm]	89.4
No. 10 [2.00 mm]	82.5
No. 20 [0.850 mm]	73.3
No. 40 [0.425 mm]	60.9
No. 60 [0.250 mm]	50.5
No. 100 [0.150 mm]	39.1
No. 200 [0.075 mm]	28.0

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

8.3

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/21/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128898** Boring No./Sample No. **HB-WEL-216/1D** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **26+500** Offset, m: **2.4** LT Dbfg, m: **0.30-0.91**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	100.0
¾ in. [19.0 mm]	90.8
½ in. [12.5 mm]	90.2
⅜ in. [9.5 mm]	87.3
¼ in. [6.3 mm]	83.1
No. 4 [4.75 mm]	78.4
No. 10 [2.00 mm]	64.4
No. 20 [0.850 mm]	46.8
No. 40 [0.425 mm]	33.3
No. 60 [0.250 mm]	23.7
No. 100 [0.150 mm]	16.5
No. 200 [0.075 mm]	10.0

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

3.7

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

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GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128899** Boring No./Sample No. **HB-WEL-216/2D(A)** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/18/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **26+500** Offset, m: **2.4** LT Dbfg, m: **0.91-1.28**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	100.0
⅜ in. [9.5 mm]	94.3
¼ in. [6.3 mm]	86.0
No. 4 [4.75 mm]	81.0
No. 10 [2.00 mm]	67.1
No. 20 [0.850 mm]	48.7
No. 40 [0.425 mm]	33.1
No. 60 [0.250 mm]	22.8
No. 100 [0.150 mm]	15.8
No. 200 [0.075 mm]	9.2

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H2O, %

Water Content (T 265), %

4.0

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/21/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **133046** Boring No./Sample No. **HB-WEL-217/S15** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/19/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **27+340** Offset, m: **4.6** LT Dbfg, m: **0.24-0.85**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	
⅜ in. [9.5 mm]	100.0
¼ in. [6.3 mm]	99.0
No. 4 [4.75 mm]	98.4
No. 10 [2.00 mm]	96.1
No. 20 [0.850 mm]	90.2
No. 40 [0.425 mm]	53.7
No. 60 [0.250 mm]	17.8
No. 100 [0.150 mm]	9.0
No. 200 [0.075 mm]	5.9

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

5.1

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **133047** Boring No./Sample No. **HB-WEL-217/S16** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/19/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **27+340** Offset, m: **4.6** LT Dbfg, m: **0.85-1.83**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	
⅜ in. [9.5 mm]	100.0
¼ in. [6.3 mm]	99.7
No. 4 [4.75 mm]	99.7
No. 10 [2.00 mm]	99.4
No. 20 [0.850 mm]	98.8
No. 40 [0.425 mm]	97.0
No. 60 [0.250 mm]	83.6
No. 100 [0.150 mm]	29.5
No. 200 [0.075 mm]	12.6

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H2O, %

Water Content (T 265), %

7.4

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **128500** Boring No./Sample No. **HB-WEL-218/1D(A)** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/19/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **27+340** Offset, m: **2.3** LT Dbfg, m: **0.30-0.67**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	82.3
¾ in. [19.0 mm]	72.5
½ in. [12.5 mm]	68.0
⅜ in. [9.5 mm]	62.5
¼ in. [6.3 mm]	57.4
No. 4 [4.75 mm]	53.9
No. 10 [2.00 mm]	43.5
No. 20 [0.850 mm]	32.5
No. 40 [0.425 mm]	22.6
No. 60 [0.250 mm]	15.8
No. 100 [0.150 mm]	12.0
No. 200 [0.075 mm]	8.4

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

4.2

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

Brown sandy gravel

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/16/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **133048** Boring No./Sample No. **HB-WEL-218/1D(B)** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/19/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **27+340** Offset, m: **2.3** LT Dbfg, m: **0.67-0.91**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	100.0
⅜ in. [9.5 mm]	99.3
¼ in. [6.3 mm]	99.0
No. 4 [4.75 mm]	98.5
No. 10 [2.00 mm]	96.7
No. 20 [0.850 mm]	90.9
No. 40 [0.425 mm]	63.3
No. 60 [0.250 mm]	19.1
No. 100 [0.150 mm]	8.9
No. 200 [0.075 mm]	4.6

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimming, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

4.4

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **133049** Boring No./Sample No. **HB-WEL-218/2D** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/19/2002** Received **12/22/2002**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **27+340** Offset, m: **2.3** LT Dbfg, m: **0.91-1.52**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	
1 in. [25.0 mm]	
¾ in. [19.0 mm]	
½ in. [12.5 mm]	
⅜ in. [9.5 mm]	
¼ in. [6.3 mm]	100.0
No. 4 [4.75 mm]	100.0
No. 10 [2.00 mm]	99.7
No. 20 [0.850 mm]	99.3
No. 40 [0.425 mm]	97.9
No. 60 [0.250 mm]	86.8
No. 100 [0.150 mm]	21.0
No. 200 [0.075 mm]	6.6

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

7.6

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **1/6/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **176180** Boring No./Sample No. **TP-WEL-101** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/3/2003** Received **12/8/2003**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **20+940** Offset, m: **3.5** LT Dbfg, m: **0.19-0.60**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	99.9
¾ in. [19.0 mm]	99.9
½ in. [12.5 mm]	99.8
⅜ in. [9.5 mm]	97.0
¼ in. [6.3 mm]	92.4
No. 4 [4.75 mm]	88.5
No. 10 [2.00 mm]	72.5
No. 20 [0.850 mm]	38.4
No. 40 [0.425 mm]	16.8
No. 60 [0.250 mm]	9.0
No. 100 [0.150 mm]	5.7
No. 200 [0.075 mm]	3.8

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

4.2

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **12/18/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **176179** Boring No./Sample No. **TP-WEL-102** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/3/2003** Received **12/8/2003**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **22+500** Offset, m: **2.7** LT Dbfg, m: **0.28-0.57**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	99.7
¾ in. [19.0 mm]	99.7
½ in. [12.5 mm]	99.6
⅜ in. [9.5 mm]	95.0
¼ in. [6.3 mm]	84.2
No. 4 [4.75 mm]	77.2
No. 10 [2.00 mm]	56.4
No. 20 [0.850 mm]	29.1
No. 40 [0.425 mm]	14.3
No. 60 [0.250 mm]	8.4
No. 100 [0.150 mm]	5.5
No. 200 [0.075 mm]	3.7

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

3.3

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **12/18/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **176178** Boring No./Sample No. **TP-WEL-103** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/3/2003** Received **12/8/2003**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **24+500** Offset, m: **3.4** LT Dbfg, m: **0.25-0.55**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	100.0
1 in. [25.0 mm]	99.9
¾ in. [19.0 mm]	99.8
½ in. [12.5 mm]	99.7
⅜ in. [9.5 mm]	87.8
¼ in. [6.3 mm]	76.1
No. 4 [4.75 mm]	69.3
No. 10 [2.00 mm]	51.2
No. 20 [0.850 mm]	32.1
No. 40 [0.425 mm]	18.0
No. 60 [0.250 mm]	11.8
No. 100 [0.150 mm]	8.3
No. 200 [0.075 mm]	5.3

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H2O, %

Water Content (T 265), %

3.2

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **12/18/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **176177** Boring No./Sample No. **TP-WEL-104** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/3/2003** Received **12/8/2003**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **26+500** Offset, m: **3.0** LT Dbfg, m: **0.20-0.53**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	99.9
1 in. [25.0 mm]	99.7
¾ in. [19.0 mm]	99.6
½ in. [12.5 mm]	99.5
⅜ in. [9.5 mm]	92.1
¼ in. [6.3 mm]	81.0
No. 4 [4.75 mm]	75.3
No. 10 [2.00 mm]	60.8
No. 20 [0.850 mm]	46.4
No. 40 [0.425 mm]	35.6
No. 60 [0.250 mm]	26.8
No. 100 [0.150 mm]	18.0
No. 200 [0.075 mm]	11.4

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimming, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

4.1

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **12/18/2003**

Paper Copy: Lab File; Project File; Geotech File



GEOTECHNICAL TEST REPORT

Central Laboratory

SAMPLE INFORMATION

Reference No. **176176** Boring No./Sample No. **TP-WEL-105** Sample Description **GEOTECHNICAL (DISTURBED)** Sampled **12/3/2003** Received **12/8/2003**

Sample Type: **GEOLOGY** Location: **ROADWAY** Station: **27+340** Offset, m: **3.1** LT Dbfg, m: **0.20-0.76**

PIN: **007998.10** Town: **Wells** Sampler: **GROSS, KAREN L**

TEST RESULTS

Sieve Analysis (T 27, T 11)

Wash Method

Procedure A

SIEVE SIZE U.S. [SI]	% Passing
3 in. [75.0 mm]	99.9
1 in. [25.0 mm]	99.7
¾ in. [19.0 mm]	99.7
½ in. [12.5 mm]	99.6
⅜ in. [9.5 mm]	94.8
¼ in. [6.3 mm]	88.8
No. 4 [4.75 mm]	84.8
No. 10 [2.00 mm]	73.1
No. 20 [0.850 mm]	55.8
No. 40 [0.425 mm]	34.2
No. 60 [0.250 mm]	14.2
No. 100 [0.150 mm]	9.8
No. 200 [0.075 mm]	7.2

Direct Shear (T 236)

Shear Angle, °			
Initial Water Content, %			
Normal Stress, kPa			
Wet Density, kg/m³			
Dry Density, kg/m³			
Specimen Thickness, m			

Consolidation (T 216)

Trimmings, Water Content, %

	Initial	Final		Void Ratio	% Strain
Water Content, %			Pmin		
Dry Density, kg/m³			Pp		
Void Ratio			Pmax		
Saturation, %			Cc/C'c		

Miscellaneous Tests

Liquid Limit @ 25 blows
(T 89), %

Plastic Limit (T 90), %

Plasticity Index (T 90), %

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

Loss on Ignition (T 267)

Loss, % H₂O, %

Water Content (T 265), %

4.8

Vane Shear Test on Shelby Tubes (Maine DOT)

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

Comments:

AUTHORIZATION AND DISTRIBUTION

Reported by: **FOGG, BRIAN**Date Reported: **12/18/2003**

Paper Copy: Lab File; Project File; Geotech File



LABORATORY TEST REPORT

Geology

TERRY

SAMPLE INFORMATION

Reference No. **98593** Sample Description: **GEOLOGY CUP** FWD-100SB Sampled: **08/29/2000**
 Sample Type: **GEOLOGY** Sampler: **GROSS, KAREN** Received: **06/26/2001**
 Location: **ROADWAY** Station: **27+315** Offset: **92mm** Depth: **.92-.61m** Washboring: **100 fwd m**
 PIN: **7998.10** Town: **WELLS** Sample: **Sample #1**

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm [3 in.]	
25 mm [1 in.]	
19 mm [¾ in.]	100.0
12.5 mm [½ in.]	97.7
mm [3/8 in.]	79.2
mm [¼ in.]	70.3
4.75 mm [No. 4]	65.9
2.00 mm [No. 10]	56.2
850 µm [No. 20]	43.5
425 µm [No. 40]	29.8
250 µm [No. 60]	21.3
150 µm [No. 100]	14.8
75 µm [No. 200]	9.6

Hydrometer Analysis (AASHTO T88)

<u>Particle Size</u>	<u>%</u>	<u>Particle Size</u>	<u>%</u>
<u>mm</u>	<u>Passing</u>	<u>mm</u>	<u>Passing</u>

Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) **1.3**
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft²)(95.76)=kPa

<u>Depth of Sample in Tube (m)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>% Water Content</u>	<u>Description of Tube Sample at Various Depths</u>
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Comments: brown silty sandy gravel

AUTHORIZATION

Reported by: FOGG, BRIAN

Date Reported: 06/28/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

98594

Sample Description: GEOLOGY CUP FWD-100SB

Sampled: 08/29/2000

Sample Type: GEOLOGYSampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAY Station: 27+315 Offset: 90mmDepth: 0.61 - 1.52m Washboring: 100 FWD MPIN: 007998.10 Town: WELLS2.4mSample: Sample #2

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm	[3 in.]
25 mm	[1 in.]
19 mm	[¾ in.]
12.5 mm	[½ in.]
mm	[3/8 in.]
	100.0
mm	[¼ in.]
	96.4
4.75 mm	[No. 4]
	91.7
2.00 mm	[No. 10]
	78.2
850 µm	[No. 20]
	57.4
425 µm	[No. 40]
	37.3
250 µm	[No. 60]
	27.0
150 µm	[No. 100]
	19.6
75 µm	[No. 200]
	13.9

Hydrometer Analysis (AASHTO T88)

<u>Particle</u>		<u>Particle</u>	
<u>Size</u>	<u>%</u>	<u>Size</u>	<u>%</u>
<u>mm</u>	<u>Passing</u>	<u>mm</u>	<u>Passing</u>

Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) **2.7**
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft2)(95.76)=kPa

<u>Depth</u>	<u>Undisturbed</u>		<u>Undisturbed</u>		<u>%</u>	<u>Description</u>
<u>of Sample</u>	<u>Shear Strength</u>	<u>Remolding</u>	<u>Shear Strength</u>	<u>Remolding</u>	<u>Water</u>	<u>of Tube Sample</u>
<u>in Tube</u>	<u>Vane</u>	<u>Vane</u>	<u>Vane</u>	<u>Vane</u>	<u>Content</u>	<u>at Various Depths</u>
<u>(m)</u>	<u>(kPa)</u>	<u>(kPa)</u>	<u>(kPa)</u>	<u>(kPa)</u>		

Comments: brown f-c sand, some gravel, some silt

AUTHORIZATION

Reported by: **FOGG, BRIAN**Date Reported: **06/28/2001**



LABORATORY TEST REPORT

Geology

7244

SAMPLE INFORMATION

Reference No.

98595

Sample Description: **GEOLOGY CUP** FWD-160SB

Sampled: 08/29/2000

Sample Type: **GEOLOGY**Sampler: **GROSS, KAREN**

Received: 06/26/2001

Location: **ROADWAY** Station: 27+315 Offset: 4.52m

Depth: 1.52-2.74m

Washboring: 100 FWD M

PIN: 007998.10 Town: **WELLS**

2.4m

Sample: **Sample #3**

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm	[3 in.]
25 mm	[1 in.]
19 mm	[¾ in.]
12.5 mm	[½ in.]
mm	[3/8 in.]
mm	[¼ in.]
4.75 mm	[No. 4]
2.00 mm	[No. 10]
850 µm	[No. 20]
425 µm	[No. 40]
250 µm	[No. 60]
150 µm	[No. 100]
75 µm	[No. 200]
	100.0
	99.8
	98.0
	92.1
	61.7
	20.3
	10.7

Hydrometer Analysis (AASHTO T88)

<u>Particle</u>		<u>Particle</u>	
<u>Size</u>	<u>%</u>	<u>Size</u>	<u>%</u>
<u>mm</u>	<u>Passing</u>	<u>mm</u>	<u>Passing</u>

Miscellaneous Tests

Liquid Limit, %, (T89):	
Plastic Limit, %, (T90):	
Plasticity Index, %, (T90):	
Loss on Ignition, %, (T267):	
Water Content, %, (Maine DOT)	2.5
Specific Gravity (T100) Corrected to 20°C:	

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft²)(95.76)=kPa

<u>Depth</u>	<u>Undisturbed</u>		<u>Undisturbed</u>		<u>%</u>	<u>Description</u>
<u>of Sample</u>	<u>Shear Strength</u>	<u>Remolding</u>	<u>Shear Strength</u>	<u>Remolding</u>	<u>Water</u>	<u>of Tube Sample</u>
<u>in Tube</u>	<u>Vane</u>	<u>Vane</u>	<u>Vane</u>	<u>Vane</u>	<u>Content</u>	<u>at Various Depths</u>
<u>(m)</u>	<u>(kPa)</u>	<u>(kPa)</u>	<u>(kPa)</u>	<u>(kPa)</u>		

Comments: brown f-sand

AUTHORIZATION

Reported by: FOGG, BRIAN

Date Reported: 06/28/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

98596

Sample Description: GEOLOGY CUP FWD-100SB

Sampled: 08/29/2000

Sample Type: GEOLOGYSampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAYStation: 27+315 Offset: 2.74-2.9m
2.4mDepth: 2.74-2.9m

Washboring: 100 FWD M

PIN: 007998.10 Town: WELLS

Sample: Sample #4

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm	[3 in.]
25 mm	[1 in.]
19 mm	[¾ in.]
12.5 mm	[½ in.]
mm	[3/8 in.]
mm	[¼ in.]
	100.0
4.75 mm	[No. 4]
	99.9
2.00 mm	[No. 10]
	99.7
850 µm	[No. 20]
	99.1
425 µm	[No. 40]
	97.8
250 µm	[No. 60]
	95.3
150 µm	[No. 100]
	89.9
75 µm	[No. 200]
	83.4

Hydrometer Analysis (AASHTO T88)

<u>Particle Size</u>	<u>%</u>	<u>Particle Size</u>	<u>%</u>
<u>mm</u>	<u>Passing</u>	<u>mm</u>	<u>Passing</u>

Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) 21.0
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft2)(95.76)=kPa

<u>Depth of Sample in Tube (m)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>% Water Content</u>	<u>Description of Tube Sample at Various Depths</u>
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Comments: brown mottled clayey silt

AUTHORIZATION

Reported by: FOGG, BRIAN

Date Reported: 06/28/2001



LABORATORY TEST REPORT

Geology

TEPR

SAMPLE INFORMATION

Reference No.

98597

Sample Description: GEOLOGY CUP FWD-1000

Sampled: 08/29/2000

Sample Type: GEOLOGY

Sampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAY

Station: 26+415 Offset: 2.43m

Depth: 243 - .76m Washboring: FWD 1000

PIN: 007998.10 Town: WELLS

2.5m

Sample: Sample #5

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm	[3 in.]
25 mm	[1 in.]
19 mm	[¾ in.]
12.5 mm	[½ in.]
mm	[3/8 in.]
mm	[¼ in.]
4.75 mm	[No. 4]
2.00 mm	[No. 10]
850 µm	[No. 20]
425 µm	[No. 40]
250 µm	[No. 60]
150 µm	[No. 100]
75 µm	[No. 200]

Hydrometer Analysis (AASHTO T88)

<u>Particle Size, mm</u>	<u>% Passing</u>	<u>Particle Size, mm</u>	<u>% Passing</u>
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Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) 12,096.3
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft²)(95.76)=kPa

<u>Depth of Sample in Tube (m)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>% Water Content</u>	<u>Description of Tube Sample at Various Depths</u>
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Comments: brown silty sandy gravel

AUTHORIZATION

Reported by: FOGG, BRIAN

Date Reported: 07/02/2001



LABORATORY TEST REPORT

Geology

TERRY

SAMPLE INFORMATION

Reference No.

98598

Sample Description: GEOLOGY CUP FWD - 1000

Sampled: 08/29/2000

Sample Type: GEOLOGYSampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAY Station: 26+415 Offset: ~~704~~Depth: .76-1.83m Washboring: FWD 1000PIN: 007998.10 Town: WELLS

2.5m

Sample: Sample #6

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm	[3 in.]
25 mm	[1 in.]
19 mm	[¾ in.]
12.5 mm	[½ in.]
mm	[3/8 in.]
	100.0
mm	[¼ in.]
	98.8
4.75 mm	[No. 4]
	97.1
2.00 mm	[No. 10]
	91.8
850 µm	[No. 20]
	84.4
425 µm	[No. 40]
	66.1
250 µm	[No. 60]
	34.9
150 µm	[No. 100]
	14.6
75 µm	[No. 200]
	5.9

Hydrometer Analysis (AASHTO T88)

<u>Particle Size, mm</u>	<u>% Passing</u>	<u>Particle Size, mm</u>	<u>% Passing</u>
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Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) 9.0
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft2)(95.76)=kPa

<u>Depth of Sample in Tube (m)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>% Water Content</u>	<u>Description of Tube Sample at Various Depths</u>
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Comments: red-brown f-c sand, some silt

AUTHORIZATION

Reported by: FOGG, BRIANDate Reported: 06/28/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

98599

Sample Description: GEOLOGY CUP FWD-2400

Sampled: 08/30/2000

Sample Type: GEOLOGYSampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAY Station: 25+00.5 Offset: 1.68mDepth: 1.68 - 1.98m Washboring: FWD 2400PIN: 007998.10 Town: WELLS2.7mSample: Sample #7

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>		
<u>Metric</u>	<u>Standard</u>	<u>% Passing</u>
75 mm	[3 in.]	
25 mm	[1 in.]	
19 mm	[¾ in.]	
12.5 mm	[½ in.]	
mm	[3/8 in.]	100.0
mm	[¼ in.]	98.9
4.75 mm	[No. 4]	97.0
2.00 mm	[No. 10]	90.7
850 µm	[No. 20]	75.1
425 µm	[No. 40]	56.7
250 µm	[No. 60]	40.0
150 µm	[No. 100]	26.4
75 µm	[No. 200]	15.0

Hydrometer Analysis (AASHTO T88)

<u>Particle Size, mm</u>	<u>% Passing</u>	<u>Particle Size, mm</u>	<u>% Passing</u>
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Miscellaneous Tests

Liquid Limit, %, (T89):	
Plastic Limit, %, (T90):	
Plasticity Index, %, (T90):	
Loss on Ignition, %, (T267):	
Water Content, %, (Maine DOT)	60.3
Specific Gravity (T100) Corrected to 20°C:	

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft2)(95.76)=kPa

<u>Depth of Sample in Tube (m)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>% Water Content</u>	<u>Description of Tube Sample at Various Depths</u>
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Comments: brown organic silt (peat), some sand

AUTHORIZATION

Reported by: FOGG, BRIAN

Date Reported: 06/29/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

98600

Sample Description: GEOLOGY CUP FWD - 2400

Sampled: 08/30/2000

Sample Type: GEOLOGY

Sampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAY

Station: 25+005 Offset: ~~1.88m~~

Depth: 1.98-2.9m

Washboring: FWD 2400

PIN: 007998.10 Town: WELLS

2.7m

Sample: Sample #8

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm	[3 in.]
25 mm	[1 in.]
19 mm	[¾ in.]
12.5 mm	[½ in.]
9.5 mm	[3/8 in.]
7.5 mm	[¾ in.]
4.75 mm	[No. 4]
2.00 mm	[No. 10]
850 µm	[No. 20]
425 µm	[No. 40]
250 µm	[No. 60]
150 µm	[No. 100]
75 µm	[No. 200]
	100.0
	96.5
	89.7
	85.2
	71.7
	61.5
	49.4
	38.7
	27.1
	17.4

Hydrometer Analysis (AASHTO T88)

<u>Particle</u>	<u>%</u>	<u>Particle</u>	<u>%</u>
<u>Size,</u>	<u>Passing</u>	<u>Size,</u>	<u>Passing</u>
<u>mm</u>		<u>mm</u>	

Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) 25.0
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft2)(95.76)=kPa

<u>Depth</u>	<u>Undisturbed</u>		<u>Undisturbed</u>		<u>%</u>	<u>Description</u>
<u>of Sample</u>	<u>Shear Strength</u>	<u>Remolding</u>	<u>Shear Strength</u>	<u>Remolding</u>	<u>Water</u>	<u>of Tube Sample</u>
<u>in Tube</u>	<u>Vane</u>	<u>Vane</u>	<u>Vane</u>	<u>Vane</u>	<u>Content</u>	<u>at Various Depths</u>
<u>(m)</u>	<u>(kPa)</u>	<u>(kPa)</u>	<u>(kPa)</u>	<u>(kPa)</u>		

Comments: brown f-c sand, some clay

AUTHORIZATION

Reported by: FOGG, BRIAN

Date Reported: 07/02/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

105032

Sample Description: GEOLOGY CUP FWD - 3000

Sampled: 08/30/2000

Sample Type: GEOLOGY

Sampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAY

Station: 24+40S Offset: 195m

Depth: 195 - 58m Washboring: FWD 3000

PIN: 007998.10 Town: WELLS

2.4m

Sample: Sample #9

TEST RESULTS

Sieve Analysis (AASHTO T27)

SIEVE SIZE		
Metric	Standard	% Passing
75 mm	[3 in.]	
25 mm	[1 in.]	100.0
19 mm	[¾ in.]	87.9
12.5 mm	[½ in.]	74.8
mm	[3/8 in.]	70.4
mm	[¼ in.]	61.1
4.75 mm	[No. 4]	57.2
2.00 mm	[No. 10]	47.7
850 µm	[No. 20]	37.5
425 µm	[No. 40]	29.1
250 µm	[No. 60]	22.9
150 µm	[No. 100]	18.0
75 µm	[No. 200]	12.8

Hydrometer Analysis (AASHTO T88)

Particle Size		Particle Size	
mm	% Passing	mm	% Passing

Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) 2.2
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	Initial	Final	Voids Ratio	% Strain
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft²)(95.76)=kPa

Depth of Sample in Tube (m)	Undisturbed Shear Strength Vane (kPa)	Remolding Vane (kPa)	Undisturbed Shear Strength Vane (kPa)	Remolding Vane (kPa)	% Water Content	Description of Tube Sample at Various Depths
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Comments: brown silty sandy gravel

