



Geotechnical Report
Retaining Walls RW-101 through RW-107
Relocation of I-91 NB Interchange 29 and Widening of I-91 NB and Rt. 15 and I-84 EB
State Project No. 63-703
Hartford and East Hartford, Connecticut

February 14, 2017

Freeman Project No.: 2014-1001

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1.0 PROJECT OVERVIEW

1.1 General

This report presents our evaluation of subsurface conditions and geotechnical engineering recommendations for retaining walls RW-101 through RW-107. These walls are part of the proposed Relocation of I-91 NB Interchange 29 and Widening of I-91 NB and Rt. 15 and I-84 EB project, located in Hartford and East Hartford, Connecticut.

1.2 Scope of Work

Freeman Companies, LLC performed the following tasks:

- Engaged a subsurface exploration contractor to conduct test borings at the site;
- Provided technical monitoring of the explorations;
- Arranged for a testing laboratory to conduct laboratory soil tests;
- Evaluated the subsurface conditions and conducted slope stability evaluations;
- Prepared this report containing geotechnical design recommendations and construction considerations.

1.3 Authorization

The work was completed in accordance with our agreement dated October 21, 2015.

1.4 Project Vertical Datum

Elevations in this report refer to the NAVD 88 datum.

2.0 SITE AND PROJECT DESCRIPTION

2.1 WALL RW101

Existing Conditions

- | | |
|---------------------|---|
| Site Description | Alignment runs parallel to the I-91 Right of Way limit and adjacent MDC property, upslope from the Right-of-Way (ROW). |
| Existing Structures | A transformer tower and a line of utility pole structures are located on MDC property at the toe of the highway embankment. A gravel drive runs parallel the ROW. |
| Ground Cover | Brush |
| Topography | The highway embankment slope is about 2 Horizontal to 1 Vertical (2H:1V). Ground surface at the highway crest is about El. 40, and ground surface at the toe is about El. 12. Ground surface along the W101 alignment varies from about El. 14 to 22. |

Proposed Wall

- | | |
|-----------|---|
| Location | Sta. 10+00 to Sta. 17+14, 42 to 88 feet Right. . |
| Wall Type | Cast-In-Place Cantilever Wall |
| Height | Up to 16 feet measured from top of footing to top of wall |
| Length | 684 feet |

Horizontal Distance to Adjacent Features 67 feet to proposed top of slope; 17 feet to highway ROW (downslope).
 Slope Above/Below Wall, Height (feet) 1.5 Horizontal to 1 Vertical (1.5H:1V) slope above wall
 2H:1V slope below wall

2.2 WALL RW103

Existing Conditions

Site Description Wall W103A and W103B located east of Rt 5/15 Exit 86 Ramp SB Ramp and West of an existing retaining wall along I-91 NB. Wall 103A connects with the southwest Abutment 1 wingwall of the New Bridge; Wall 103B connects with the southeast Abutment 1 wingwall of the New Bridge.

Existing Structures Existing MSE retaining wall ranging from 3 to 23 feet tall (measured from grade at the crest to grade at the toe). A 24-inch diameter reinforced concrete pipe (RCP) and an 84-inch diameter reinforced concrete pipe (RCP) pass beneath W103A and W103B at Sta. 161+35 and Sta. 166+75, respectively.

Ground Cover Grass, brush, trees

Topography Level to gently sloping. Ground surface along Rt. 5/15 Exit 86 Ramp SB ranges from El. 14 to 16.

Proposed Wall

Location Wall W103A: Sta. 156+00 to Sta. 167+21, 12 feet Left.
 Wall W103B: Sta. 165+41 to Sta. 167+21, 40 feet Right
 Walls will be within a landscaped area on the east side of Route 5/15 Exit 86. A portion of Walls W103A and W103B will be constructed within the footprint of the existing MSE wall supporting I-91 NB.

Wall Type Concrete Centilever

Height W103A: 10 to 36 feet tall measured from top of footing
 W103B: 32 to 36 feet tall measured from top of footing

Length W103A: 1,121 feet
 W103B: 180 feet

Horizontal Distance to Adjacent Features 10 to 27 feet from Rt. 5/15 Ramp 86 SB.

Slope Above/Below Wall, Height (feet) None

2.3 WALL RW104

Existing Conditions

Site Description Wall W104A will be located within the Rt 5/15 highway between the SB and NB travel lanes. Wall W104B will be located along the east side of the Rt 5/15 NB travel lanes. Both walls will be located within existing highways.

Existing Structures Wall W104A: Concrete median between the existing Rt 5/15 SB and NB travel lanes.
 Wall W104B: Roadway shoulder and embankment slope along the east side of the existing Rt 5/15 NB travel lanes

Ground Cover Wall W104A: Pavement
 Wall W104B: Grass, brush, trees
 Topography Wall W104A: Ground surface along Rt. 5/15 SB ranges from El. 40 to El. 64.
 Wall W104B: Ground surface along Rt. 5/15 NB ranges from El. 39 to El. 59. Ground surface to the east slopes downward at a 2H:1V slope from Rt. 5/15 NB to El. 29 at I-91 NB 29

Proposed Wall

Location Wall W104A: Sta. 176+59 to Sta. 182+75, 12 to 4 feet Left.
 Wall W104B: Sta. 176+59 to Sta. 182+19, 40 feet Right
 Wall Type Concrete Cantilever
 Height 12 to 25 from top of footing
 Length W104A: 616 feet
 W104B: 557.2 feet
 Horizontal Distance to Adjacent Features None
 Slope Above/Below Wall, Height (feet) None

2.4 WALL RW105

Existing Conditions

Site Description Alignment is located in a landscaped area on the west side of I-91 NB.
 Existing Structures Storm drains cross the alignment at Sta. 411+30 and Sta. 418+70.
 Ground Cover Grass, brush, trees
 Topography The W105 alignment is located along the toe of the of the Rt 5/15 NB highway embankment, a 20-foot high embankment. Ground surface along the W101 alignment varies from about El. 28 to 29.

Proposed Wall W105

Location Sta. 417+00 to 418+45.66, 35 feet Right.
 Wall Type Concrete Cantilever
 Height 13 to 25 feet measured from top of the footing
 Length 145 feet
 Horizontal Distance to Adjacent Features None
 Slope Above/Below Wall, Height (feet) None

2.5 WALL RW106

Existing Conditions

Site Description Alignment runs from the Bridge 06043 (Route 15 over Main Street) wingwall along the edge of Route 15 NB at the crest of the widened highway embankment, and ending on Exit 91 (to Silver Lane).
 Existing Structures Noise barrier from Sta. 82+60 to the end of the wall

Ground Cover Trees, brush, grass on slope
 Topography The highway embankment slope is about 2H:1V. Ground surface at the highway crest is about El. 51 to 62, and ground surface at the toe of the slope is about El. 37 to El. 40.

Proposed Wall

Location Sta. 76+93.65 to Sta. 90+00, 25 feet Right.
 Wall Type Cast-in-Place Concrete Gravity Wall with Noise Barrier
 Height 10 feet to 14 feet measured from the top of the footing
 Length 1,304.9 feet
 Horizontal Distance to Adjacent Features None
 Slope Above/Below Wall, Height (feet) 2H:1V slope below toe, up to 14 feet high

2.6 WALL RW107

Existing Conditions

Site Description Alignment runs along the edge of Route 15 NB from north of Exit 91 at the crest of the widened highway embankment to the Bridge 05796 (Rt. 15 over Silver Lane) wingwall
 Existing Structures Noise barrier
 Ground Cover Trees, brush, grass on slope below noise barrier
 Topography The highway embankment slope is about 2 Horizontal to 1 Vertical (2H:1V). Ground surface at the highway crest is about El. 52 to 59, and ground surface at the toe is about El. 46 to El. 34.

Proposed Wall

Location Sta. 251+00 to Sta. 257+73.19, 45 feet right
 Wall Type Concrete Cantilever
 Height 7 to 22 feet measured from the top of the footing
 Length 674.7 feet
 Horizontal Distance to Adjacent Features None
 Slope Above/Below Wall, Height (feet) Match existing

3.0 SUBSURFACE EXPLORATIONS

A summary of subsurface explorations conducted at each retaining wall is summarized below:

3.1 Wall RW101

Recent Explorations

Type/Number Five test borings: SRW-1, SRW-2, SRW-2A, SRW-3, and R-3
 Driller New England Boring Contractors, Inc., of Glastonbury, Connecticut.
 Date April 25 to 28 and November 17 to 18, 2016
 Depths 22 feet to 71 feet (refer to Table I – Wall 101)

Soil/Rock Samples Standard Penetration Tests and soil samples recovered at maximum 5-foot-intervals.
Termination Criteria Terminated at predetermined depths
Test Boring Logs Prepared by Freeman Companies, refer to Appendix A
Locations Refer to Figure 2-Wall 101

Previous Explorations

Type/Number Two previous explorations, designated B1 and B2
Test Boring Logs Prepared by others, refer to Appendix B

3.2 Wall RW103

Recent Explorations

Type/Number Eleven test borings: SRW-5, SRW-6, R-11, RW-1 to RW-5, RW-3A, S1-1 and S1-2
One Cone Penetrometer Test: CPT-RW5
Driller (Test Borings) New England Boring Contractors, Inc., of Glastonbury, Connecticut.
Driller (CPT) ConeTec, Inc., West Berlin, New Jersey
Date Between May 1 and June 14, 2016 (Test Borings)
June 13, 2016 (CPT)
Depths 31 to 65 feet, refer to Table I – Wall 103
Soil/Rock Samples Standard Penetration Tests and soil samples recovered at maximum 5-foot-intervals;
undisturbed tube samples of the lacustrine deposits were recovered from select
locations.
Termination Criteria Terminated at predetermined depths
Test Boring Logs Prepared by Freeman Companies, refer to Appendix A
CPT Log Prepared by ConeTec, Inc., refer to Appendix A
Locations Refer to Figure 2-Wall 103

Previous Explorations

Type/Number Five previous explorations, designated B185, B186, B241, B242 and B243.
Test Boring Logs Prepared by others, refer to Appendix B

3.3 Wall RW104

Recent Explorations

Type/Number Nine test borings: S1-11, S1-12, RW-7 through RW-12, and S2-1
One Cone Penetrometer Test: CPT-RW10
Driller (Test Borings) New England Boring Contractors, Inc., of Glastonbury, Connecticut.
Driller (CPT) ConeTec, Inc., West Berlin, New Jersey
Date May 2 to June 8, 2016 (Test Borings)
June 13, 2016 (CPT)
Depths 89.5 to 120 feet (borings), refer to Table I – Wall 104
87.9 feet (CPT)
Soil/Rock Samples Standard Penetration Tests and soil samples recovered at maximum 5-foot-intervals;
undisturbed tube samples of the lacustrine deposits were recovered from select
locations.
Termination Criteria Terminated at predetermined depths

Test Boring Logs Prepared by Freeman Companies, refer to Appendix A
 CPT Log Prepared by ConeTec, Inc., refer to Appendix A
 Locations Refer to Figure 2-Wall 104

Previous Explorations

Type/Number Three previous explorations, designated B2, B106, and B107.
 Test Boring Logs Prepared by others, refer to Appendix B

3.4 Wall RW105

Recent Explorations

Type/Number Seven test borings: S1-12, RW-8 through RW-12, and S2-1
 One Cone Penetrometer Test: CPT-RW10
 Driller (Test Borings) New England Boring Contractors, Inc., of Glastonbury, Connecticut.
 Driller (CPT) ConeTec, Inc., West Berlin, New Jersey
 Date May 16 and June 7, 2016 (Test Borings)
 June 13, 2016 (CPT)
 Depths 90 to 120 feet (borings), refer to Table I – Wall 105
 87.9 feet (CPT)
 Soil/Rock Samples Standard Penetration Tests and soil samples recovered at maximum 5-foot-intervals;
 undisturbed tube samples of the lacustrine deposits were recovered from select
 locations.
 Termination Criteria Terminated at predetermined depths
 Test Boring Logs Prepared by Freeman Companies, refer to Appendix A
 CPT Log Prepared by ConeTec, Inc., refer to Appendix A
 Locations Refer to Figure 2-Wall 105

Previous Explorations

Type/Number Four previous explorations, designated B-221A, B-221B, B222, and B-227
 Test Boring Logs Prepared by others, refer to Appendix B

3.5 Wall RW106

Recent Explorations

Type/Number Five test borings: S6043-1, SRW-7, SRW-8, R-15 to R-17
 One Cone Penetrometer Test: CPT-6043-1
 Driller (Test Borings) New England Boring Contractors, Inc., of Glastonbury, Connecticut.
 Driller (CPT) ConeTec, Inc., West Berlin, New Jersey
 Date May 21 to 27, 2016 (Test Borings)
 June 15, 2016 (CPT)
 Depths 22 to 189 feet (borings), refer to Table I – Wall 106
 164.4 feet (CPT)
 Soil/Rock Samples Standard Penetration Tests and soil samples recovered at maximum 5-foot-intervals;
 undisturbed tube samples of the lacustrine deposits were recovered from select
 locations.
 Termination Criteria Terminated at predetermined depths

Test Boring Logs Prepared by Freeman Companies, refer to Appendix A
CPT Log Prepared by ConeTec, Inc., refer to Appendix A
Locations Refer to Figure 2-Wall 106

Previous Explorations

Type/Number Three previous explorations, designated B-165, B-321, and B-326
Test Boring Logs Prepared by others, refer to Appendix B

3.6 Wall RW107

Recent Explorations

Type/Number Four test borings: R-17, SRW-10, SRW-11, S5796-1
One Cone Penetrometer Test: CPT-5796-1
Driller (Test Borings) New England Boring Contractors, Inc., of Glastonbury, Connecticut.
Driller (CPT) ConeTec, Inc., West Berlin, New Jersey
Date May 9 to June 21, 2016 (Test Borings)
June 14, 2016 (CPT)
Depths 22 to 319 feet (borings), refer to Table I – Wall 107
222.3 feet (CPT)
Soil/Rock Samples Standard Penetration Tests and soil samples recovered at maximum 5-foot-intervals; undisturbed tube samples of the lacustrine deposits were recovered from select locations.
Termination Criteria Terminated at predetermined depths
Test Boring Logs Prepared by Freeman Companies, refer to Appendix A
CPT Log Prepared by ConeTec, Inc., refer to Appendix A
Locations Refer to Figure 2-Wall 107

Previous Explorations

Type/Number Four previous explorations, designated B-16, L-501, L-503, B-319
Test Boring Logs Prepared by others, refer to Appendix B

4.0 LABORATORY TESTING

Laboratory tests were performed on representative soil samples recovered from the test borings. Testing included the following:

Wall RW101: 1 Grain Size Distribution Test

Wall RW103: 16 Moisture Content Tests
1 Corrosion Series (Resistivity, Ph, Sulfates)
4 Grain Size Analyses
8 Atterberg Limit Tests
4 Constant Rate of Strain (CRS) Consolidation Tests

Wall RW104: 28 Moisture Content Tests
2 Corrosion Series (Resistivity, Ph, Sulfates)

5 Grain Size Analyses
14 Atterberg Limit Tests
7 Constant Rate of Strain (CRS) Consolidation Tests
2 Unconfined Compression Tests on Rock Core

Wall RW105: 20 Moisture Content Tests
2 Corrosion Series (Resistivity, Ph, Sulfates)
1 Grain Size Analyses
10 Atterberg Limit Tests
5 Constant Rate of Strain (CRS) Consolidation Tests
2 Unconfined Compression Tests on Rock Core

Wall RW106: 8 Moisture Content Tests
1 Corrosion Series (Resistivity, Ph, Sulfates)
2 Grain Size Analyses
4 Atterberg Limit Tests
2 Constant Rate of Strain (CRS) Consolidation Tests
1 Unconfined Compression Test on Rock Core

Wall RW107: 8 Moisture Content Tests
2 Grain Size Analyses
4 Atterberg Limit Tests
2 Constant Rate of Strain (CRS) Consolidation Tests

Laboratory testing was conducted by Geotesting Express, Inc., of Acton, Massachusetts. Results of laboratory testing are provided in Appendix C.

5.0 SUBSURFACE CONDITIONS

5.1 Subsurface Conditions

Subsurface conditions encountered in the explorations consist of fill, alluvium, varved clay, glacial till, and bedrock, as generally described below. Subsurface profiles along each of the retaining walls are shown in Figures 3A to 3F. Subsurface data are summarized on Tables I, Wall 101 through Table 7, Wall 107.

STRATUM	GENERALIZED DESCRIPTION
Fill	Very loose to medium dense, brown, SAND with subordinate amounts of silt and gravel, also includes brick, glass, asphalt, and other miscellaneous materials. Fill is associated with existing embankments, roadways, and structures.
Alluvium	Connecticut River floodplain and channel deposits with variable thickness consisting of: (1) medium dense, coarse to fine SAND, with subordinate amounts of silt, and fine gravel; and (2) loose to medium dense green-gray SILT, with fine sand and clay.
Varved Clay	Very soft to medium stiff, red-brown, varved CLAY and SILTY CLAY, in regular layers typically ¼ to ½ inch thick and over 1 inch thick at some locations
Glacial Till	Dense to very dense red-brown coarse to fine sandy SILT with subordinate coarse to fine gravel, clay, and occasional cobbles. Glacial till in the area generally includes boulders.
Bedrock	Moderately hard to hard, red-brown fine sandy SILTSTONE; ranges from moderately to extremely fractured with two primary joint attitudes: parallel to bedding, and steep to vertical. Joints generally smooth, planar, open. Up to 3 feet of rock at the surface is typically decomposed.
Groundwater	Groundwater levels were typically between El. 0 and El. 20 during drilling or a short period of time following drilling on the west side of the river, and between El. 20 and El. 30 on the east side of the river. Groundwater was encountered west of the river in observation wells S2-3 (OW), S-3244-1 (OW), and S480-2 (OW), at El. 6, El. -2, and below El. 2, respectively, 4 months after the wells were installed. East of the river water was encountered in observation well S6043-1 (OW) at El. 29, 4 months after the well was installed. These measurements were made following and extended period of dry weather, and water levels may be higher during construction. Groundwater levels are expected to vary with season, precipitation, temperature, construction activity in the area and other factors.

5.2 Summary of Soil Properties

The following soil properties are recommended for use during design based on Kulhawy, F.H. and Mesri, P.W., (1990) "Manual on Estimating Soil Properties for Foundation Design", EPRI EL-6800, and the results of laboratory testing:

STRATUM	TOTAL UNIT WEIGHT (PCF)	DRAINED STRENGTH PARAMETERS		UNDRAINED STRENGTH PARAMETERS		Unconfined Compression Strength (psi)
		Friction Angle (deg)	Cohesion (psf)	Friction Angle (deg)	Cohesion (psf)	
New Fill – Pervious Structure Backfill or Pavement Section	125	34	0	---	---	
New Fill – Embankment Fill	120	32	0	---	---	
New Fill – Expanded Shale Aggregate	65	36	0	---	---	
Existing Fill	115	30	0	---	---	
Alluvium	115	30	0	---	---	
Varved Clay	115	---	---	0	Triaxial: $S_u = 0.21 \times OCR^{0.7} \times \text{Eff Stress}^{(1)}$ DSS: $S_u = 0.16 \times OCR^{0.7} \times \text{Eff Stress}^{(1)}$ 1,000 (minimum)	
Glacial Till	130	35	0	---	---	
Bedrock						7,000 to 11,000

(1.) Undrained strength relationships were determined by laboratory testing in previous report prepared by Haley & Aldrich titled "Geotechnical Laboratory Data Report, Charter Oak Bridge and Approaches, Hartford-East Hartford, Connecticut, State Project No. 63-384", dated May 1987.

6.0 GEOTECHNICAL ENGINEERING RECOMMENDATIONS

6.1 Retaining Wall Design – Wall 101

Retaining Wall Type: Cast-in-place; foundations designed as spread footings bearing on existing embankment fill or alluvium. Proprietary walls may be considered as an alternative to cast-in-place.

Retaining Wall Height: Up to 16 feet high from top of footing.

Retaining Wall Backfill: Expanded shale aggregate required for global stability. Place expanded shale within the backfill, and within a zone above a 1 horizontal to 1 vertical line extending into the embankment from the heel of the wall.

Service Limit Bearing: Nominal Bearing Resistance = 3,000 pounds per square foot (psf); Resistance Factor = 1.0 (per AASHTO 10.5.5.1); Allowable bearing capacity = 3,000 psf.

Strength Limit Bearing: Strength unfactored bearing resistance 12,000 psf (AASHTO 10.6.3.1.3-1); Resistance Factor = 0.55 (AASHTO Table 11.5.7-1).

Coefficient of Friction (tan δ) Along Bottom: 0.45 (AASHTO Table 3.11.5.3-1); Resistance factor 1.0 (AASHTO Table 11.5.7.1).

Seismic Design: Soils are not susceptible to liquefaction. Soil conditions are AASHTO Site Class D, Stiff Soils. Seismic design is not required for site retaining walls.

Weep Holes: 4 inch dia. weep holes at max 10 foot spacing installed according to CTDOT specifications, or other drainage elements appropriate for a modular block wall.

Lateral Earth Pressures – See Attached Figures.

Global Stability: The factor of safety for global stability of the wall is approximately 1.26 (resistance factor 0.79),

Estimated Settlement: Settlement is currently estimated to be less than about 1 inch

6.2 Retaining Wall Design – Wall 103

Retaining Wall Type: Sta. 156+00 to Sta. 166+68 Left and Right Concrete Cantilever

Sta. 166+68 to Sta. 167+21 Left and Right Concrete Cantilever – Pile Supported*
 *See Bridge Report for Pile Recommendations

Proprietary walls systems may also be considered

Retaining Wall Backfill: Sta. 156+00 to Sta. 165+70 Pervious Structure Backfill
 Sta. 165+70 to Sta. 167+21 Expanded Shale Aggregate
 Transition pervious structure backfill to expanded shale aggregate with 1H:1V slope

Retaining Wall Height: W103A: 10 to 36 feet
 W103B: 32 to 36 feet

Service Limit Bearing: Nominal Bearing Resistance = 6,000 pounds per square foot (psf); Resistance Factor = 1.0 (per AASHTO 10.5.5.1); Allowable bearing capacity = 6,000 psf.

Strength Limit Bearing: Strength unfactored bearing resistance 18,000 psf; Resistance Factor = 0.55 (for gravity) 0.65 (for MSE) (AASHTO Table 11.5.7-1).

Coefficient of Friction (tan δ) Along Bottom: 0.45 (AASHTO Table 3.11.5.3-1); Resistance factor 1.0 (AASHTO Table 11.5.7.1).

Seismic Design: Soils are not susceptible to liquefaction. Soil conditions are AASHTO Site Class D, Stiff Soils. Seismic design is not required for site retaining walls.

Weep Holes: 4 inch dia. weep holes at max 10 foot spacing, installed according to CTDOT specifications.

Lateral Earth Pressures: See attached figures

Global Stability Calculated global factors of safety is 1.25 (resistance factor = 0.8)

Estimated Settlement: Up to 1½ inches; ½ inch at Sta. 167+21 (at bridge abutment)

6.3 Retaining Wall Design – Wall 104

Retaining Wall Type: Concrete Cantilever - Proprietary walls may be considered as an alternative

Sta. 176+59 to Sta. 177+37 Left and Right Concrete Cantilever - Pile Supported*
*See Bridge Report for Pile Recommendations

Retaining Wall Backfill: Expanded Shale Aggregate
Retaining Wall Height: 12 to 25 feet tall measured from top of footing
Service Limit Bearing: Nominal Bearing Resistance = 3,000 pounds per square foot (psf); Resistance Factor = 1.0 (per AASHTO 10.5.5.1); Allowable bearing capacity = 3,000 psf.
Strength Limit Bearing: Strength unfactored bearing resistance 12,000 psf; Resistance Factor = 0.55 and 0.65 (for MSE) (AASHTO Table 11.5.7-1).
Coefficient of Friction ($\tan \delta$) Along Bottom: 0.45 (AASHTO Table 3.11.5.3-1); Resistance factor 1.0 (AASHTO Table 10.5.5.2.2-1).
Seismic Design: Soils are not susceptible to liquefaction. Soil conditions are AASHTO Site Class D, Stiff Soils. Seismic design is not required for site retaining walls.
Weep Holes: 4 inch dia. weep holes at max 10 foot spacing, installed according to CTDOT specifications.
Lateral Earth Pressures – See attached Figures
Global Stability Calculated global factors of safety is 1.5 (resistance factor = 0.65)
Estimated Settlement: Up to 1½ inches; up to 1 inch at Sta. 182+75

6.4 Retaining Wall Design – Wall 105

Retaining Wall Type: Concrete Cantilever
Retaining Wall Backfill: Expanded Shale Aggregate
Service Limit Bearing: Nominal Bearing Resistance = 3,000 pounds per square foot (psf); Resistance Factor = 1.0 (per AASHTO 10.5.5.1); Allowable bearing capacity = 3,000 psf.
Strength Limit Bearing: Strength unfactored bearing resistance 12,000 psf; Resistance Factor = 0.55 and 0.65 (for MSE) (AASHTO Table 11.5.7-1).
Coefficient of Friction ($\tan \delta$) Along Bottom: 0.45 (AASHTO Table 3.11.5.3-1); Resistance factor 1.0 (AASHTO Table 11.5.7.1).
Seismic Design: Soils are not susceptible to liquefaction. Soil conditions are AASHTO Site Class D, Stiff Soils. Seismic design is not required for site retaining walls.
Weep Holes: 4 inch dia. weep holes at max 10 foot spacing, installed according to CTDOT specifications.
Lateral Earth Pressures – See attached Figures
Global Stability Calculated global factors of safety is 1.5 (resistance factor = 0.65)
Estimated Settlement: Up to 1-1/2 inches

6.5 Retaining Wall Design – Wall 106

Retaining Wall Type: Cast-in-Place Gravity, however other proprietary alternatives are acceptable.
Retaining Wall Backfill: Lightweight Fill (Expanded Shale Aggregate)
Retaining Wall Height: 14 feet measured from the top of the footing
Service Limit Bearing: Nominal Bearing Resistance = 3,000 pounds per square foot (psf); Resistance Factor = 1.0 (per AASHTO 10.5.5.1); Allowable bearing capacity = 3,000 psf.
Strength Limit Bearing: Strength unfactored bearing resistance 12,000 psf; Resistance Factor = 0.55 (AASHTO Table 11.5.7-1).
Coefficient of Friction ($\tan \delta$) Along Bottom: 0.45 (AASHTO Table 3.11.5.3-1); Resistance factor 1.0 (AASHTO Table 11.5.7.1).