AUTHORIZATION

Reported by: FOGG, BRIAN

Date Reported: 06/28/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

105033

Sample Description: GEOLOGY CUP FWD - 3000

Sampled: 08/30/2000

Sample Type: GEOLOGYSampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAY Station: 2A+405 Offset: 195mDepth: .58-.98m Washboring: FWD 3000PIN: 007998.10 Town: WELLS2.4mSample: Sample #10

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm	[3 in.]
25 mm	[1 in.]
19 mm	[¾ in.]
	100.0
12.5 mm	[½ in.]
	97.2
mm	[3/8 in.]
	93.0
mm	[¼ in.]
	90.1
4.75 mm	[No. 4]
	87.1
2.00 mm	[No. 10]
	79.0
850 µm	[No. 20]
	68.7
425 µm	[No. 40]
	56.9
250 µm	[No. 60]
	48.0
150 µm	[No. 100]
	37.9
75 µm	[No. 200]
	27.2

Hydrometer Analysis (AASHTO T88)

<u>Particle Size</u>	<u>%</u>	<u>Particle Size</u>	<u>%</u>
<u>mm</u>	<u>Passing</u>	<u>mm</u>	<u>Passing</u>

Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) 4.5
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft2)(95.76)=kPa

<u>Depth of Sample in Tube (m)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>% Water Content</u>	<u>Description of Tube Sample at Various Depths</u>
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Comments: brown silty f-m sand, some cobbles, some gravel

AUTHORIZATION

Reported by: FOGG, BRIANDate Reported: 06/28/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

105034

Sample Description: GEOLOGY CUP

FWD-3402

Sampled:

08/30/2000

Sample Type: GEOLOGYSampler: GROSS, KAREN

Received:

06/26/2001

Location: ROADWAYStation: 23+998 Offset: 1.52mDepth: 1.52-2.9m Washboring: FWD 3402PIN: 007998.10 Town: WELLS2.7m

Sample:

Sample #11

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>		
<u>Metric</u>	<u>Standard</u>	<u>% Passing</u>
75 mm	[3 in.]	
25 mm	[1 in.]	
19 mm	[¾ in.]	
12.5 mm	[½ in.]	
mm	[3/8 in.]	100.0
mm	[¼ in.]	99.9
4.75 mm	[No. 4]	99.9
2.00 mm	[No. 10]	99.3
850 µm	[No. 20]	98.2
425 µm	[No. 40]	95.8
250 µm	[No. 60]	93.6
150 µm	[No. 100]	91.9
75 µm	[No. 200]	88.6

Hydrometer Analysis (AASHTO T88)

<u>Particle</u>		<u>Particle</u>	
<u>Size</u>	<u>%</u>	<u>Size</u>	<u>%</u>
<u>mm</u>	<u>Passing</u>	<u>mm</u>	<u>Passing</u>

Miscellaneous Tests

Liquid Limit, %, (T89):

Plastic Limit, %, (T90):

Plasticity Index, %, (T90):

Loss on Ignition, %, (T267):

Water Content, %, (Maine DOT) 23.2

Specific Gravity (T100)
Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft2)(95.76)=kPa

<u>Depth</u>	<u>Undisturbed</u>	<u>Remolding</u>	<u>Undisturbed</u>	<u>Remolding</u>	<u>%</u>	<u>Description</u>
<u>of Sample</u>	<u>Shear Strength</u>		<u>Shear Strength</u>		<u>Water</u>	<u>of Tube Sample</u>
<u>in Tube</u>	<u>Vane</u>	<u>Vane</u>	<u>Vane</u>	<u>Vane</u>	<u>Content</u>	<u>at Various Depths</u>
<u>(m)</u>	<u>(kPa)</u>	<u>(kPa)</u>	<u>(kPa)</u>	<u>(kPa)</u>		

Comments: olive brown mottled clay silt

AUTHORIZATION

Reported by: FOGG, BRIANDate Reported: 06/28/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

105035

Sample Description: GEOLOGY CUP

FWD-4200

Sampled: 08/30/2000

Sample Type: GEOLOGYSampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAYStation: 23+196Offset: 1.70mDepth: 6.17 - .91mWashboring: FWD 4200PIN: 007998.10 Town: WELLS2.5m RtSample: Sample #13

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>		<u>% Passing</u>
<u>Metric</u>	<u>Standard</u>	
75 mm	[3 in.]	
25 mm	[1 in.]	100.0
19 mm	[¾ in.]	95.0
12.5 mm	[½ in.]	86.6
9.5 mm	[3/8 in.]	82.1
7.5 mm	[¾ in.]	72.8
4.75 mm	[No. 4]	68.2
2.00 mm	[No. 10]	55.3
850 µm	[No. 20]	34.9
425 µm	[No. 40]	19.9
250 µm	[No. 60]	14.2
150 µm	[No. 100]	10.4
75 µm	[No. 200]	7.0

Hydrometer Analysis (AASHTO T88)

<u>Particle Size, mm</u>	<u>% Passing</u>	<u>Particle Size, mm</u>	<u>% Passing</u>
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Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) 1.7
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft2)(95.76)=kPa

<u>Depth of Sample in Tube (m)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>% Water Content</u>	<u>Description of Tube Sample at Various Depths</u>
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Comments: brown f-c sand, some gravel

AUTHORIZATION

Reported by: FOGG, BRIAN

Date Reported: 06/29/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

105036

Sample Description: **GEOLOGY CUP** FWD-4200

Sampled: 08/30/2000

Sample Type: **GEOLOGY**Sampler: **GROSS, KAREN**

Received: 06/26/2001

Location: **ROADWAY**Station: **23+196**Offset: **24m**Depth: **91-1.58m**Washboring: **FWD 4200**PIN: **007998.10** Town: **WELLS**

2.5m RT

Sample: **Sample #14**

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm	[3 in.]
25 mm	[1 in.]
19 mm	[¾ in.]
12.5 mm	[½ in.]
mm	[3/8 in.]
	100.0
mm	[¼ in.]
	99.7
4.75 mm	[No. 4]
	99.3
2.00 mm	[No. 10]
	97.2
850 µm	[No. 20]
	91.9
425 µm	[No. 40]
	81.3
250 µm	[No. 60]
	67.8
150 µm	[No. 100]
	54.9
75 µm	[No. 200]
	41.8

Hydrometer Analysis (AASHTO T88)

<u>Particle Size, mm</u>	<u>% Passing</u>	<u>Particle Size, mm</u>	<u>% Passing</u>
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Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) **20.8**
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Void Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft2)(95.76)=kPa

<u>Depth of Sample in Tube (m)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>% Water Content</u>	<u>Description of Tube Sample at Various Depths</u>
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Comments: brown silty f-sand

AUTHORIZATION

Reported by: **FOGG, BRIAN**Date Reported: **07/02/2001**



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

105037

Sample Description: GEOLOGY CUP

FWD - 5000

Sampled: 08/30/2000

Sample Type: GEOLOGYSampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAYStation: 22+396 Offset: ~~2.5m~~Depth: 21m - 55m Washboring: FWD 5000PIN: 007998.10 Town: WELLS

2.5m R+

Sample: Sample #15

TEST RESULTS

Sieve Analysis (AASHTO T27)

SIEVE SIZE		% Passing
Metric	Standard	
75 mm	[3 in.]	
25 mm	[1 in.]	100.0
19 mm	[¾ in.]	89.9
12.5 mm	[½ in.]	80.5
mm	[3/8 in.]	73.0
mm	[¼ in.]	64.7
4.75 mm	[No. 4]	59.8
2.00 mm	[No. 10]	49.4
850 µm	[No. 20]	34.1
425 µm	[No. 40]	21.8
250 µm	[No. 60]	15.4
150 µm	[No. 100]	11.5
75 µm	[No. 200]	7.7

Hydrometer Analysis (AASHTO T88)

Particle Size, mm	% Passing	Particle Size, mm	% Passing
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Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) 3.2
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	Initial	Final	Voids Ratio	% Strain
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft²)(95.76)=kPa

Depth of Sample in Tube (m)	Undisturbed Shear Strength Vane (kPa)	Remolding Vane (kPa)	Undisturbed Shear Strength Vane (kPa)	Remolding Vane (kPa)	% Water Content	Description of Tube Sample at Various Depths
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Comments: brown f-c sand, some gravel

AUTHORIZATION

Reported by: FOGG, BRIANDate Reported: 06/28/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

105038

Sample Description: GEOLOGY CUP FWD - 5000

Sampled: 08/29/2000

Sample Type: GEOLOGY

Sampler: GROSS, KAREN

Received: 06/26/2001

Location: ROADWAY

Station: 22+396 Offset: ~~55m~~

Depth: .55 - 2.44m Washboring: FWD 5000

PIN: 007998.10 Town: WELLS

2.5m R+

Sample: Sample #16

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm	[3 in.]
25 mm	[1 in.]
19 mm	[¾ in.]
	100.0
12.5 mm	[½ in.]
	97.4
7.5 mm	[3/8 in.]
	95.3
4.75 mm	[No. 4]
	84.8
2.00 mm	[No. 10]
	79.8
850 µm	[No. 20]
	67.5
425 µm	[No. 40]
	53.0
250 µm	[No. 60]
	36.0
150 µm	[No. 100]
	28.2
75 µm	[No. 200]
	22.3
	16.4

Hydrometer Analysis (AASHTO T88)

<u>Particle Size</u>	<u>%</u>	<u>Particle Size</u>	<u>%</u>
<u>mm</u>	<u>Passing</u>	<u>mm</u>	<u>Passing</u>

Miscellaneous Tests

Liquid Limit, %, (T89):
 Plastic Limit, %, (T90):
 Plasticity Index, %, (T90):
 Loss on Ignition, %, (T267):
 Water Content, %, (Maine DOT) 0.8
 Specific Gravity (T100)
 Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft2)(95.76)=kPa

<u>Depth of Sample in Tube (m)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>Undisturbed Shear Strength Vane (kPa)</u>	<u>Remolding Vane (kPa)</u>	<u>% Water Content</u>	<u>Description of Tube Sample at Various Depths</u>
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Comments: brown sandy silt, some gravel

AUTHORIZATION

Reported by: FOGG, BRIAN

Date Reported: 06/29/2001



LABORATORY TEST REPORT

Geology

SAMPLE INFORMATION

Reference No.

105039

Sample Description: GEOLOGY CUP

FWD - 5000

Sampled:

08/29/2000

Sample Type: GEOLOGYSampler: GROSS, KAREN

Received:

06/26/2001

Location: ROADWAYStation: 22+396Offset: 2.44mDepth: 2.44 - 2.9m

Washboring:

FWD 5000

PIN: 007998.10Town: WELLS

2.5m R+

Sample:

Sample #17

TEST RESULTS

Sieve Analysis (AASHTO T27)

<u>SIEVE SIZE</u>	
<u>Metric</u>	<u>Standard</u>
<u>% Passing</u>	
75 mm	[3 in.]
25 mm	[1 in.]
19 mm	[¾ in.]
12.5 mm	[½ in.]
	100.0
mm	[3/8 in.]
	98.6
mm	[¼ in.]
	96.7
4.75 mm	[No. 4]
	94.7
2.00 mm	[No. 10]
	85.1
850 µm	[No. 20]
	69.1
425 µm	[No. 40]
	42.7
250 µm	[No. 60]
	28.5
150 µm	[No. 100]
	22.4
75 µm	[No. 200]
	17.4

Hydrometer Analysis (AASHTO T88)

<u>Particle</u>	<u>%</u>	<u>Particle</u>	<u>%</u>
<u>Size</u>	<u>Passing</u>	<u>Size</u>	<u>Passing</u>
<u>mm</u>		<u>mm</u>	

Miscellaneous Tests

Liquid Limit, %, (T89):

Plastic Limit, %, (T90):

Plasticity Index, %, (T90):

Loss on Ignition, %, (T267):

Water Content, %, (Maine DOT)

4.2

Specific Gravity (T100)

Corrected to 20°C:

Consolidation (AASHTO T297)

	<u>Initial</u>	<u>Final</u>	<u>Voids Ratio</u>	<u>% Strain</u>
GWN			Pmin	Pmin
Void Ratio			Pp	Pp
ry Density, kg/m³			Pmax	Pmax
Saturation, %			Cc	Cc

Vane Shear Test on Shelby Tubes (Maine DOT)

(T/ft²)(95.76)=kPa

<u>Depth</u>	<u>Undisturbed</u>	<u>Remolding</u>	<u>Undisturbed</u>	<u>Remolding</u>	<u>%</u>	<u>Description</u>
<u>of Sample</u>	<u>Shear Strength</u>	<u>Shear Strength</u>	<u>Shear Strength</u>	<u>Shear Strength</u>	<u>Water</u>	<u>of Tube Sample</u>
<u>in Tube</u>	<u>Vane</u>	<u>Vane</u>	<u>Vane</u>	<u>Vane</u>	<u>Content</u>	<u>at Various Depths</u>
<u>(m)</u>	<u>(kPa)</u>	<u>(kPa)</u>	<u>(kPa)</u>	<u>(kPa)</u>		

Comments: brown f-c sand

AUTHORIZATION

Reported by: FOGG, BRIAN

Date Reported: 06/29/2001

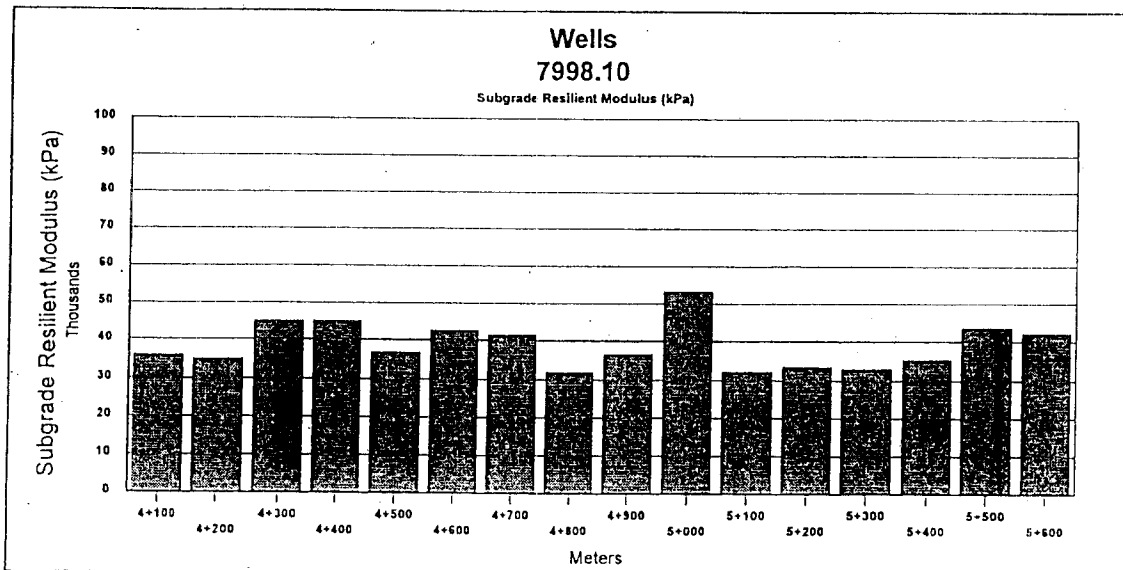
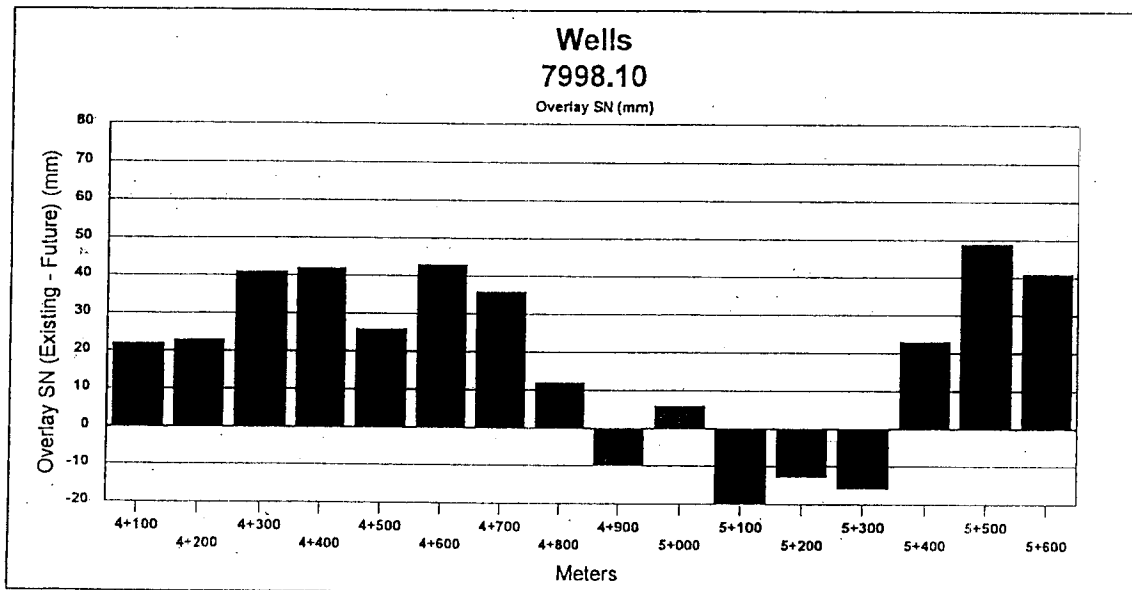
Appendix D: Design

- FWD Analysis
- Resilient Modulus (Mr) Calculation
- Frost Depth Information
- Detail – *Frost Susceptible Soils over Ledge*

Wells
7998.10
Sta. 4+000 to 5+600

Station (Meters)	Existing Structural Number (mm)	Future Traffic Structural Number (mm)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (mm)	Existing Pavement Modulus (kPa)	Subgrade Resilient Modulus (kPa)	Pavement Depth (mm)	Pavement/ Gravel Depth (mm)
4+100	141	119	22	-	458716	36102	90	760
4+200	143	120	23	-	483624	35011	90	760
4+300	151	110	41	-	570887	45162	90	760
4+400	152	110	42	-	579202	45197	90	760
4+500	144	118	26	-	487609	37005	125	760
4+600	155	112	43	-	616077	42773	125	760
4+700	149	113	36	-	540612	41541	125	760
4+800	135	123	12	-	409393	32154	125	760
4+900	108	118	-10	-	550158	36630	105	550
5+000	110	104	6	-	581710	53310	105	550
5+100	102	123	-21	-	461475	32393	105	550
5+200	109	122	-13	-	557111	33582	105	550
5+300	106	122	-16	-	514077	33222	105	550
5+400	143	120	23	-	478075	35372	150	760
5+500	161	112	49	-	691217	43699	150	760
5+600	154	113	41	-	601175	42082	150	760

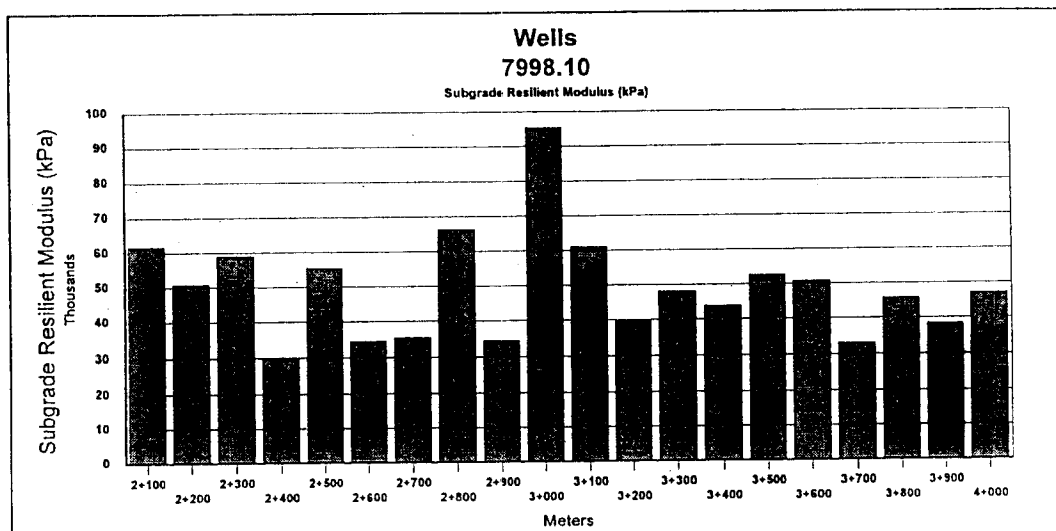
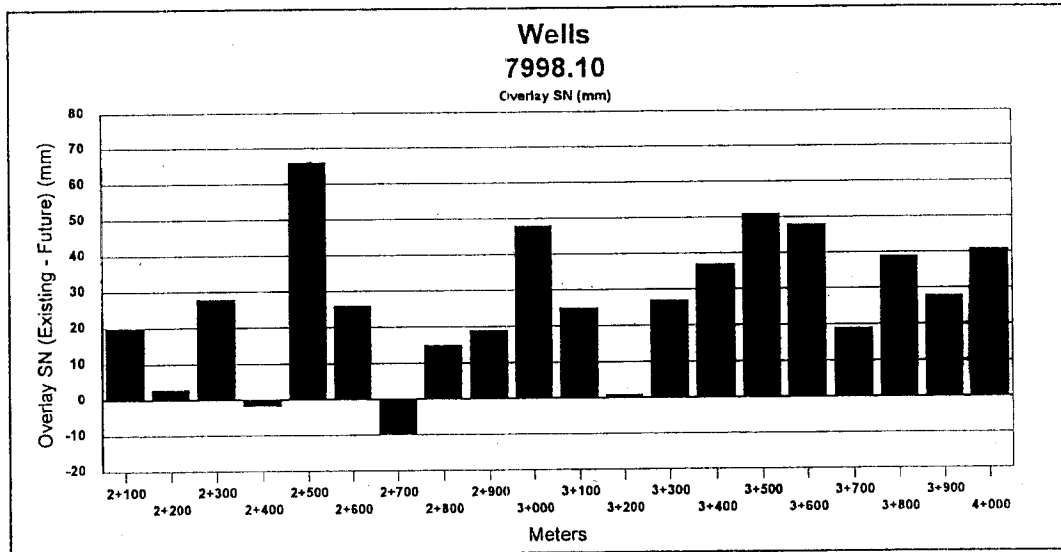
FWD Test Location	Design Station
5600	21+796
5500	21+896
5400	21+996
5300	22+096
5200	22+196
5100	22+296
5000	22+396
4900	22+496
4800	22+596
4700	22+696
4600	22+796
4500	22+896
4400	22+996
4300	23+096
4200	23+196
4100	23+296
4000	23+396
3900	23+496
3800	23+596
3700	23+696
3600	23+796
3500	23+896
3400	23+996
3300	24+096
3200	24+196
3100	24+296
3000	24+396
2900	24+496
2800	24+596
2700	24+696
2600	24+796
2500	24+896
2400	24+996
2300	25+096
2200	25+196
2100	25+296



Wells
7998.10
Sta. 2+000 to 4+000

Station (Meters)	Existing Structural Number (mm)	Future Traffic Structural Number (mm)	Overlay Structural Number (Existing - Future)	Recommended Pavement Thickness (mm)	Existing Pavement Modulus (kPa)	Subgrade Resilient Modulus (kPa)	Pavement/ Gravel Depth (mm)	Pavement/ Gravel Depth (mm)
2+100	119	99	20	-	738582	61719	165	550
2+200	109	106	3	-	569694	50958	165	550
2+300	129	101	28	-	690319	59082	125	610
2+400	124	126	-2	-	609278	30206	125	610
2+500	169	103	66	-	795145	55448	255	760
2+600	146	120	26	-	513329	34698	255	760
2+700	109	119	-10	-	786715	35666	220	490
2+800	112	97	15	-	855604	66351	220	490
2+900	139	120	19	-	988795	34608	195	580
3+000	133	85	48	-	872047	95441	195	580
3+100	125	100	25	-	723122	61107	85	520
3+200	116	115	1	-	805279	39596	85	520
3+300	135	108	27	-	409210	48129	195	760
3+400	148	111	37	-	534474	43931	195	760
3+500	156	105	51	-	630543	52703	205	760
3+600	154	106	48	-	607537	50813	205	760
3+700	141	122	19	-	464748	33249	160	760
3+800	149	110	39	-	549227	45822	160	760
3+900	144	116	28	-	495381	38466	160	760
4+000	150	109	41	-	554182	47135	160	760

FWD Test Location	Design Station
5600	21+796
5500	21+896
5400	21+996
5300	22+096
5200	22+196
5100	22+296
5000	22+396
4900	22+496
4800	22+596
4700	22+696
4600	22+796
4500	22+896
4400	22+996
4300	23+096
4200	23+196
4100	23+296
4000	23+396
3900	23+496
3800	23+596
3700	23+696
3600	23+796
3500	23+896
3400	23+996
3300	24+096
3200	24+196
3100	24+296
3000	24+396
2900	24+496
2800	24+596
2700	24+696
2600	24+796
2500	24+896
2400	24+996
2300	25+096
2200	25+196
2100	25+296



	A	B	C	D	E	F	G	H	I	J
1					Wells					
2					7998.10					
3					Sta. 0+000 to 2+000					
4										
5										
6	Station	Existing	Future Traffic	Overlay	Recommended	Existing	Subgrade	Pavement	Pavement/	
7	(Meters)	Structural	Structural	Structural Number	Pavement	Pavement	Resilient	Depth (mm)	Gravel	
8		Number (mm)	Number (mm)	(Existing - Future)	Thickness (mm)	Modulus (kPa)	Modulus (kPa)	Depth (mm)	Depth (mm)	
9	0+100	114	120	6	14	475117	34789	95	610	
10	0+200	126	114	12	-	632448	40709	95	610	
11	0+300	141	126	15	-	900745	29769	95	610	
12	0+400	109	121	12	27	844458	33778	220	480	
13	0+500	127	119	8	-	681766	35949	95	600	
14	0+600	168	114	54	-	777658	40907	85	760	
15	0+700	151	117	34	-	571463	37763	85	760	
16	0+800	132	104	28	-	860063	53741	90	580	
17	0+900	119	107	12	-	621873	49840	90	580	
18	1+000	160	105	55	-	681302	51928	240	760	
19	1+100	157	103	54	-	635837	54893	240	760	
20	1+200	109	109	0	-	667473	47391	180	520	
21	1+300	103	109	6	14	560877	46648	180	520	
22	1+400	110	115	5	11	573019	39769	200	550	
23	1+500	122	91	31	-	792505	79813	200	550	
24	1+600	125	105	20	-	999033	51610	205	520	
25	1+700	111	116	5	11	706476	38866	205	520	
26	1+800	133	121	12	-	1209509	33866	205	520	
27	1+900	108	117	9	20	945154	38277	180	460	
28	2+000	104	115	11	25	846188	39489	180	460	
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
41										
42										

Wells
7998.10
Overlay \$N (mm)

55.00

Future) (mm)

30.00

FWD Test Location	Design Station
2+000	25+396
1+900	25+496
1+800	25+596
1+700	25+696
1+600	25+796
1+500	25+896
1+400	25+996
1+300	26+096
1+200	26+196
1+100	26+296
1+000	26+396
0+900	26+496
0+800	26+596
0+700	26+696
0+600	26+796
0+500	26+896
0+400	26+996
0+300	27+096
0+200	27+196
0+100	27+296
0+000	27+396

STATE OF MAINE

INTERDEPARTMENTAL MEMORANDUM

FILE: 109

Also: Rte 9

Date of Request: 2/12/2009

Return: 2/20/09

Latest Date Needed By

2/19/2009

To: Ed Hanscom

Dept.: MDOT, Bureau of Planning

From: Shawn Smith

Dept.: Highway Division

Subject: Request for Traffic Information

Project Manager: Shawn Smith

TOWN(S): Wells

P.I.N. 7998.10

Consultant Proj ☒

COUNTY: York

ROUTE: Route 109

LOCATION/ DESCRIPTION: Starting 0.15 miles Northerly of the Wells Turnpike Exit # 19 ramp, extending northerly 2.33 miles.