Seismic Design: Soils are not susceptible to liquefaction. Soil conditions are AASHTO Site Class D, Stiff Soils. Seismic design is not required for site retaining walls.

Weep Holes: 4 inch dia. weep holes at max 10 foot spacing, installed according to CTDOT specifications.

Lateral Earth Pressures -

Global Stability Calculated global factors of safety is 1.4 (resistance factor = 0.71)

Estimated Settlement: Less than an inch of settlement is anticipated

6.6 Retaining Wall Design – Wall 107

Retaining Wall Type: Cast-in-Place Concrete Cantilever, other proprietary alternatives are also acceptable

Retaining Wall Backfill: Lightweight Fill (Expanded Shale Aggregate)

Retaining Wall Height: 22 feet measured from top of the footing

Service Limit Bearing: Nominal Bearing Resistance = 3,000 pounds per square foot (psf); Resistance Factor = 1.0 (per AASHTO 10.5.5.1); Allowable bearing capacity = 3,000 psf.

Strength Limit Bearing: Strength unfactored bearing resistance 12,000 psf; Resistance Factor = 0.55 (AASHTO Table 11.5.7-1).

Coefficient of Friction ($\tan \delta$) Along Bottom: 0.45 (AASHTO Table 3.11.5.3-1); Resistance factor 0.9 (AASHTO Table 10.5.5.2.2-1).

Seismic Design: Soils are not susceptible to liquefaction. Soil conditions are AASHTO Site Class D, Stiff Soils. Seismic design is not required for site retaining walls.

Weep Holes: 4 inch dia. weep holes at max 10 foot spacing, installed according to CTDOT specifications.

Lateral Earth Pressures – See attached Figures

Global Stability Calculated global factors of safety is 1.3 (resistance factor = 0.77)

Estimated Settlement: Less than an inch of settlement is anticipated

7.0 CONSTRUCTION CONSIDERATIONS

7.1 Excavation

Proposed bottom of retaining walls will be within the Fill and Alluvium strata. The alluvium and portions of the fill are highly susceptible to disturbance by construction equipment, and are expected to be wet due to shallow groundwater. Excavation to footing subgrade should be made using a smooth-bladed backhoe bucket. Excavation geometries should conform to OSHA excavation regulations contained in 29 CFR 1926, latest edition.

7.2 Subgrade Preparation

The alluvium and portions of the fill have low strength and are highly susceptible to disturbance from construction equipment and vibrations. The contractor shall anticipate that a temporary working pad will be necessary to support installation equipment.

Soil bearing surfaces should be protected against freezing both before and after concrete placement. If construction takes place during winter months, foundations should be backfilled as soon as possible following construction. Alternatively, insulating blankets or other methods may be used to protect against freezing.

7.3 Expanded Shale Aggregate

Expanded shale aggregate should be placed in layers 1.5 to 2 feet thick, and compacted with self-propelled vibratory compaction equipment with static weight less than 6,600 lbs. The minimum number of passes should be limited to two and the maximum four, to avoid particle breakdown during compaction. A draft special provision is included in Appendix D.

7.4 Temporary Lateral Support

Temporary lateral support of excavations will be required to maintain and protect traffic flow, and to protect nearby utilities. Steel sheetpiling or soldier piles and lagging with one or more levels of bracing appears feasible. Surface water should be diverted away from excavations.

7.5 Excavation Dewatering

Excavation dewatering will be required to permit construction in-the-dry. Pumping from sumps located in the bottom of excavations appears feasible. Surface water should be diverted away from excavations. Pumping, handling, and treatment of excavation dewatering fluids should be in accordance with all applicable regulatory agency requirements.

7.6 Reuse of Existing Soils

The existing soils to be excavated will consist primarily of fill and alluvium (silty sands with and without gravel). These soils are silty and are not expected to be suitable for reuse as Previous Structure Backfill or Granular Fill. Excavated soils may be suitable for reuse as embankment fill. However the silty soils are difficult to properly compact when wet, and may need to be dried to achieve compaction. Drying the soils can be difficult and at times impractical, particularly during periods of cold and wet weather.

8.0 FUTURE SERVICES AND LIMITATIONS

We recommend that a qualified geotechnical engineer be engaged during construction to observe:

- Preparation of foundation bearing surfaces
- Verify that soil conditions exposed in excavations are in general conformance with design assumptions, and that the geotechnical aspects of construction are consistent with the project specifications.

This report was prepared for the exclusive use of CME Associates and the project design team. The recommendations provided herein are based on the project information provided at the time of this report and may require modification if there are any changes in the nature, design, or location of the structure.

The recommendations in this report are based in part on the data obtained from the subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations from the anticipated conditions are encountered, it may be necessary to revise the recommendations in this report.

Our professional services for this project have been performed in accordance with generally accepted engineering practices; no warranty, express or implied, is made.

TABLES

Draft

Table 3 - Wall W103
Summary of Subsurface Explorations
Contract CORE ID: 15DOT0148AA, State Project No. 63-703, Hartford, Connecticut

Boring No.	Ground Surface El.	Depth (ft.)	Thickness (ft.)							Groundwater		Bedrock	
			Pavement/Topsoil	Fill	Alluvial Deposit	Lacustrine Deposit	Glacial Till	Weathered Bedrock	Depth (ft.)	Elevation	Depth (ft.)	Elevation	
Recent Test Borings													
SRW-5	21.3	31	0.9	15.1	>15	---	---	---	---	19	2.3	---	---
SRW-6	31.4	40	1	23	>16	---	---	---	---	24	7.4	---	---
R-11	35.5	44	1.5	33.5	>9	---	---	---	---	36	-0.5	---	---
RW-1	14.2	37	0.5	13	>23.5	---	---	---	---	---	---	---	---
RW-2	15.6	55	0.3	9.7	25	8	---	2	---	9	6.6	43	-27.4
RW-3	15.5	60	0.3	9.7	28	10	2	---	---	9	6.5	50	-34.5
RW-3A	14.8	40	---	8.5	25	---	4.5	2	---	---	---	38	-23.2
RW-4	25.2	60	0.5	8.5	26.5	5.5	6.5	2.5	---	10	15.2	47.5	-22.3
RW-5	13.8	60	0.5	13.5	19	15	1.5	0.5	---	7.8	6	49.5	-35.7
CPT-RW5	13.8	50.7	3	5	28	13	1.7	---	---	11.5	2.3	---	---
S1-1	16.5	65	0.3	9.7	28	11	3	3	---	10	6.5	52	-35.5
S1-2	14.7	64	0.4	13.6	24	12.5	2.5	1	---	7.1	7.6	53	-38.3
Previous Test Borings													
B-185		48	1.0	7.0	26.0	---	7.0	2.0	---	---	---	41	---
B-186		67	---	7.5	29.5	4.0	16.0	5.0	---	5.2	---	57	---
B-241	18.3	22	---	9.0	>13	---	---	---	---	7	11.3	---	---
B-242		22	---	9.0	>13	---	---	---	---	8	---	---	---
B-243	15.1	22	0.3	11.7	>10	---	---	---	---	9	6.1	---	---

Notes:

1. Ground surface elevations for recent borings were surveyed by CME Associates, Inc., and refer to NAVD-88. Ground surface elevations for previous borings are based on information on the logs and corrected from NGVD-29.
2. Groundwater levels are approximate
3. Top of bedrock depth is inclusive of weathered bedrock.
4. ">" - Greater Than "---" - Not Encountered (C) - Bedrock Core Taken "NM" - Not Measured

Table 4 - Wall W104
Summary of Subsurface Explorations
 Contract CORE ID: 15DOT0148AA, State Project No. 63-703, Hartford, Connecticut

Boring No.	Ground Surface El.	Depth (ft.)	Thickness (ft.)						Groundwater		Bedrock	
			Pavement/Topsoil	Fill	Alluvial Deposit	Lacustrine Deposit	Glacial Till	Weathered Bedrock	Depth (ft.)	Elevation	Depth (ft.)	Elevation
Recent Explorations												
S1-11	37.7	89.5	1	25	32	15	11.5	NE	18.5	19.2	84.5	-46.8
S1-12	40.7	95	1	27	27	19.5	6	4.5	19	21.7	80.5	-39.8
RW-7	43.6	94.5	1.0	32.0	28.5	20.0	5.5	1.0	13.8	29.8	87	-43.4
RW-8	28.8	90	0.7	15.3	29.5	27.5	6	1	14.5	14.3	79	-50.2
RW-9	52	103	1	39	25	28	NE	4	39	13	93	-41
CPT-RW10	27.7	87.9	---	10	37	34	6.9	NE	15	12.7	---	---
RW-10	36.5	95	0.7	15.8	30	32.5	5	1	16.5	20	84	-47.5
RW-11	58.2	120	1	44	28	30	4	3	47	11.2	107	-48.8
RW-12	28.1	100	0.5	9.5	40	30.5	7.5	2	10	18.1	88	-59.9
S2-1	29.6	100	1	19	29	35	3	3	11.5	18.1	87	-57.4
Previous Test Borings												
B-2 (OW)	15.4	83	1.5	15.5	16.5	40.0	4.5	---	4.8	10.6	78	-62.6
B-106	19	95	2.0	---	36.0	39.0	6.5	1.5	10.3	8.7	83.5	-64.5
B-107	15.2	86	---	4.0	30.0	38.0	4.0	---	8.5	6.7	76.0	-60.8

Notes:

1. Ground surface elevations for recent borings were surveyed by CME Associates, Inc., and refer to NAVD-88. Ground surface elevations for previous borings are based on information on the logs and corrected from NGVD-29.
2. Groundwater levels are approximate
3. Top of bedrock depth is inclusive of weathered bedrock.
4. Cone penetration test (CPT) data presented for CPT-RW10 is based on an interpretation of the information provided following CPT testing.
5. ">" - Greater Than "-" - Not Encountered (C) - Bedrock Core Taken "NM" - Not Measured

Table 5 - Wall W105
Summary of Subsurface Explorations
 Contract CORE ID: 1SDOT0148AA, State Project No. 63-703, Hartford, Connecticut

Boring No.	Ground Surface El.	Depth (ft.)	Thickness (ft.)						Groundwater		Bedrock	
			Pavement/Topsoil	Fill	Alluvial Deposit	Lacustrine Deposit	Glacial Till	Weathered Bedrock	Depth (ft.)	Elevation	Depth (ft.)	Elevation
Recent Explorations												
S1-12	40.7	95	1	27	27	19.5	6	4.5	19	21.7	80.5	-39.8
RW-8	28.8	90	0.7	15.3	29.5	27.5	6	1	14.5	14.3	79	-50.2
RW-9	52	103	1	39	25	28	NE	4	39	13	93	-41
CPT-RW10	27.7	87.9	---	10	37	34	7	NE	15	12.7	---	---
RW-10	36.5	95	0.7	15.8	30	32.5	5	1	16.5	20	84	-47.5
RW-11	58.2	120	1	44	28	30	4	3	47	11.2	107	-48.8
RW-12	28.1	100	0.5	9.5	40	30.5	7.5	2	10	18.1	88	-59.9
S2-1	29.6	100	1	19	29	35	3	3	11.5	18.1	87	-57.4
Previous Test Borings												
B-221A	NM	27	1.0	9.0	>17.0	---	---	---	4.0	---	---	---
B-221B	NM	17	---	8.5	>8.5	---	---	---	2	---	---	---
B-222	NM	27	0.5	6.5	>20.0	---	---	---	9	---	---	---
B-227	NM	17	---	---	>17.0	---	---	---	0.5 (above gs)	---	---	---

Notes:

1. Ground surface elevations for recent borings were surveyed by CME Associates, Inc., and refer to NAVD-88.
2. Groundwater levels are approximate
3. Top of bedrock depth is inclusive of weathered bedrock.
4. Cone penetration test (CPT) data presented for CPT-RW5 and CPT-RW10 is based on an interpretation of the information provided following CPT testing.
5. ">" - Greater Than "-" - Not Encountered (C) - Bedrock Core Taken "NM" - Not Measured

Table 6 - Wall W106
Summary of Subsurface Explorations
Contract CORE ID: 15DOT0148AA, State Project No. 63-703, East Hartford, Connecticut

Boring No.	Ground Surface El.	Depth (ft.)	Thickness (ft.)						Groundwater		Bedrock	
			Pavement/Topsoil	Fill	Alluvial Deposit	Lacustrine Deposit	Glacial Till	Weathered Bedrock	Depth (ft.)	Elevation	Depth (ft.)	Elevation
Recent Test Borings												
S6043-1 (OW)	39.6	189 C	0.1	8.4	10	150.5	7.5	2.5	10.6	29	176.5	-136.9
CPT6043-1	39.9	164.4 R	---	4	14	139	7.4	---	15	24.9	---	---
SRW-7	52.7	22	1	12	>9	---	---	---	NE	---	---	---
R-15	49.9	22	1	10.5	>10.5	---	---	---	19	30.9	---	---
R-16	48	22	1.0	9.0	>12	---	---	---	19	29	---	---
SRW-8	49.4	22	0.7	9.3	>12	---	---	---	21	28.4	---	---
R-17	49.6	22	1	5	>16	---	---	---	22	27.6	---	---
Previous Test Borings												
B-165	38.3	172 C	1	17	12	135	2	---	17.5	20.8	167	-128.7
B-321	---	10.5	0.5	>10	---	---	---	---	8.6	---	---	---
B-326	---	17	---	9	>8	---	---	---	---	---	---	---

Notes:

1. Ground surface elevations for recent borings were surveyed by CME Associates, Inc., and refer to NAVD-88. Ground surface elevations for previous borings are based on information on the logs and corrected from NGVD-29.
2. Groundwater levels are approximate
3. Top of bedrock depth is inclusive of weathered bedrock.
4. Cone penetration test (CPT) data presented for CPT-6043-1 is based on an interpretation of the information provided following CPT testing
5. ">" - Greater Than "-" - Not Encountered (C) - Bedrock Core Taken "NM" - Not Measured

Table 7 - Wall W107
Summary of Subsurface Explorations
Contract CORE ID: 15DOT0148AA, State Project No. 63-703, East Hartford, Connecticut

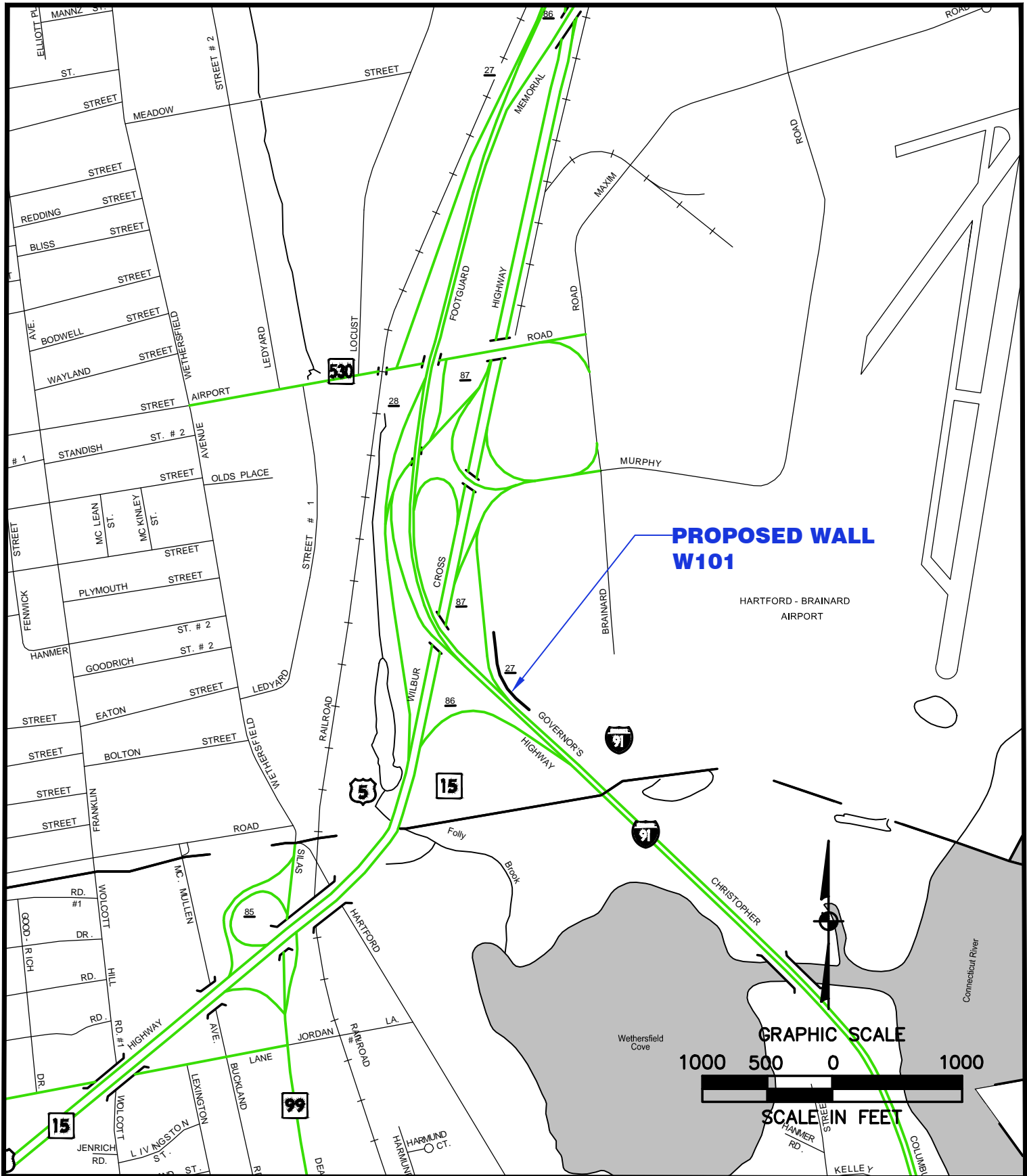
Boring No.	Ground Surface El.	Depth (ft.)	Thickness (ft.)						Groundwater		Bedrock	
			Pavement/Topsoil	Fill	Alluvial Deposit	Lacustrine Deposit	Glacial Till	Weathered Bedrock	Depth (ft.)	Elevation	Depth (ft.)	Elevation
Recent Test Borings												
R-17	49.6	22	1	5	>16	---	---	---	22	27.6	---	---
SRW-10	57.4	37	1	15	>21	---	---	---	NE	NE	---	---
SRW-11	60.8	47	1	24.8	>21.2	---	---	---	NE	NE	---	---
CPT5796-1	35.8	222.3	---	19.5	31.5	>171.3	---	---	15	20.8	---	---
S5796-1	36.1	319 R	0.5	3.5	56	228	31	---	8	28.1	319	-282.9
Previous Test Borings												
B-16	36.7	260	---	13	33.5*	>213.5	---	---	14	22.7	---	---
L-501	57.1	76.5	---	44	19	>13.5	---	---	25	32.1	---	---
L-503	42.1	51.5	---	37	7	>7.5	---	---	22	20.1	---	---
B-319		10		>10	---	---	---	---	---	---	---	---

Notes:

1. Ground surface elevations for recent borings were surveyed by CME Associates, Inc., and refer to NAVD-88. Ground surface elevations for previous borings are based on information on the logs and corrected from NGVD-29.
2. Groundwater levels are approximate
3. Top of bedrock depth is inclusive of weathered bedrock.
4. Cone penetration test (CPT) data presented for CPT-5796-1 is based on an interpretation of the information provided following CPT testing
5. ">" - Greater Than "---" - Not Encountered (C) - Bedrock Core Taken "NM" - Not Measured

FIGURES

Draft



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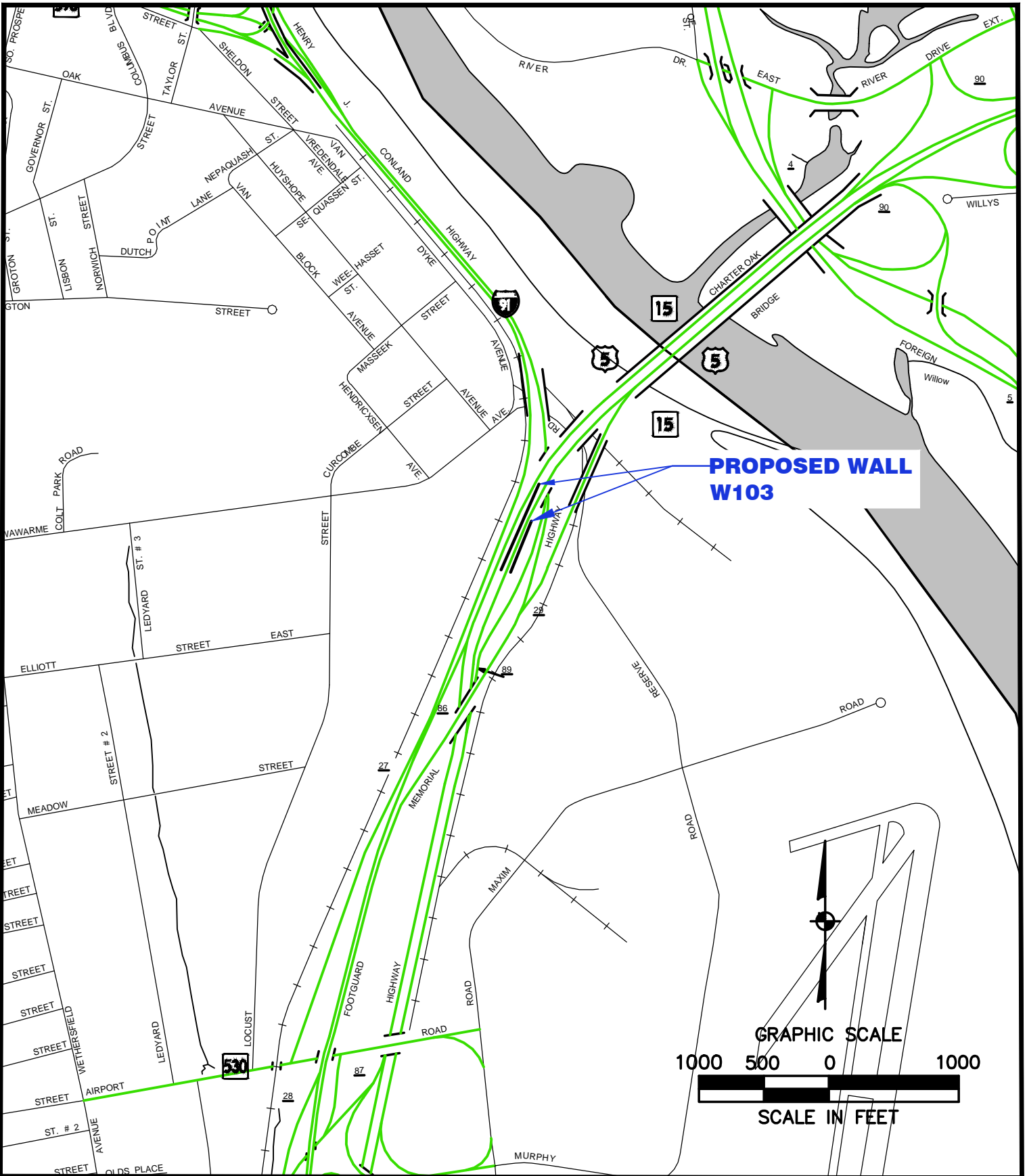
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 STATE PROJECT No. 63-703
 PROPOSED RETAINING WALL W101
 HARTFORD, CONNECTICUT

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 CHECKED: A.M.
 APPROVED: A.M.
 SCALED: 1"=1000'
 PROJECT NO.: 2014-1001
 DATE: 09/6/2016

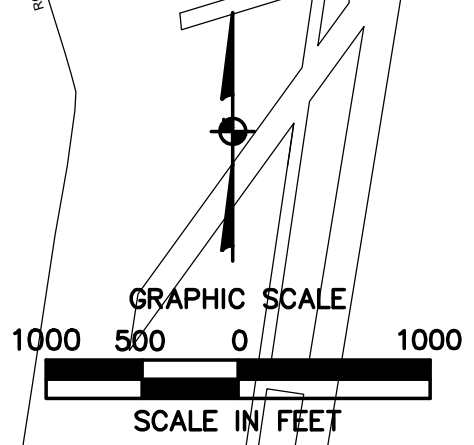
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FIGURE 1

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**PROPOSED WALL
W103**



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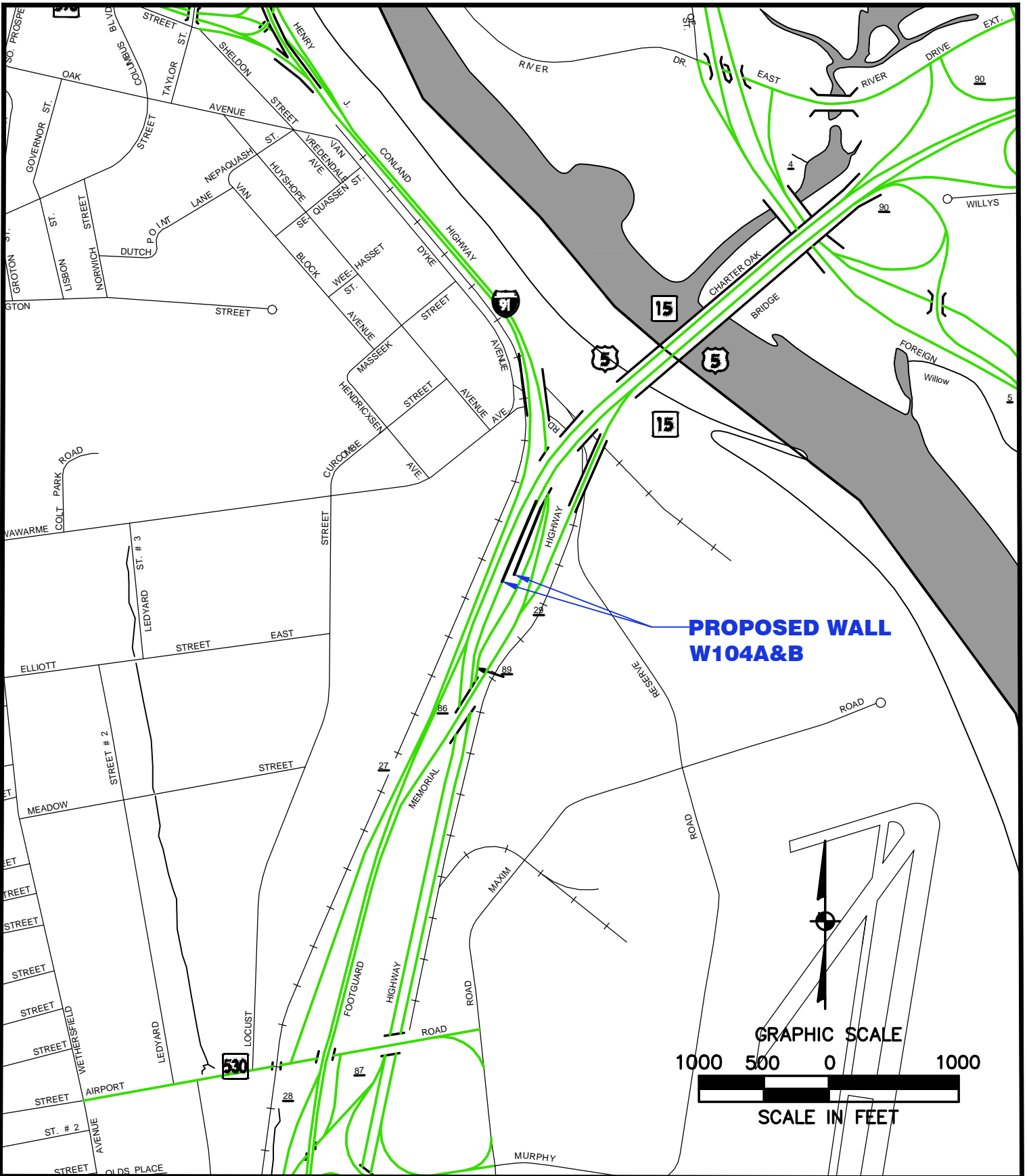
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STATE PROJECT No. 63-703
PROPOSED RETAINING WALL W103
HARTFORD, CONNECTICUT