	Roadway Changes or Relocation (Attach Sketch)	Turning Movement needed (Provide Locations under Comments)	Other Please Describe Under Comments
Please Check Box if Applicable:	☐	☒	☐

Prep By: MAM

Sec. 1

Sec. 2A

Sec. 2B

Sec. 4

Sec. 5

Description of Sections

Wells - SR 9/109 W/O
Ramp to Maine
Turnpike

Wells - SR 9/109
(Sanford Road) SE/O
SR 9A (Branch Rd)

Wells - SR 109 (Sanford
Road) SE/O Meeting
House Road

	1 Latest AADT (Year)	2 Current <u>2009</u> AADT	3 Future <u>2019</u> AADT	4 Future <u>2029</u> AADT	5 DHV - % of AADT	6 Design Hourly Volume	7 % Heavy Trucks (AADT)	8 % Heavy Trucks (DHV)	9 Direct.Dist. (DHV)	10 18-KIP Equivalent P 2.0	11 18-KIP Equivalent P 2.5
	<u>16780(2005)</u>	<u>17330</u>	<u>19930</u>	<u>22530</u>	<u>9%</u>	<u>1938</u>	<u>11%</u>	<u>8%</u>	<u>54%</u>	<u>1109</u>	<u>1056</u>
	<u>9240(2007)</u>	<u>9520</u>	<u>10950</u>	<u>12380</u>	<u>9%</u>	<u>1098</u>	<u>8%</u>	<u>6%</u>	<u>66%</u>	<u>457</u>	<u>435</u>
	<u>7990(2000)</u>	<u>8770</u>	<u>10090</u>	<u>11400</u>	<u>9%</u>	<u>1047</u>	<u>7%</u>	<u>5%</u>	<u>65%</u>	<u>345</u>	<u>329</u>
					<u>%</u>		<u>%</u>	<u>%</u>	<u>%</u>		

Notes or Remarks: 18-Kip ESALS is based on 20 year life

PLEASE PROVIDE: (1) PIN NUMBER, (2) THE CURRENT & FUTURE YEARS FOR WHICH YOU WANT AADT CALCULATED, AND SEND TO MIKE MORGAN. (A LOCATION MAP IS NO LONGER NEEDED.) TRAFFIC REQUESTS WILL BE FILLED ON A FIRST COME / SERVE BASIS. PLEASE SEND WHEN PROJECT KICKS OFF!!!

Need Only Data Items Numbered

Comments: Traffic Data and Truck Counts needed to design pavement section, and turn movements.

This is an update to exsiting Traffic Counts from 2005.

$$\begin{aligned}
 \text{ESALS } \left\{ \begin{aligned} (1056)(20)(345) &= 7,108,800 \\ (435)(20)(345) &= 3,175,500 \end{aligned} \right.
 \end{aligned}$$

STATE OF MAINE

FILE: Rte 109

NHS - Rte 109 = 95%
Principal Arterial

INTERDEPARTMENTAL MEMORANDUM

Date of Request: 2/12/2009

Return: 2/20/09

Latest Date Needed By

2/19/2009

To: **Ed Hanscom**

Dept.: **MDOT, Bureau of Planning**

From: **Shawn Smith**

Dept.: **Highway Division**

Subject: **Request for Traffic Information**

Project Manager: **Shawn Smith**

TOWN(S): **Wells**

P.I.N. **7998.20**

Consultant Proj ☒

COUNTY: **York**

ROUTE: **Route 109**

LOCATION/ DESCRIPTION: Starting 2.33miles Northerly of the Wells Turnpike Exti 19 in Wells, extending 2.25 miles

	Roadway Changes or Relocation (Attach Sketch)	Turning Movement needed (Provide Locations under Comments)	Other Please Describe Under Comments
Please Check Box if Applicable:	☐	☐	☐

Prep By: **MAM**

Sec. 3A

Sec. 3B

Description of Sections

Wells - SR
109(sanford rd)
SE/O High Pine
Loop

SR 109 - Wells-
Sanford Town
Line

1 Latest AADT (Year)	<u>7780(2007)</u>	<u>7050(2007)</u>			
2 Current 2009 AADT	<u>8010</u>	<u>7260</u>			
3 Future 2019 AADT	<u>9210</u>	<u>8350</u>			
4 Future 2029 AADT	<u>10410</u>	<u>9440</u>			
5 DHV - % of AADT	<u>9%</u>	<u>10%</u>	<u>%</u>	<u>%</u>	<u>%</u>
6 Design Hourly Volume	<u>989</u>	<u>944</u>			
7 % Heavy Trucks (AADT)	<u>8%</u>	<u>9%</u>	<u>%</u>	<u>%</u>	<u>%</u>
8 % Heavy Trucks (DHV)	<u>6%</u>	<u>7%</u>	<u>%</u>	<u>%</u>	<u>%</u>
9 Direct.Dist. (DHV)	<u>65%</u>	<u>65%</u>	<u>%</u>	<u>%</u>	<u>%</u>
10 18-KIP Equivalent P 2.0	<u>345</u>	<u>345</u>			
11 18-KIP Equivalent P 2.5	<u>329</u>	<u>329</u>			

Notes or Remarks: 18-Kip ESALS is based on 20 year life

PLEASE PROVIDE: (1) PIN NUMBER, (2) THE CURRENT & FUTURE YEARS FOR WHICH YOU WANT AADT CALCULATED, AND SEND TO MIKE MORGAN. (A LOCATION MAP IS NO LONGER NEEDED.) TRAFFIC REQUESTS WILL BE FILLED ON A FIRST COME / SERVE BASIS. PLEASE SEND WHEN PROJECT KICKS OFF!!!

Need Only Data Items Numbered

Comments: Traffic Data and Truck Counts needed to design pavement section. Will need Turning movements.

This is an update to the original counts completed in 2005.

$$ESAL'S = (329)(20)(365) = 2,401,700$$

PIN # 7998.10 / .20

Mr Calculation

Phase 1

Mr from FWD (kPa)	Mr throw outs (kPa)
42082	
43699	
35372	
33222	
33582	
32393	
53310	
36630	
32154	
41541	
42773	
34005	
45197	
35011	
36102	
47135	
38466	
45822	
33249	
50813	
52703	
43931	
48129	
39596	
	61107
	95441
34608	
	66351

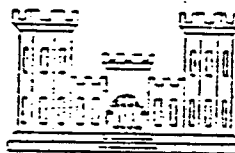
75th percentile
34610 kPa

Phase 2

35666	
34698	
30206	
59082	
50958	
61719	

FROST INVESTIGATIONS

PREDICTION OF FREEZING TEMPERATURE PENETRATION IN NEW ENGLAND



MISCELLANEOUS PAPER NO. 11

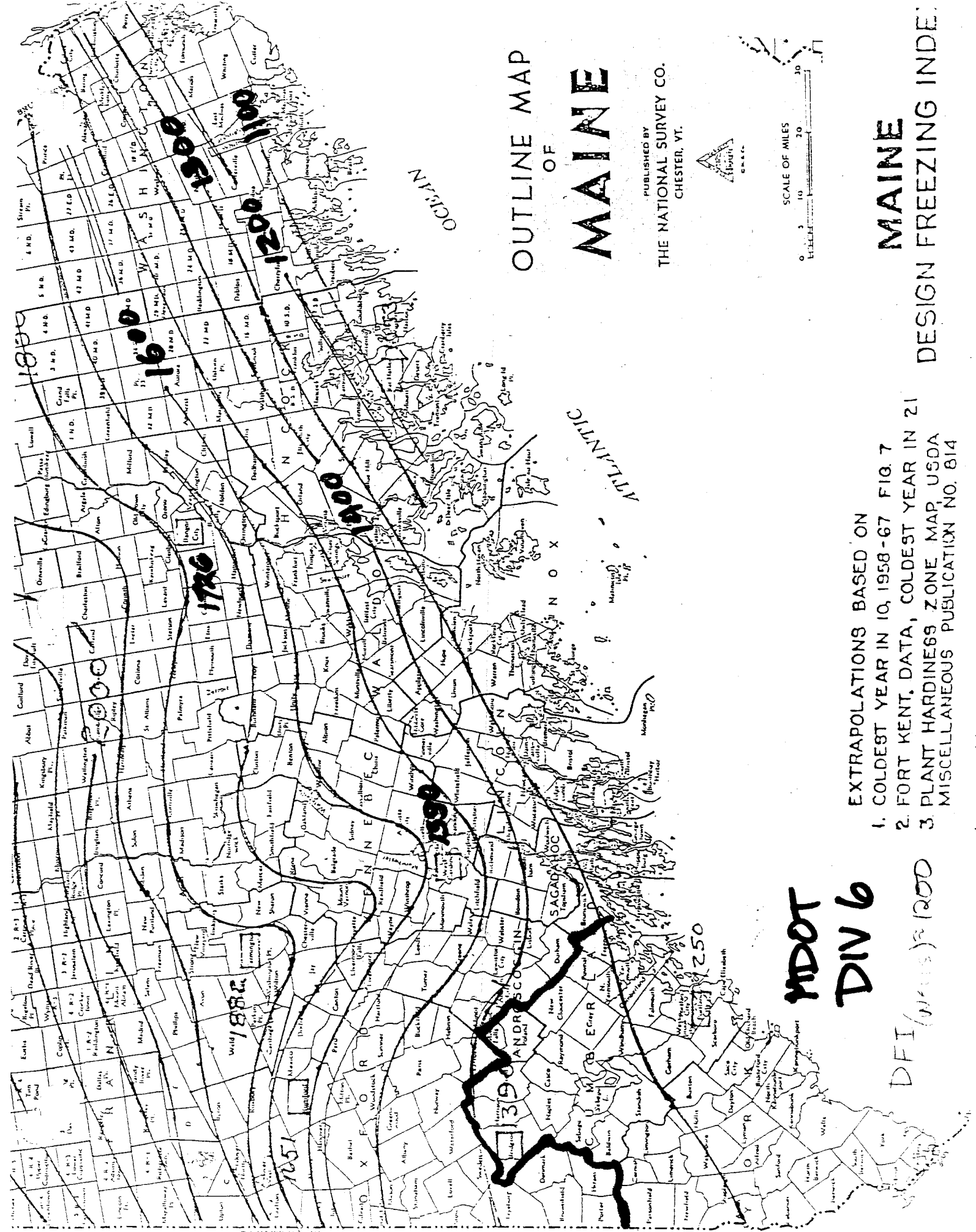
PREPARED BY

ARCTIC CONSTRUCTION AND FROST EFFECTS LABORATORY
NEW ENGLAND DIVISION
BOSTON, MASSACHUSETTS

FOR

OFFICE OF THE CHIEF OF ENGINEERS -
AIRFIELDS BRANCH
ENGINEERING DIVISION
MILITARY CONSTRUCTION

June 1955



OUTLINE MAP OF MAINE

PUBLISHED BY
THE NATIONAL SURVEY CO.
CHESTER, VT.



SCALE OF MILES
0 5 10 20

MAINE

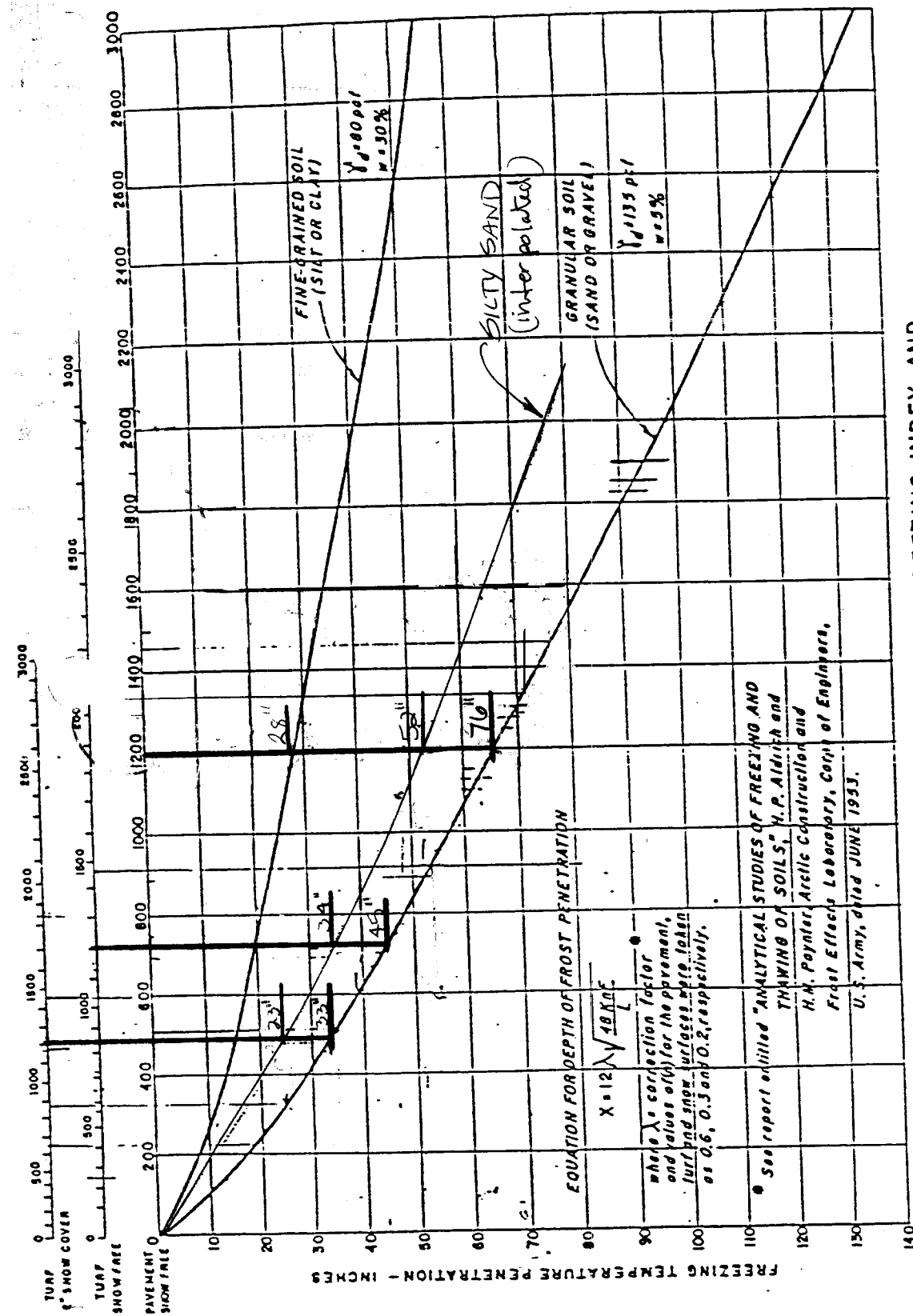
DESIGN FREEZING INDEX

EXTRAPOLATIONS BASED ON

1. COLDEST YEAR IN 10, 1958-67 FIG. 7
2. FORT KENT, DATA, COLDEST YEAR IN 21
3. PLANT HARDINESS ZONE MAP, USDA MISCELLANEOUS PUBLICATION NO. 814

**MDOT
DIV 6**

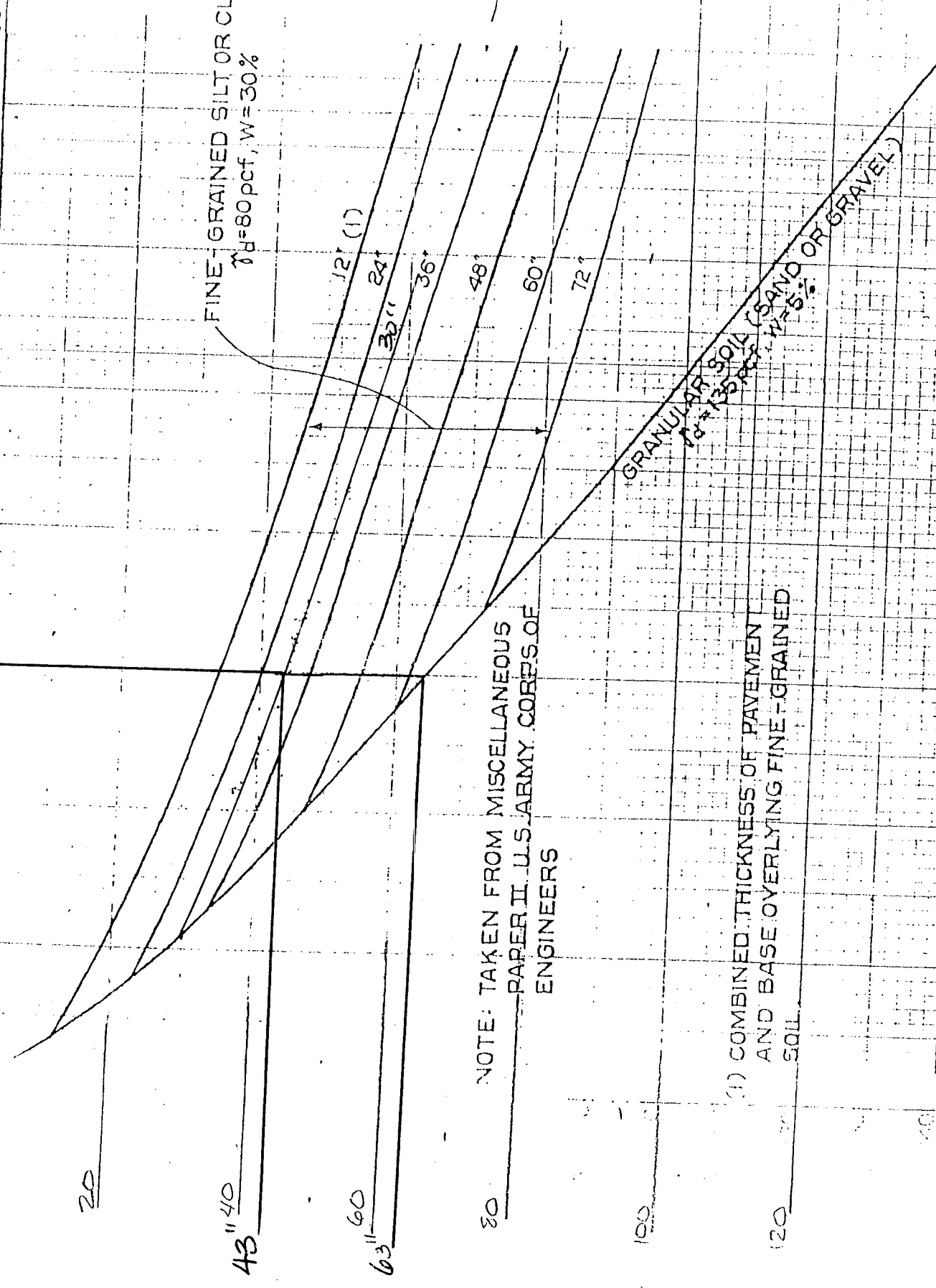
DFI (1958-67) 1200



RELATIONSHIP BETWEEN FREEZING INDEX AND
FREEZING TEMPERATURE PENETRATION FOR VARIOUS SURFACE
CONDITIONS FOR GRANULAR AND FINE-GRAINED SOILS

200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000

FREEZING INDEX



FINE-GRAINED SILT OR CLAY SOIL
 $\gamma_d = 80 \text{ pcf}$, $w = 30\%$

GRANULAR SOIL (SAND OR GRAVEL)
 $\gamma_d = 135 \text{ pcf}$, $w = 5\%$

NOTE: TAKEN FROM MISCELLANEOUS
 PAPER II, U.S. ARMY CORPS OF
 ENGINEERS

(1) COMBINED THICKNESS OF PAVEMENT
 AND BASE OVERLYING FINE-GRAINED
 SOIL

RELATIONSHIP BETWEEN FREEZING INDEX AND FREEZING TEMPERATURE PENETRATION
 FOR GRANULAR SOIL UNDERLAIN BY FINE-GRAINED SOIL

Appendix E: Plans

- As-Built Plans
- Geoplans

STATE OF MAINE STATE HIGHWAY COMMISSION

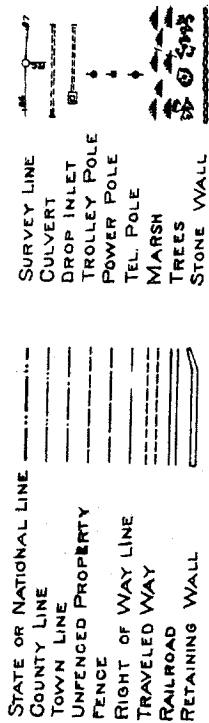
PLAN AND PROFILE STATE HIGHWAY ^{A-5} PP A-SPUR 99

WELLS

YORK COUNTY
 FEDERAL AID PROJECT NO. 293-A

TOTAL LENGTH 1.800 MILES
 PLAN 1 IN. = 50 FT.
 PROFILE { HOR. 1 IN. = 50 FT.
 VER. 1 IN. = 5 FT.
 CROSS SECTIONS 1 IN. = 5 FT.

CONVENTIONAL SIGNS



INDEX OF SHEETS

SHEET NO.	TITLE PAGE	STA.
1	TYPICAL SECTIONS	0+00 — 113+00
2	PLAN AND PROFILE	0+00 — 113+00
3—10	CROSS-SECTIONS	0+00 — 113+00
11—24	BRIDGES	0+00 — 113+00
SHEET NO.	SPECIAL DETAILS	STA.



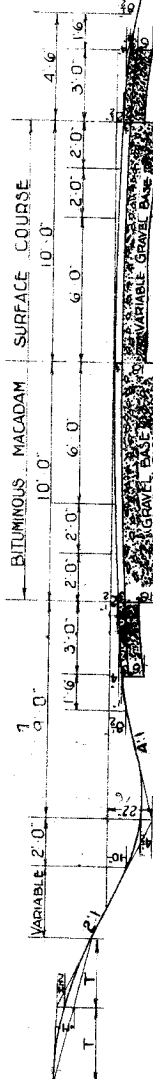
NOTE: STATION 53+50: 71+50
 1800 FT. OUT FOR R.R. OVER-HEAD AND FILL
 NOT A PART OF THIS PROJECT.

TO BOSTON
 BOSTON AND MAINE RAIL ROAD
 WESTERN DIVISION

NOTE: EQUATION
 STATION 98+07.08 EQUALS
 98+000 +7.08 FEET.

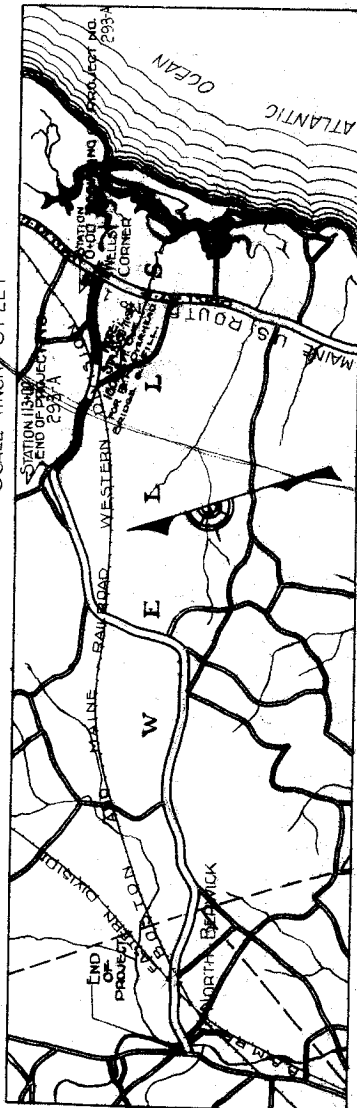
STATION 0+00 BEGINNING
 F. A. PROJECT 293-A

SHEET LAYOUT PLAN
 SCALE 1 INCH = 400 FEET



TYPICAL SECTION

SCALE 1 INCH = 5 FEET



NOTE: All work contemplated under this contract
 to be governed by and in conformity with the
 specifications revised May 1935, except as
 modified on this plan.

APPROVED:
 MAINE STATE HIGHWAY COMMISSION

[Signature]
 CHIEF ENGINEER

[Signature]
 DISTRICT ENGINEER

[Signature]
 CHIEF ENGINEER

[Signature]
 DISTRICT ENGINEER

APPROVED:
 U. S. BUREAU OF PUBLIC ROADS

[Signature]
 DISTRICT ENGINEER

[Signature]
 CHIEF ENGINEER

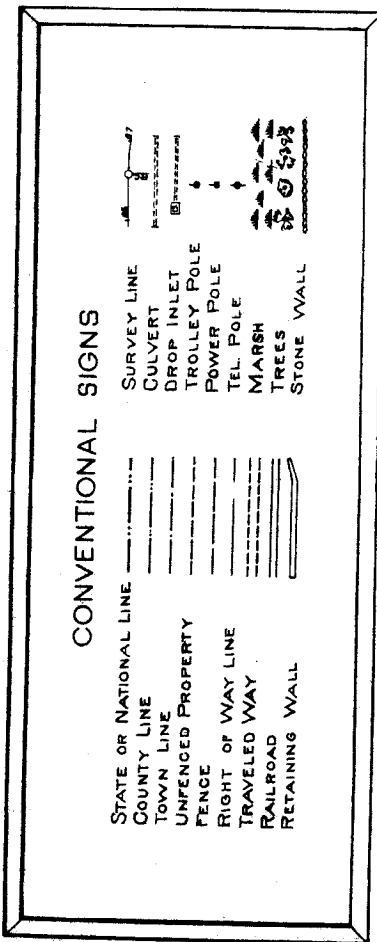
STATE OF MAINE STATE HIGHWAY COMMISSION

PLAN AND PROFILE STATE HIGHWAY PROJECT NO. 294-A

WELLS YORK COUNTY

FEDERAL AID PROJECT NO. 294-A

TOTAL LENGTH 1.022 MILES
PLAN 1 IN. = 50 FT.
PROFILE 1 IN. = 50 FT.
SCALES { CROSS SECTIONS 1 IN. = 5 FT.

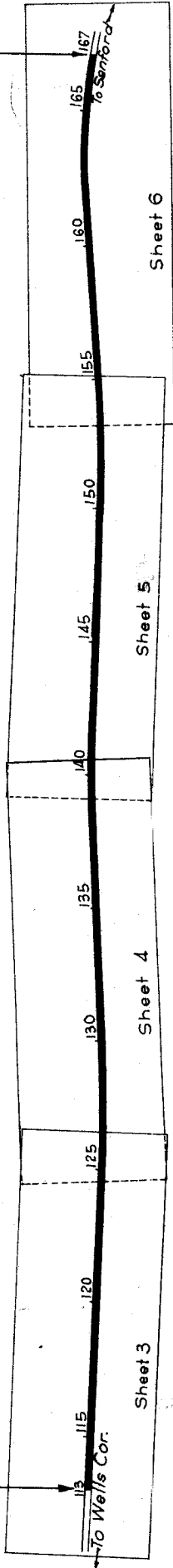


INDEX OF SHEETS

SHEET NO.	TITLE PAGE	STA.
1	TYPICAL SECTIONS	113+0 to 167+0
2	PLAN AND PROFILE	113+0 to 167+0
3-6	CROSS-SECTIONS	113+0 to 167+0
6-12	BRIDGES	STA.
SHEET NO.	SPECIAL DETAILS	

Sta. 113+0 Beg. Fed. Aid
Project No. 294-A

Sta. 167+0 End Fed. Aid
Proj. No. 294-A

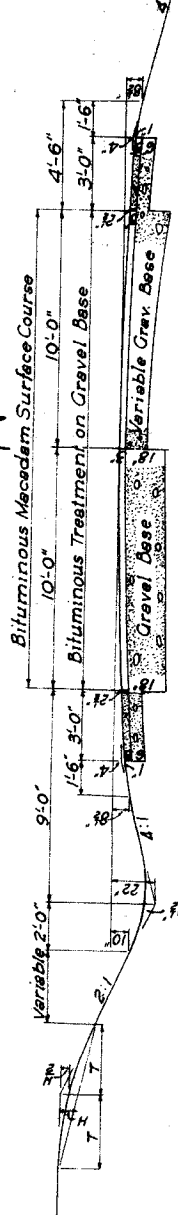


LAYOUT PLAN
Scale 1 in. = 300 ft.

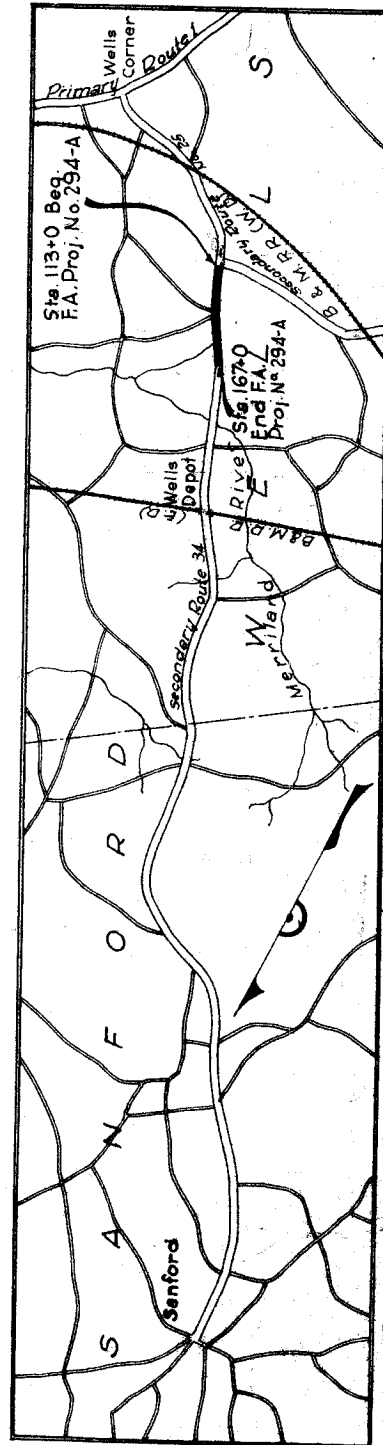
All work contemplated under this contract to be governed by and in conformity with the specifications revised May 1935, except as modified on these plans.

24 564 → 23 + 210

Note: Design Stations are approximate



TYPICAL SECTION



APPROVED:
MAINE STATE HIGHWAY COMMISSION

Paul C. Bennett
CHAIRMAN

Edward J. Bennett
DISTRICT ENGINEER

John D. Bennett
CHIEF ENGINEER

John D. Bennett
DISTRICT ENGINEER

APPROVED:
U. S. BUREAU OF PUBLIC ROADS

DISTRICT ENGINEER

CHIEF ENGINEER

DIRECTOR

STATE OF MAINE

STATE HIGHWAY COMMISSION

PLAN AND PROFILE

STATE HIGHWAY "A-299"

WELLS-SANFORD

YORK COUNTY

FEDERAL AID PROJECTS NO. 290 AND 294-B

TOTAL LENGTH F.A.P. NO. 290 = 0.303 MILES
TOTAL LENGTH F.A.P. NO. 294-B = 4.024 MILES

PLAN 1 IN. = 50 FT. 4.327

PROFILES
HOR. 1 IN. = 50 FT.
VER. 1 IN. = 5 FT.
CROSS SECTIONS 1 IN. = 5 FT.

CONVENTIONAL SIGNS

- STATE OR NATIONAL LINE
- COUNTY LINE
- TOWN LINE
- UNFENCED PROPERTY
- FENCE
- RIGHT OF WAY LINE
- RAILROAD
- RETAINING WALL
- SURVEY LINE
- CULVERT
- DROP INLET
- TROLLEY POLE
- POWER POLE
- TEL. POLE
- MARSH
- TREES
- STONE WALL

INDEX OF SHEETS

SHEET NO.	TITLE	PAGE
1	TYPICAL SECTIONS	STA. 167+0 TO 437+0
2	PLAN AND PROFILE	STA. 167+0 TO 437+0
3-20	CROSS-SECTIONS	STA. 167+0 TO 437+0
21-43	BRIDGES	STA. 167+0 TO 437+0
SHEET NO.	SPECIAL DETAILS	STA.

Note: Design sheets are approximately 28x40.

23+210 → 27+53
28+0

WELLS

Sta. 228+50 to 270+0
Not a part of this project

Sta. 167+0 Beginning F.A. Proj. No. 294-B
End F.A. Proj. No. 294-A

Sta. 380+370 Beg.
F.A. Proj. No. 290

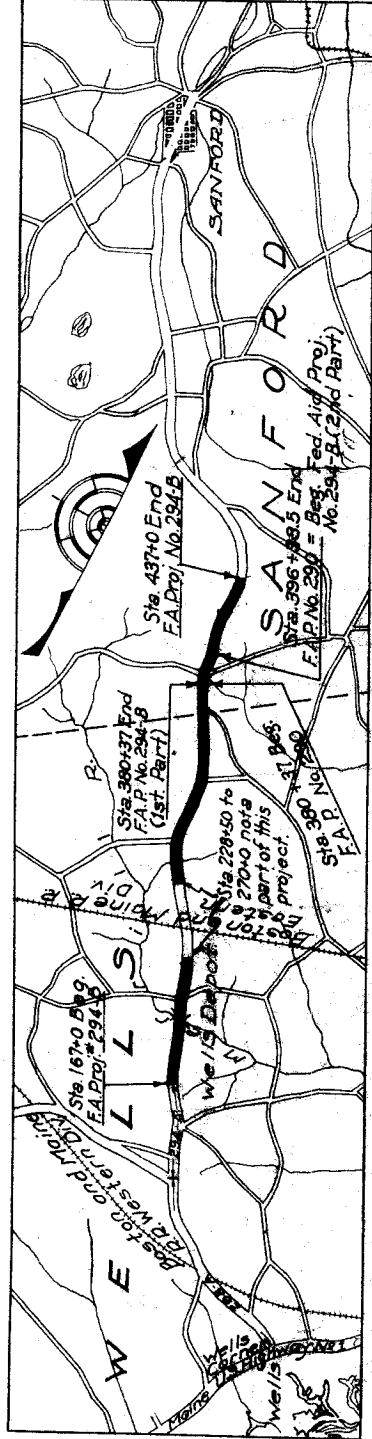
Sta. 396+385 End F.A.P.
No. 290 = Sta. 167+0 End
Proj. No. N.R.S. 290 (1935)
Sta. 396+385 = Beg.
F.A. Proj. No. 294-B (2nd Part)

Sta. 437+0
End F.A. Proj. No. 294-B

LAYOUT PLAN
Scale 1 inch = 1000 Ft.

TYPICAL SECTION
SCALE 1 INCH = 5 FEET

All work contemplated under this contract to be governed by and in conformity with the Specifications adopted Sept. 20, 1935, except as modified on these plans.



A Portion of York County
1 inch = 1 mile

APPROVED:
MAINE STATE HIGHWAY COMMISSION

Paul C. Thurston
CHAIRMAN

Ed. [Signature]
[Title]

Wm. D. [Signature]
CHIEF ENGINEER

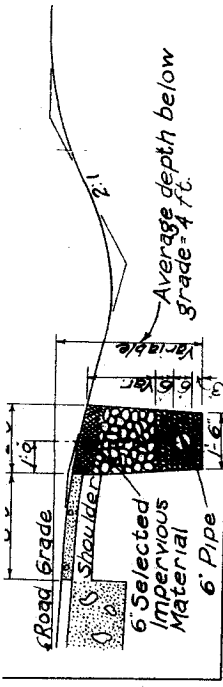
APPROVED:
U. S. BUREAU OF PUBLIC ROADS

Chief Engineer

Chief Engineer

Chief Engineer

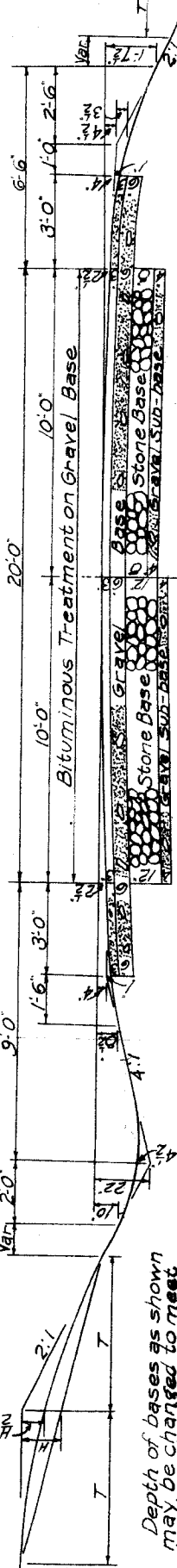
BITUMINOUS MACADAM SURFACE COURSE



For all sections depth of ditch and length of curve at top of slope depend on local conditions. Use longest curve practicable, T being 2 min. and 5 max.

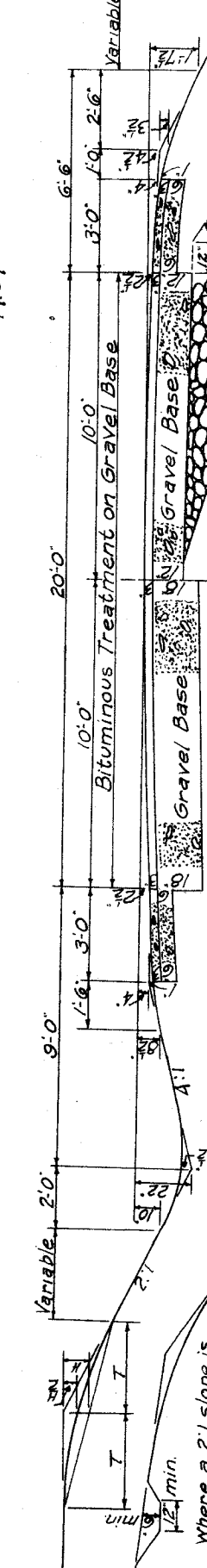
18" GRAVEL BASE - VARIABLE GRAVEL BASE

3" Macadam Surface Course = 18.52 CY per 100 L.F.
6" Grav. Surface Course both shoulders = 5.56
Base inc. shoulders = 11.11
124.79
Sta 326+50 to 375+50
382+0 to 404+0
421+50 to 437+0



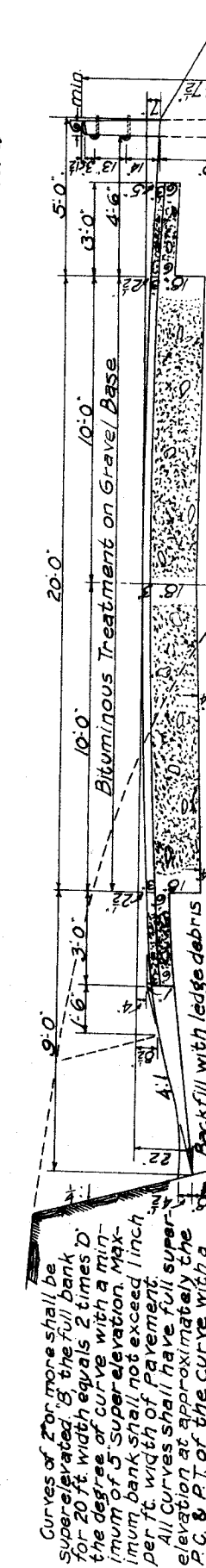
STONE BASE

6" Gravel Base Course including shoulders = 48.15 CY per 100 L.F.
4" Gravel Sub-base Course = 27.26
8" Stone Base Course = 49.38 CY per 100 L.F.
T being 2 min. and 4 max.



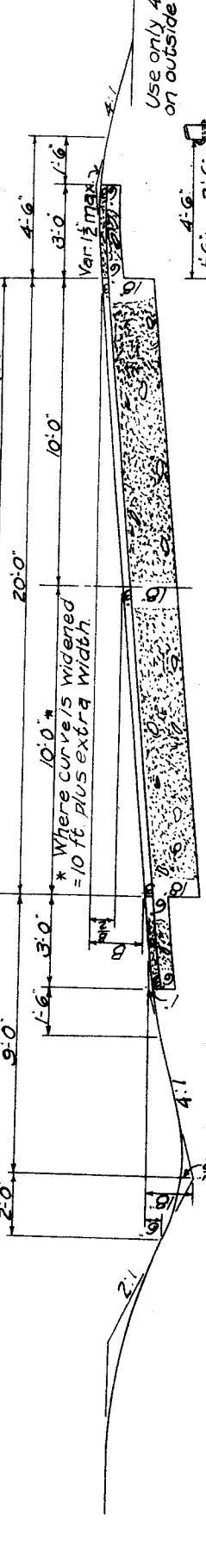
GRAVEL BASE - STONE FILL

12" Gravel Base Course including shoulders = 87.76 CY per 100 L.F.
18" Grav. Base inc. shoulders = 124.79 CY per 100 L.F.
T being 2 min. and 4 max.



LEDGE - GUARD RAIL

Curves of 20' or more shall be super-elevated 3" the full bank for 20' width equals 2 times D' the degree of curve with a minimum of 5" super-elevation. Maximum bank shall not exceed 1 inch per ft. width of pavement. All curves shall have full super-elevation at approximately the P.C. & P.T. of the curve with a transition of 150 ft. unless otherwise specified. Curves of 60' or more shall be widened. The extra width expressed in feet is given by formula $\frac{W}{2} = \frac{D}{2} + 2$. Widening and super-elevating may be limited by unusual conditions.



WIDENED - SUPERELEVATED

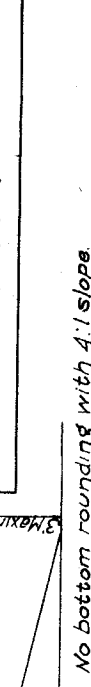
6" Gravel Base Course inc. shoulders = 48.15 CY per 100 L.F.
12" Stone Base Course = 74.07 CY per 100 L.F.
18" Grav. Sub-base = 11.11
4" Grav. Sub-base = 24.09
159.26



ESTIMATED QUANTITIES	
ITEM	DESCRIPTION
11	Clearing and Grubbing
12-A	Earth Excavation
12-B	Rock Excavation
12-C	Trees Removed
13	Excavation for Structures
17-A	Common Borrow
23	Gravel Base Course
27	Gravel Surface Course
29-A	Bit Mac Surface Course
29-B	Emul Asphalt for and Applied
35-A	Class "A" Concrete
35-B	Class "B" Concrete
36	Steel Reinft. for Conc. Struct.
38	Cement Rubble Masonary
40-A	12" C.M.P.
40-B	15" C.M.P.
40-C	18" C.M.P.
43-B	15" R.C.P.
43-C	18" R.C.P.
43-D	24" R.C.P.
51-A	Wire Cable Guard Rail
51-B	Anchorage for W.C.G.R.
51-C	Anchorage of Bridges
52	Loam
55	Bituminous Treatment
57	Muck Excavation

CULVERTS	
R.C.P.	
179+50	24" x 36"
188+52	18" x 40"
194+0	24" x 36"
204+40	18" x 44"
216+04	15" x 48"
219+49	18" x 48"
278+52	18" x 44"
284+14	18" x 40"
295+50	24" x 40"
299+50	15" x 40"
305+70	18" x 36"
325+50	24" x 40"
338+88	15" x 36"
420+90	15" x 44"
R.W. Conc. Box	
226+25	8' x 3' x 48"
286+24	8' x 3' x 48"
C.M.P.	
172+26 L	12" x 20"
172+93 L	12" x 20"
172+76 R	12" x 20"
423+22 L	

UNDER DRAIN



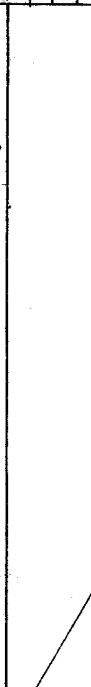
COBBLE STONE GUTTER



COBBLE STONE GUTTER



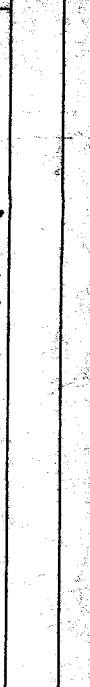
COBBLE STONE GUTTER



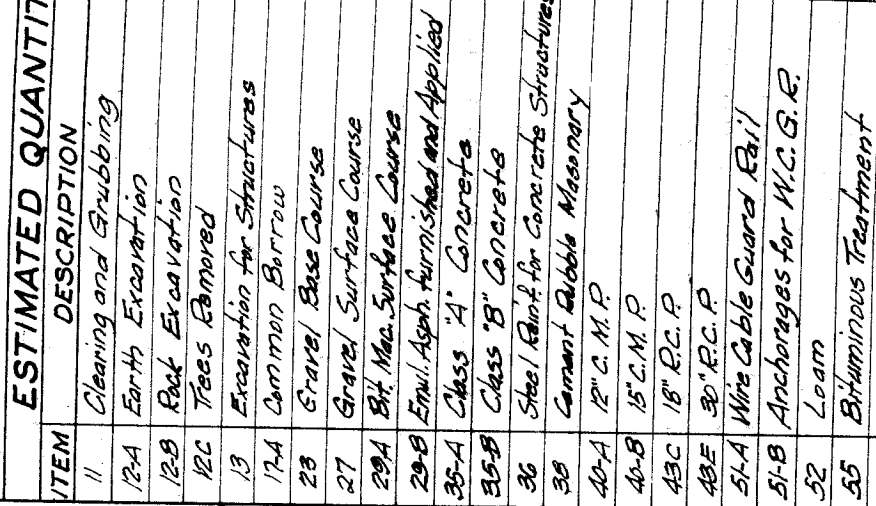
COBBLE STONE GUTTER



SODDED GUTTER



NEW ROAD STATE
DIST. MD
MAINE



ESTIMATED QUANTITIES	
ITEM	DESCRIPTION
11	Cleaning and Grubbing
12-A	Earth Excavation
12-B	Rock Excavation
12-C	Trees Removed
13	Excavation for Structures
17-A	Common Burrow
23	Gravel Base Course
27	Gravel Surface Course
29-A	Bit. Mac. Surface Course
29-B	Emul. Asph. furnished and Applied
35-A	Class "A" Concrete
35-B	Class "B" Concrete
36	Steel Reinft for Concrete Structures
38	Common Rubble Masonry
40-A	12" C. M. P.
40-B	15" C. M. P.
43-C	18" R.C. P.
43-E	30" R.C. P.
51-A	Wire Cable Guard Rail
51-B	Anchorage for W.C. G. R.
52	Loam
55	Bituminous Treatment

STATE OF MAINE

STATE HIGHWAY COMMISSION

PLAN AND PROFILE

STATE HIGHWAY A-299

WELLS-SANFORD

YORK COUNTY

299
AND
294-B
0.303 MILES
0.303 MILES
0.303 MILES

INDEX OF SHEETS

SHEET NO.	TITLE PAGE	STA. 167+0 TO 437+0
1	TYPICAL SECTIONS	
2	PLAN AND PROFILE	STA. 167+0 TO 437+0
3-20	CROSS-SECTIONS	STA. 167+0 TO 437+0
21-43	BRIDGES	STA. 167+0 TO 437+0
SHEET NO.	SPECIAL DETAILS	STA.