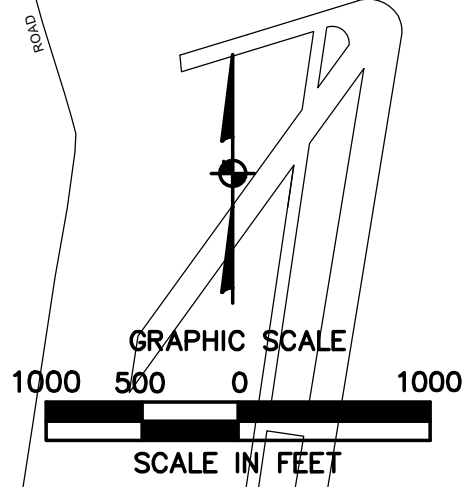
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FIGURE 1

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**PROPOSED WALL
W104A&B**



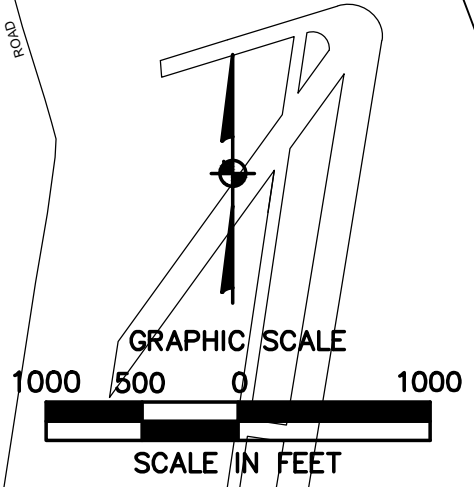
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STATE PROJECT No. 63-703
PROPOSED RETAINING WALL W104A and W104B
HARTFORD, CONNECTICUT

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FIGURE 1

**PROPOSED WALL
W105**



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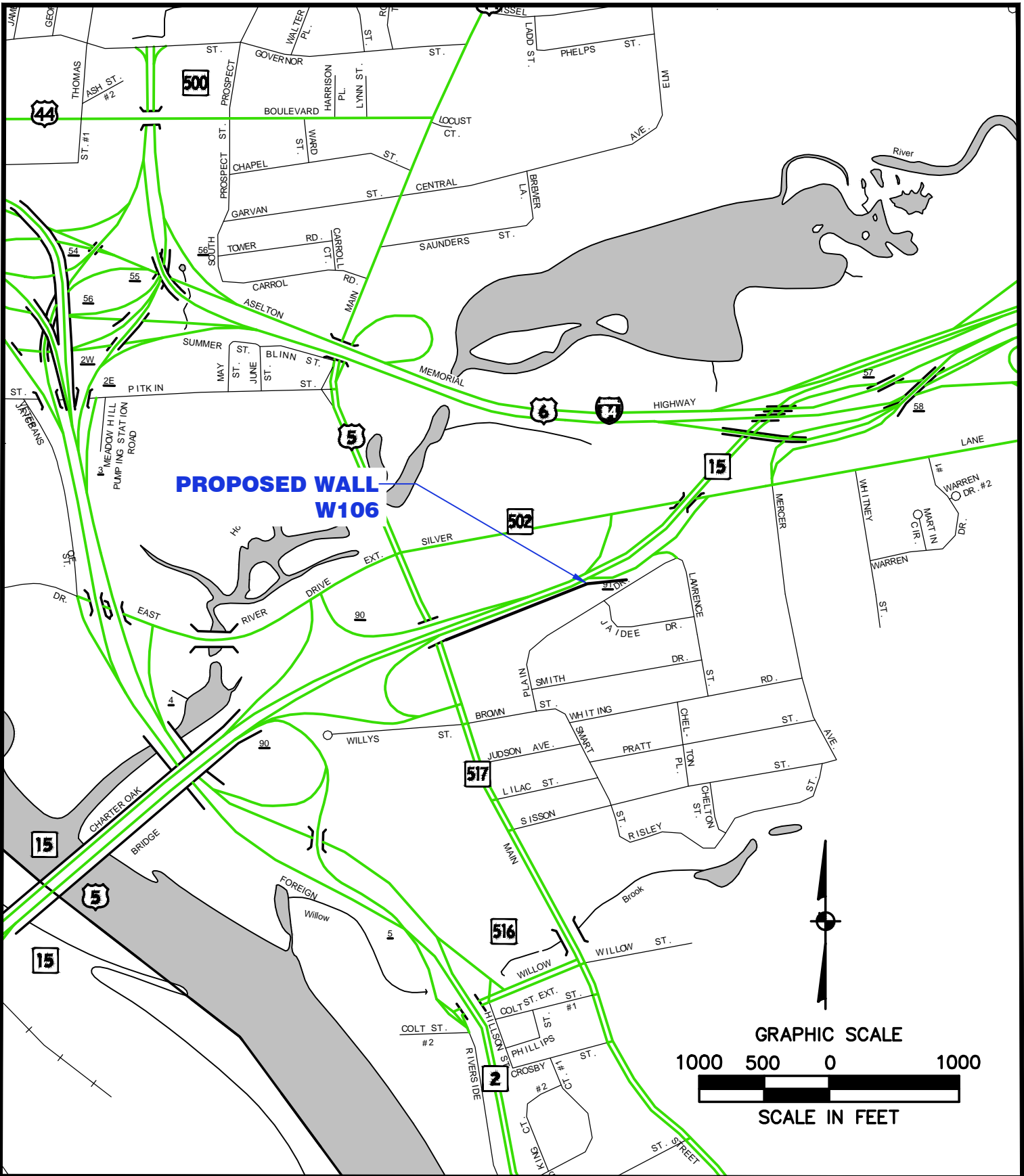
STRUCTURE & EMBANKMENT LOCATION PLAN
STATE PROJECT No. 63-703
PROPOSED RETAINING WALL W105
HARTFORD, CONNECTICUT

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FIGURE 1

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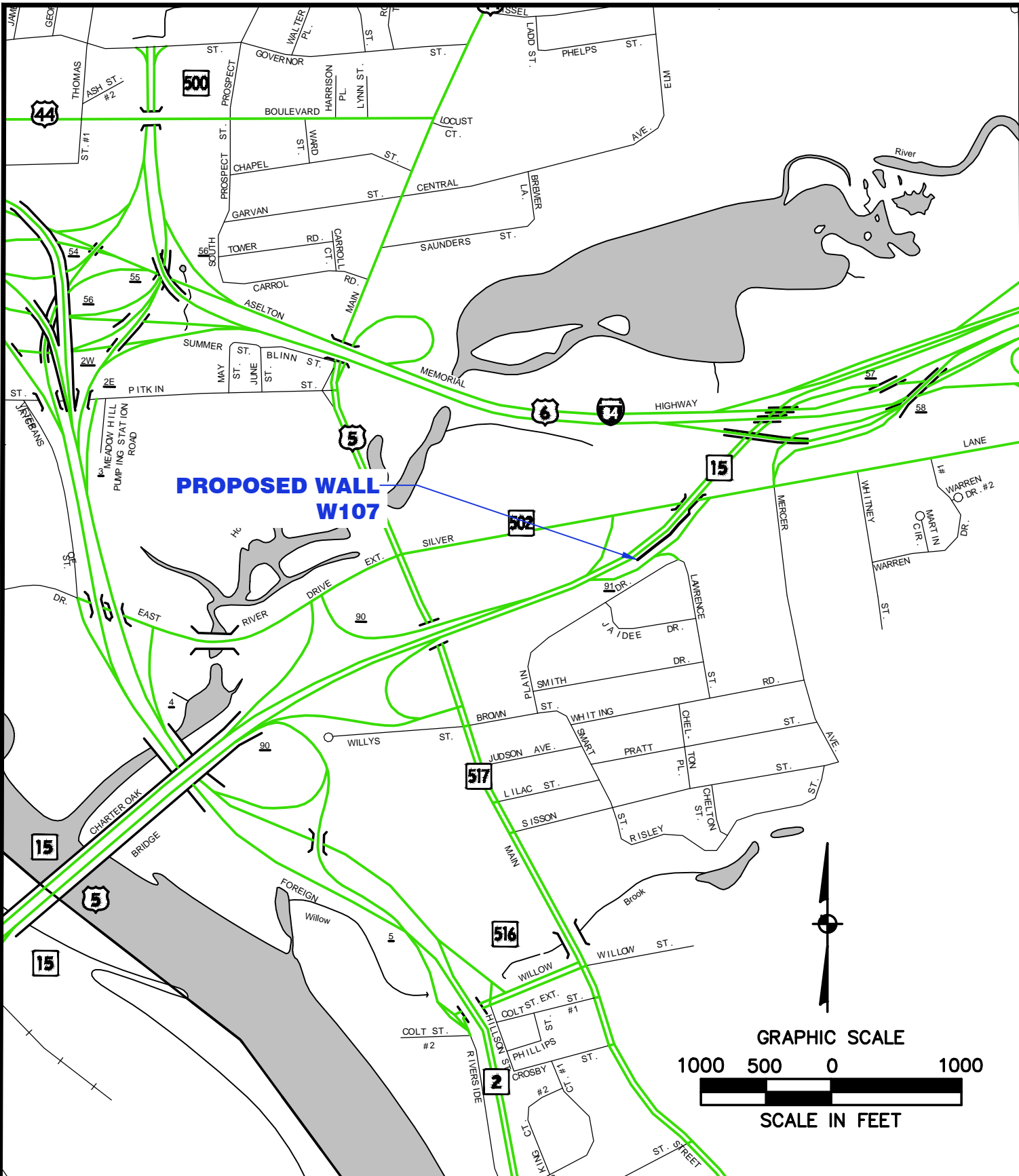
STRUCTURE & EMBANKMENT LOCATION PLAN
STATE PROJECT No. 63-703
PROPOSED RETAINING WALL W106
HARTFORD, CONNECTICUT

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PROJECT NO.: 2014-1001
DATE: 09/6/2016

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FIGURE 1

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**PROPOSED WALL
W107**

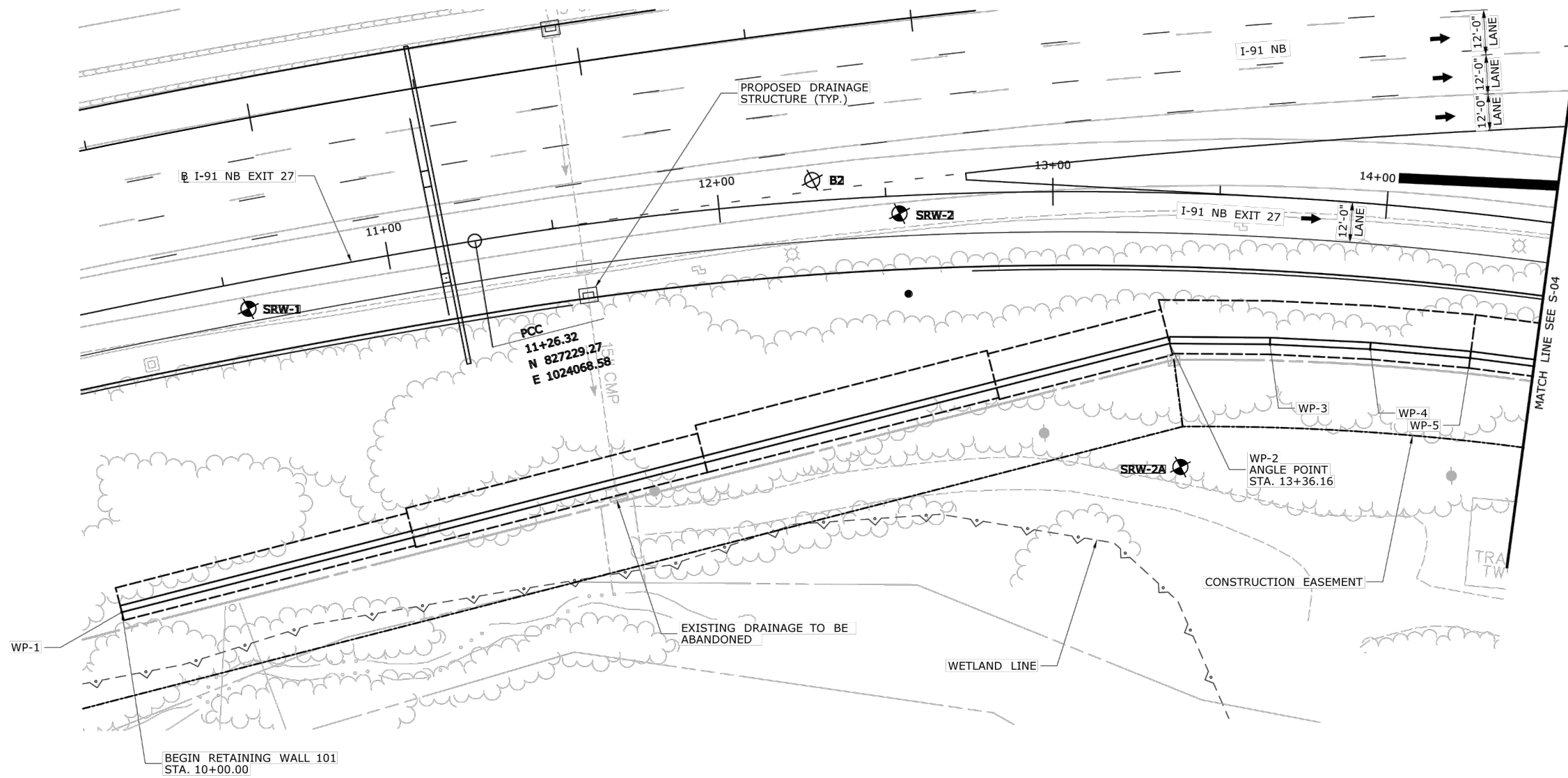
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STRUCTURE & EMBANKMENT LOCATION PLAN
 STATE PROJECT No. 63-703
 PROPOSED RETAINING WALL W107
 HARTFORD, CONNECTICUT



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 APPROVED: A.M.
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 DATE: 09/6/2016

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FIGURE 1

Freeman Companies, LLC - Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 101\Figure 2 - Wall 101 - (2-8-2017).dwg Feb 14, 2017 - 10:57am Plotted By: tta

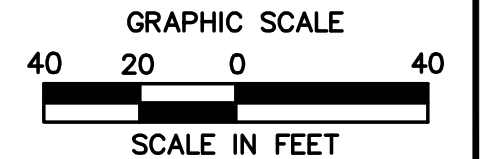
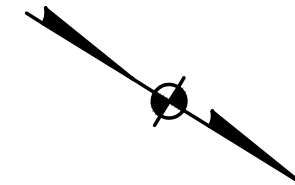


LEGEND:

-  RECENT BORINGS
-  PREVIOUS BORINGS

NOTES:

1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN

PROPOSED RETAINING WALL W101
 STATE PROJECT NO. 63-703
 HARTFORD, CONNECTICUT



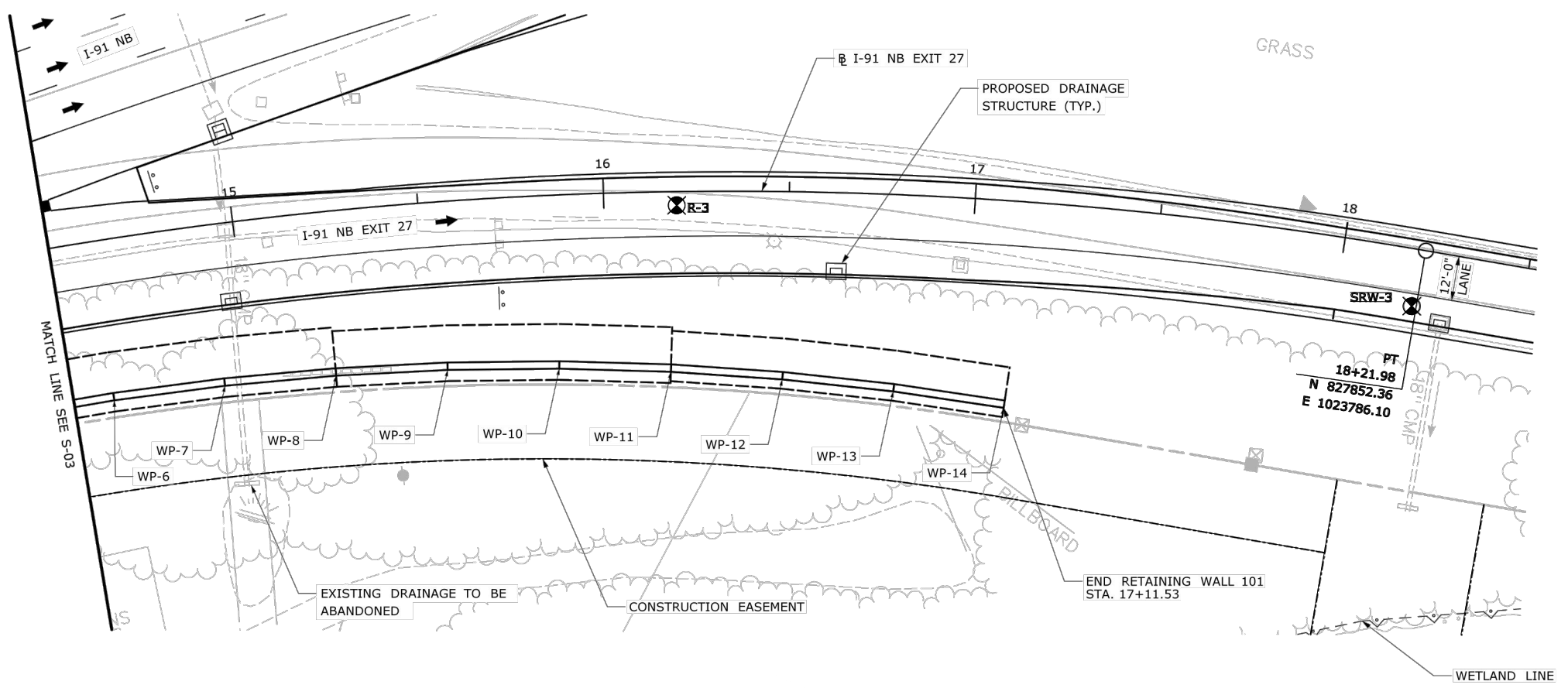
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**WALL 101
 FIGURE 2A**

Freeman Companies, LLC . Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 101\Figure 2 - Wall 101 - (2-8-2017).dwg Feb 14, 2017-10:57am Plotted By: tta

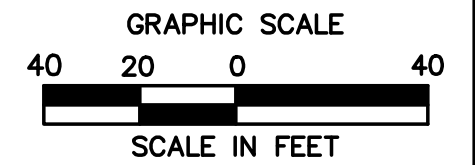
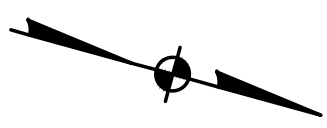


LEGEND:

-  RECENT BORINGS
-  PREVIOUS BORINGS

NOTES:

1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN
PROPOSED RETAINING WALL W101
STATE PROJECT NO. 63-703
HARTFORD, CONNECTICUT

FREEMAN
COMPANIES

FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860)251-9550
 TOLL FREE: (800)604-5141
 FAX: (860)986-7161

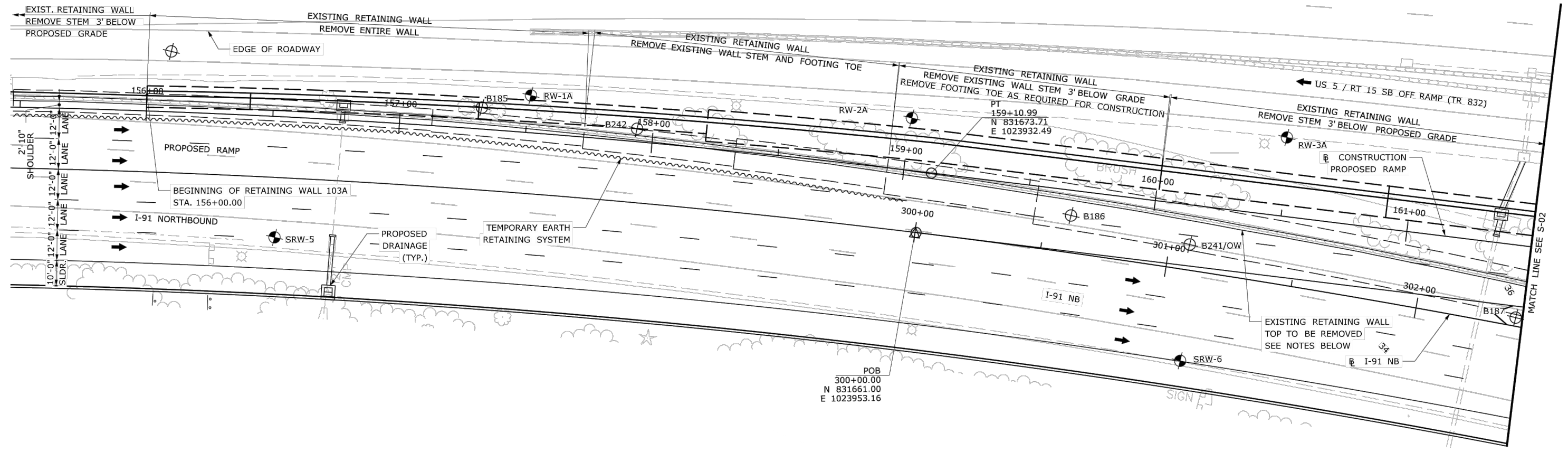
ELEVATE YOUR EXPECTATIONS

No.	Date	Description
REVISIONS		



DESIGNED: A.M.
 DRAWN: T.T.
 CHECKED: N.W.
 APPROVED: N.W.
 SCALE: 1"=40'
 PROJECT NO.: 2014-1001
 DATE: 02/08/2017

SHEET NO.
WALL 101
FIGURE 2B

Freeman Companies, LLC - Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 103\Figure 2 - Wall 103 - (2-8-2017).dwg Feb 14, 2017-11:00am Plotted By: tta

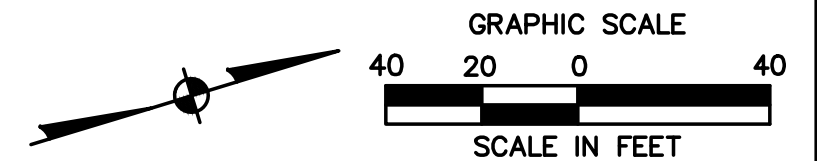


LEGEND:

-  RECENT BORINGS
-  PREVIOUS BORINGS

NOTES:

1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN
PROPOSED RETAINING WALL W103
STATE PROJECT NO. 63-703
HARTFORD, CONNECTICUT



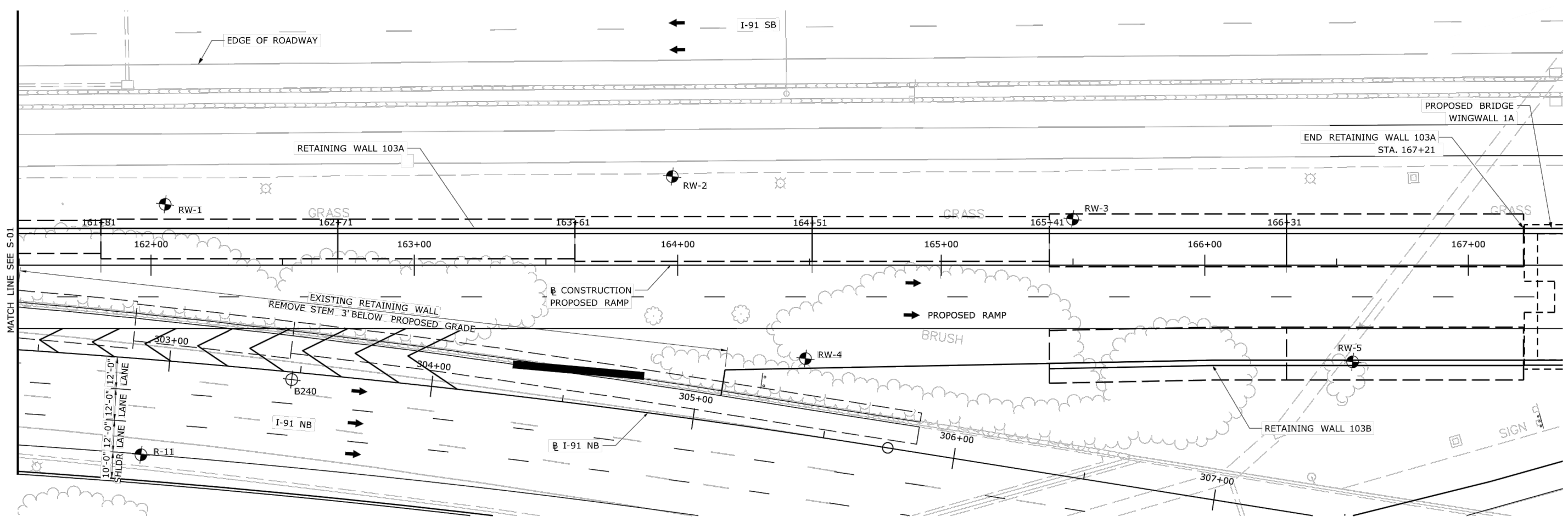
FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860)251-9550
 TOLL FREE: (800)604-5141
 FAX: (860)986-7161
ELEVATE YOUR EXPECTATIONS