Sta. 380+370 Beg.
F.A. Proj. No. 290

Sta. 396+385 End F.A.P.
No. 290 = Sta. 167+0 End
Proj. No. N.R.S. 290 (1935)
Sta. 396+385 = Beg.
F.A. Proj. No. 294-B (2nd Part)

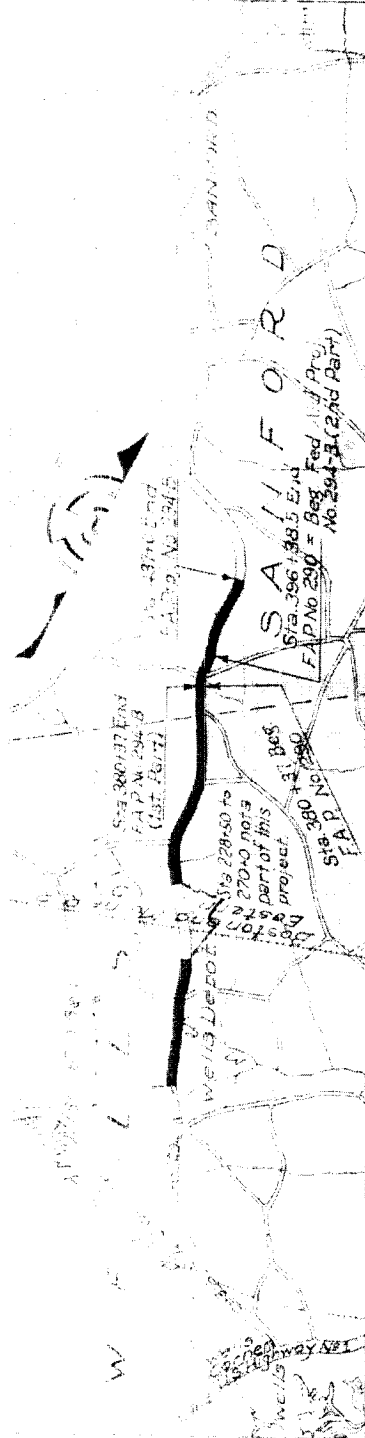
Sta. 437+0
End F.A. Proj. No. 294-B



LAYOUT PLAN
Scale: 1 inch = 1000 ft.

All work contemplated under this contract
is to be governed by and in conformity with
the Specifications adopted Sept. 20, 1935,
except as modified on these plans.

TYPICAL SECTION
SCALE: 1 inch = 100 ft.



A Portion of York County
approx. scale

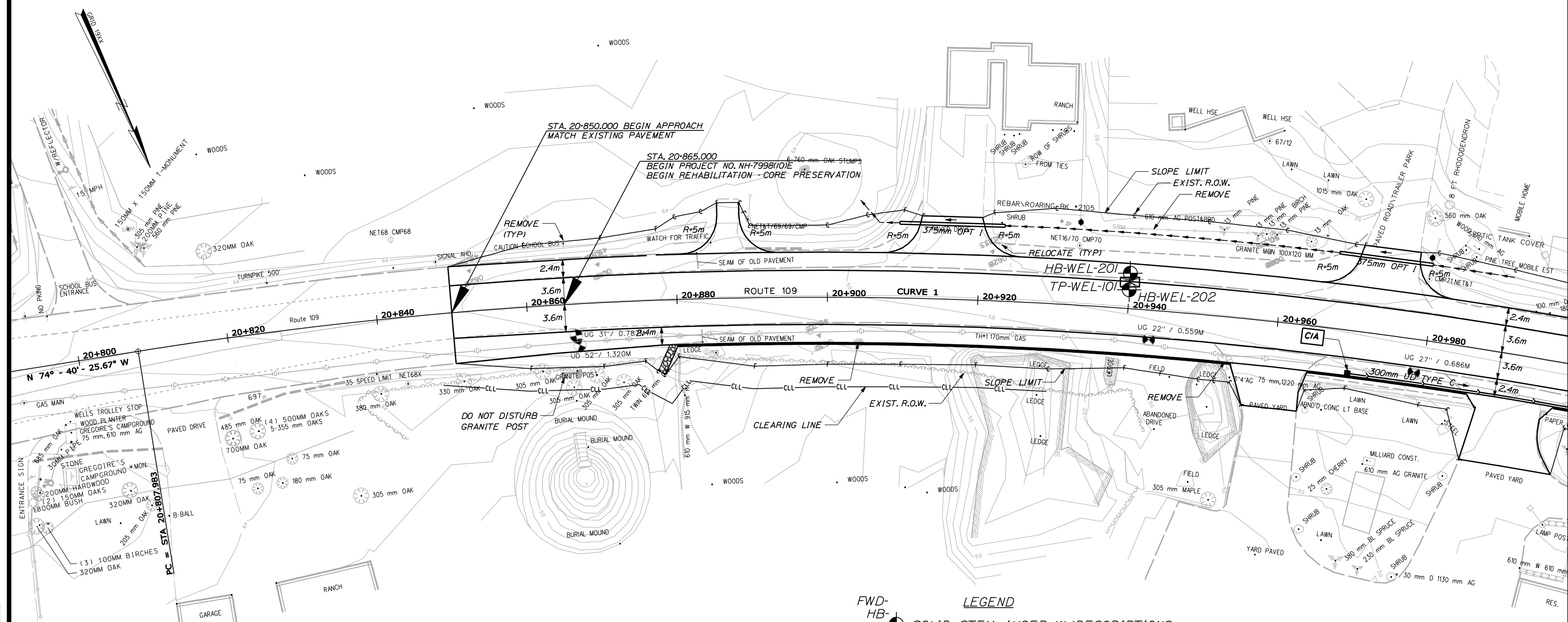
APPROVED:
MAINE STATE HIGHWAY COMMISSION
Paul C. Rinehart
CHAIRMAN

DISTRICT ENGINEER

CHIEF ENGINEER

DIRECTOR

APPROVED:
U. S. BUREAU OF PUBLIC ROADS



CURVE 1

PI = 20+954.592
PA = 28° - 50' - 55.6" Rt.
PR = 570.000 m
LC = 286.999 m
EA = 146.610 m
E = 18.553 m

FWD-
HB-  *SOLID STEM AUGER W/DESCRIPTIONS*

P-  *POWER AUGER PROBE*

PC-  *PAVEMENT CORE*

 *TEST PIT*

KEY

R = Refusal of augers (actual nature of refusal surface unknown)

NR = No Refusal surface encountered

PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN-DETAILED	K. GROSS	APR 2005
	CHECKED		
	REVISIONS		
	FIELD CHANGES		

**STATE OF MAINE
DEPARTMENT OF TRANSPORTATION**

GEOPLANS
WELLS
ROUTE 109



SHEET OF AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filenome: ... \geotech\msta\002_GEOPlan2.dgn

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	T. WHITE	APR. 2005
CHECKED		
REVISIONS		
FIELD CHANGES		

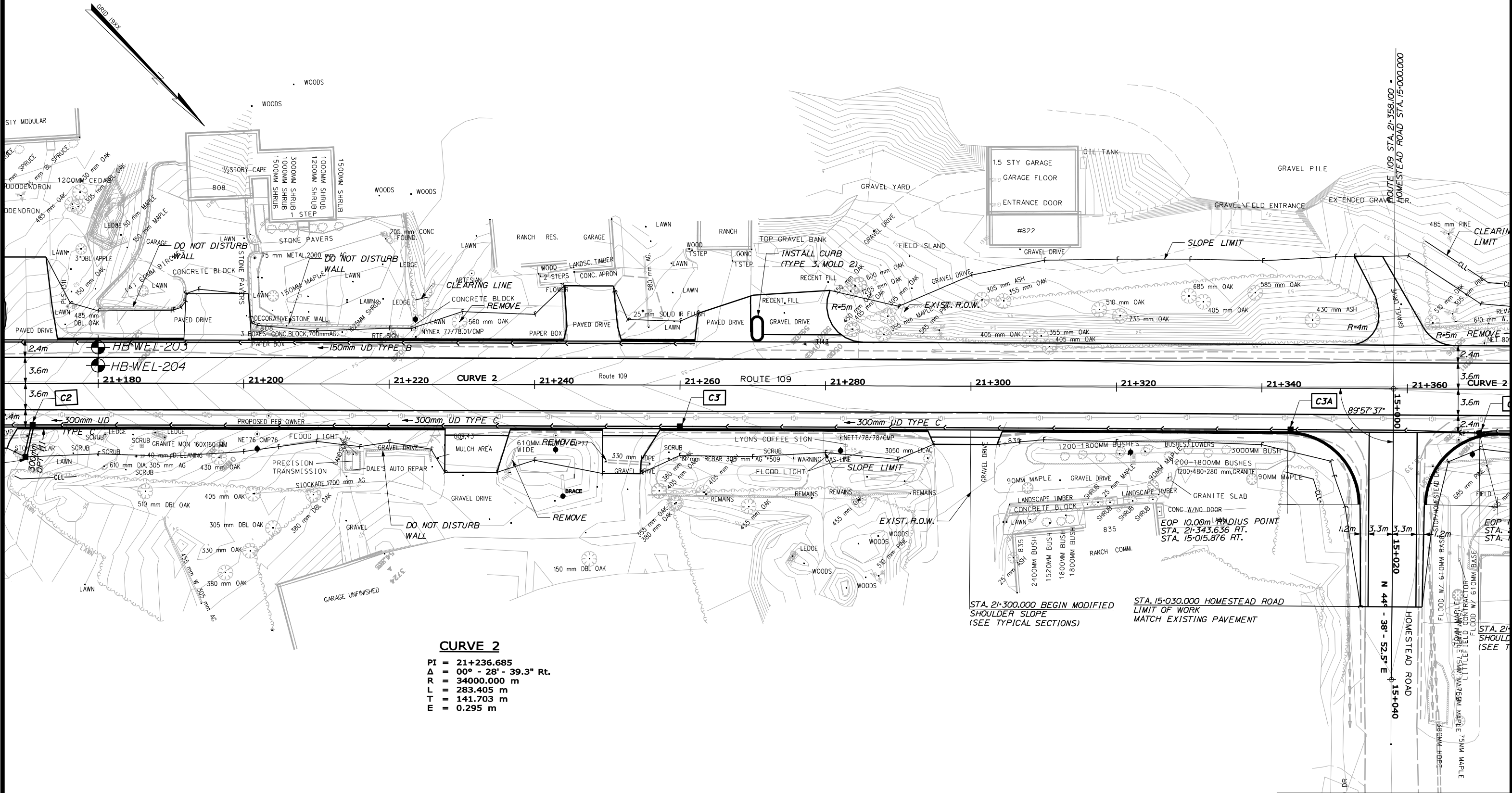
PLANS

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	2	28

7998.10



CURVE 2

PI = 21+236.685
Δ = 00° - 28' - 39.3" Rt.
R = 34000.000 m
L = 283.405 m
T = 141.703 m
E = 0.295 m

STA. 21+300.000 BEGIN MODIFIED
SHOULDER SLOPE
(SEE TYPICAL SECTIONS)

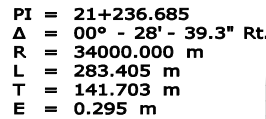
STA. 15+030.000 HOMESTEAD ROAD
LIMIT OF WORK
MATCH EXISTING PAVEMENT

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109



SHEET OF AUGUSTA, MAINE



PROJECT DESIGN ENGINEER		BY	DATE
DESIGN-DETAILED	K. GROSS	T. WHITE	APR 2005
CHECKED			
REVISIONS			
FIELD CHANGES			

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\004_GEOPlan4.dgn

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	T. WHITE	APR. 2005
CHECKED		
REVISIONS		
FIELD CHANGES		

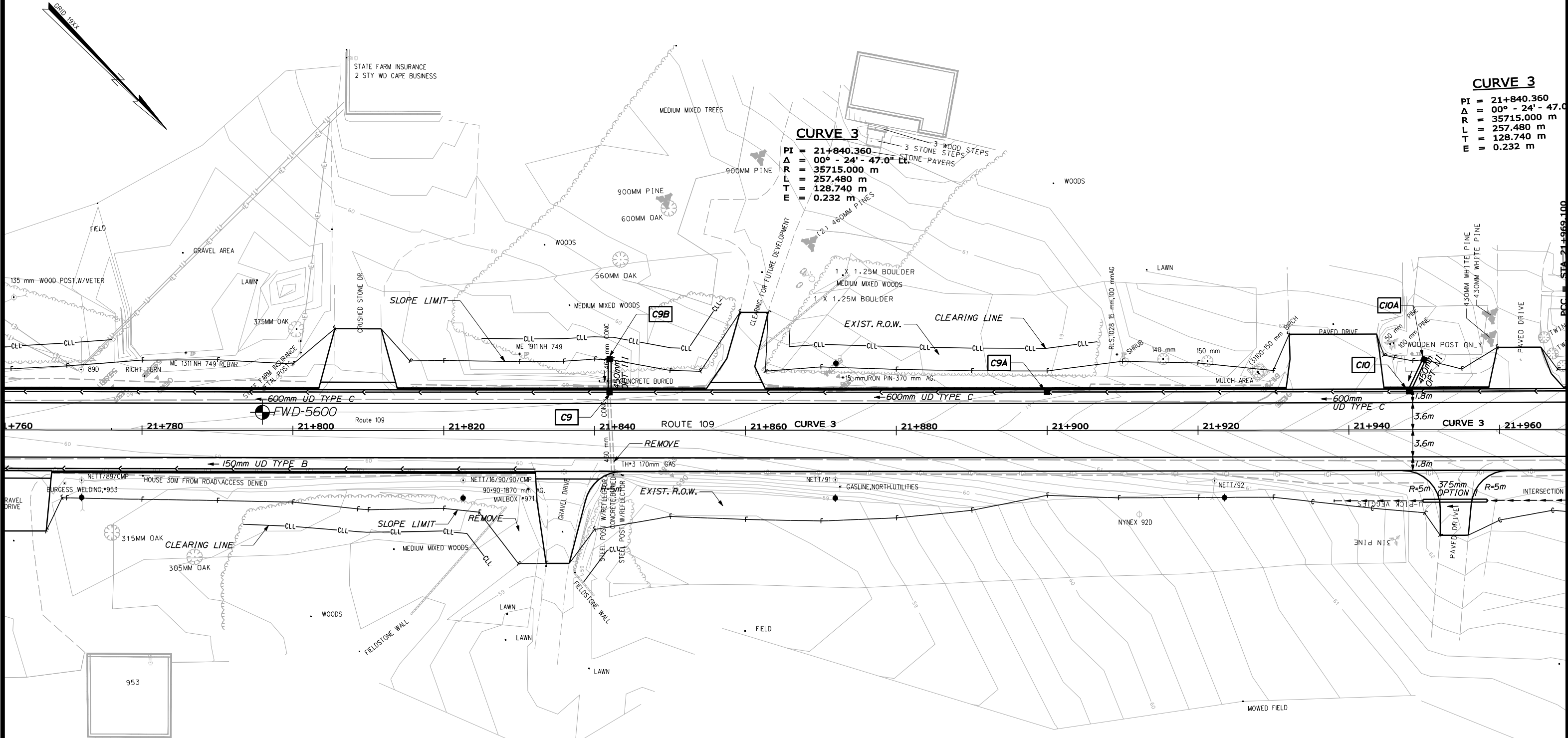
PLANS

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	4	28

7998.10



CURVE 3

PI = 21+840.360
Δ = 00° - 24' - 47.0"
R = 35715.000 m
L = 257.480 m
T = 128.740 m
E = 0.232 m

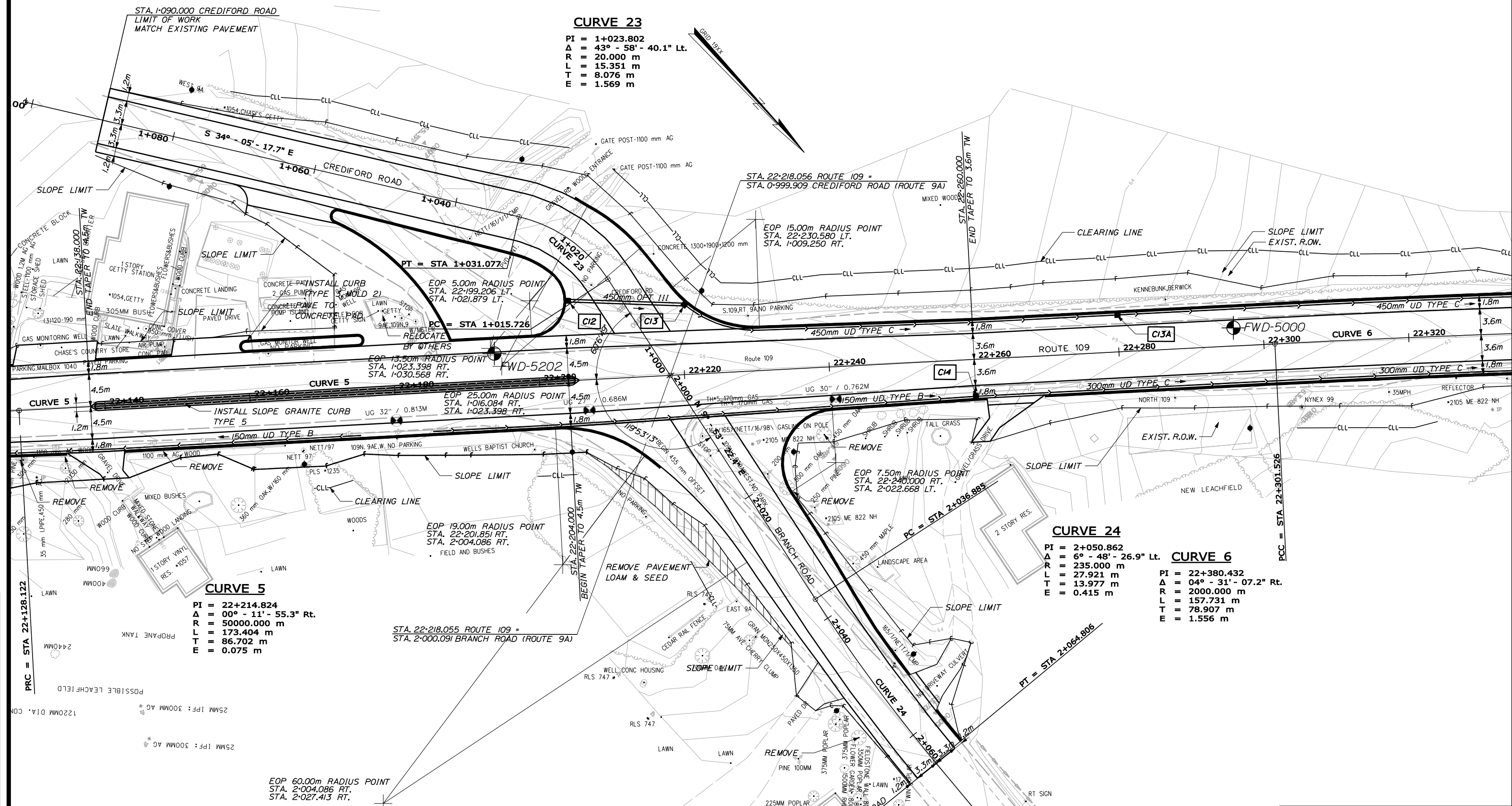
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET OF AUGUSTA, MAINE

7998.10



PROJECT DESIGN ENGINEER		BY	DATE
DESIGN-DETAILED	K. GROSS	T. WHITE	APR 2005
CHECKED			
REVISIONS			
FIELD CHANGES			

Date: 10/21/2010

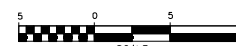
Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\005_GEOPlan5.dgn

**STATE OF MAINE
DEPARTMENT OF TRANSPORTATION**

GEOPLANS

WELLS
ROUTE 109

SHEET OF AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\006_GEOPlan6.dgn

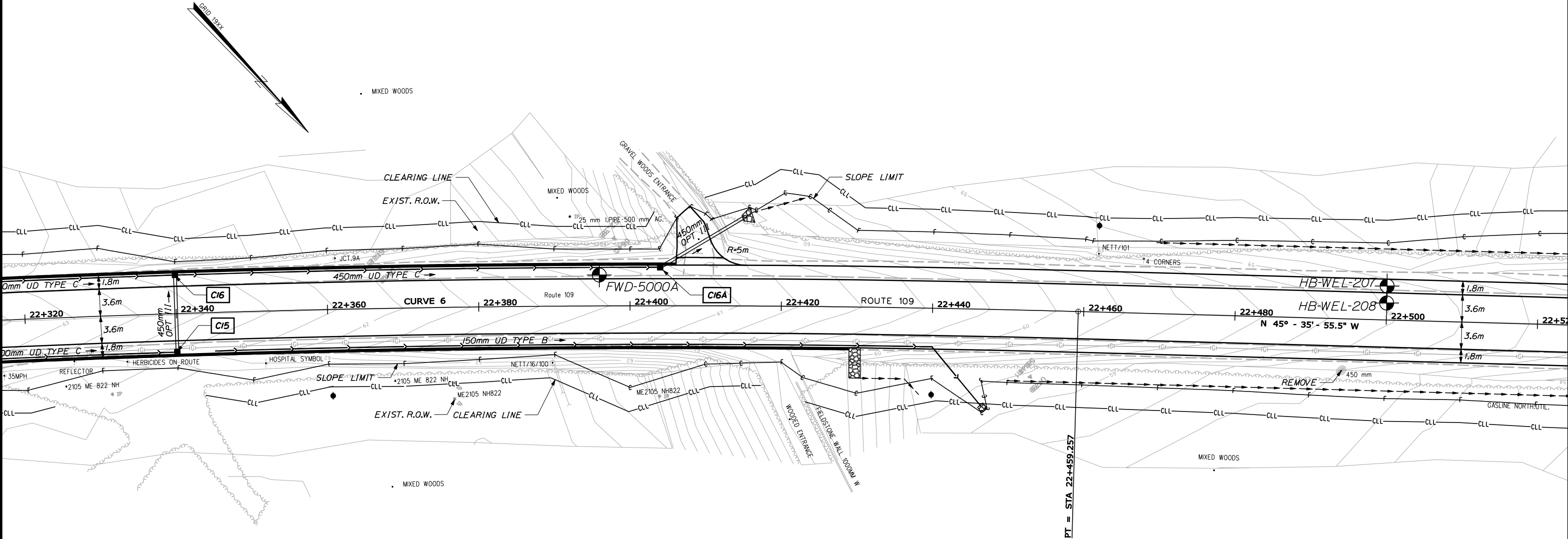
PROJECT DESIGN ENGINEER PLANS	BY	DATE
	K. GROSS	APR 2005
	T. WHITE	
DESIGN-DETAILED		
CHECKED		
REVISIONS		
FIELD CHANGES		

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	6	28

7998.10



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

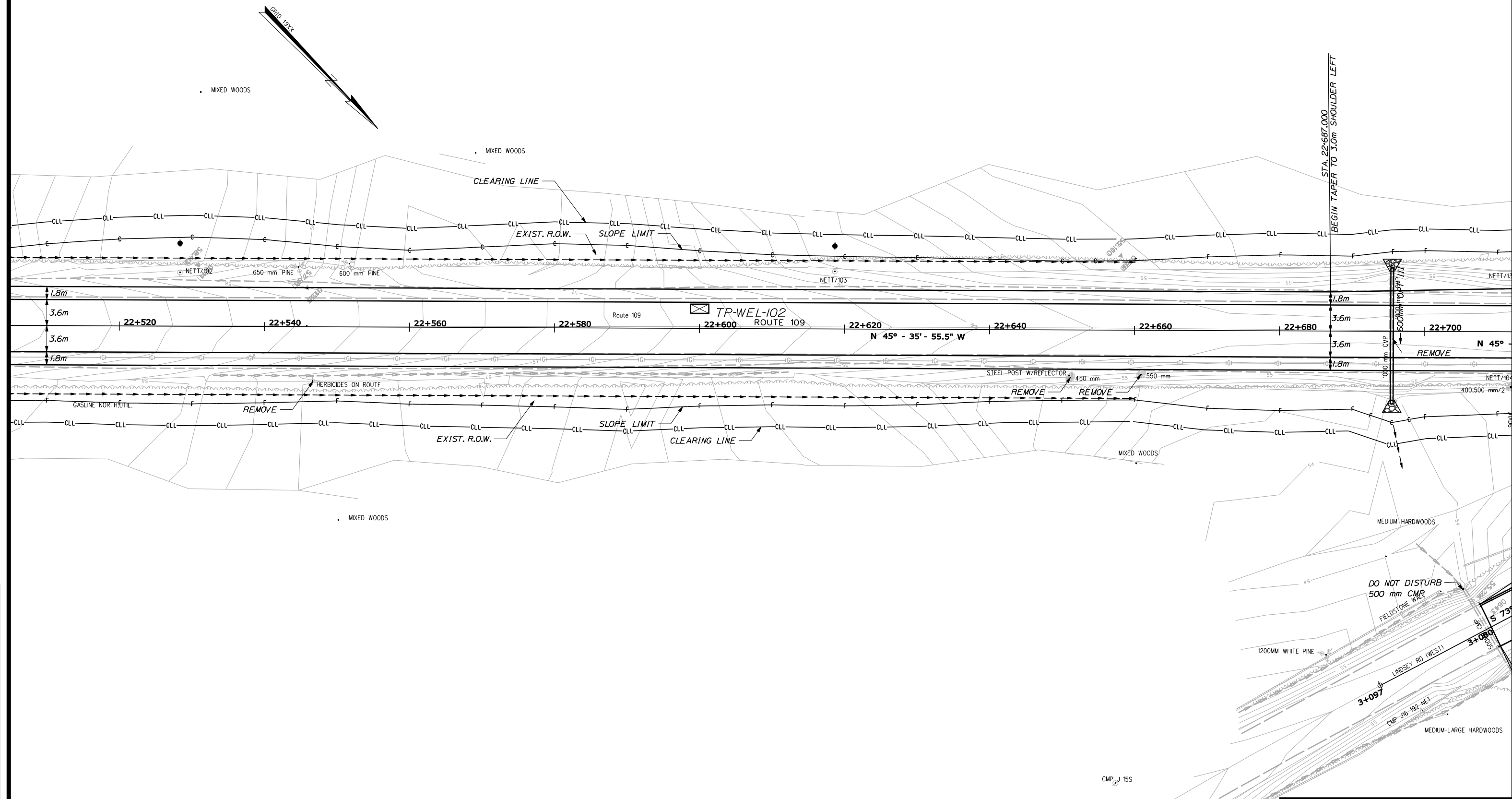
GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET OF
AUGUSTA, MAINE

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	7	28

7998.10



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS

WELLS

ROUTE 109



5 0 5 10

SCALE
(in meters)

SHEET OF AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\mst\008_GEOPlan8.dgn

PROJECT DESIGN ENGINEER DESIGN-DETAILED CHECKED REVISIONS FIELD CHANGES	BY T. WHITE K. GROSS	DATE APR 2005	
PLANS			

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	8	28

7998.10

CURVE 7

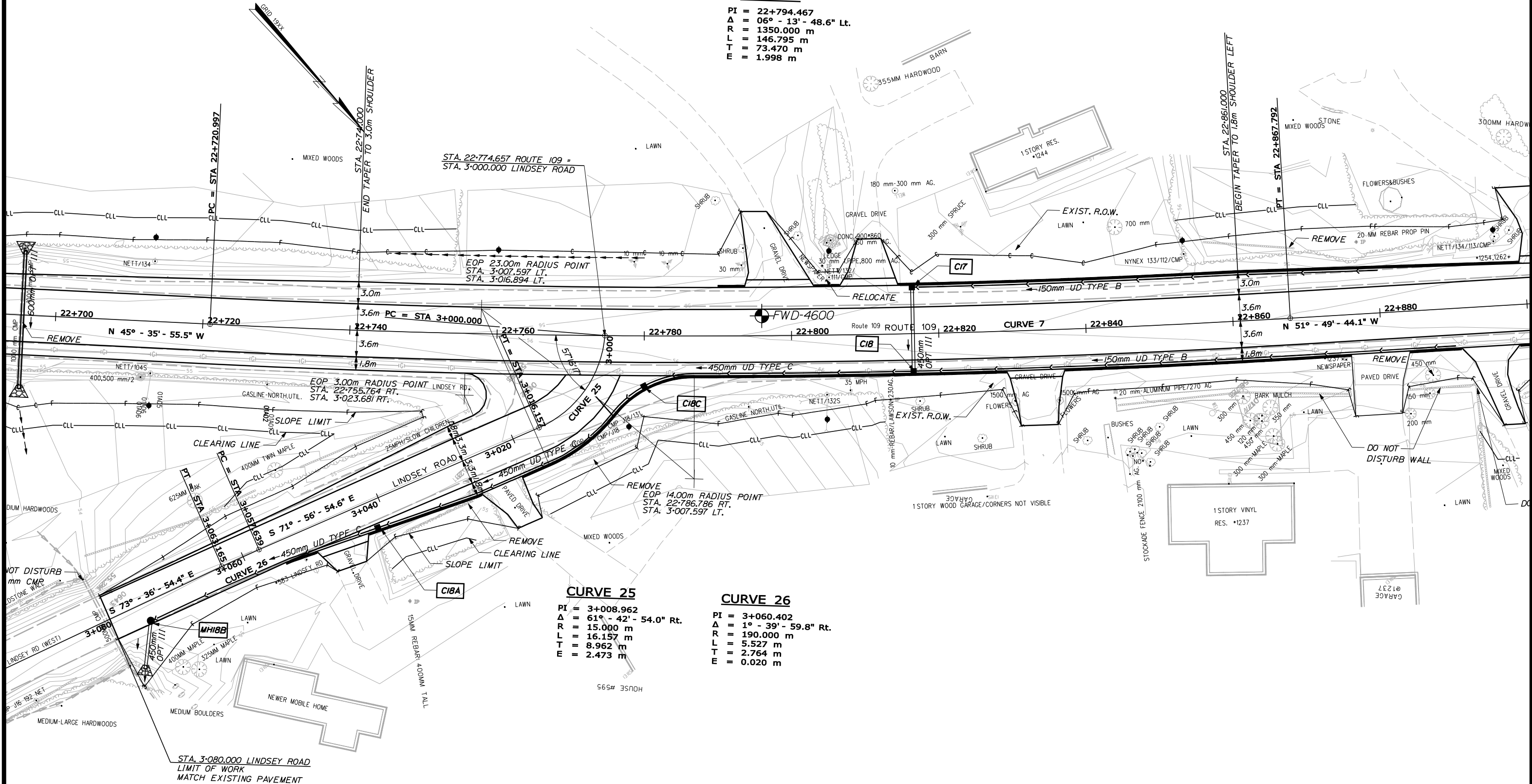
PI = 22+794.467
Δ = 06° - 13' - 48.6" Lt.
R = 1350.000 m
L = 146.795 m
T = 73.470 m
E = 1.998 m

CURVE 25

PI = 3+008.962
Δ = 61° - 42' - 54.0" Rt.
R = 15.000 m
L = 16.157 m
T = 8.962 m
E = 2.473 m

CURVE 26

PI = 3+060.402
Δ = 1° - 39' - 59.8" Rt.
R = 190.000 m
L = 5.527 m
T = 2.764 m
E = 0.020 m

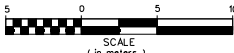


STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS

WELLS

ROUTE 109



SHEET OF AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\009_GEOPlans9.dgn

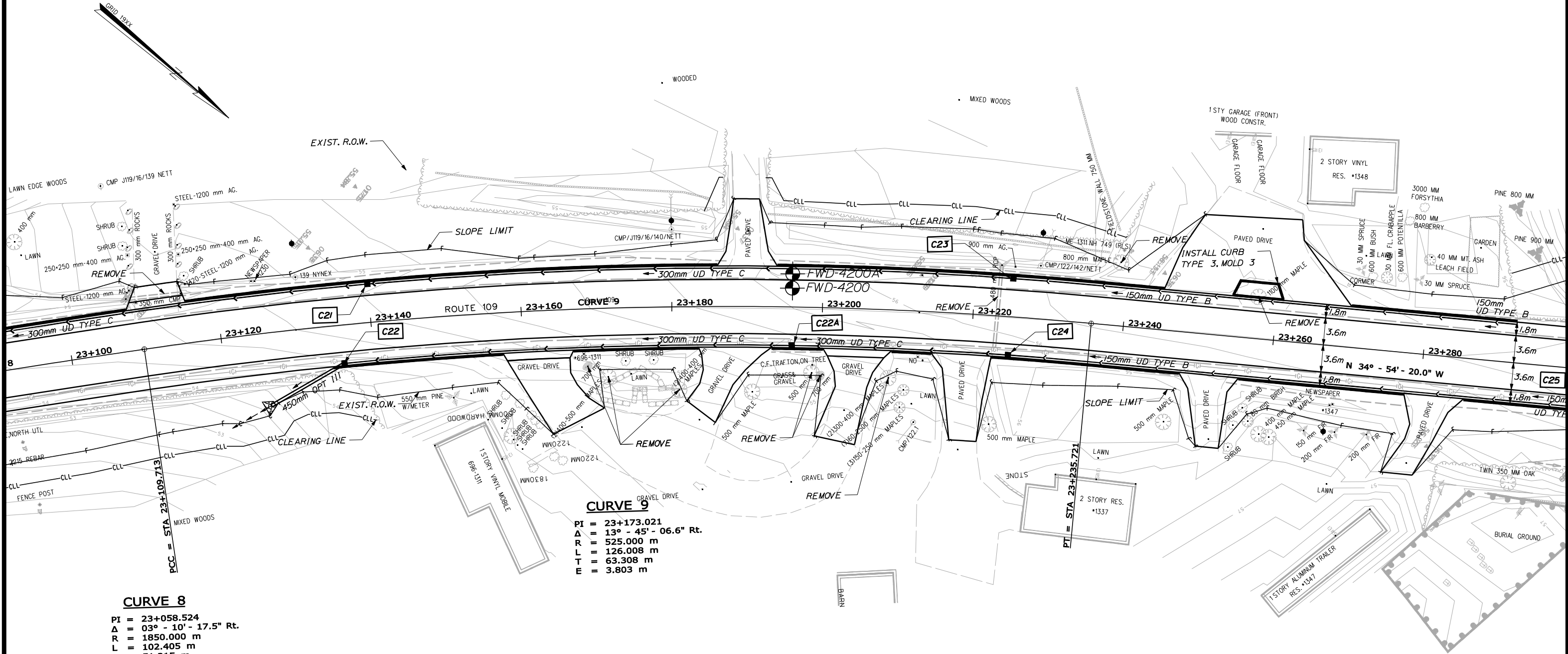
PROJECT DESIGN ENGINEER DESIGN-DETAILED CHECKED REVISIONS FIELD CHANGES	BY	DATE
	K. GROSS	APR 2005
PLANS		

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FWMA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	9	28

7998.10



CURVE 8

PI = 23+058.524
Δ = 03° - 10' - 17.5" Rt.
R = 1850.000 m
L = 102.405 m
T = 51.215 m
E = 0.709 m

CURVE 9

PI = 23+173.021
Δ = 13° - 45' - 06.6" Rt.
R = 525.000 m
L = 126.008 m
T = 63.308 m
E = 3.803 m

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109



SHEET OF AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\010_GEOPlan10.dgn

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	T. WHITE	APR. 2005
CHECKED		
REVISIONS		
FIELD CHANGES		

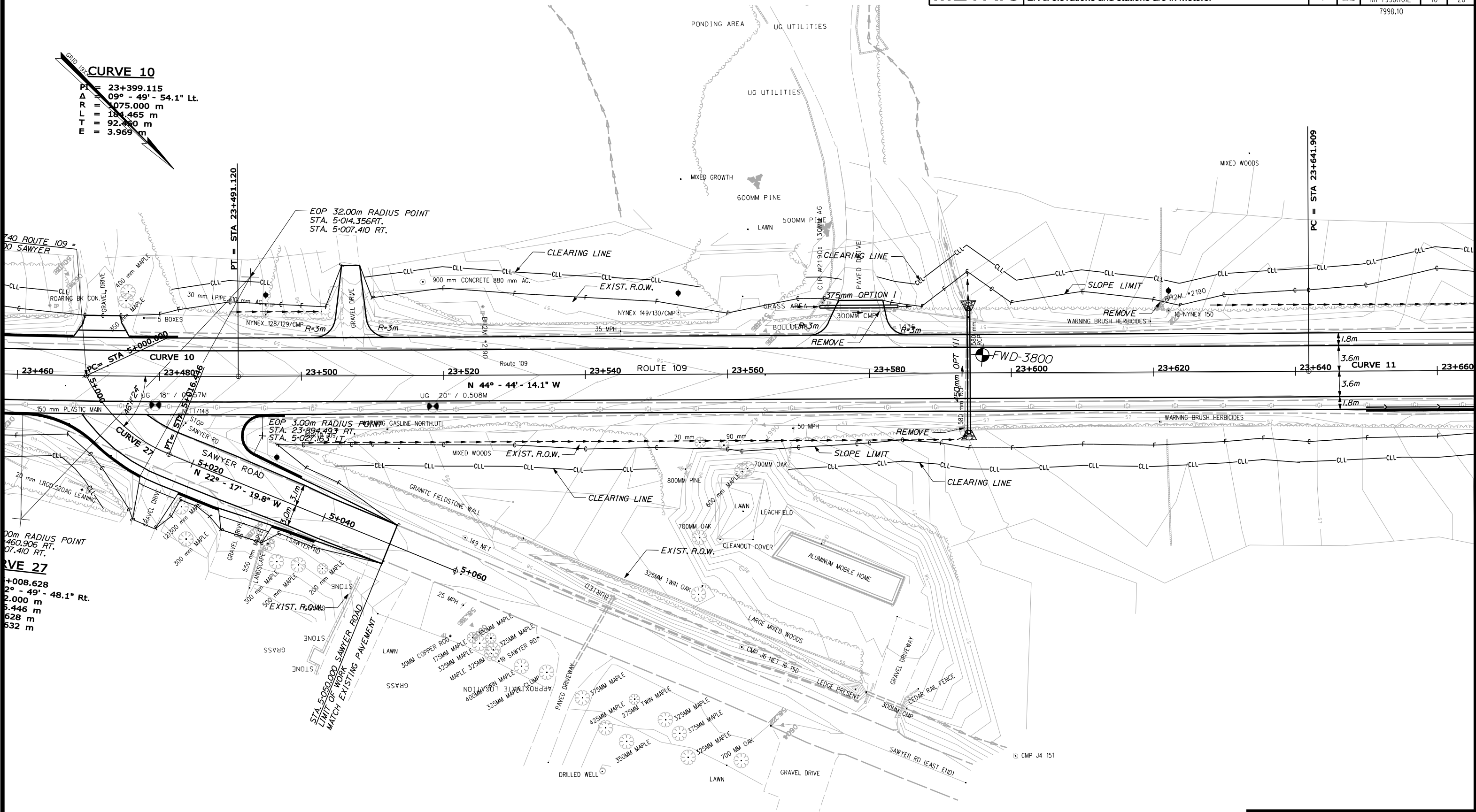
PLANS

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	10	28

7998.10



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET OF AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\011_Geoplan1.dgn

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	K. GROSS	APR. 2005
CHECKED	T. WHITE	
REVISIONS		
FIELD CHANGES		

PLANS

METRIC

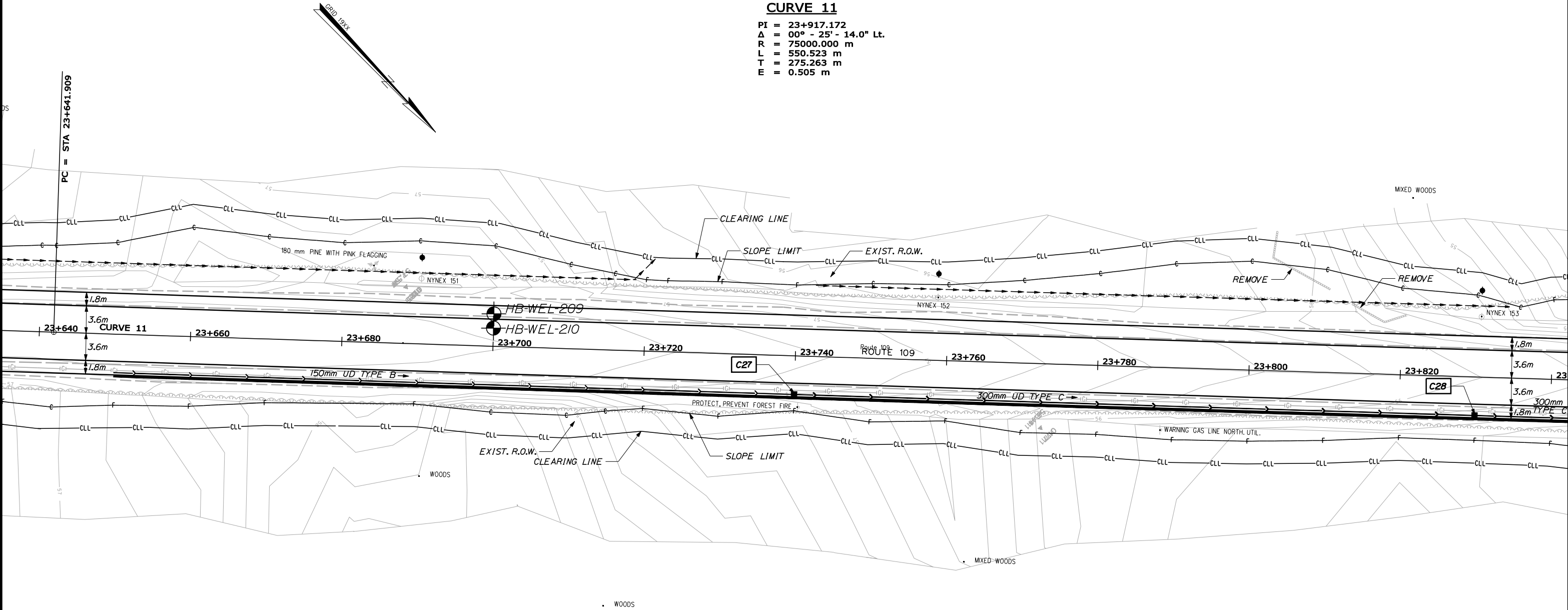
1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	11	28

7998.10

CURVE 11

PI = 23+917.172
Δ = 00° - 25' - 14.0" Lt.
R = 75000.000 m
L = 550.523 m
T = 275.263 m
E = 0.505 m



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET OF
AUGUSTA, MAINE

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	12	28

7998.10

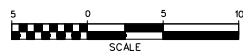
PI = 23+917.172
Δ = 00° - 25' - 14.0" Lt.
R = 75000.000 m
L = 550.523 m
T = 275.263 m
E = 0.505 m



PROJECT DESIGN ENGINEER		BY	DATE
DESIGN-DETAILED		K. GROSS	T. WHITE
CHECKED			
REVISIONS			
FIELD CHANGES			

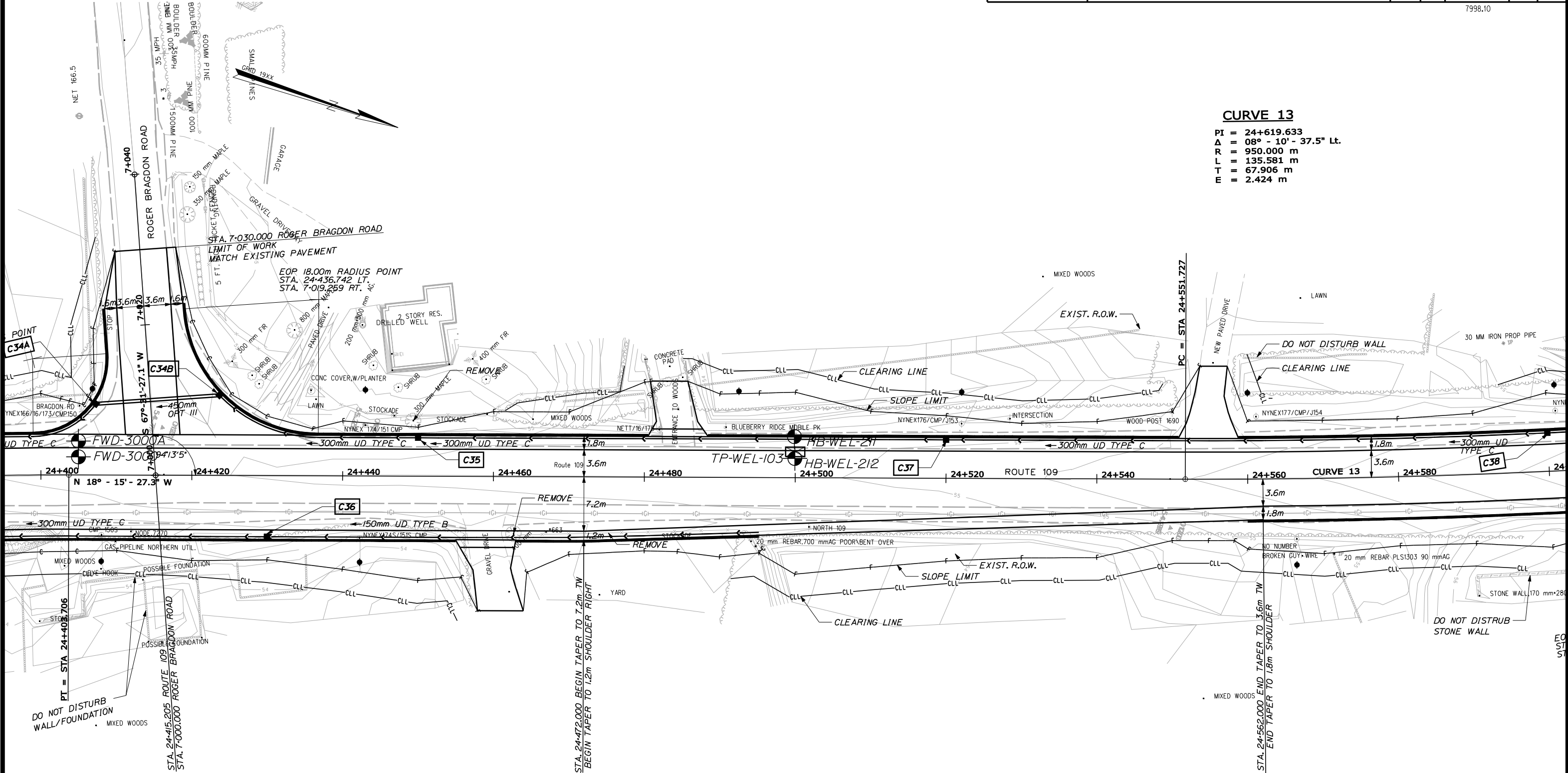
**STATE OF MAINE
DEPARTMENT OF TRANSPORTATION**

GEOPLANS
WELLS
ROUTE 109



SHEET OF AUGUSTA, MAINE

PROJECT DESIGN ENGINEER PLANS	BY	DATE
	T. WHITE	APR 2005
	K. GROSS	
	CHECKED	
	REVISIONS	
	FIELD CHANGES	



METRIC

- 1. All dimensions are in millimeters unless otherwise noted.
- 2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	13	28

7998.10

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET OF
AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\014_Geoplan4.dgn

PROJECT DESIGN ENGINEER DESIGN-DETAILED CHECKED REVISIONS FIELD CHANGES	BY T. WHITE K. GROSS	DATE APR 2005	PLANS

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	14	28

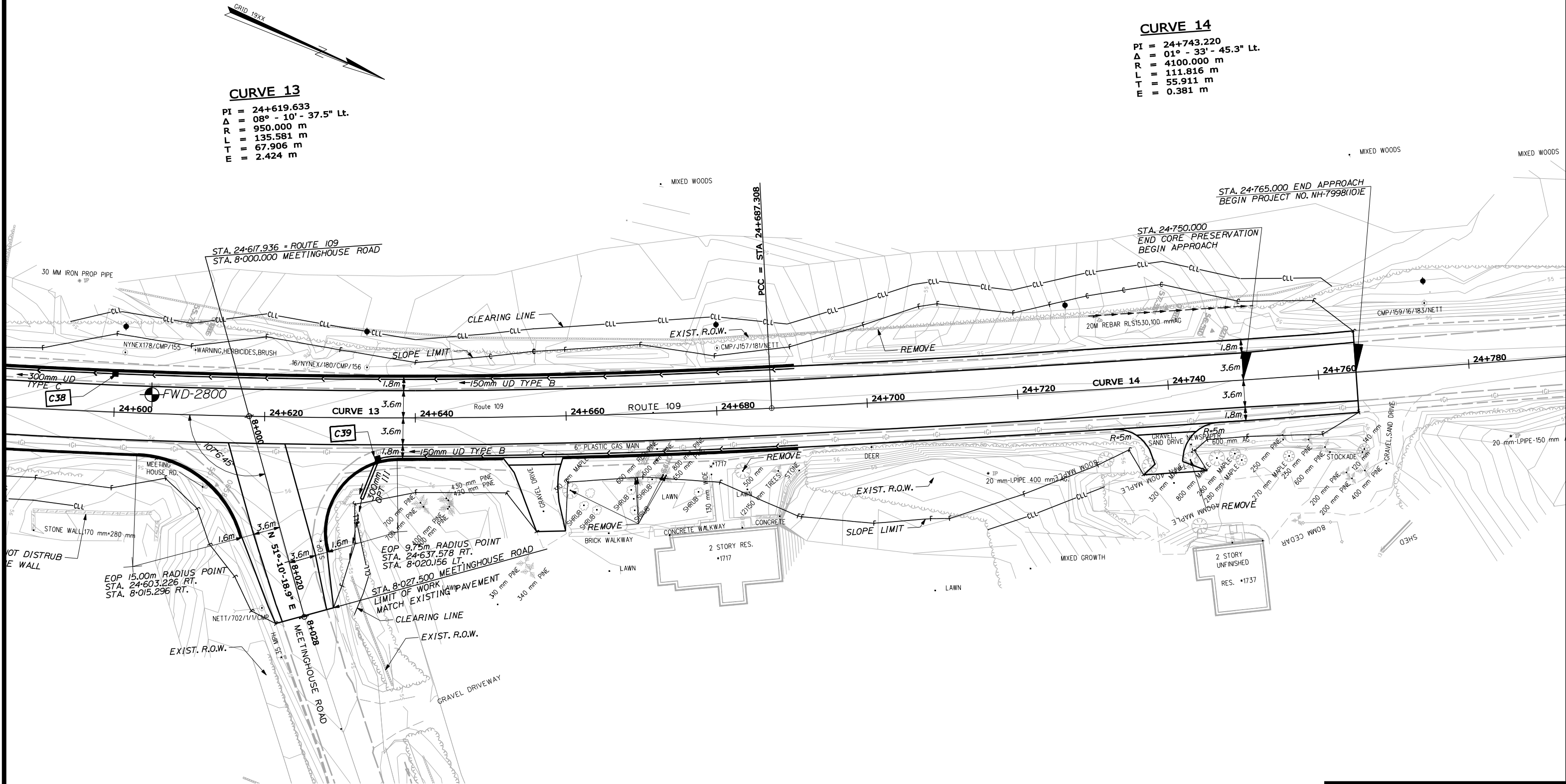
7998.10

CURVE 13

PI = 24+619.633
Δ = 08° - 10' - 37.5" Lt.
R = 950.000 m
L = 135.581 m
T = 67.906 m
E = 2.424 m