No.	Date	Description
REVISIONS		



DESIGNED: A.M.
 DRAWN: T.T.
 CHECKED: N.W.
 APPROVED: N.W.
 SCALE: 1"=40'
 PROJECT NO.: 2014-1001
 DATE: 02/09/2017

SHEET NO.
WALL 103
FIGURE 2A

Freeman Companies, LLC - Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 103\Figure 2 - Wall 103 - (2-8-2017).dwg Feb 14, 2017 11:01am Plotted By: tta

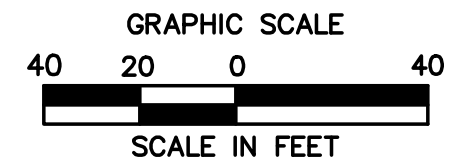
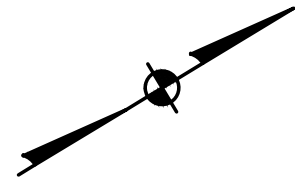


LEGEND:

-  RECENT BORINGS
-  PREVIOUS BORINGS

NOTES:

1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



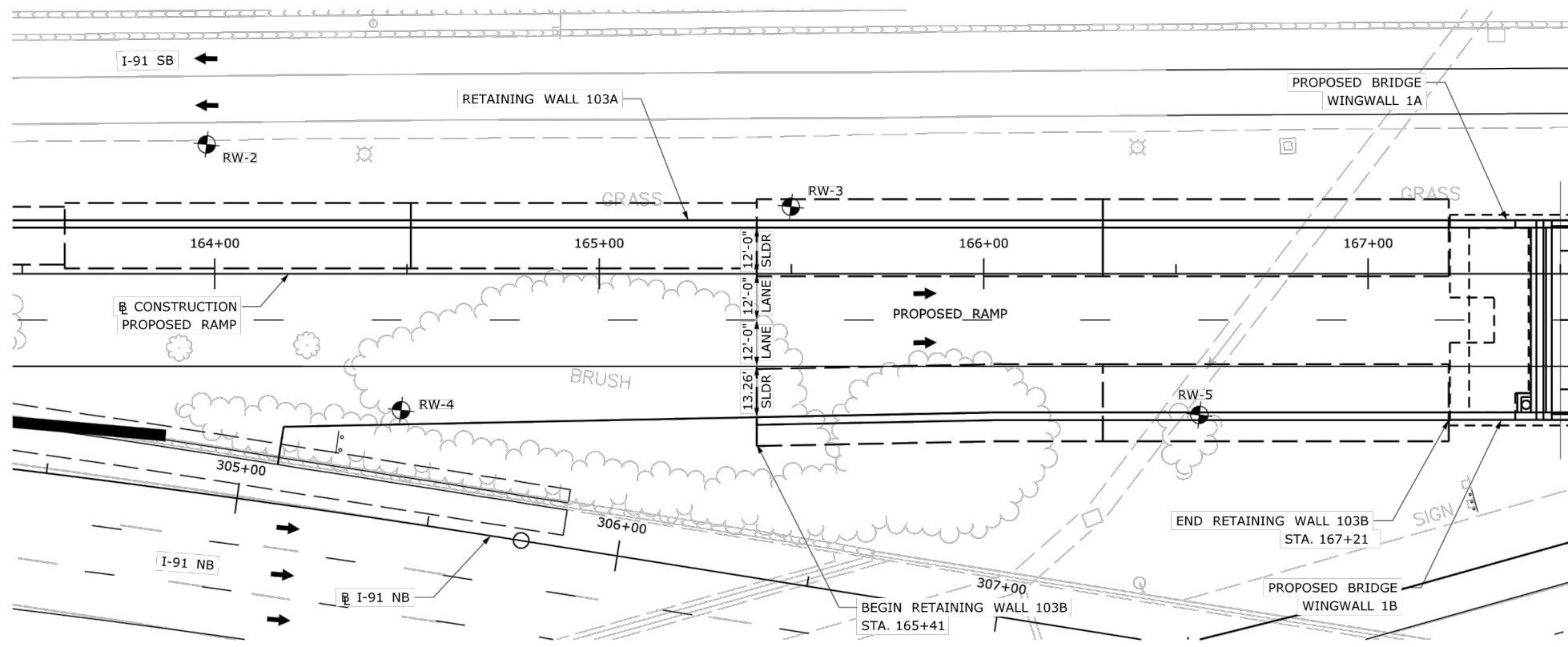
SUBSURFACE EXPLORATION LOCATION PLAN
PROPOSED RETAINING WALL W103
STATE PROJECT NO. 63-703
HARTFORD, CONNECTICUT

FREEMAN COMPANIES
 FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860)251-9550
 TOLL FREE: (800)604-5141
 FAX: (860)986-7161
 ELEVATE YOUR EXPECTATIONS



No.	Date	Description
REVISIONS		

DESIGNED: A.M.
 DRAWN: T.T.
 CHECKED: N.W.
 APPROVED: N.W.
 SCALE: 1"=40'
 PROJECT NO.: 2014-1001
 DATE: 02/09/2017

SHEET NO.
WALL 103
FIGURE 2B

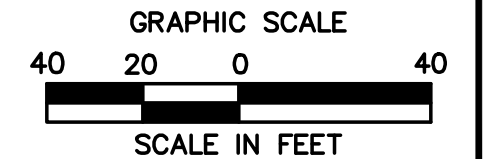
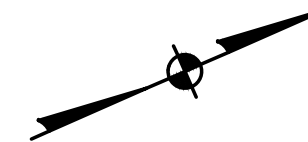


LEGEND:

-  RECENT BORINGS
-  PREVIOUS BORINGS

NOTES:

1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN

PROPOSED RETAINING WALL W103
 STATE PROJECT NO. 63-703
 HARTFORD, CONNECTICUT



FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860)251-9550
 TOLL FREE: (800)604-5141
 FAX: (860)986-7161
 ELEVATE YOUR EXPECTATIONS

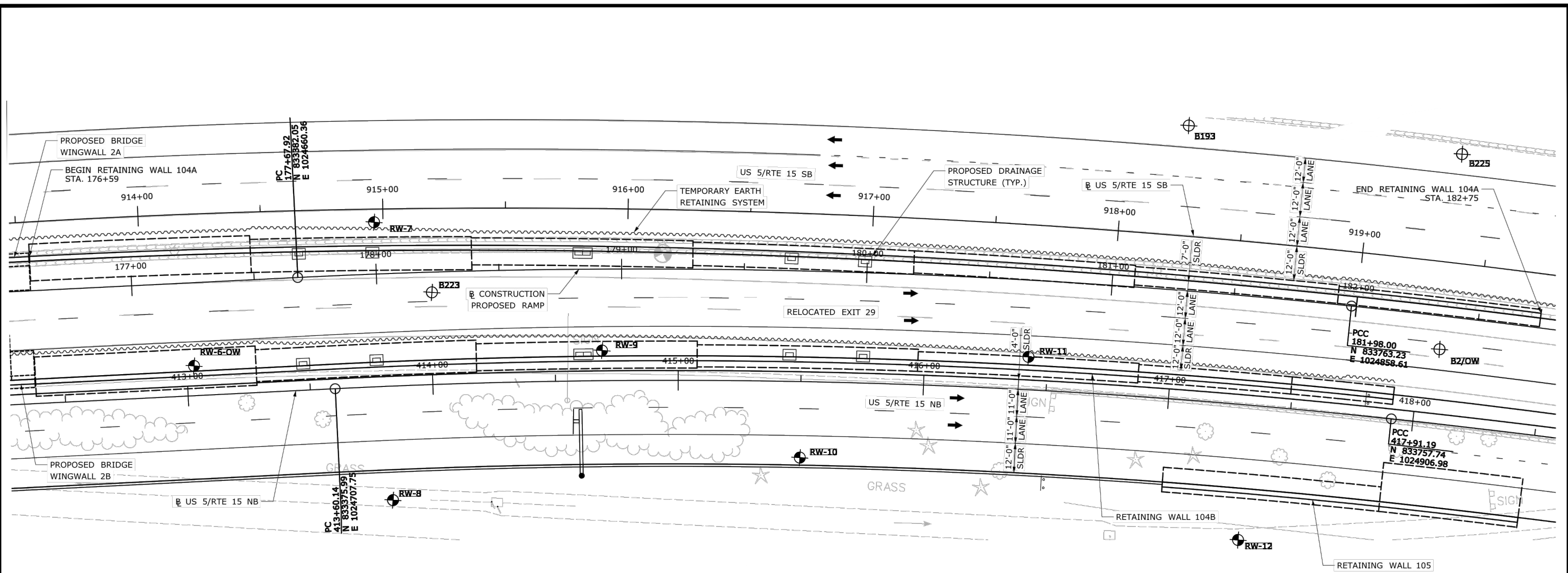
No.	Date	Description
REVISIONS		



DESIGNED: A.M.
 DRAWN: T.T.
 CHECKED: N.W.
 APPROVED: N.W.
 SCALE: 1"=40'
 PROJECT NO.: 2014-1001
 DATE: 02/09/2017

SHEET NO.
**WALL 103
 FIGURE 2C**

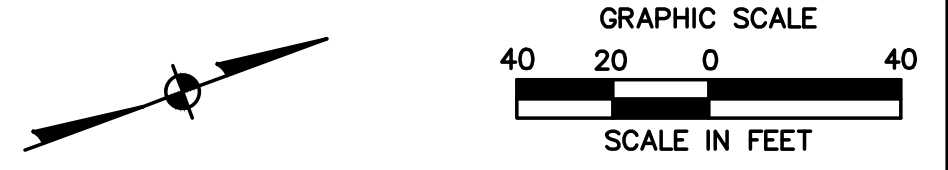
Freeman Companies, LLC · Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 103\Figure 2 - Wall 103 - (2-8-2017).dwg Feb 14, 2017-11:01am Plotted By: tta

Freeman Companies, LLC - Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 104\Figure 2 - Wall 104 - (2-8-2017).dwg Feb 14, 2017 11:03am Plotted By: tta



- LEGEND:**
-  RECENT BORINGS
 -  PREVIOUS BORINGS

- NOTES:**
1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
 2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
 3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN

PROPOSED RETAINING WALL W104 STATE PROJECT NO. 63-703 HARTFORD, CONNECTICUT

FREEMAN
COMPANIES

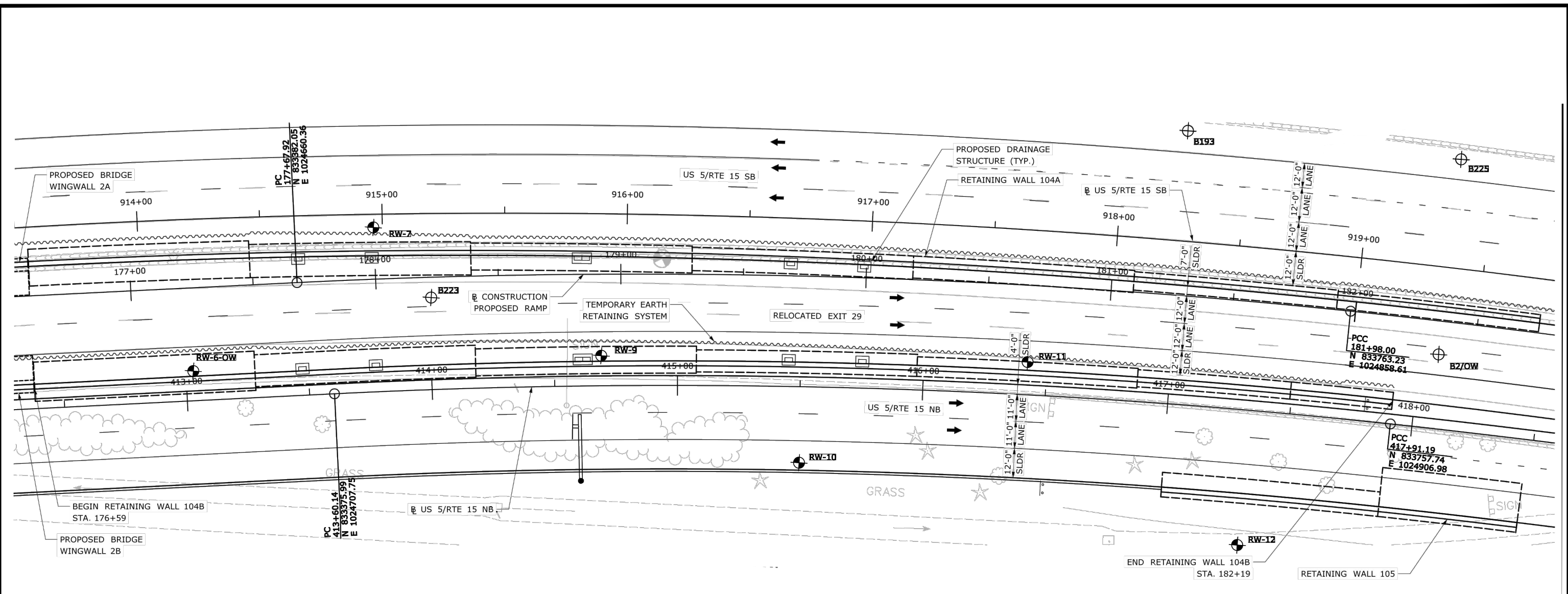
FREEMAN COMPANIES, LLC
36 JOHN STREET
HARTFORD, CT 06106
WWW.FREEMANCOS.COM
TEL: (860)251-9550
TOLL FREE: (800)604-5141
FAX: (860)986-7161
ELEVATE YOUR EXPECTATIONS

No.	Date	Description
REVISIONS		

DESIGNED: A.M.
DRAWN: T.T.
CHECKED: N.W.
APPROVED: N.W.
SCALE: 1"=40'
PROJECT NO.: 2014-1001
DATE: 02/09/2017

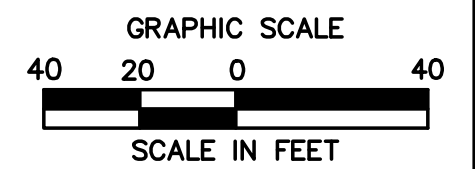
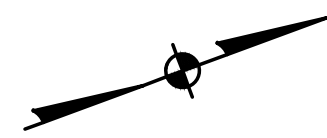
SHEET NO.
**WALL 104
FIGURE 2A**

Freeman Companies, LLC - Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 104\Figure 2 - Wall 104 - (2-8-2017).dwg Feb 14, 2017 11:04am Plotted By: tta



- LEGEND:**
- RECENT BORINGS
 - PREVIOUS BORINGS

- NOTES:**
1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
 2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
 3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN

PROPOSED RETAINING WALL W104 STATE PROJECT NO. 63-703 HARTFORD, CONNECTICUT

FREEMAN
COMPANIES

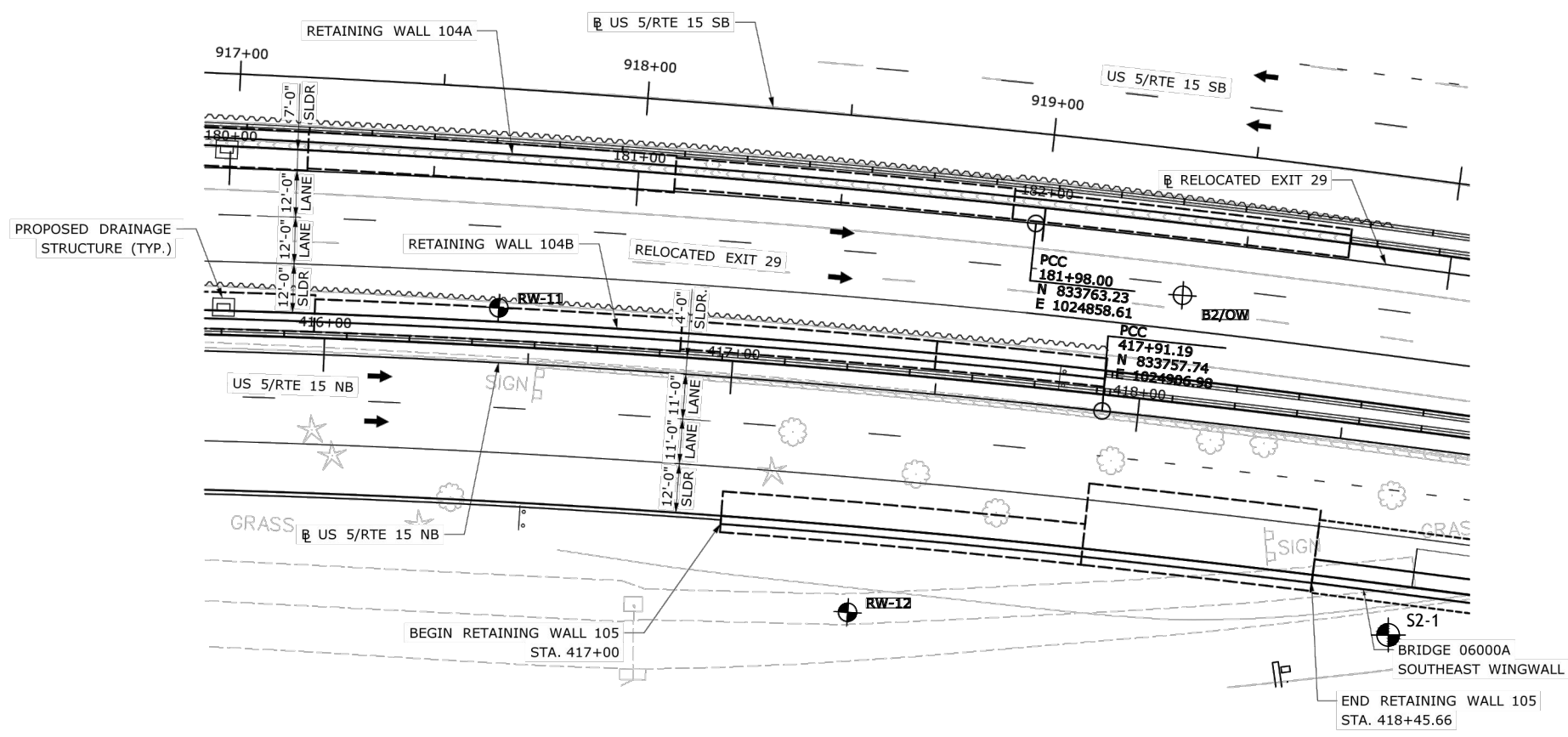
FREEMAN COMPANIES, LLC
36 JOHN STREET
HARTFORD, CT 06106
WWW.FREEMANCOS.COM
TEL: (860)251-9550
TOLL FREE: (800)604-5141
FAX: (860)986-7161
ELEVATE YOUR EXPECTATIONS

No.	Date	Description
REVISIONS		



DESIGNED: A.M.
DRAWN: T.T.
CHECKED: N.W.
APPROVED: N.W.
SCALE: 1"=40'
PROJECT NO.: 2014-1001
DATE: 02/09/2017

SHEET NO.
**WALL 104
FIGURE 2B**

Freeman Companies, LLC - Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 105\Figure 2 - Wall 105 - (2-8-2017).dwg Feb 14, 2017-11:06am Plotted By: tta

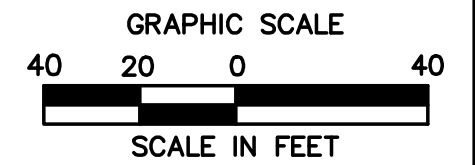
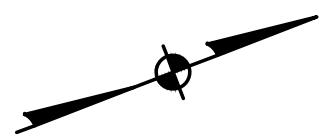


LEGEND:

-  RECENT BORINGS
-  PREVIOUS BORINGS

NOTES:

1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN
PROPOSED RETAINING WALL W105
STATE PROJECT NO. 63-703
HARTFORD, CONNECTICUT

FREEMAN
COMPANIES

FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860) 251-9550
 TOLL FREE: (800) 604-5141
 FAX: (860) 986-7161

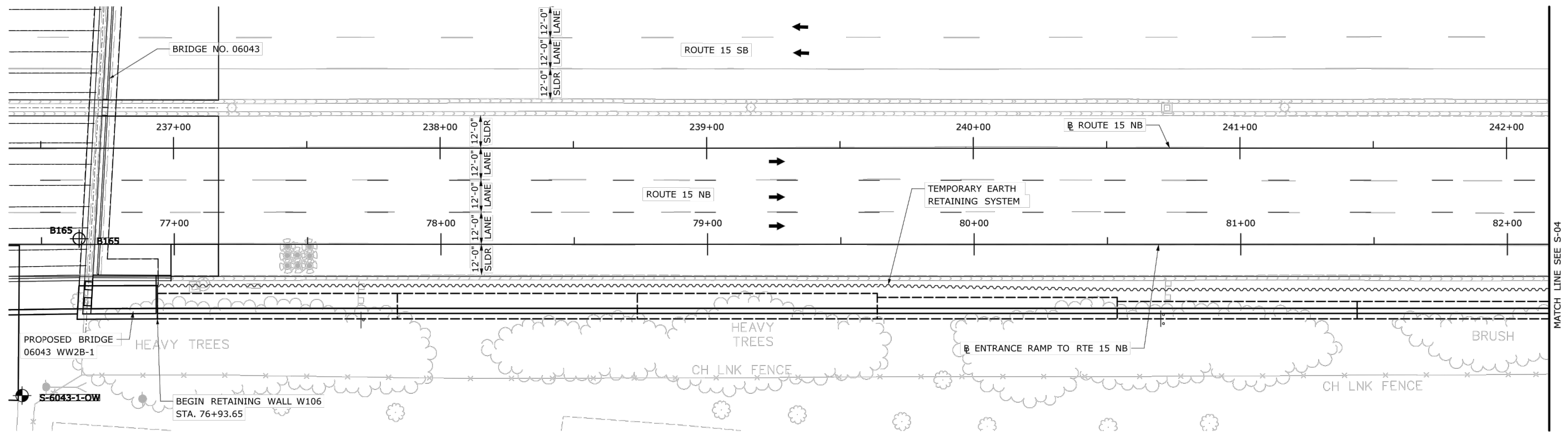
ELEVATE YOUR EXPECTATIONS

No.	Date	Description
REVISIONS		



DESIGNED: A.M.
 DRAWN: T.T.
 CHECKED: N.W.
 APPROVED: N.W.
 SCALE: 1"=40'
 PROJECT NO.: 2014-1001
 DATE: 02/09/2017

SHEET NO.
WALL 105
FIGURE 2A

Freeman Companies, LLC - Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 106\Figure 2 - Wall 106 - (2-8-2017).dwg Feb 14, 2017 11:08am Plotted By: tta

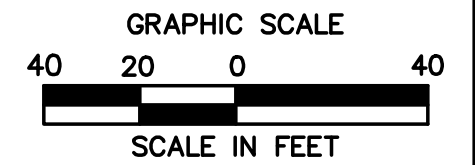
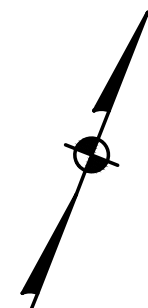


LEGEND:

-  RECENT BORINGS
-  PREVIOUS BORINGS

NOTES:

1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN
PROPOSED RETAINING WALL W106
STATE PROJECT NO. 63-703
HARTFORD, CONNECTICUT

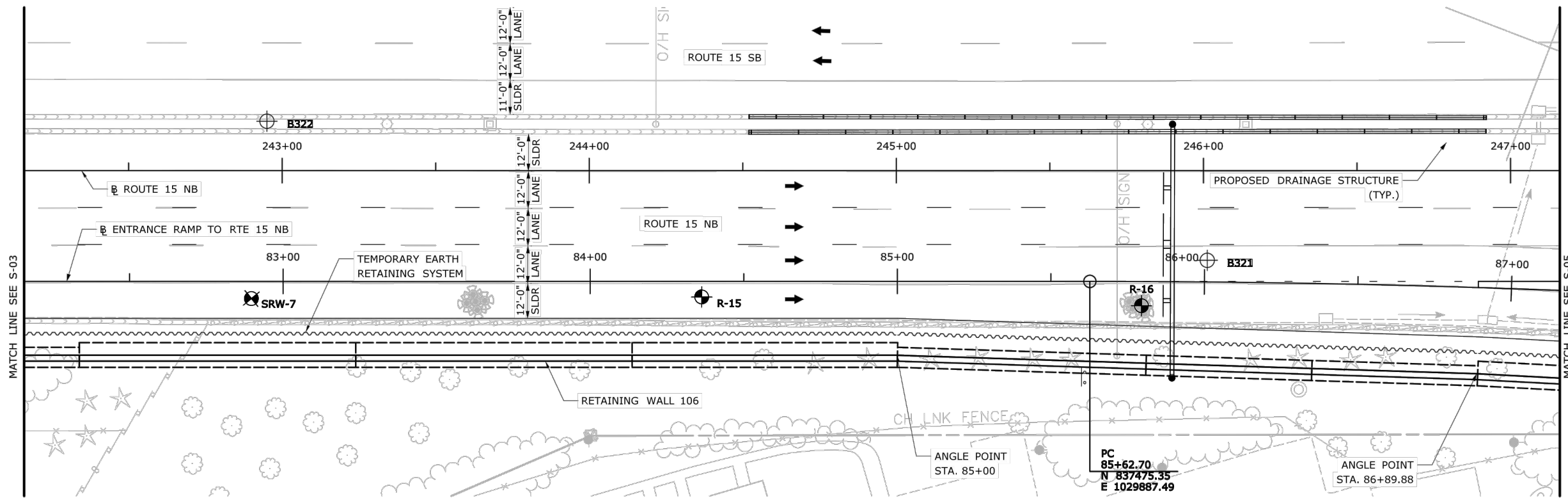
FREEMAN
COMPANIES
FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860)251-9550
 TOLL FREE: (800)604-5141
 FAX: (860)986-7161
 ELEVATE YOUR EXPECTATIONS