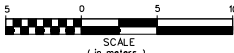
CURVE 14

PI = 24+743.220
Δ = 01° - 33' - 45.3" Lt.
R = 4100.000 m
L = 111.816 m
T = 55.911 m
E = 0.381 m



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109



SHEET OF AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\015_Geoplan15.dgn

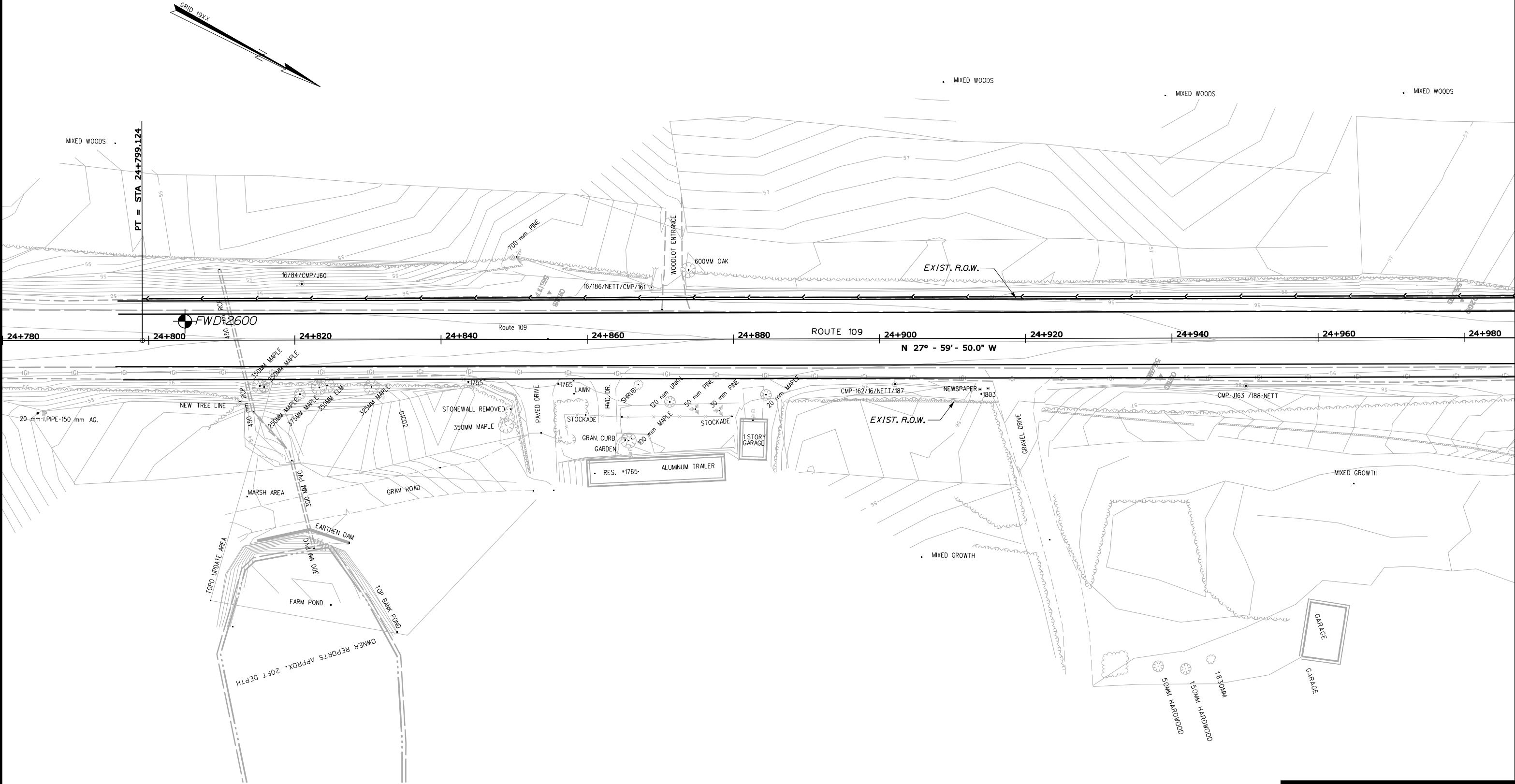
PROJECT DESIGN ENGINEER PLANS	BY	DATE
	K. GROSS	APR 2005
	DESIGN-DETAILED	
	CHECKED	
REVISIONS	FIELD CHANGES	

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	15	28

7998.10



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

50
0
5
10

SCALE
(in meters)

SHEET 15 OF 28
AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\016_Geoplan16.dgn

PROJECT DESIGN ENGINEER PLANS	DESIGN-DETAILED	BY	DATE
	CHECKED	K. GROSS	T. WHITE
	REVISIONS		
	FIELD CHANGES		

METRIC

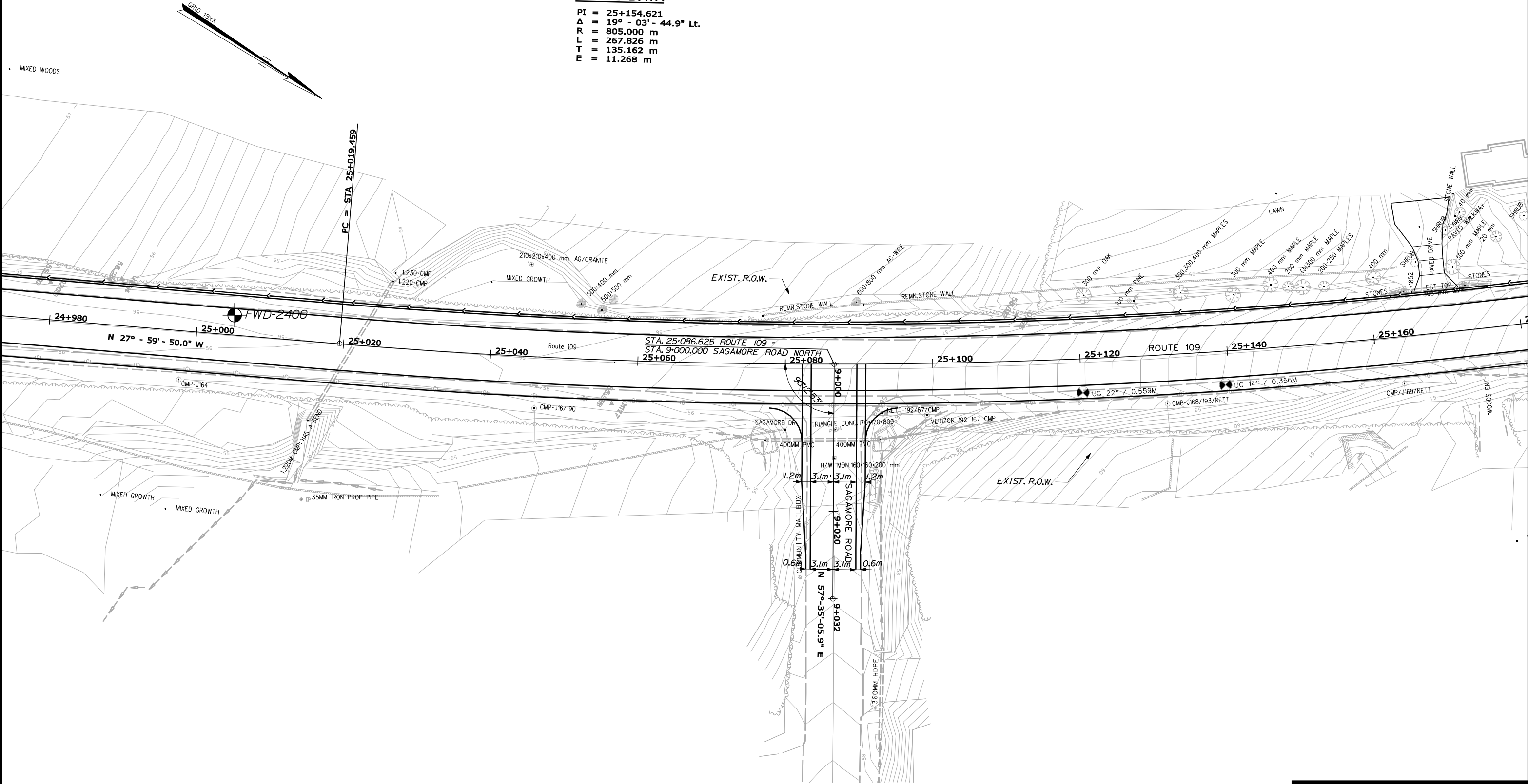
1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	16	28

7998.10

CURVE DATA

PI = 25+154.621
Δ = 19° - 03' - 44.9" Lt.
R = 805.000 m
L = 267.826 m
T = 135.162 m
E = 11.268 m



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET 16 OF 28
AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\017_Geoplan17.dgn

PROJECT DESIGN ENGINEER PLANS	BY	DATE
	K. GROSS	APR. 2005
	DESIGN-DETAILED	
	CHECKED	
REVISIONS		
FIELD CHANGES		

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

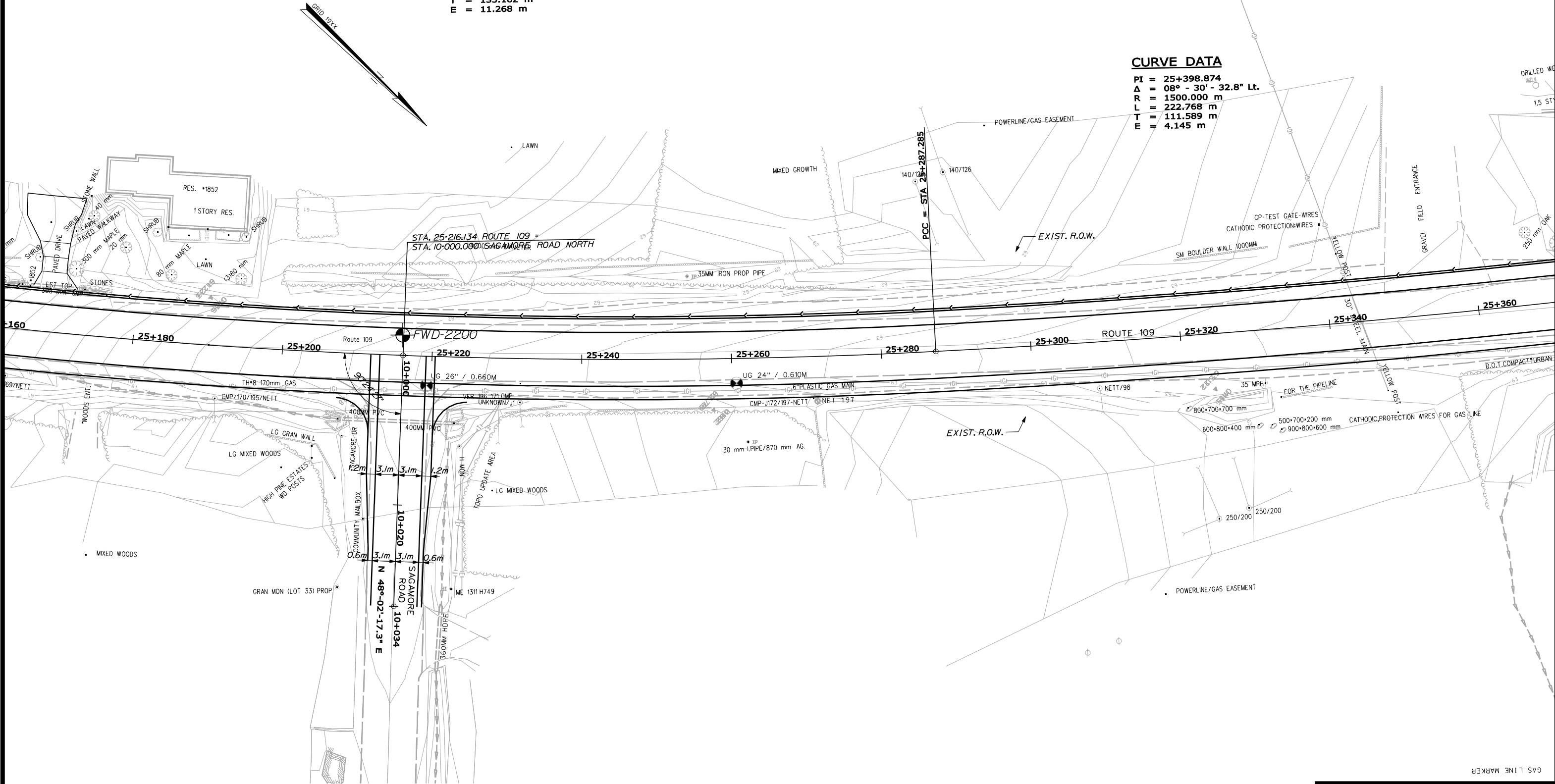
FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	17	28

CURVE DATA

PI = 25+154.621
Δ = 19° - 03' - 44.9" Lt.
R = 805.000 m
L = 267.826 m
T = 135.162 m
E = 11.268 m

CURVE DATA

PI = 25+398.874
Δ = 08° - 30' - 32.8" Lt.
R = 1500.000 m
L = 222.768 m
T = 111.589 m
E = 4.145 m



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET OF
AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\018_Geoplan18.dgn

PROJECT DESIGN ENGINEER DESIGN-DETAILED CHECKED REVISIONS FIELD CHANGES	BY K. GROSS	T. WHITE	DATE APR 2005
PLANS			

METRIC

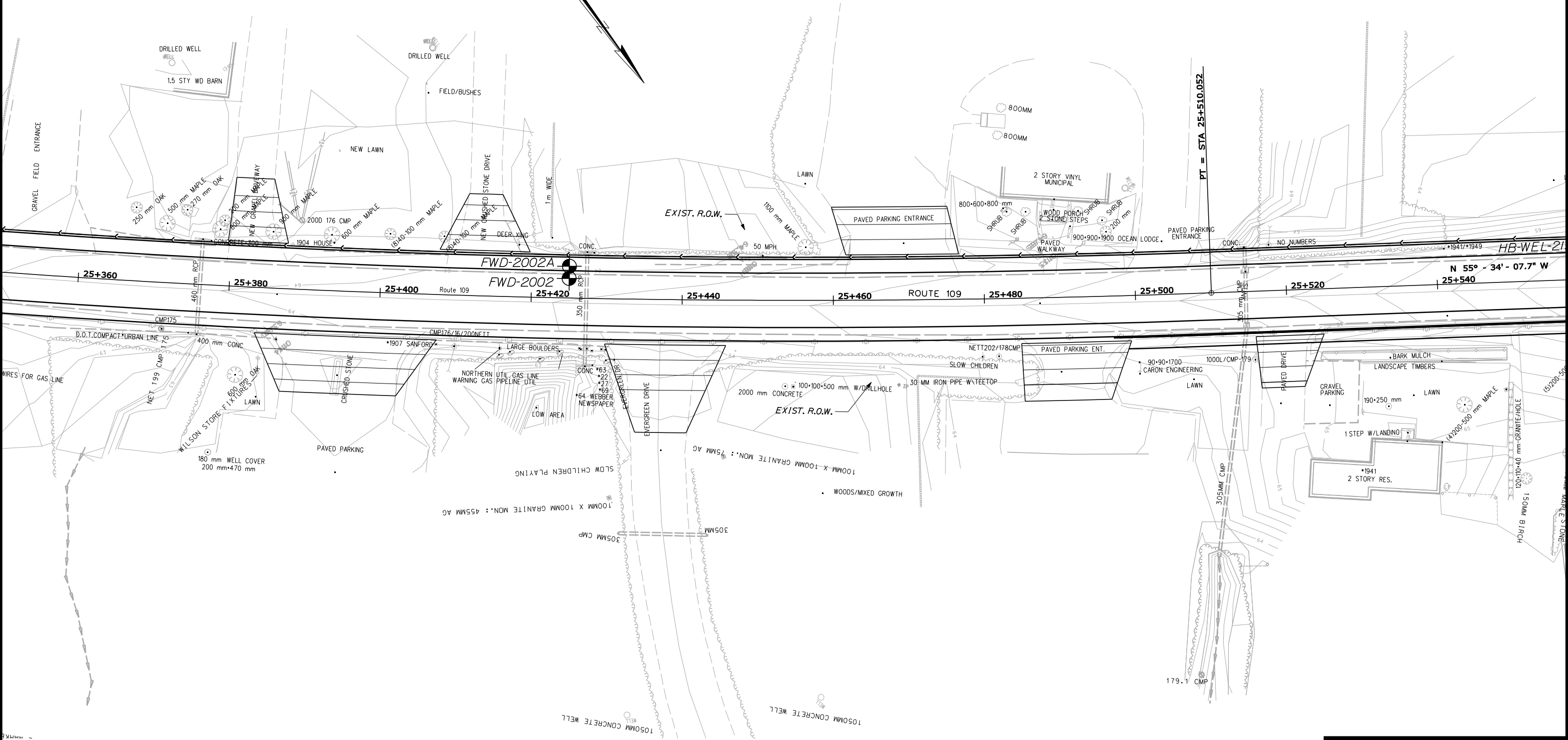
1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	18	28

7998.10

CURVE DATA

PI = 25+398.874
Δ = 08° - 30' - 32.8" Lt.
R = 1500.000 m
L = 222.768 m
T = 111.589 m
E = 4.145 m



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109



SHEET OF AUGUSTA, MAINE

METRIC	1. All dimensions are in millimeters unless otherwise noted.	F.J.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
	2. All elevations and stations are in meters.	1	MAINE	NH-7998(10)E	19	28

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filenam: ... \geotech\msta\020_Geoplan20.dgn

PROJECT DESIGN ENGINEER DESIGN-DETAILED CHECKED REVISIONS FIELD CHANGES	BY K. GROSS	T. WHITE	DATE APR 2005
PLANS			

METRIC

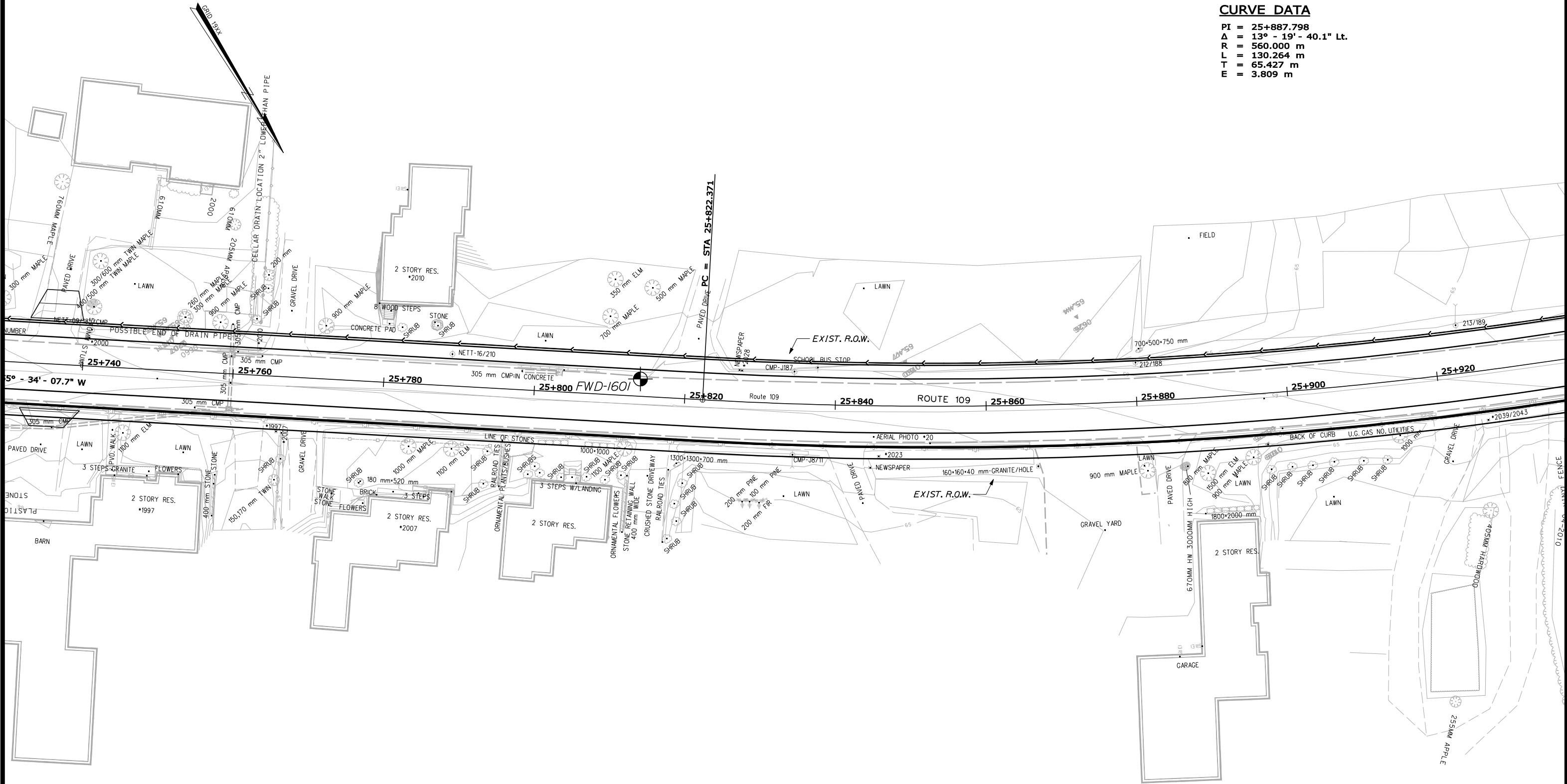
1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	20	28

7998.10

CURVE DATA

PI = 25+887.798
Δ = 13° - 19' - 40.1" Lt.
R = 560.000 m
L = 130.264 m
T = 65.427 m
E = 3.809 m



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET 20 OF 28
AUGUSTA, MAINE

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	21	28

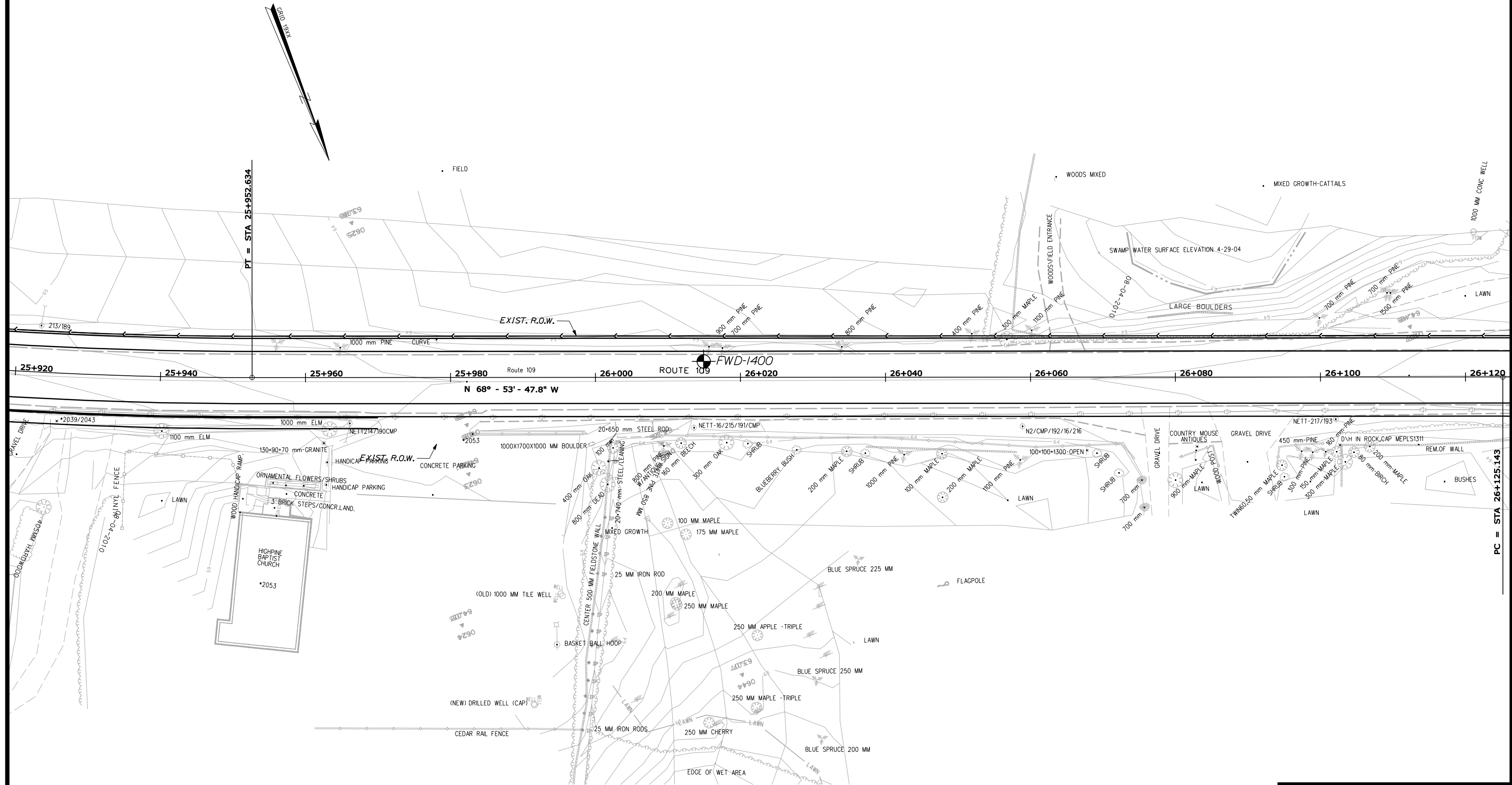
Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\021_Geoplan21.dgn

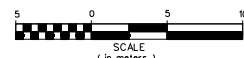
PROJECT DESIGN ENGINEER		BY	DATE
DESIGN-DETAILED	K. GROSS	T. WHITE	APR. 2005
CHECKED			
REVISIONS			
FIELD CHANGES			



PC = STA 26+125.143

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109



SHEET OF AUGUSTA, MAINE

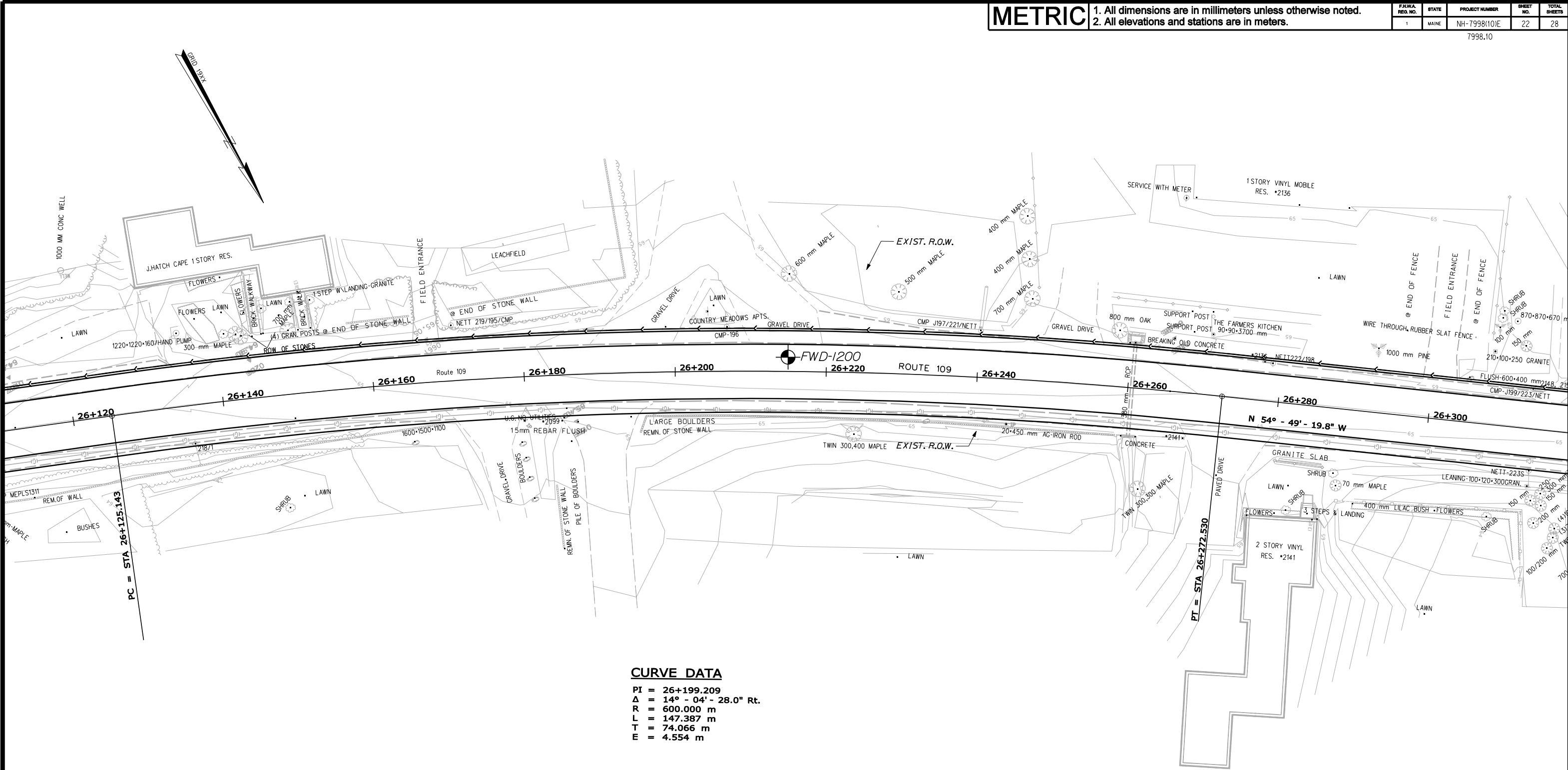
Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\022_Geoplan22.dgn

PROJECT DESIGN ENGINEER PLANS	BY	DATE
	K. GROSS	APR 2005
	T. WHITE	
	CHECKED	
	REVISIONS	
FIELD CHANGES		



CURVE DATA
PI = 26+199.209
Δ = 14° - 04' - 28.0" Rt.
R = 600.000 m
L = 147.387 m
T = 74.066 m
E = 4.554 m

METRIC	1. All dimensions are in millimeters unless otherwise noted.		FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
	2. All elevations and stations are in meters.		1	MAINE	NH-7998(10)E	22	28

7998.10

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET OF
AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\023_Geoplan23.dgn

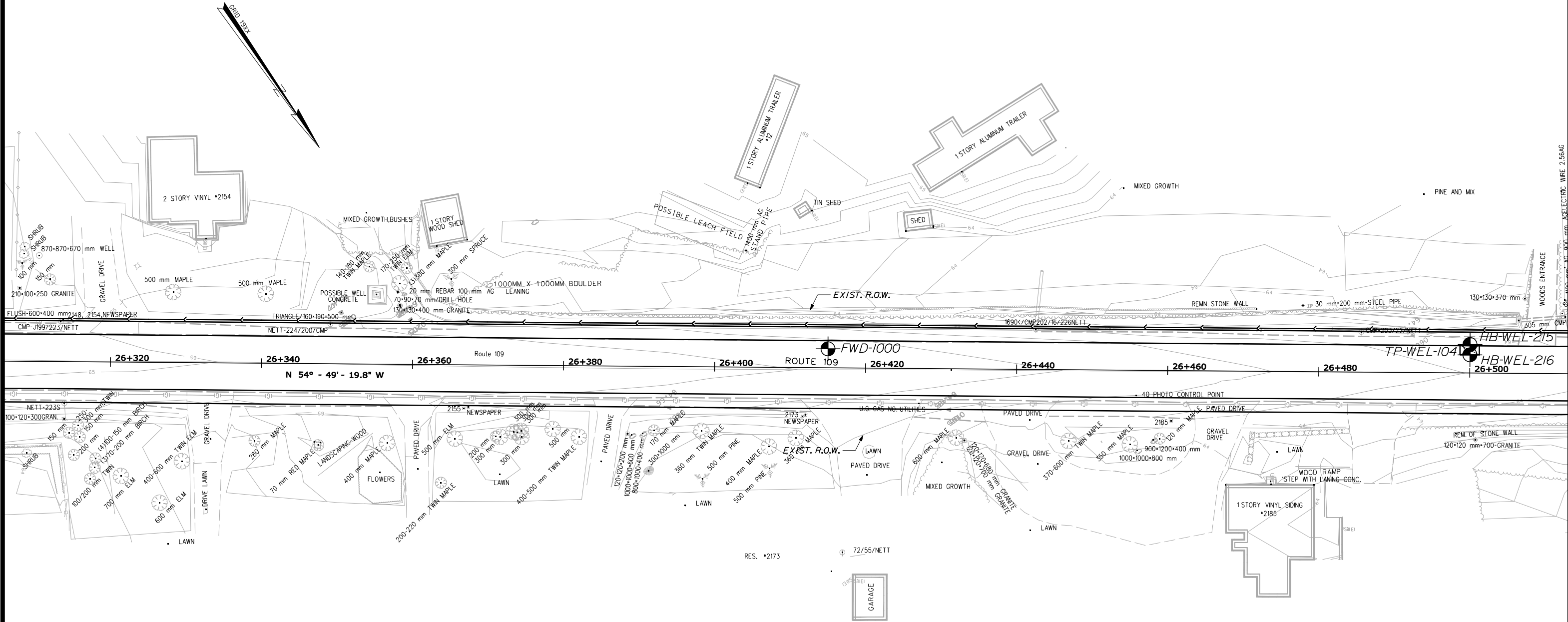
PROJECT DESIGN ENGINEER PLANS	BY	DATE
	K. GROSS	APR 2005
	T. WHITE	
DESIGN-DETAILED		
CHECKED		
REVISIONS		
FIELD CHANGES		

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	23	28

7998.10



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET OF
AUGUSTA, MAINE

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\024_Geoplan24.dgn

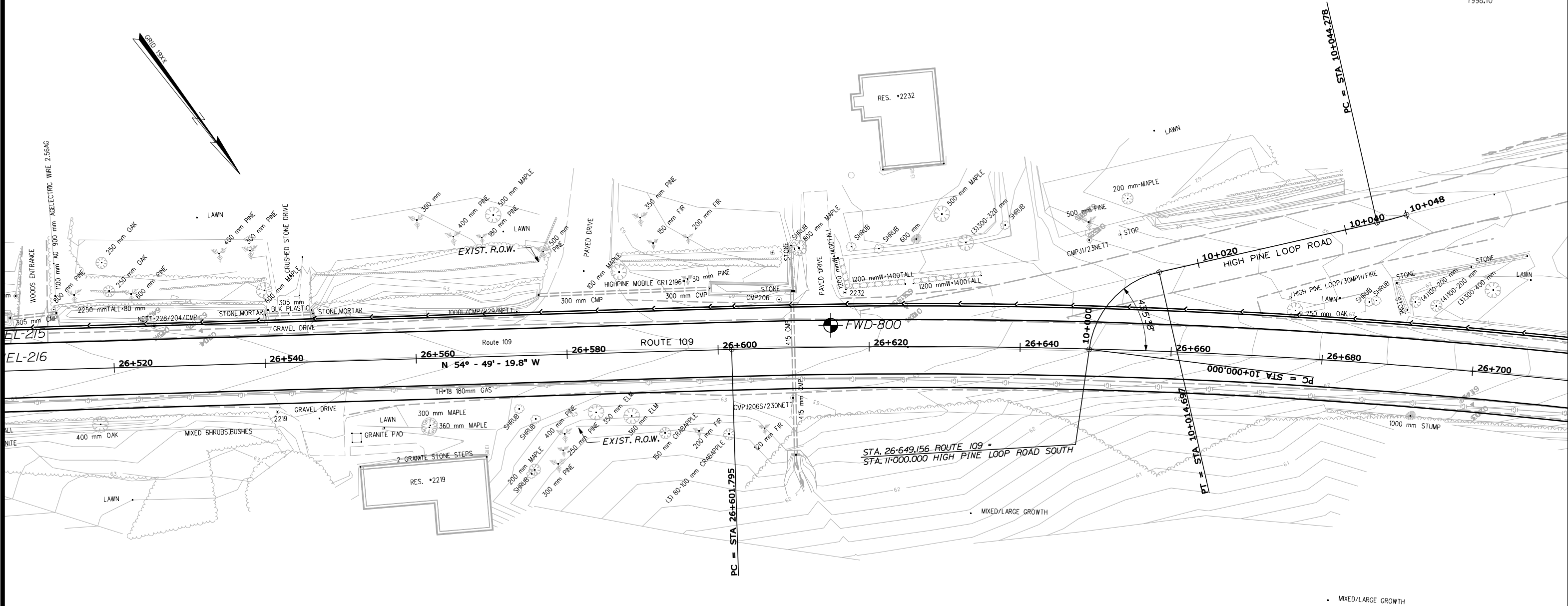
PROJECT DESIGN ENGINEER PLANS	BY	DATE
	K. GROSS	APR. 2005
	T. WHITE	
DESIGN-DETAILED		
CHECKED		
REVISIONS		
FIELD CHANGES		

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	24	28

7998.10



CURVE DATA

PI = 26+711.721
Δ = 15° - 10' - 44.9" Rt.
R = 825.000 m
L = 218.564 m
T = 109.926 m
E = 7.291 m

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)
AUGUSTA, MAINE

SHEET OF

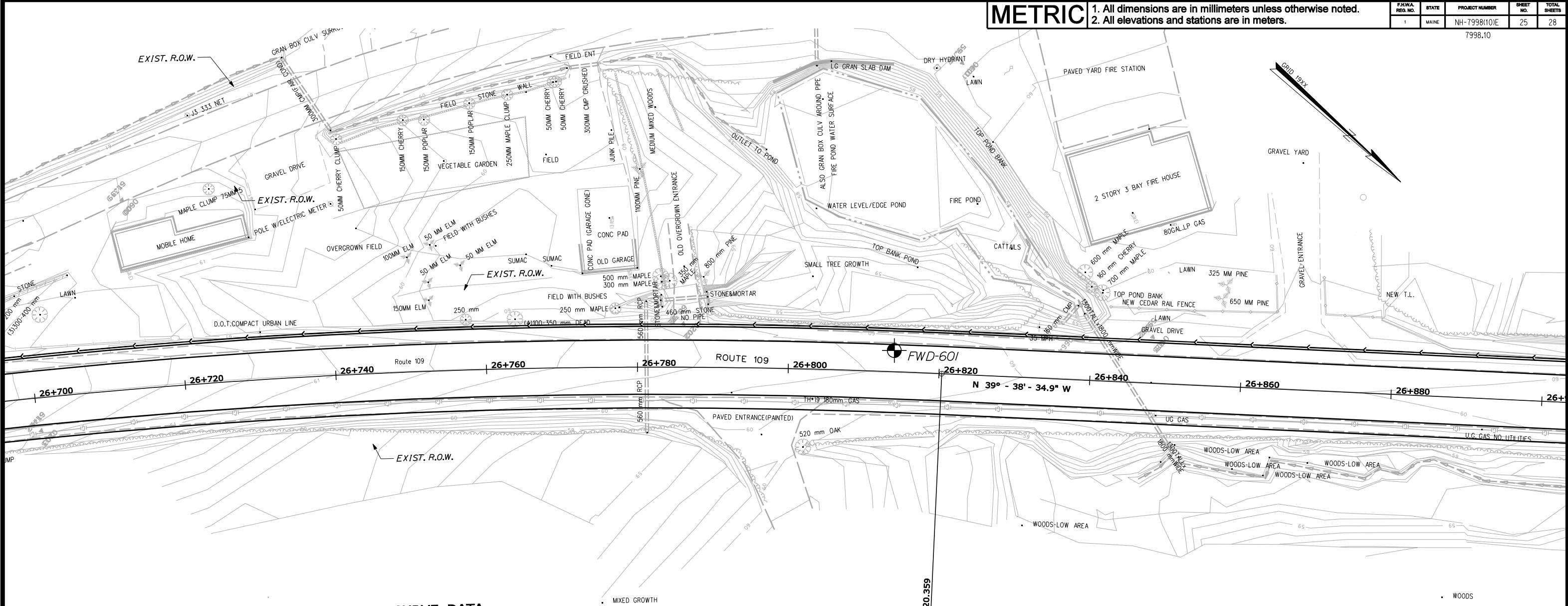
Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\025_Geoplan25.dgn

PROJECT DESIGN ENGINEER PLANS	DESIGN-DETAILED	BY	DATE
	CHECKED	K. GROSS	T. WHITE
	REVISIONS		
	FIELD CHANGES		



CURVE DATA

PI = 26+711.721
Δ = 15° - 10' - 44.9" Rt.
R = 825.000 m
L = 218.564 m
T = 109.926 m
E = 7.291 m

METRIC

- 1. All dimensions are in millimeters unless otherwise noted.
- 2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	25	28

7998.10

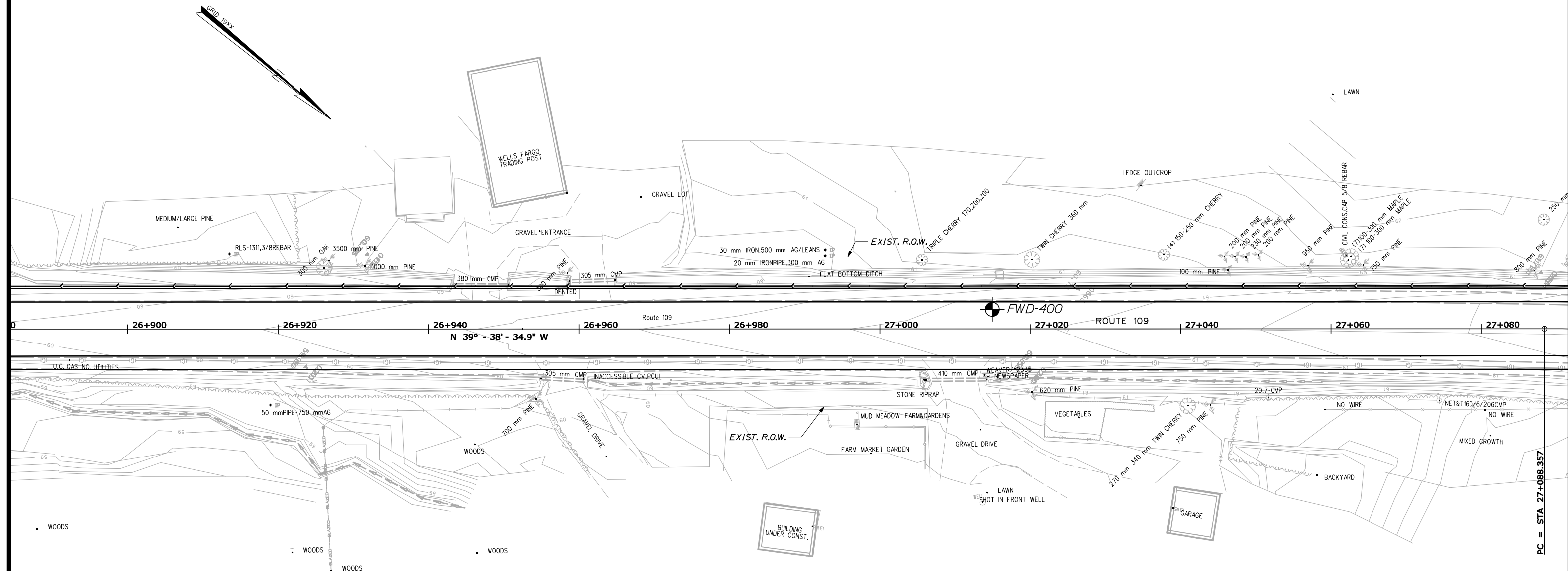
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109



F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	26	28

7998.10



PC = STA 27+088.357

Date: 10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\026_Geoplan26.dgn

PLANS	PROJECT DESIGN ENGINEER	BY	DATE
	DESIGN-DETAILED	K. GROSS	T. WHITE
	CHECKED		APR. 2005
	REVISIONS		
	FIELD CHANGES		

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS

WELLS

ROUTE 109



SCALE
(in meters)

SHEET OF

Date:10/21/2010

Username: Karen.Gross

Division: HIGHWAY

Filename: ... \geotech\msta\028_Geoplan28.dgn

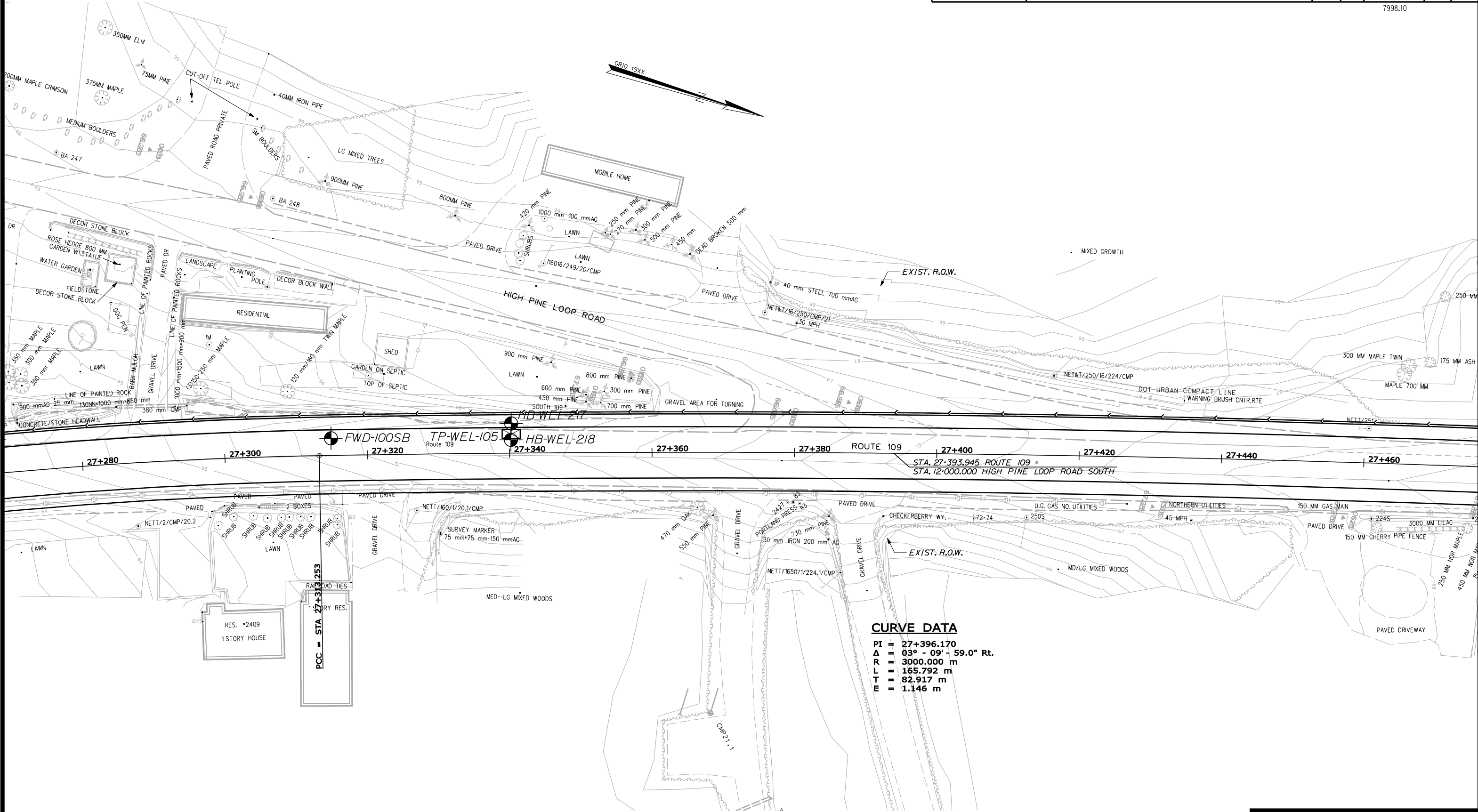
PROJECT DESIGN ENGINEER DESIGN-DETAILED CHECKED REVISIONS FIELD CHANGES	BY	T. WHITE	DATE
PLANS			

METRIC

1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

FAHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NH-7998(10)E	28	28

7998.10



CURVE DATA

PI = 27+396.170
Δ = 03° - 09' - 59.0" Rt.
R = 3000.000 m
L = 165.792 m
T = 82.917 m
E = 1.146 m

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

GEOPLANS
WELLS
ROUTE 109

5 0 5 10
SCALE
(in meters)

SHEET OF AUGUSTA, MAINE