No.	Date	Description
REVISIONS		



DESIGNED:	A.M.
DRAWN:	T.T.
CHECKED:	N.W.
APPROVED:	N.W.
SCALE:	1"=40'
PROJECT NO.:	2014-1001
DATE:	02/10/2017

SHEET NO.
WALL 106
FIGURE 2A

Freeman Companies, LLC - Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 106\Figure 2 - Wall 106 - (2-8-2017).dwg Feb 14, 2017-11:08am Plotted By: tta

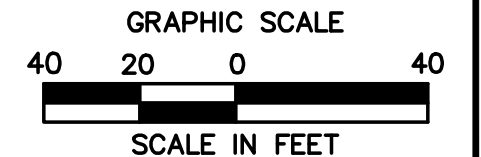
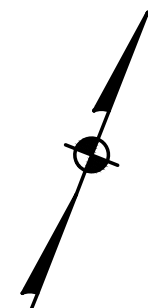


LEGEND:

-  RECENT BORINGS
-  PREVIOUS BORINGS

NOTES:

1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN
PROPOSED RETAINING WALL W106
STATE PROJECT NO. 63-703
HARTFORD, CONNECTICUT



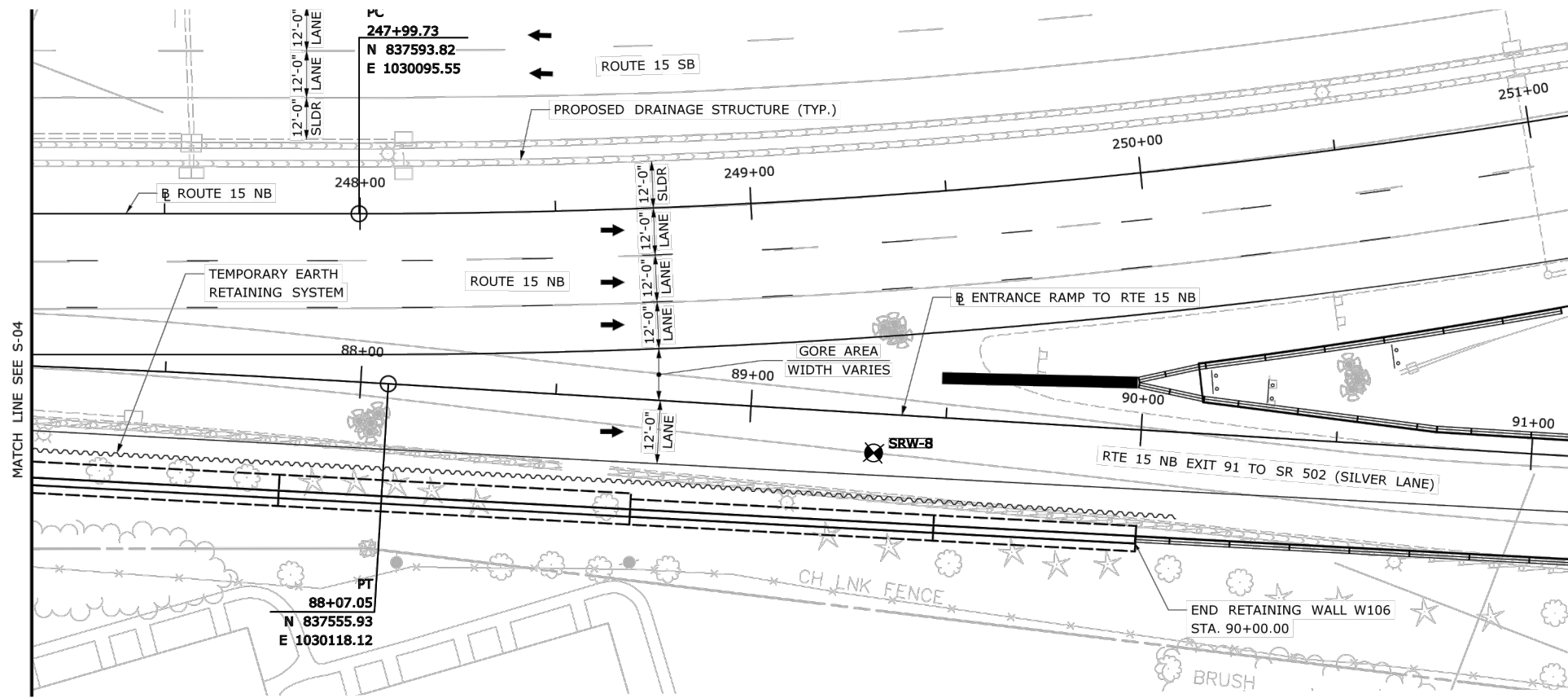
FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860)251-9550
 TOLL FREE: (800)604-5141
 FAX: (860)986-7161
 ELEVATE YOUR EXPECTATIONS

No.	Date	Description
REVISIONS		



DESIGNED: A.M.
 DRAWN: T.T.
 CHECKED: N.W.
 APPROVED: N.W.
 SCALE: 1"=40'
 PROJECT NO.: 2014-1001
 DATE: 02/10/2017

SHEET NO.
WALL 106
FIGURE 2B

Freeman Companies, LLC - Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 106\Figure 2 - Wall 106 - (2-8-2017).dwg Feb 14, 2017-11:09am Plotted By: tta

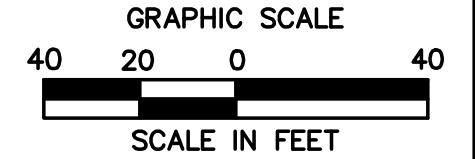
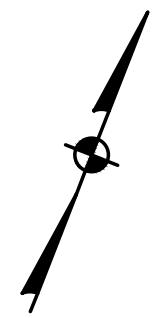


LEGEND:

-  RECENT BORINGS
-  PREVIOUS BORINGS

NOTES:

1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN
PROPOSED RETAINING WALL W106
STATE PROJECT NO. 63-703
HARTFORD, CONNECTICUT

FREEMAN
COMPANIES

FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860)251-9550
 TOLL FREE: (800)604-5141
 FAX: (860)986-7161

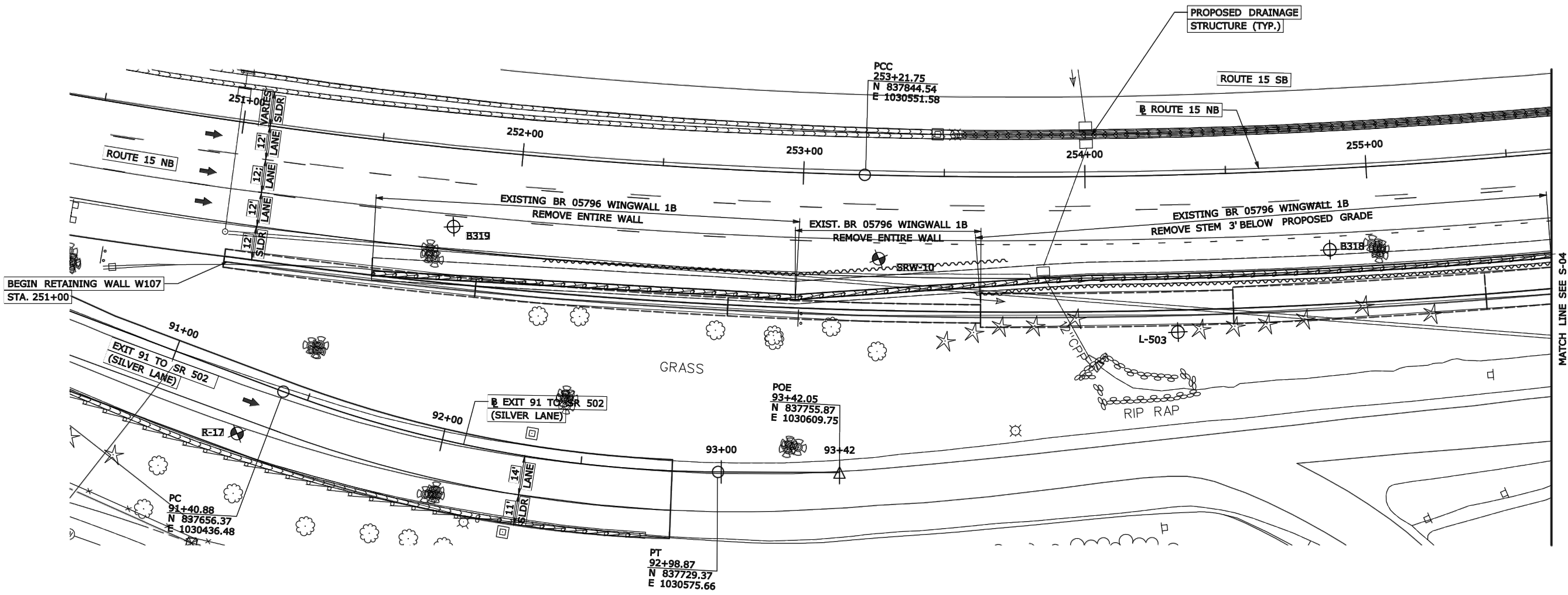
ELEVATE YOUR EXPECTATIONS

No.	Date	Description
REVISIONS		

DESIGNED: A.M.
 DRAWN: T.T.
 CHECKED: N.W.
 APPROVED: N.W.
 SCALE: 1"=40'
 PROJECT NO.: 2014-1001
 DATE: 02/10/2017

SHEET NO.
WALL 106
FIGURE 2C

Freeman Companies, LLC - Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 107 - (2-8-2017).dwg Feb 14, 2017 - 11:11am Plotted By: tta



- LEGEND:**
- RECENT BORINGS
 - PREVIOUS BORINGS

- NOTES:**
1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
 2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
 3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN
PROPOSED RETAINING WALL W107
STATE PROJECT NO. 63-703
HARTFORD, CONNECTICUT

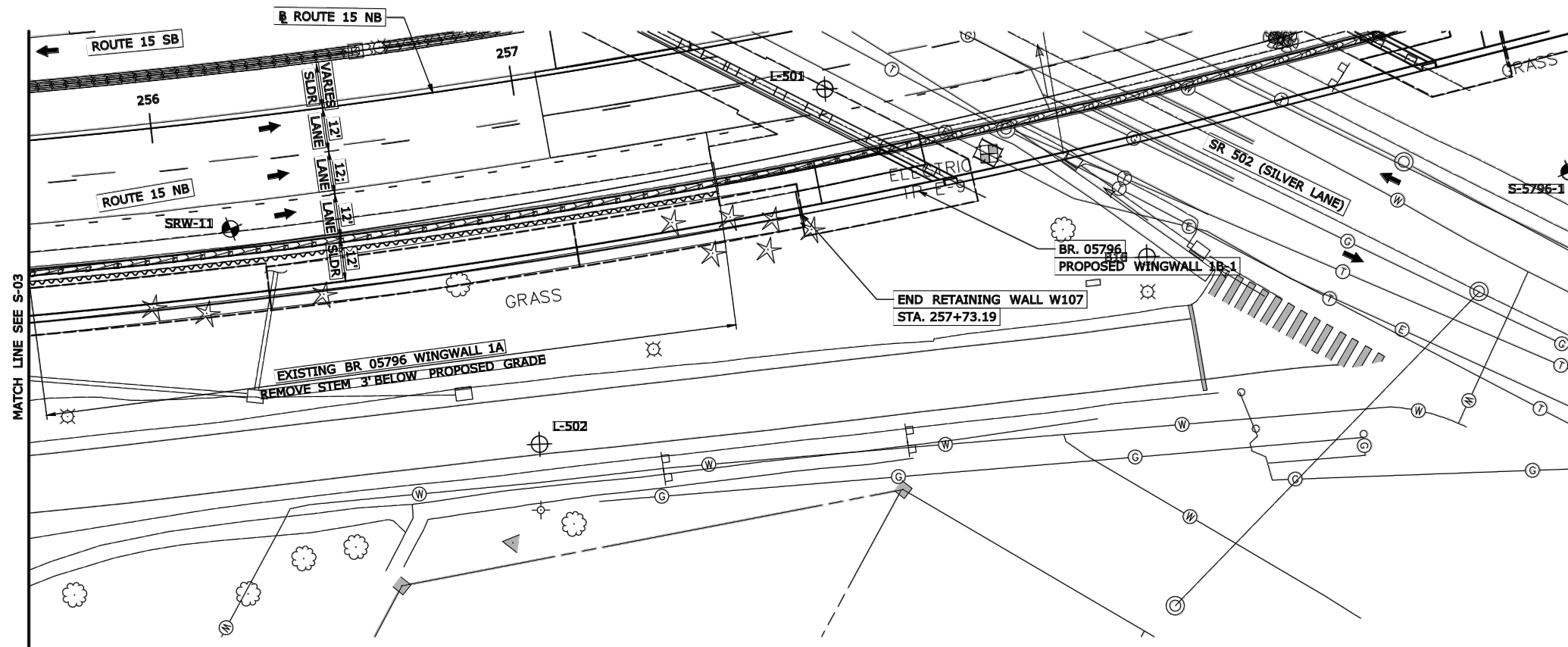
FREEMAN
COMPANIES

FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860)251-9550
 TOLL FREE: (800)604-5141
 FAX: (860)986-7161
ELEVATE YOUR EXPECTATIONS



No.	Date	Description
REVISIONS		

DESIGNED: A.M.
 DRAWN: T.T.
 CHECKED: N.W.
 APPROVED: N.W.
 SCALE: 1"=40'
 PROJECT NO.: 2014-1001
 DATE: 02/10/2017

SHEET NO.
WALL 107
FIGURE 2A

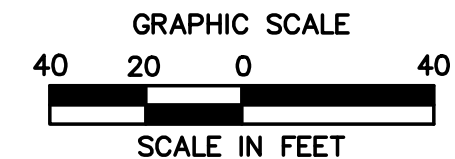
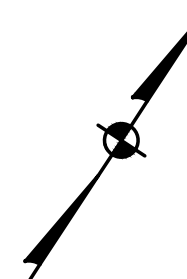


LEGEND:

-  RECENT BORINGS
-  PREVIOUS BORINGS

NOTES:

1. RECENT EXPLORATION LOCATIONS WERE SURVEYED BY CME ASSOCIATES, INC., AND PREVIOUS BORING LOCATIONS WERE ESTIMATED FROM RECORD INFORMATION AND ARE APPROXIMATE.
2. REFER TO THE TEXT AND APPENDICES FOR ADDITIONAL INFORMATION
3. BASE PLAN PROVIDED BY H.W. LOCHNER, INC.



SUBSURFACE EXPLORATION LOCATION PLAN

PROPOSED RETAINING WALL W107
 STATE PROJECT NO. 63-703
 HARTFORD, CONNECTICUT



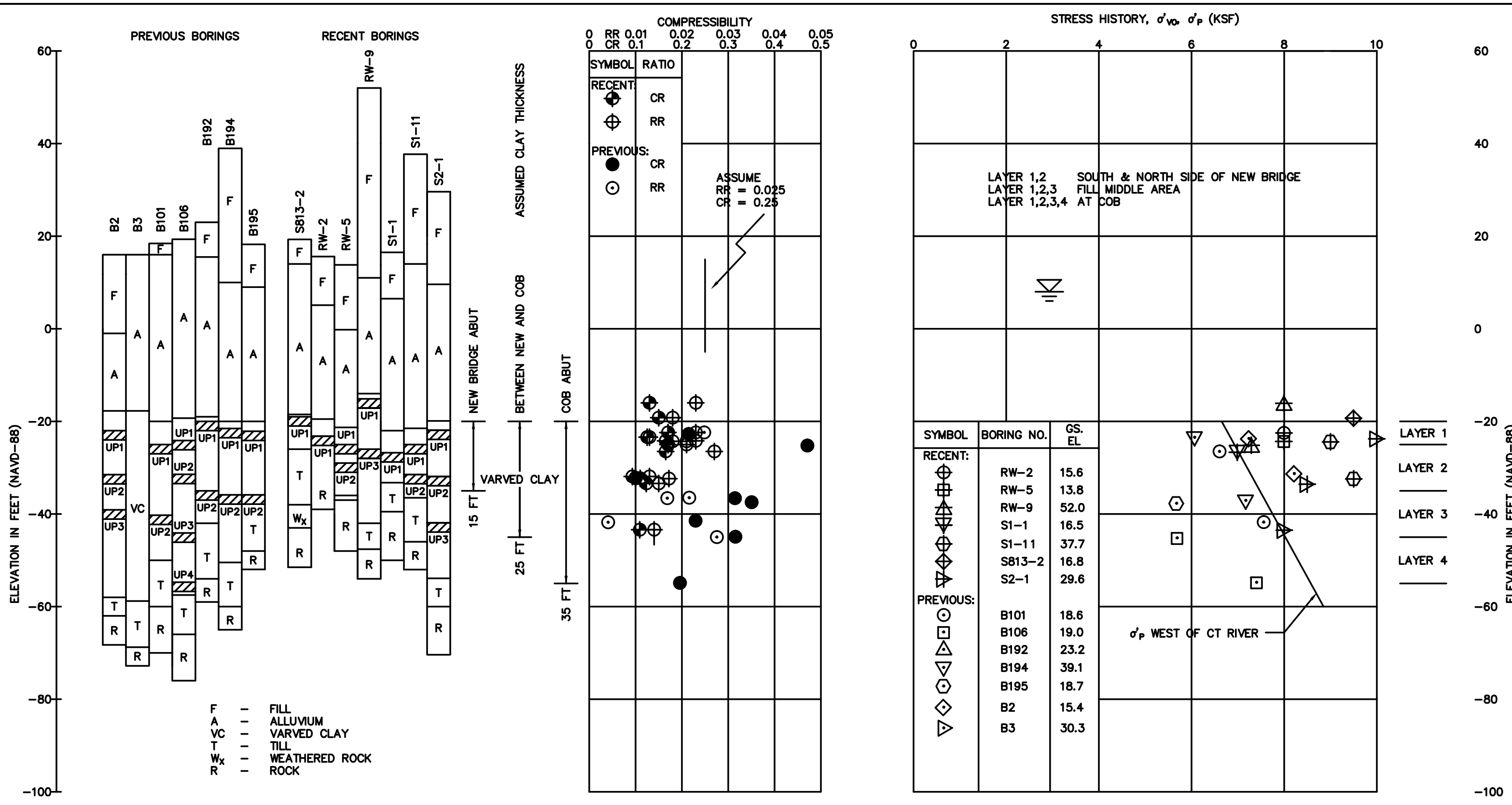
FREEMAN COMPANIES, LLC
 36 JOHN STREET
 HARTFORD, CT 06106
 WWW.FREEMANCOS.COM
 TEL: (860)251-9550
 TOLL FREE: (800)604-5141
 FAX: (860)986-7161
 ELEVATE YOUR EXPECTATIONS

No.	Date	Description
REVISIONS		

DESIGNED: A.M.
 DRAWN: T.T.
 CHECKED: N.W.
 APPROVED: N.W.
 SCALE: 1"=40'
 PROJECT NO.: 2014-1001
 DATE: 02/10/2017

SHEET NO.
**WALL 107
 FIGURE 2B**

Freeman Companies, LLC · Y:\2014\2014-1001 ConnDot CSO 2232 CME\DWG\Retaining Walls\Wall 107\Figure 2 - Wall 107 - (2-8-2017).dwg Feb 14, 2017 11:12am Plotted By: tta

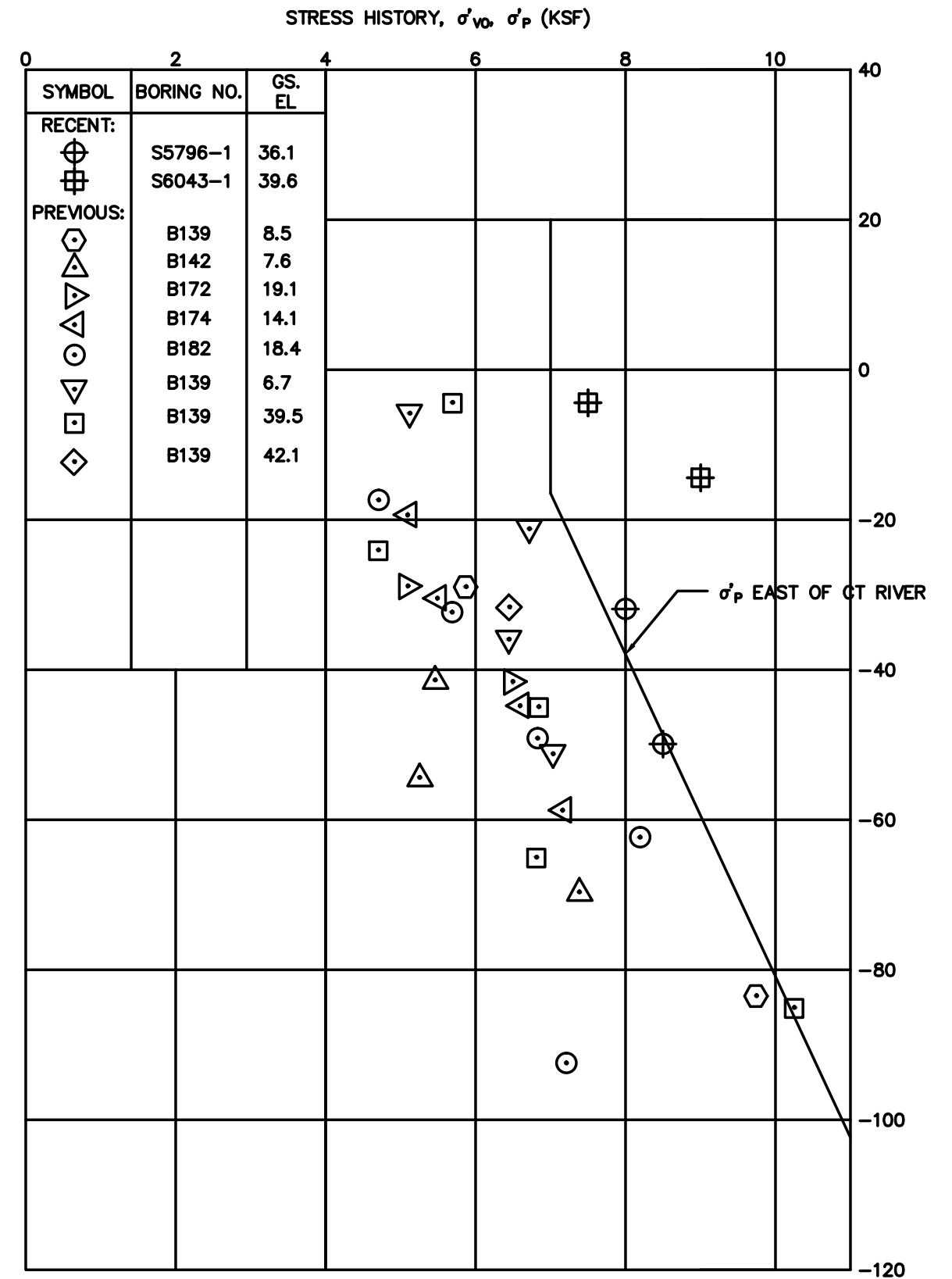
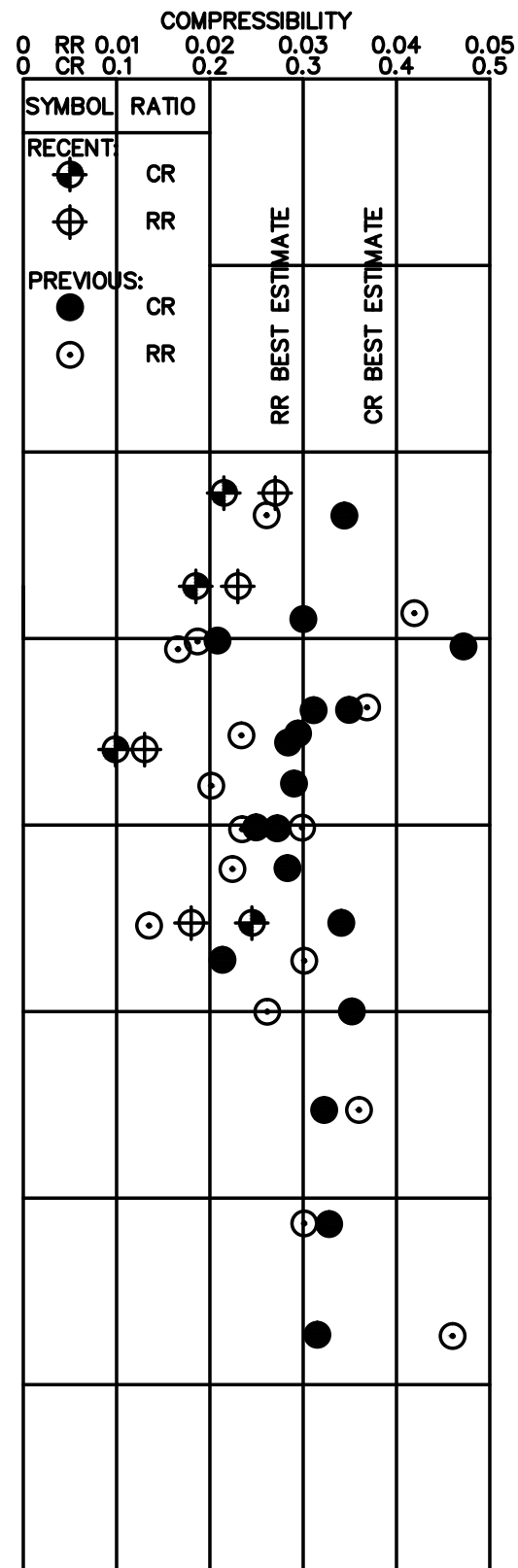
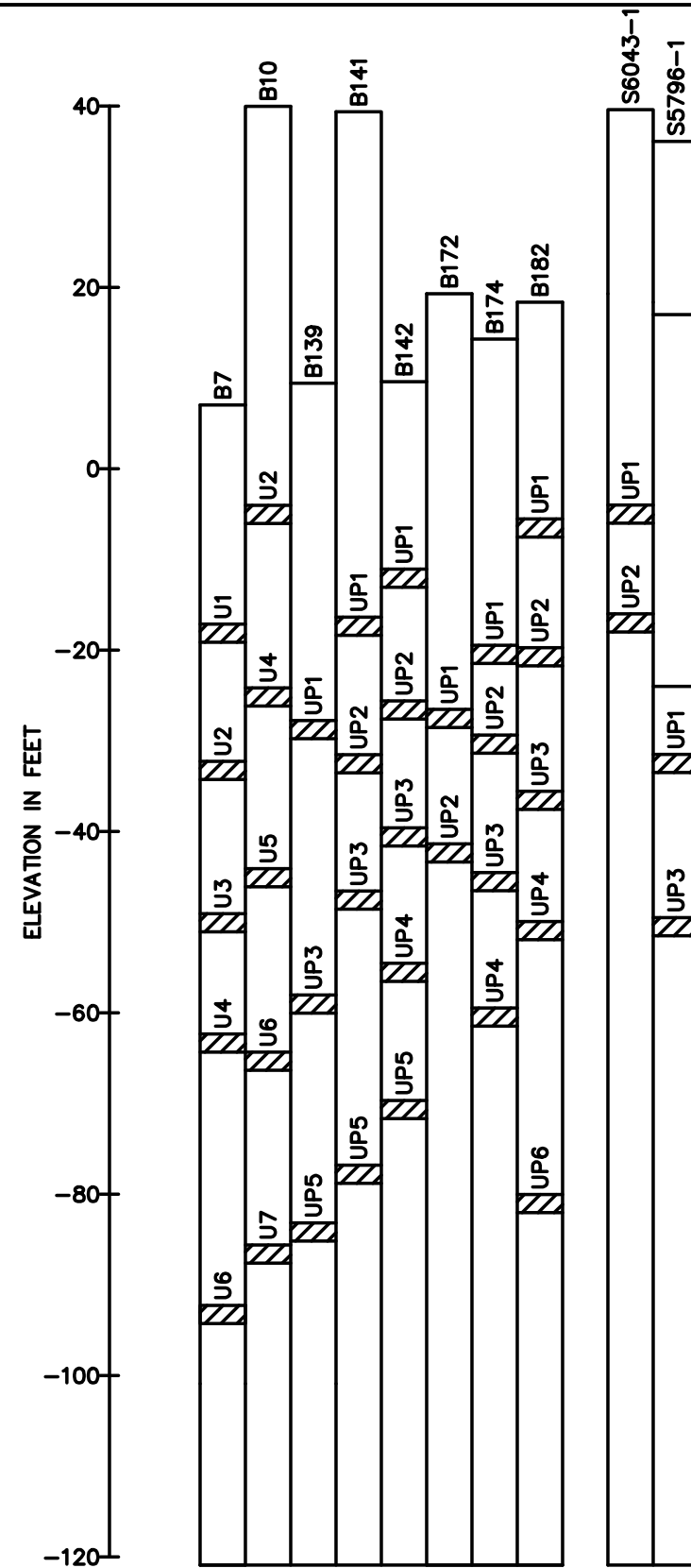


- NOTES**
- PREVIOUS DATA WAS OBTAINED FROM THE REPORT TITLED "GEOTECHNICAL LABORATORY DATA REPORT, CHARTER OAK BRIDGE AND APPROACHES, HARTFORD-EAST HARTFORD, CONNECTICUT" DATED MAY 1987.
 - ELEVATIONS REFER TO NAVD-88. PREVIOUS ELEVATIONS WERE ADJUSTED FROM NGVD-29.

- DEFINITIONS**
- CR - COMPRESSION RATIO ($=\Delta\varepsilon/\Delta\log\sigma'_v$) DURING VIRGIN COMPRESSION
 - RR - RECOMPRESSION RATIO ($=\Delta\varepsilon/\log\sigma'_v$) DURING RECOMPRESSION
 - σ'_{vo} - IN SITU VERTICAL EFFECTIVE STRESS
 - σ'_p - PRECONSOLIDATION STRESS

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SUMMARY OF VARVED CLAY PROPERTIES
WEST OF CONNECTICUT RIVER
STATE PROJECT NO. 63-703
HARTFORD, CONNECTICUT
FIGURE 3A



NOTES

1. PREVIOUS DATA WAS OBTAINED FROM THE RECORD REPORT TITLED "GEO TECHNICAL LABORATORY DATA REPORT, CHARTER OAK BRIDGE AND APPROACHES, HARTFORD-EAST HARTFORD, CONNECTICUT" DATED MAY 1987.
2. ELEVATIONS REFER TO NAVD-88. PREVIOUS ELEVATIONS WERE ADJUSTED FROM NGVD-29.

DEFINITIONS

- CR - COMPRESSION RATIO ($=\Delta\varepsilon/\Delta\log\sigma'_v$) DURING VIRGIN COMPRESSION
- RR - RECOMPRESSION RATIO ($=\Delta\varepsilon/\log\sigma'_v$) DURING RECOMPRESSION
- σ'_{vo} - IN SITU VERTICAL EFFECTIVE STRESS
- σ'_p - PRECONSOLIDATION STRESS

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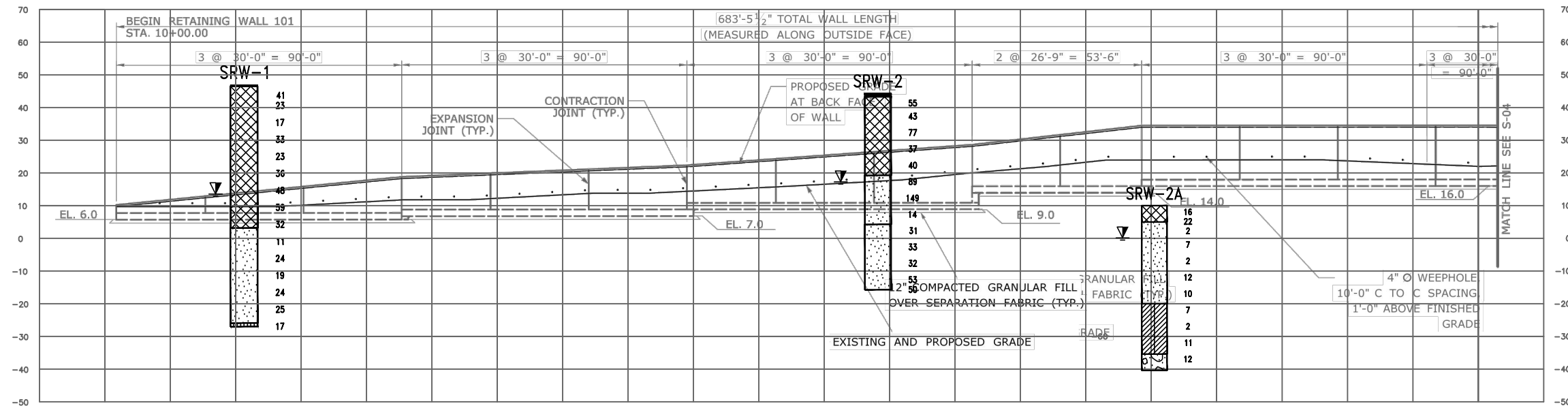
SUMMARY OF VARVED CLAY PROPERTIES
 EAST OF CONNECTICUT RIVER
 STATE PROJECT NO. 63-703
 HARTFORD, CONNECTICUT
 FIGURE 3B

Freeman Companies, LLC
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SUBSURFACE DIAGRAM

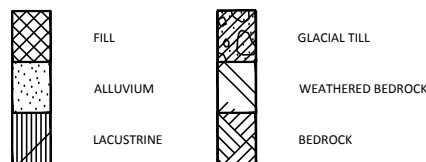
PRIME DESIGNER CME
 PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
 PROJECT LOCATION Hartford



STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:\2014\2014-1001 CONDOT CSO 2232 CME\GEO\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ

LEGEND



LEGEND
 13 SPT N-VALUE
 60%/0% RECOVERY/RQD

NOTE:
 THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 40'
 VERTICAL SCALE: 1" = 40'

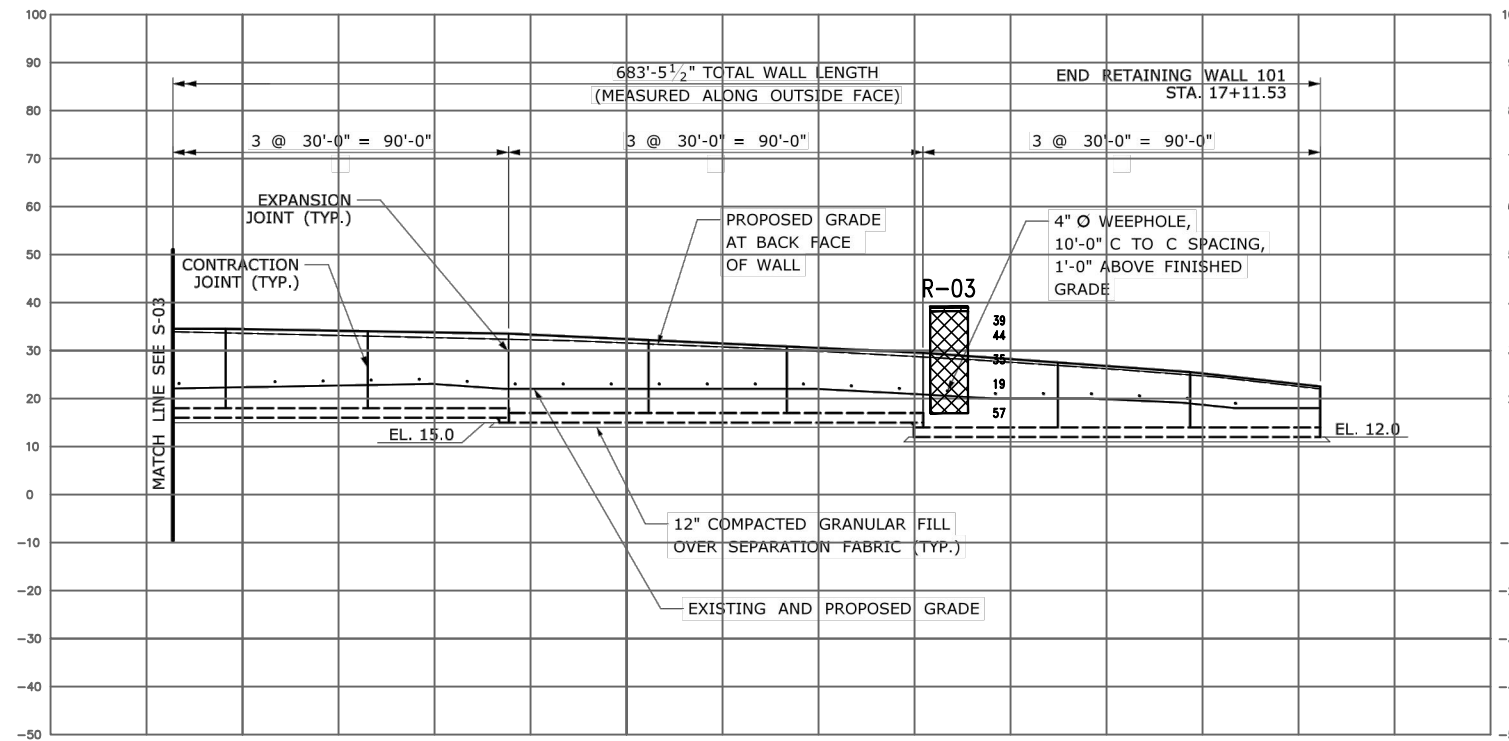
WALL 101
 FIGURE 4A

Freeman Companies, LLC
 36 John Street
 Hartford, CT 06109

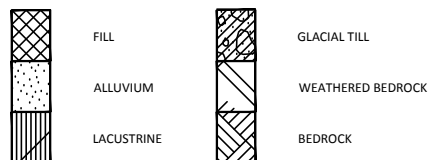
SUBSURFACE DIAGRAM

PRIME DESIGNER CME
 PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
 PROJECT LOCATION Hartford



LEGEND



LEGEND
 13 SPT N-VALUE
 60%/0% RECOVERY/RQD

NOTE:
 THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT
 THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 40'
 VERTICAL SCALE: 1" = 40'

WALL 101
 FIGURE 4B

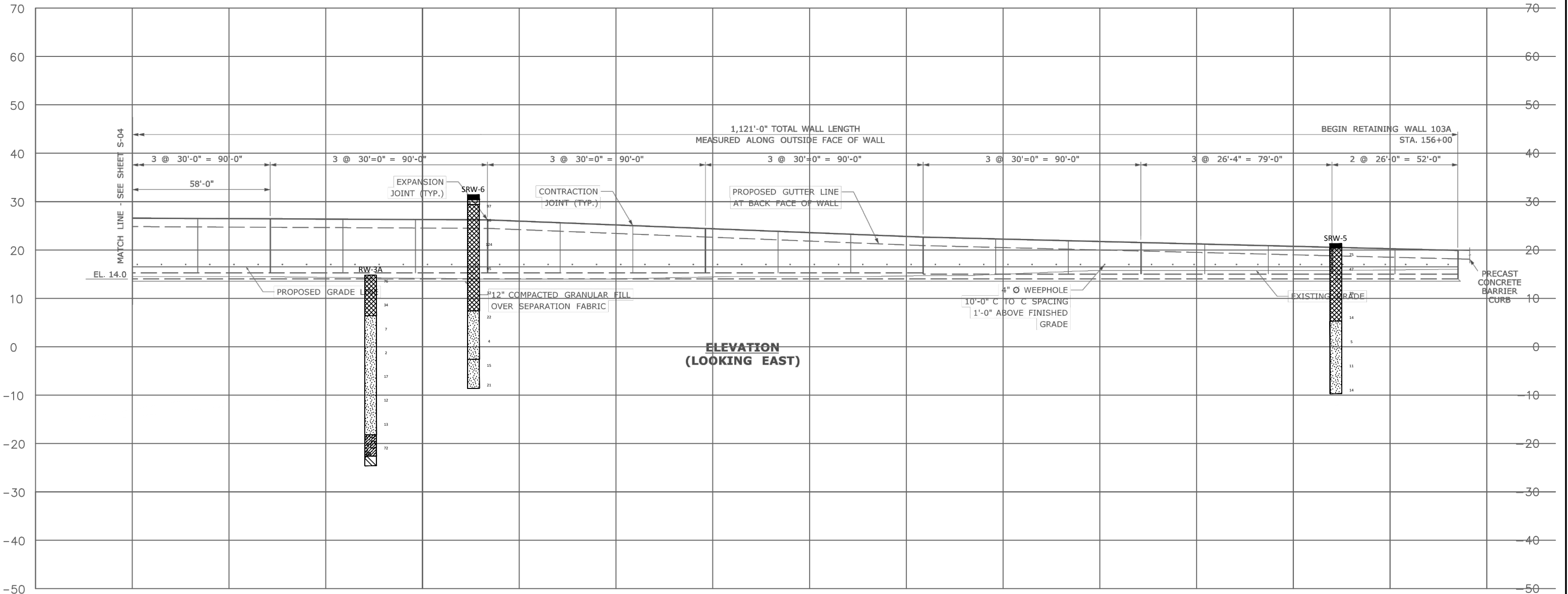
STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:\2014\2014-1001 CONNDOT CSO 2232 CME\GEO\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ

SUBSURFACE DIAGRAM

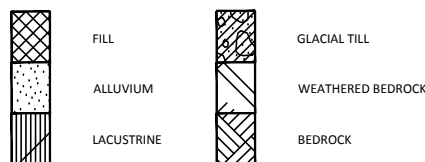
Freeman Companies, LLC
36 John Street
Hartford, CT 06109

PRIME DESIGNER CME
PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
PROJECT LOCATION Hartford



LEGEND



LEGEND
13 SPT N-VALUE
60%/0% RECOVERY/RQD

NOTE:
THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT
THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 20'

WALL 103
FIGURE 4A

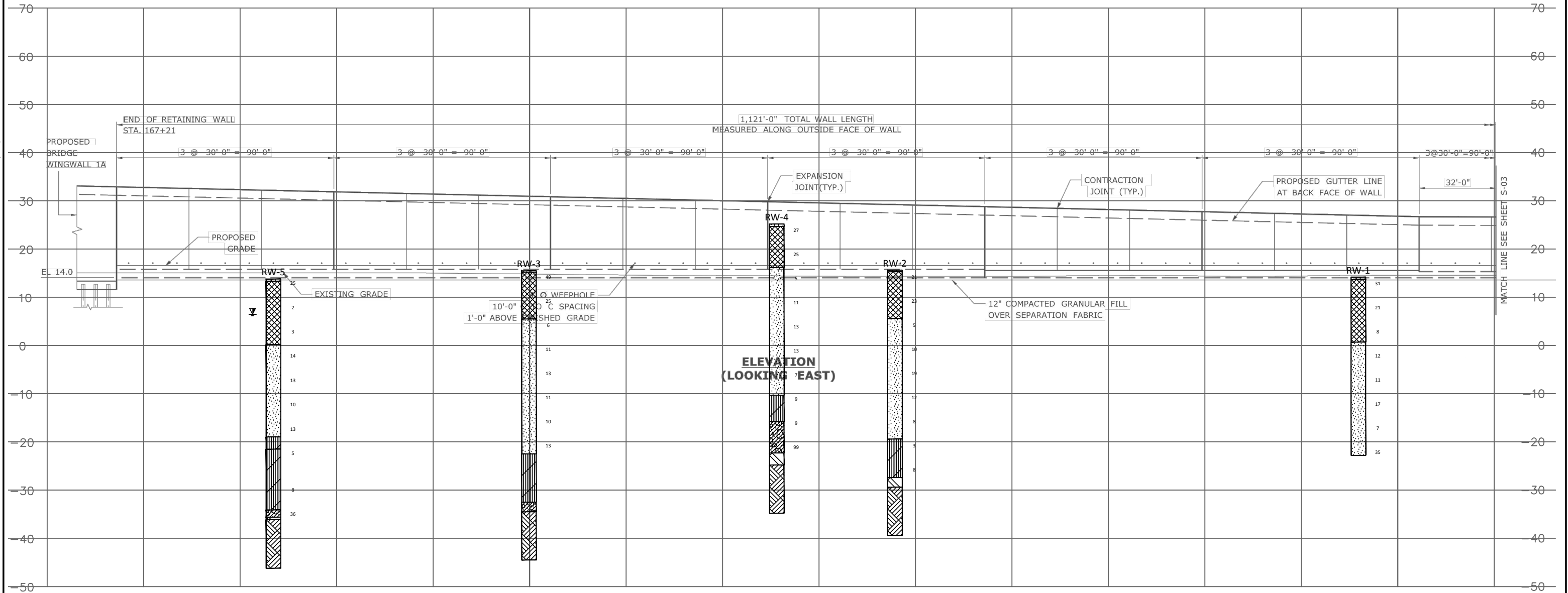
STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:\2014\2014-1001 CONNDOT CSO 2232 CME\GEO\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ

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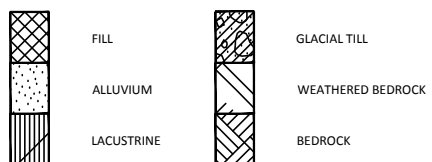
SUBSURFACE DIAGRAM

PRIME DESIGNER CME
 PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
 PROJECT LOCATION Hartford



LEGEND



LEGEND
 13 SPT N-VALUE
 60%/0% RECOVERY/RQD

NOTE:
 THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 20'
 VERTICAL SCALE: 1" = 20'

WALL 103
 FIGURE 4B

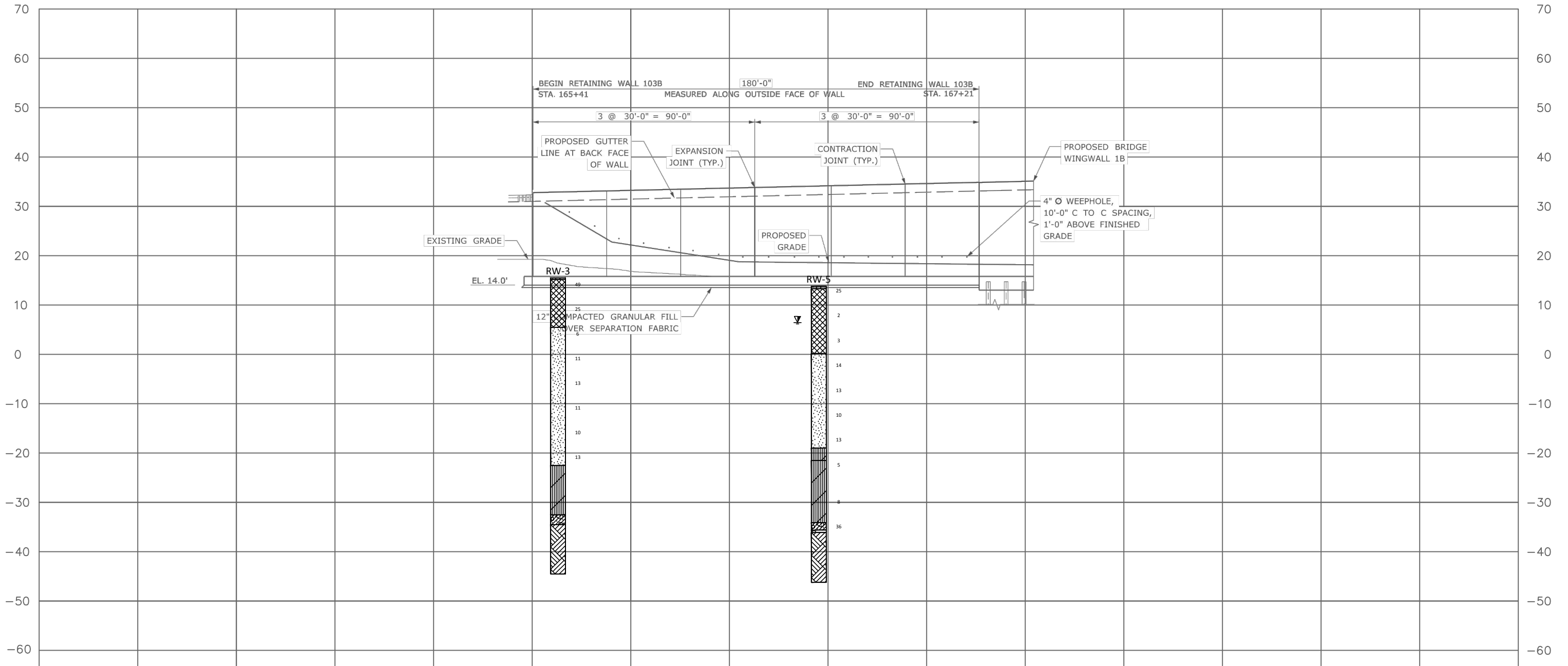
STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:\2014\2014-1001 CONNDOT CSO 2232 CME\GEO\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPU

SUBSURFACE DIAGRAM

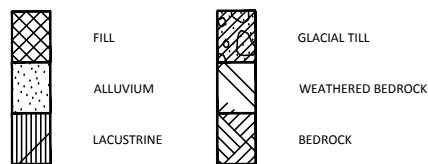
Freeman Companies, LLC
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PRIME DESIGNER CME
PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
PROJECT LOCATION Hartford



LEGEND



LEGEND
13 SPT N-VALUE
60%/0% RECOVERY/RQD

NOTE:
THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 20'

WALL 103
FIGURE 4C

STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:\2014\2014-1001 CONNDOT CSO 2232 CME\GEO\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ

SUBSURFACE DIAGRAM

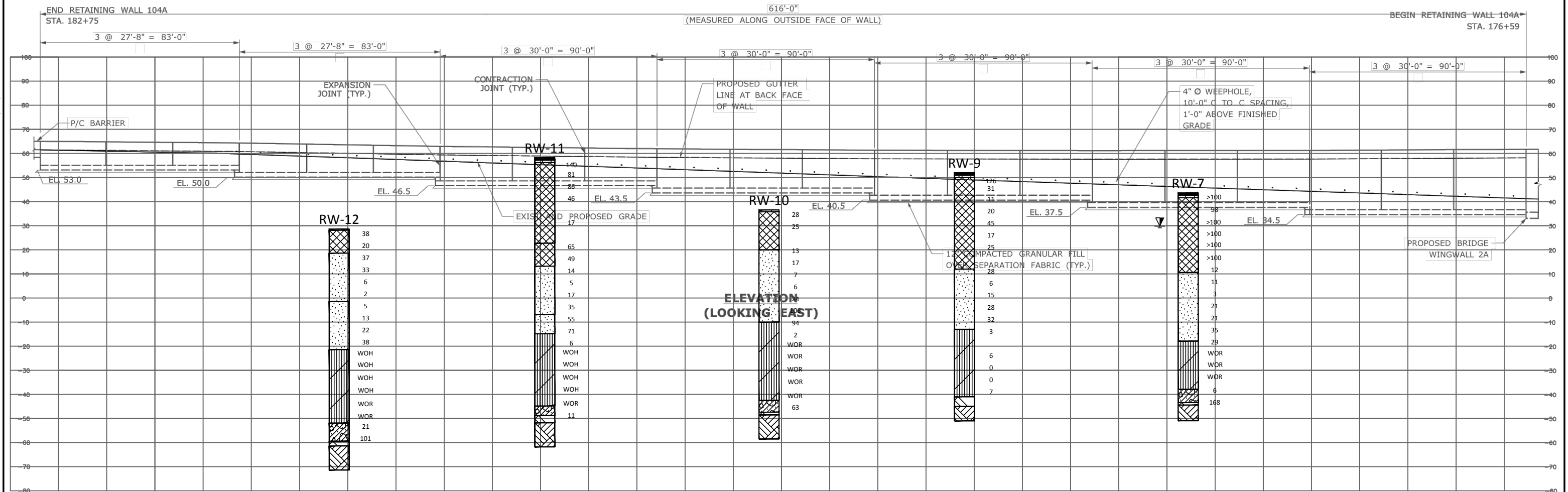
Freeman Companies, LLC
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PRIME DESIGNER CME

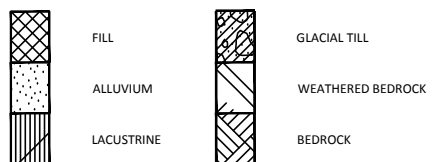
PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening

PROJECT LOCATION Hartford



LEGEND



LEGEND
13 SPT N-VALUE
60%/0% RECOVERY/RQD

NOTE:
THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 40'

WALL 104
FIGURE 4A

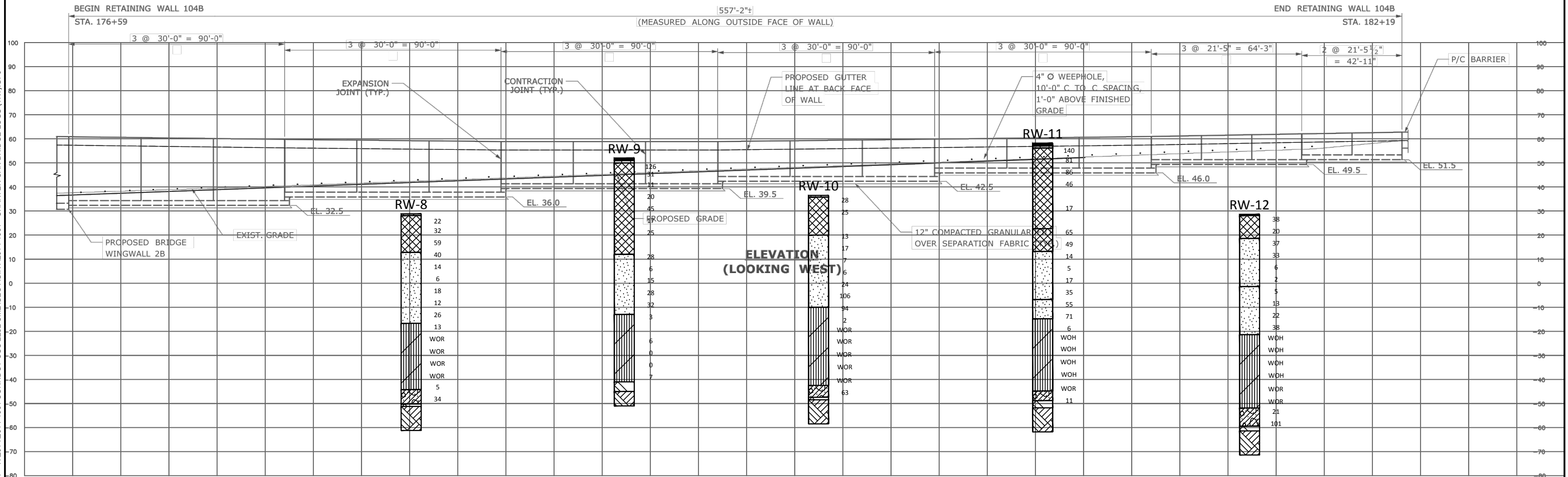
Freeman Companies, LLC
 36 John Street
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SUBSURFACE DIAGRAM

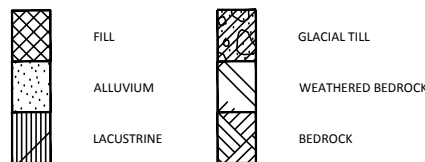
PRIME DESIGNER CME
 PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
 PROJECT LOCATION Hartford

STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:\2014\2014-1001 CONNDOT CSO 2232 CME\GEO\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ



LEGEND



LEGEND
 13 SPT N-VALUE
 60%/0% RECOVERY/RQD

NOTE:
 THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 40'
 VERTICAL SCALE: 1" = 40'

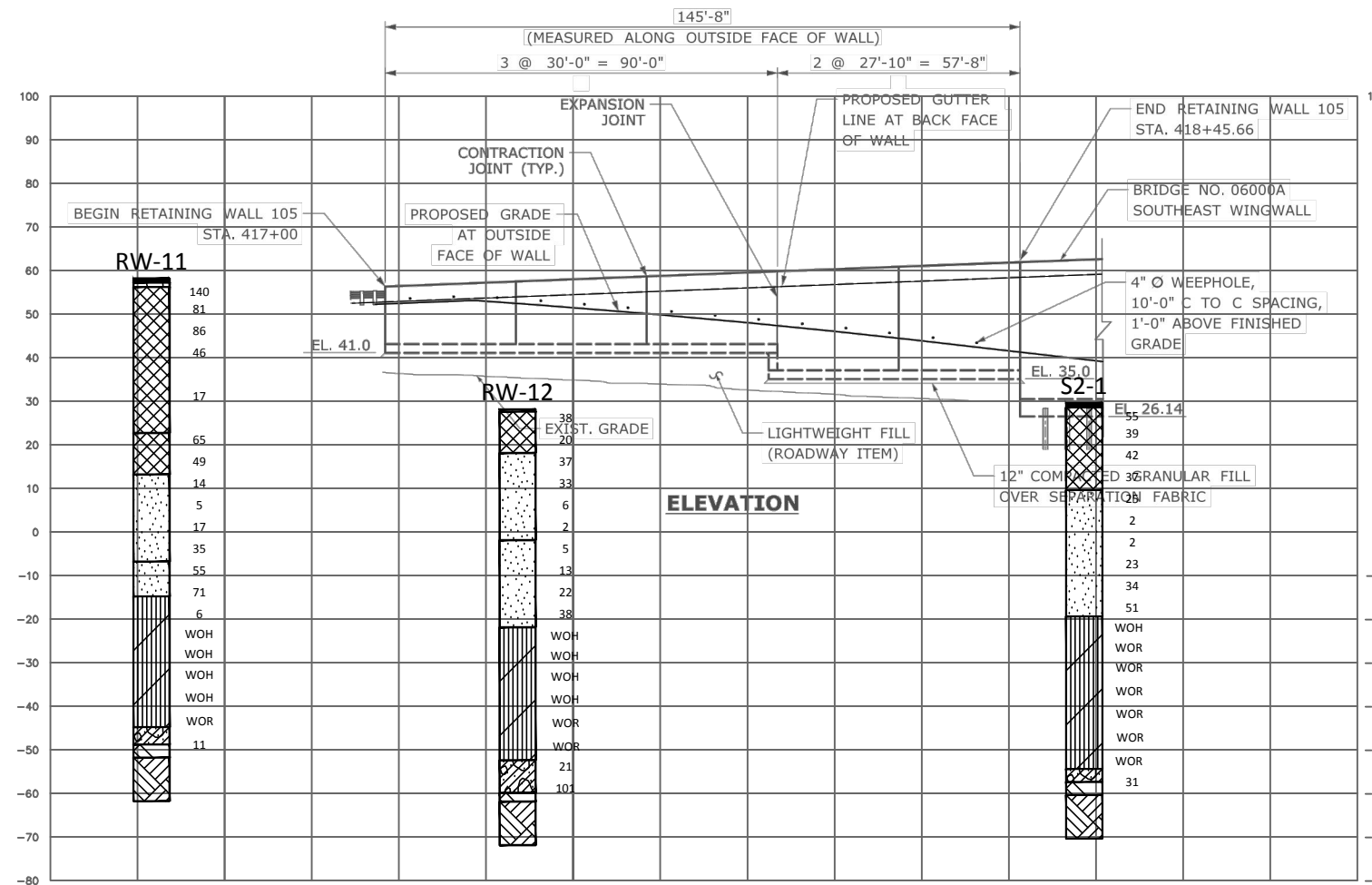
**WALL 104
 FIGURE 4B**

SUBSURFACE DIAGRAM

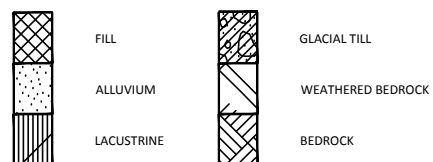
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Hartford, CT 06109

PRIME DESIGNER CME
PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
PROJECT LOCATION Hartford



LEGEND



LEGEND
13 SPT N-VALUE
60%/0% RECOVERY/RQD

NOTE:
THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 40'

**WALL 105
FIGURE 4A**

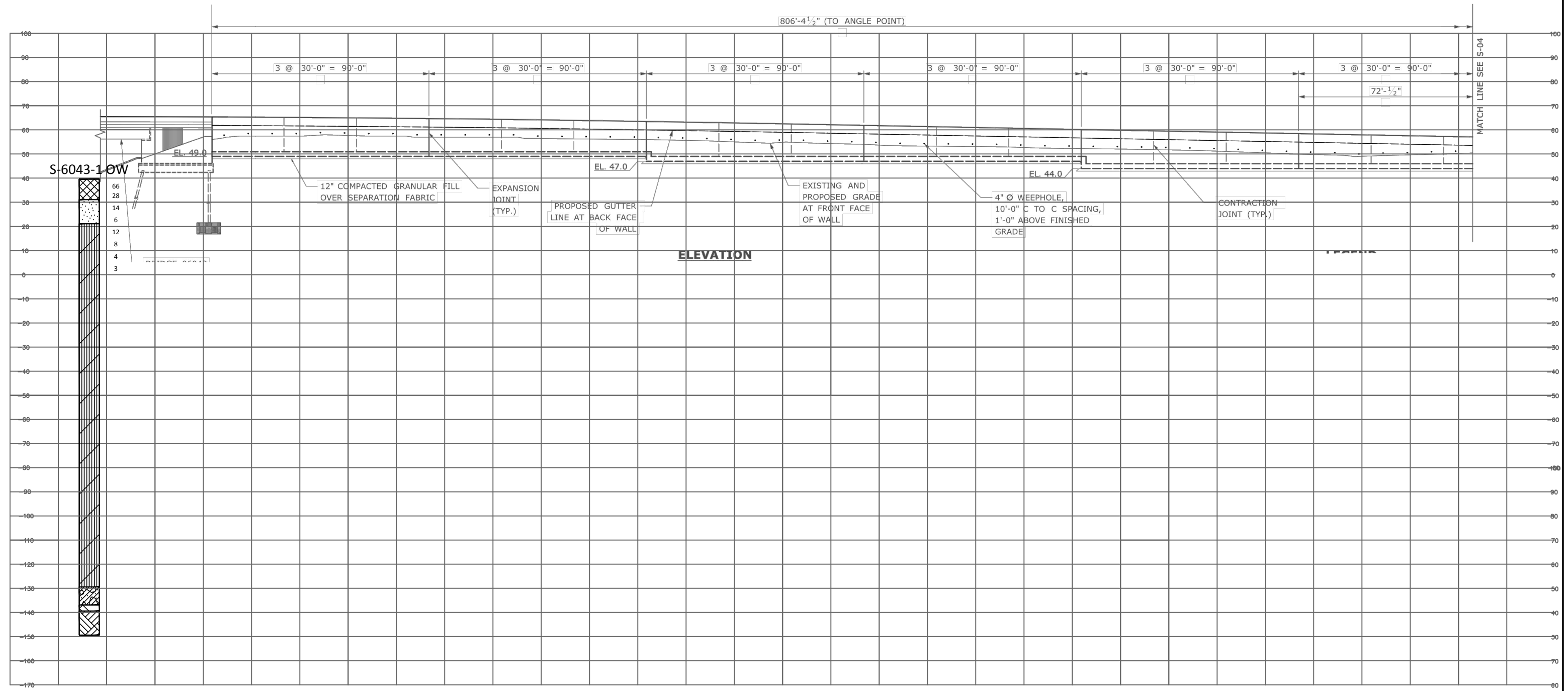
STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:\2014\2014-1001 CONNDOT CSO 2232 CME\GEO\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ

Freeman Companies, LLC
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SUBSURFACE DIAGRAM

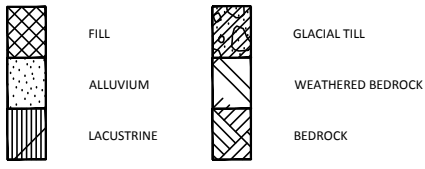
PRIME DESIGNER CME
 PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
 PROJECT LOCATION Hartford



ELEVATION

LEGEND



LEGEND
 13 SPT N-VALUE
 60%/0% RECOVERY/RQD

NOTE:
 THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 40'
 VERTICAL SCALE: 1" = 40'

**WALL 106
 FIGURE 4A**

STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:20142014-1001 CONNDOT CSO 2232 CME\GEOT\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ

SUBSURFACE DIAGRAM

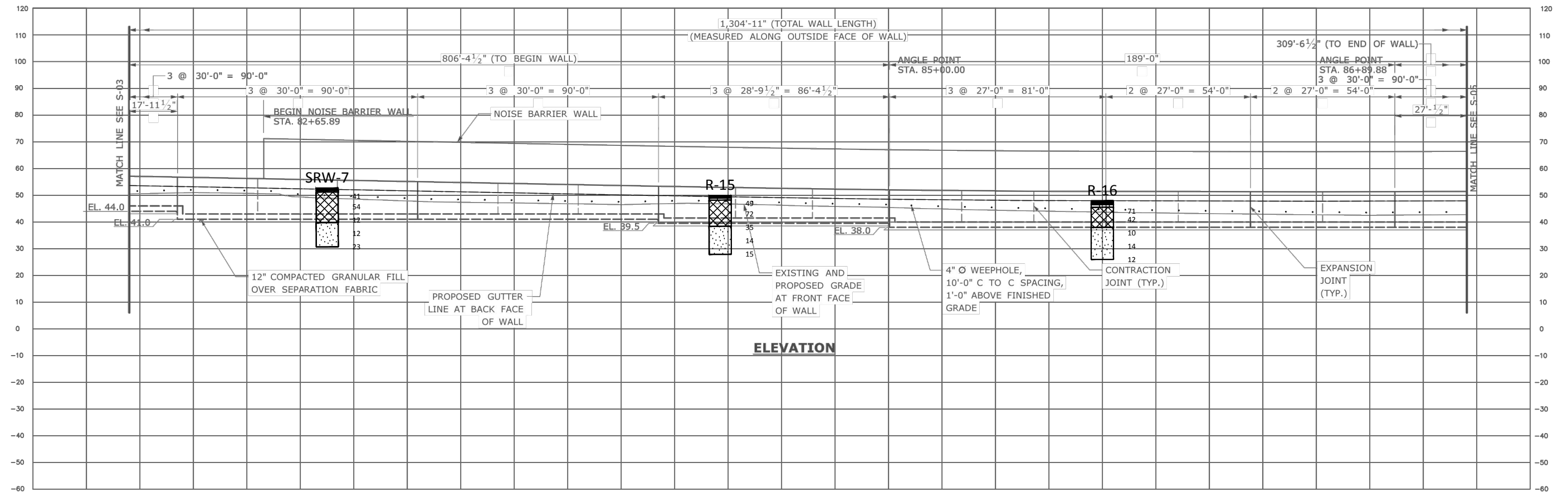
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PRIME DESIGNER CME

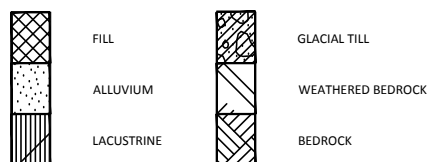
PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening

PROJECT LOCATION Hartford



LEGEND



LEGEND
13 SPT N-VALUE
60%/0% RECOVERY/RQD

NOTE:
THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 40'

**WALL 106
FIGURE 4B**

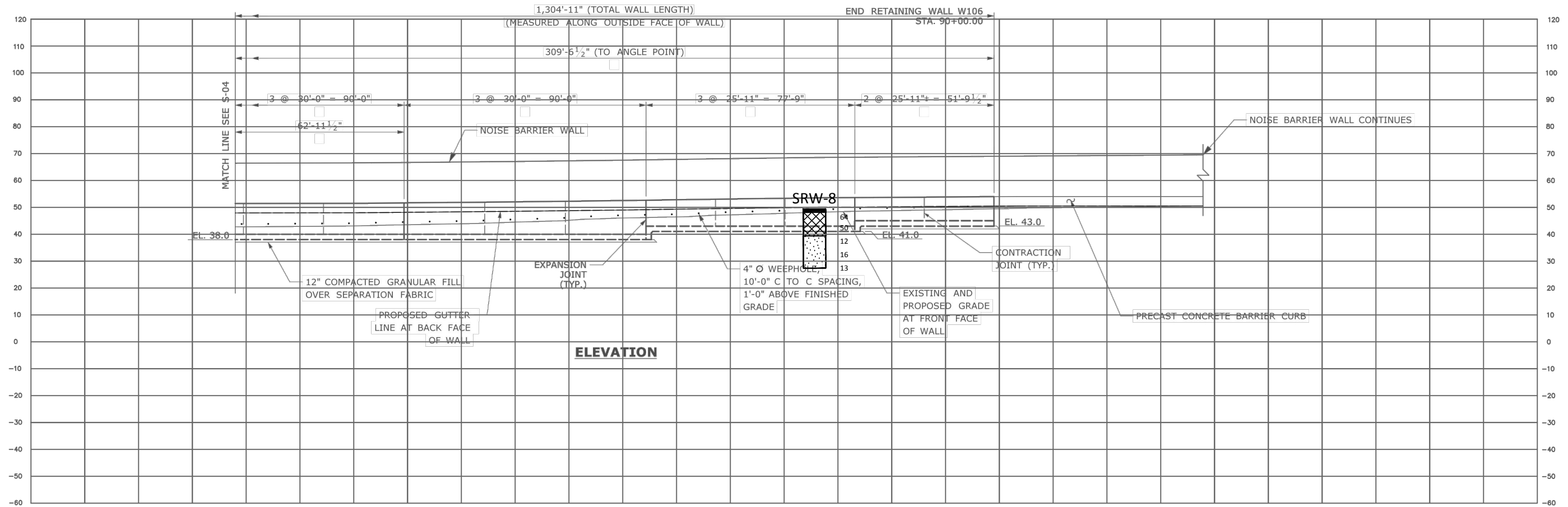
STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:\2014\2014-1001 CONNDOT CSO 2232 CME\GEO\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ

Freeman Companies, LLC
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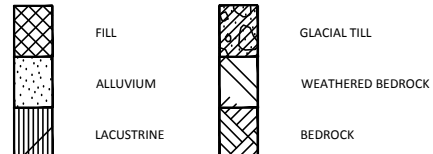
SUBSURFACE DIAGRAM

PRIME DESIGNER CME
 PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
 PROJECT LOCATION Hartford



LEGEND



LEGEND
 13 SPT N-VALUE
 60%/0% RECOVERY/RQD

NOTE:
 THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 40'
 VERTICAL SCALE: 1" = 40'

WALL 106
 FIGURE 4C

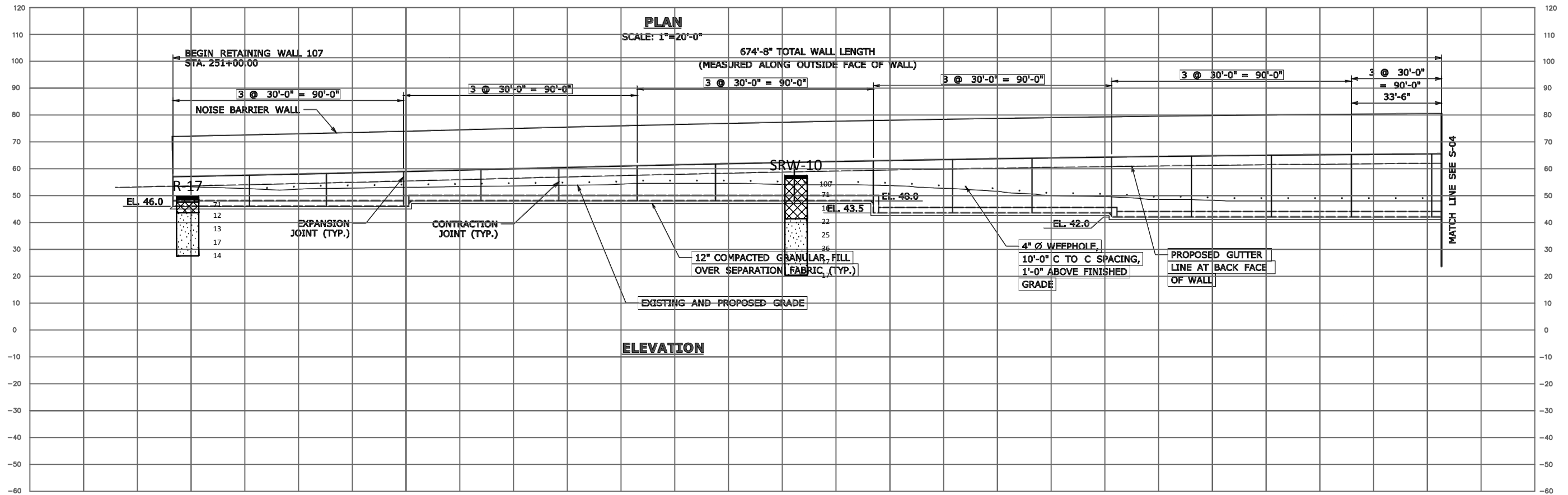
STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:\2014\2014-1001 CONNDOT CSO 2232 CME\GEO\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ

SUBSURFACE DIAGRAM

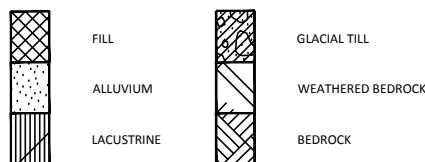
Freeman Companies, LLC
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PRIME DESIGNER CME
PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
PROJECT LOCATION Hartford



LEGEND



LEGEND
13 SPT N-VALUE
60%/0% RECOVERY/RQD

NOTE:
THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 40'

**WALL 107
FIGURE 4A**

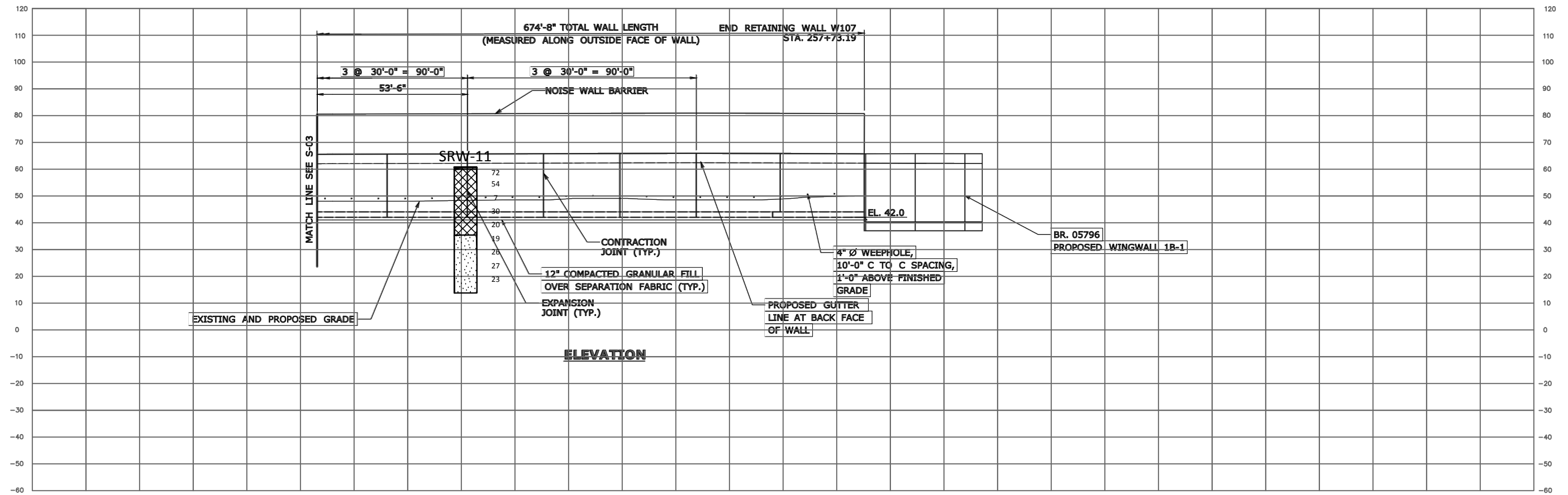
STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:\2014\2014-1001 CONNDOT CSO 2232 CME\GEO\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ

SUBSURFACE DIAGRAM

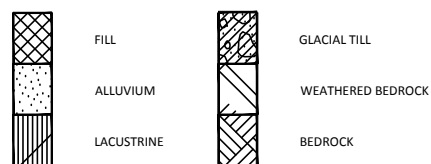
Freeman Companies, LLC
36 John Street
Hartford, CT 06109

PRIME DESIGNER CME
PROJECT NUMBER DOT Project No. 63-703

PROJECT NAME Relocation of I-91 NB Interchange 29 & Widening
PROJECT LOCATION Hartford



LEGEND



LEGEND
13 SPT N-VALUE
60%/0% RECOVERY/RQD

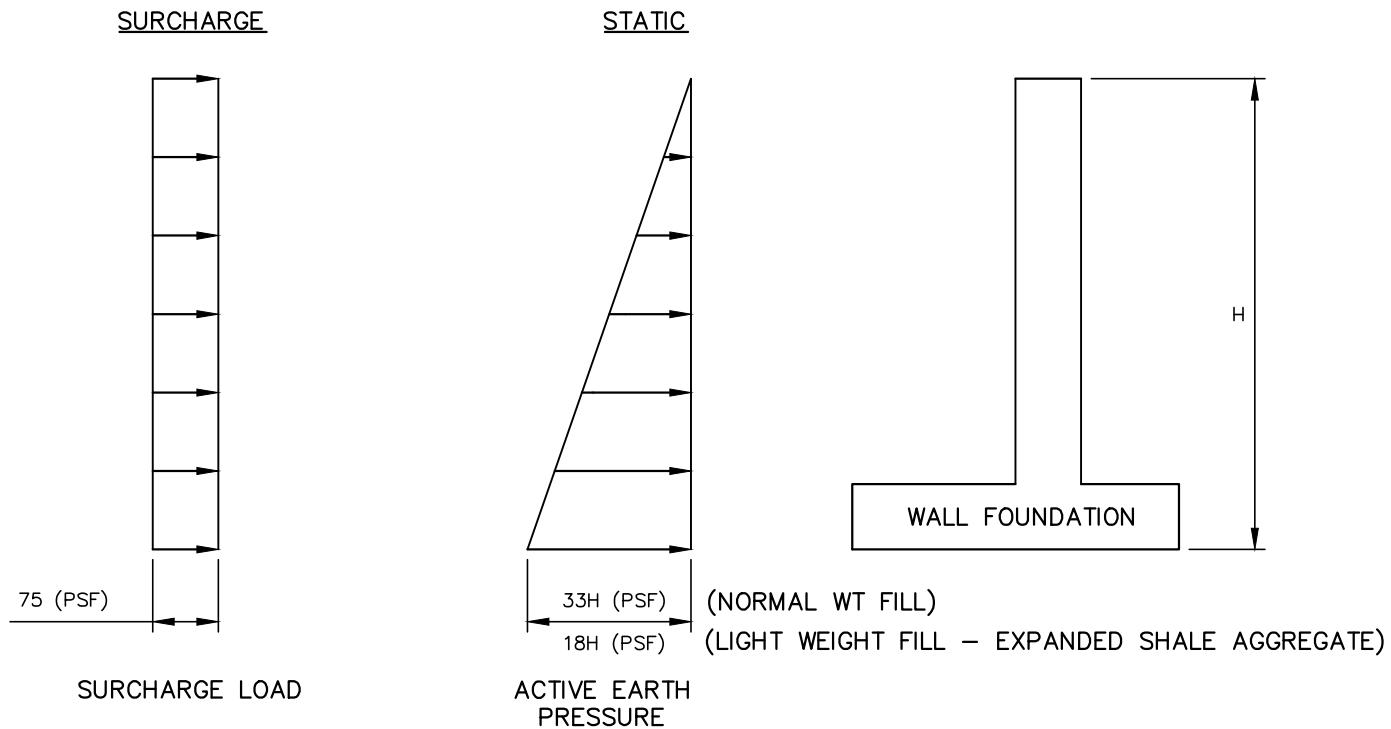
NOTE:
THE STRATA BOUNDARIES INDICATED ARE KNOWN ONLY AT
THE BORING LOCATIONS AND WILL VARY BETWEEN LOCATIONS

HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 40'

WALL 107
FIGURE 4B

STRATIGRAPHY & GW - A SIZE - GINT STD US.GDT - 10/21/16 15:07 - Y:20142014-1001 CONNDOT CSO 2232 CME\GEOT\GINT\2014-1001 - CHARTER OAK BRIDGE LOGS (TKT).GPJ

Freeman Companies, LLC . Y:\2014\2014-1001 ComDot CSO 2232 CME\DWG\Figure 5 - Retaining Walls.dwg Feb 14, 2017-12:15pm Plotted By: lto



NOTES:

1. ASSUMES LEVEL BACKFILL
2. APPLIES TO WALLS THAT CAN DEFLECT AT THE TOP AND ASSUMES ACTIVE EARTH PRESSURES.
3. H IS MEASURED IN FEET
4. THE WALL SHOULD BE DRAINED BY PERVIOUS STRUCTURE BACKFILL (FORM 817 M02.05) WITH A UNIT WEIGHT OF 125 PCF OR EXPANDED SHALE AGGREGATE WITH A UNIT WEIGHT OF 65 PCF AND WEEPHOLES THROUGH THE WALL. THEREFORE, HYDROSTATIC PRESSURE IS NOT INCLUDED.
5. THESE PRESSURE DISTRIBUTIONS ASSUME HORIZONTAL BACKFILL BEHIND THE WALL.
6. SLIDING:
COEFFICIENT OF FRICTION BETWEEN FOOTING AND BASE= 0.45 (2012 AASHTO TABLE 3.11.5.3-1) RESISTANCE FACTOR FROM THE TABLE TO LEFT (2012 AASHTO TABLE 10.5.5.2.2.1).
7. IGNORE PASSIVE RESISTANCE IN FRONT OF FOOTING.

STRUCTURE	RES. FACTOR
MSE	1.0
GRAVITY	1.0
CANTILEVER	0.9

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LATERAL EARTH PRESSURES
ACTIVE EARTH PRESSURES

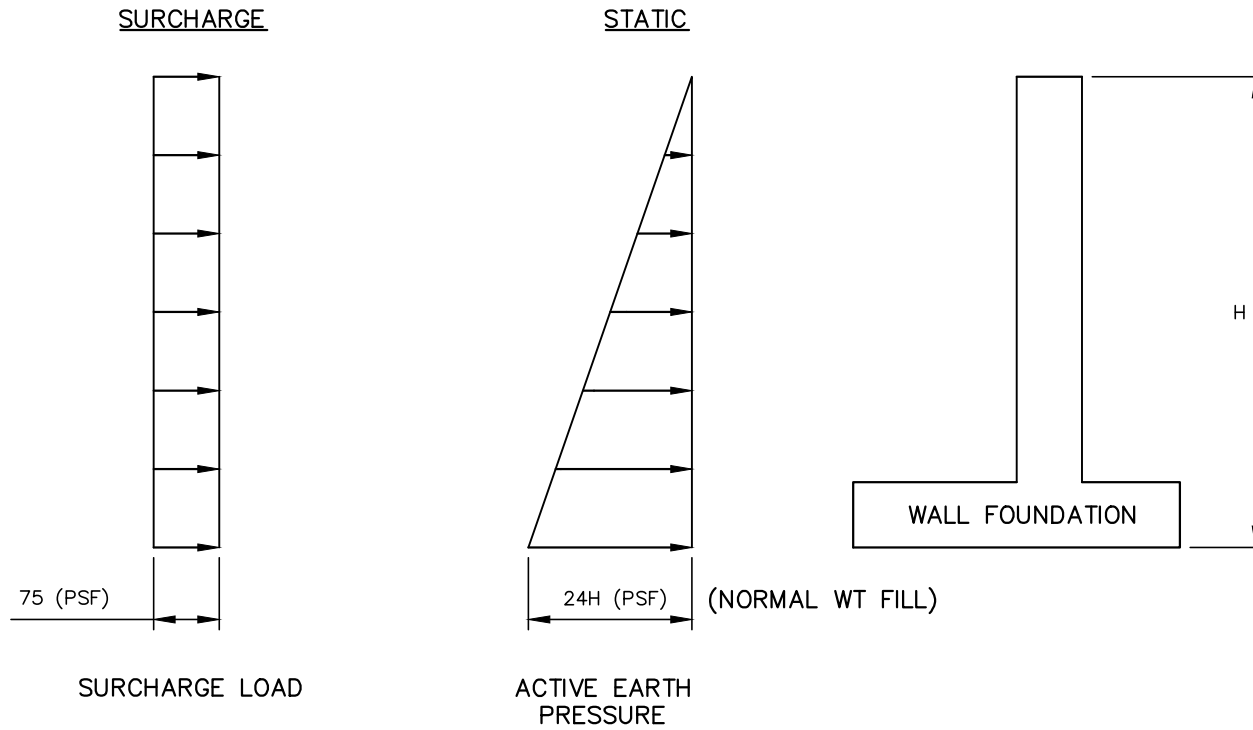
RETAINING WALLS
I-91 NB OVER ROUTE 5/15
STATE PROJECT NO. 63-703
EAST HARTFORD, CONNECTICUT

DRAFTED:	T.T
CHECKED:	A.M.
APPROVED:	N.W.
SCALED:	N.T.S.
PROJECT NO.:	2014-1001
DATE:	02/08/2017

FIG.

FIGURE 5

Freeman Companies, LLC . Y:\2014\2014-1001 ComDot CSO 2232 CME\DWG\Figure 5 - Retaining Walls.dwg Feb 08, 2017-3:49pm Plotted By: tta



NOTES:

1. WALL 101- ASSUMES 2H:1V SLOPE AT TOP OF WALL.
2. APPLIES TO WALLS THAT CAN DEFLECT AT THE TOP AND ASSUMES ACTIVE EARTH PRESSURES.
3. H IS MEASURED IN FEET
4. THE WALL SHOULD BE DRAINED BY PERVIOUS EXPANDED SHALE AGGREGATE (FORM 817 M.02.05) WITH A UNIT WEIGHT OF 65 PCF AND WEEPHOLES THROUGH THE WALL. THEREFORE, HYDROSTATIC PRESSURE IS NOT INCLUDED.
5. THESE PRESSURE DISTRIBUTIONS ASSUME HORIZONTAL BACKFILL BEHIND THE WALL.
6. SLIDING:
COEFFICIENT OF FRICTION BETWEEN FOOTING AND BASE= 0.45 (2012 AASHTO TABLE 3.11.5.3-1) RESISTANCE FACTOR= 1.0 (2012 AASHTO TABLE 10.5.5.2.2.1)
7. IGNORE PASSIVE RESISTANCE IN FRONT OF FOOTING.

APPENDIX A
LOGS OF RECENT TEST BORINGS

Draft

WALL 101 LOGS

Draft

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: R-3
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 827655.47	
Start Date: 4-27-16	Route No.: 91N / Exit 27 Off Ramp	Easting: 1023830.04	
Finish Date: 4-27-16	Bridge No.:	Surface Elevation: 39.3	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: after Not Observed hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt Base Fill	ASPHALT (4") GRAVEL BASE (8") Brown c-f SAND, little c-f gravel, trace silt	
	S1	21	19	20	21	24	18		
5	S2	19	23	21	21	24	15		Brown c-f SAND, little m-f gravel, trace silt
10	S3	15	16	19	17	24	16		Brown c-f SAND, some silt, little m-f gravel
15	S4	11	12	7	9	24	14		Brown c-f SAND, little silt, trace f gravel
20	S5	25	22	35	27	24	14		Brown c-f SAND, little silt, trace f gravel
25									END OF BORING 22ft
30									

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 22ft Rock: 0ft	NOTES:	Sheet 1 of 1
No. of Soil Samples: 5 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: SRW-1
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 827183.63	
Start Date: 4-25-16	Route No.: 91N	Easting: 1024122.62	
Finish Date: 4-26-16	Bridge No.:	Surface Elevation: 46.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @32 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0							Asphalt Fill	45
	S1	43	20	21	16	24	20	45
5	S2	8	12	11	13	24	14	40
10	S3	9	8	9	10	24	10	35
15	S4	9	14	19	17	24	15	30
20	S5	8	10	13	10	24	18	25
25	S6	21	23	13	9	24	19	20
30	S7	23	19	29	33	24	11	15

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 71ft Rock: 0ft	NOTES: Casing to 50'	Sheet 1 of 3
No. of Soil Samples: 14	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: SRW-1
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 827183.63	
Start Date: 4-25-16	Route No.: 91N	Easting: 1024122.62	
Finish Date: 4-26-16	Bridge No.:	Surface Elevation: 46.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @32 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	15	22	37	38	24	12		Fill (cont)	Brown f-c SAND, little c-f gravel, trace silt	10
40	S9	11	18	14	19	24	13				
45	S10	7	4	7	11	24	15			Brown to gray c-f SAND, trace silt	0
50	S11	12	13	11	17	24	12			Brown to gray c-f SAND, trace silt	-5
55	S12	8	10	9	11	24	12			Brown to gray c-f SAND, trace silt	-10
60	S13	7	12	12	13	24	10			Brown to gray c-f SAND, trace silt	-15
65	S14	8	7	18	21	24	12			Gray c-f SAND, trace f gravel, trace silt	-20

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 71ft Rock: 0ft	NOTES: Casing to 50'	Sheet 2 of 3
No. of Soil Samples: 14	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: SRW-1
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 827183.63	
Start Date: 4-25-16	Route No.: 91N	Easting: 1024122.62	
Finish Date: 4-26-16	Bridge No.:	Surface Elevation: 46.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @32 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
70	S15	6	6	11	5	24	7	Alluvium (con't)	Brown to gray c-f SAND, little f gravel	-25
								Lacustrine	Brown SILTY CLAY, trace f sand	
75										-30
80										-35
85										-40
90										-45
95										-50
100										-55

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 71ft Rock: 0ft	NOTES: Casing to 50'	Sheet 3 of 3
No. of Soil Samples: 14	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: P. Labossiere	Connecticut DOT Boring Report		Hole No.: SRW-2
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 827331.14	
Start Date: 4-26-16	Route No.: 91N	Easting: 1023992.37	
Finish Date: 4-27-16	Bridge No.:	Surface Elevation: 44.3	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @27.0 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
0							Asphalt	ASPHALT (12")		
	S1	44	33	22	22	24	18	Fill	Brown c-f SAND, little m-f gravel, little silt	40
5	S2	10	15	28	30	24	16		Brown c-f SAND, trace silt	
10	S3	24	36	41	36	24	8		Brown c-f SAND, little silt, trace f gravel	35
15	S4	15	18	19	27	24	12		Brown c-f SAND, trace f gravel, trace silt	30
20	S5	16	22	18	19	24	14		Brown c-f SAND, trace f gravel, trace silt	25
25	S6	20	50	39	40	24	14	Alluvium	Brown c-f SAND, little m-f gravel, little silt	20
30	S7	35	93	56	64	24	18		Brown c-f SAND, some silt, little c-f gravel	15

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 60ft Rock: 0ft	NOTES: Casing to 30'	Sheet 1 of 2
No. of Soil Samples: 13	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: P. Labossiere	Connecticut DOT Boring Report		Hole No.: SRW-2
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 827331.14	
Start Date: 4-26-16	Route No.: 91N	Easting: 1023992.37	
Finish Date: 4-27-16	Bridge No.:	Surface Elevation: 44.3	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @27.0 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	5	7	7	7	24	20		Alluvium (con't)	Gray f SAND and SILT	10
40	S9	10	14	17	17	24	20		Alluvium	Gray c-f SAND, trace silt	5
45	S10	13	15	18	17	24	12			Gray c-f SAND, trace silt	0
50	S11	8	12	20	21	24	14			Gray c-f SAND, trace silt	-5
55	S12	12	21	32	30	24	14			Gray c-f SAND, trace silt	-10
60	S13	16	24	26	42	24	20			Gray c-f SAND, trace silt	-15
65										END OF BORING 60ft	-20

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 60ft Rock: 0ft	NOTES: Casing to 30'	Sheet 2 of 2
No. of Soil Samples: 13	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: T. Roe	Connecticut DOT Boring Report		Hole No.: SRW-2A
Inspector: G. Jacobsen	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing:	
Start Date: 11-17-16	Route No.: 91N	Easting:	
Finish Date: 11-18-16	Bridge No.: Wall 101	Surface Elevation: 9	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: Fall: in.	Hammer Wt.: 140 Fall: 30in.	

Groundwater Observations: @10.2 after 0.5 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S-1	3	7	9	11	24	14		Fill	Red-brown c-f SAND, little m-f gravel, trace silt	-5
	S-2	9	10	12	11	24	18				
5	S-3	1	1	1	1	24	18		Alluvial	Dark gray SILT, little f sand, wet	-0
	S-4	3	4	3	8	24	16				
15	S-5	1	1	1	6	24	16		Alluvial	Gray SILT and f SAND, with severalo seams of brown peat, slight organic odor	-10
	S-6	5	6	6	10	24	6				
25	S-7	6	4	6	8	24	8		Alluvial	Gray c-f SAND, little f gravel Drove casing to 30 feet, wash contains wood from 25 to 30 feet	-20
30	S-8	6	3	4	4	24	20				

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 50.4ft Rock: 0ft	NOTES: Sample wet at 5 feet (perched water) Roller bit open hole 10 to 25 feet. Advanced 4" casing to 30 feet, and then to 35 feet. Roller bit to 50 feet	Sheet 1 of 2
No. of Soil Samples: 12	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: T. Roe	Connecticut DOT Boring Report		Hole No.: SRW-2A
Inspector: G. Jacobsen	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing:	
Start Date: 11-17-16	Route No.: 91N	Easting:	
Finish Date: 11-18-16	Bridge No.: Wall 101	Surface Elevation: 9	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: Fall: in.	Hammer Wt.: 140 Fall: 30in.	

Groundwater Observations: @10.2 after 0.5 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches			Pen. (in.)				Rec. (in.)	RQD %	
35	S-9	woh	1	1	4	24	24		Glacial Till (cont)	Red brown to tan varved CLAY to SILT and CLAY, varve layers 1/2" to 2" thick (PP=0.25 to 0.5 tsf)	-25
40	S-10		2	5	6	6	24	18		Similar to S9	-30
45	S-11	woh	6	6	10	24	14			45 - 45.4: Red brown to tan varved CLAY to SILT and CLAY, varve layers 1/2" to 2" thick 45.4 to 47: Red brown CLAY, some c-f sand, little m-f gravel Roller bit gravel 47 to 49 feet, hard and steady 49-50 feet	-35
50	S-12	100/5"				5	5			Red-brown c-f SAND, some m-f gravel, little silt, well bonded in-situ	-40
55										END OF BORING 50.4ft	-45
60											-50
65											-55

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 50.4ft Rock: 0ft	NOTES: Sample wet at 5 feet (perched water) Roller bit open hole 10 to 25 feet. Advanced 4" casing to 30 feet, and then to 35 feet. Roller bit to 50 feet	Sheet 2 of 2
No. of Soil Samples: 12	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: P. Labossiere	Connecticut DOT Boring Report		Hole No.: SRW-3
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 827852.89	
Start Date: 4-27-16	Route No.: 91N / Exit 27 Off Ramp	Easting: 1023801.49	
Finish Date: 4-28-16	Bridge No.:	Surface Elevation: 32.9	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @30.0' ATD, @23.0 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
0							Asphalt	ASPHALT (12")		
	S1	26	26	20	24	24	14	Fill	Brown f-c SAND, some silt, little m-f gravel	30
5										
	S2	29	52	28	30	24	12		Brown c-f SAND, some silt, little c-f gravel	25
10										
	S3	30	40	37	29	24	19		Brown c-f SAND, little m-f gravel, little silt	20
15										
	S4	35	25	26	31	24	14		Brown c-f SAND, little c-f gravel, trace silt	15
20										
	S5	23	48	29	22	24	12		Brown c-f SAND, little m-f gravel, trace silt	10
25										
	S6	31	20	18	12	24	12		Brown c-f SAND, little m-f gravel, trace silt	5
30								Alluvium		
	S7	4	4	10	17	24	18		Gray c-f SAND, trace silt	0

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 50ft Rock: 0ft	NOTES: Casing to 30'	Sheet 1 of 2
No. of Soil Samples: 11	No. of Core Runs: 0	SM-001-M REV. 1/02

WALL 103 LOGS

Draft

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: SRW-5
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 831417.51	
Start Date: 5-1-16	Route No.: 91N	Easting: 1023885.01	
Finish Date: 5-1-16	Bridge No.:	Surface Elevation: 21.3	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @19.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt		
	S1	38	42	33	31	24	18		20
								Fill	
								ASPHALT (11")	
								Brown c-f SAND, little c-f gravel, trace silt	
5	S2	14	22	25	24	24	15		15
								Brown c-f SAND, little silt, trace f gravel	
10	S3	26	48	31	31	24	1		10
								Brown c-f SAND, some silt, little f-c gravel, pushed gravel	
15	S4	13	7	7	10	24	13		5
								Brown c-f SAND, little silt, trace m-f gravel	
								Alluvium	
20	S5	3	3	2	3	24	1		0
								Brown SILT, some f sand, trace f gravel, pushed gravel	
25	S6	3	3	8	6	24	0		-5
								No Recovery 3" sampler was pushed from 26' to 28', Brown to gray f SAND, some m-f gravel, trace silt, 4" seam of gray sandy silt	
30	S7	9	7	7	13	24	12		-10
								Gray c-f SAND, trace silt	
								END OF BORING 31ft	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 31ft Rock: 0ft	NOTES: Casing to 15'	Sheet 1 of 1
No. of Soil Samples: 7	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: SRW-6
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 831747.52	
Start Date: 5-1-16	Route No.: 91N	Easting: 1024030.84	
Finish Date: 5-1-16	Bridge No.:	Surface Elevation: 31.4	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @24.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt	30	
	S1	65	54	43	71	24	18		Base
									Fill
5	S2	39	28	28	34	24	21	Brown c-f SAND, some m-f gravel, some silt	25
10	S3	38	55	69	77	24	22	Brown c-f SAND, some m-f gravel, some silt	20
15	S4	16	36	59	51	24	15	Brown c-f SAND, little m-f gravel, trace silt	15
20	S5	35	20	12	10	24	12	Brown to gray c-f SAND, some silt, little m-f gravel, trace glass	10
25	S6	5	10	12	13	24	18	Alluvium Gray f SAND and SILT	5
30	S7	2	2	2	2	24	23	Gray f SAND and SILT	0

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 41ft Rock: 0ft	NOTES: Casing to 15'	Sheet 1 of 2
No. of Soil Samples: 9	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: SRW-6
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 831747.52	
Start Date: 5-1-16	Route No.: 91N	Easting: 1024030.84	
Finish Date: 5-1-16	Bridge No.:	Surface Elevation: 31.4	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @24.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	9	7	8	11	24	10		Alluvium	Gray c-f SAND, trace silt	-5
40	S9	9	9	12	10	24	12			Gray c-f SAND, trace silt	
										END OF BORING 40ft	-10
45											-15
50											-20
55											-25
60											-30
65											-35

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 41ft Rock: 0ft	NOTES: Casing to 15'	Sheet 2 of 2
No. of Soil Samples: 9	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: R-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 831907.9	
Start Date: 5-22-16	Route No.: 91N	Easting: 1024110.41	
Finish Date: 5-23-16	Bridge No.:	Surface Elevation: 35.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @36.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt Concrete Fill	35	
	S1	58 100/3"				9	6		CONCRETE (8") Brown to tan c-f SAND, some c-f gravel, little silt
5									
	S2	29 100/4"				10	7		Brown c-f SAND, and c-f gravel, little silt
10									
	S3	34	48	44	58	24	22		Brown c-f SAND, some silt, little m-f gravel
15									
	S4	27	26	44	41	24	20		Brown c-f SAND, little m-f gravel, little silt
20									
	S5	28	46	74	100/3"	21	18		Brown c-f SAND, some silt, little m-f gravel Brown c-f SAND, trace m-f gravel, trace silt
25									
	S6	11	7	10	7	24	8	Fill	Gray SILT, little organic silt, trace f sand
30								Fill	
	S7	21	24	21	19	24	18		Gray f SAND and SILT

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 44ft Rock: 0ft	NOTES: Casing to 5 feet, open hole mud drilling	Sheet 1 of 2
No. of Soil Samples: 10	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: R-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 831907.9	
Start Date: 5-22-16	Route No.: 91N	Easting: 1024110.41	
Finish Date: 5-23-16	Bridge No.:	Surface Elevation: 35.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @36.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	7	8	5	6	24	18		Fill (<i>con't</i>) Alluvium	Gray f SAND, and silt	0
40	S9	10	10	10	13	24	10			Gray c-f SAND, trace silt	-5
	S10	20	23	28	27	24	14			Gray c-f SAND, trace silt	
45										END OF BORING 44ft	-10
50											-15
55											-20
60											-25
65											-30

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 44ft Rock: 0ft	NOTES: Casing to 5 feet, open hole mud drilling	Sheet 2 of 2
No. of Soil Samples: 10	No. of Core Runs: 0	SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: RW-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 831953.55	
Start Date: 6-14-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024026.67	
Finish Date: 6-14-16	Bridge No.:	Surface Elevation: 14.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations:

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	4	11	20	27	24	17		Topsoil Fill	TOPSOIL (6") Brown c-f SAND, little m-f gravel, little silt	0
5	S2	9	10	11	12	24	16			Brown c-f SAND, some silt, little f gravel	5
10	S3	5	4	4	5	24	7			Brown c-f SAND, some silt, little f gravel	10
15	S4	5	5	7	6	24	12		Alluvium	Brown c-f SAND, little silt	15
20	S5	5	5	6	9	24	12			Brown c-f SAND, little silt	20
25	S6	6	7	10	10	24	12			Brown c-f SAND, little silt	25
30	S7	4	3	4	10	24	10			Brown c-f SAND, little silt	30

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 37ft Rock: 0ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 8 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: RW-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 831953.55	
Start Date: 6-14-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024026.67	
Finish Date: 6-14-16	Bridge No.:	Surface Elevation: 14.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations:

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	25	12	23	20	24	17		Alluvium (con't)	Brown c-f SAND, some silt, little c-f gravel, with weathered rock	-20
40										END OF BORING 37ft	-25
45											-30
50											-35
55											-40
60											-45
65											-50

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 37ft Rock: 0ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 8 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: RW-2
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832134.85	
Start Date: 5-24-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024092.44	
Finish Date: 5-25-16	Bridge No.:	Surface Elevation: 15.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @9.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	4	9	12	17	24	17		Topsoil Fill	TOPSOIL (4") Brown c-f SAND, little m-f gravel, little silt	15
5	S2	8	12	11	11	24	11			Brown c-f SAND, some silt, little m-f gravel	10
10	S3	1	2	3	1	24	7		Alluvium	Gray f SAND and SILT	5
15	S4	5	5	5	6	24	3			Brown c-f SAND, little silt	0
20	S5	9	11	8	12	24	9			Brown to gray c-f SAND, some m-f gravel, trace silt	-5
25	S6	1	4	8	12	24	13			Gray c-f SAND, little m-f gravel, trace silt	-10
30	S7	2	4	4	9	24	12			Gray f SAND, trace m-f gravel, trace silt	-15

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 45ft Rock: 10ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 10 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: RW-2
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832134.85	
Start Date: 5-24-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024092.44	
Finish Date: 5-25-16	Bridge No.:	Surface Elevation: 15.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @9.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	3	1	2	4	24	24		-20		
	UD-1					30	30				
40	S9	WOH	4	4	5	24	24		-25		
45								Weathered Rock	WEATHERED BEDROCK		
	C-1					60	12	0	Bedrock	Brown ARKOSE, moderately weathered, extremely weak, highly fractured (3-3-4-3-4)	-30
50	C-2					60	50	10		Brown ARKOSE, moderately weathered, extremely weak, highly fractured, (4-3-3-4-3)	-35
55										END OF BORING 55ft	-40
60											-45
65											-50

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 45ft Rock: 10ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 10 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-3
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832268.29	
Start Date: 5-24-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024166.88	
Finish Date: 5-25-16	Bridge No.:	Surface Elevation: 15.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @9' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	6	18	31	36	24	16		Topsoil Fill	TOPSOIL (4") Brown c-f SAND, little c-f gravel, little silt	15
5	S2	5	6	19	19	24	12			Brown c-f SAND, little m-f gravel, little silt	10
10	S3	3	2	4	3	24	16		Alluvium	Gray f SAND and SILT	5
15	S4	5	5	6	8	24	16			Brown c-f SAND, trace f gravel, trace silt	0
20	S5	5	6	7	5	24	10			Brown to gray c-f SAND, trace silt	-5
25	S6	5	4	7	7	24	10			Gray f SAND, trace silt	-10
30	S7	4	5	5	10	24	14			Gray f SAND, trace silt	-15

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 50ft Rock: 10ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 10 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-3
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832268.29	
Start Date: 5-24-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024166.88	
Finish Date: 5-25-16	Bridge No.:	Surface Elevation: 15.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @9' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches		Pen. (in.)	Rec. (in.)				RQD %		
35	S8	6	7	6	12	24	12		Alluvium (con't)	Gray to brown c-f SAND, trace f gravel, trace silt	-20
40	S9	WORWOH	2	1		24	24		Lacustrine	Brown SILTY CLAY	-25
45	S10	WORWOH	2	5		24	24			Brown SILTY CLAY Brown CLAYEY SILT (change observed in last 6-inches of sample)	-30
50									Glacial Till	Rough drilling and higher casing blow count	
55	C-1					60	8	0	Bedrock	Brown ARKOSE, highly weathered, highly fractured, medium strong, (3-4-4-3-4)	-35
60	C-2					60	46	0		Brown ARKOSE, medium banded, highly fractured, medium strong, little sand embedded (4-5-5-6-4)	-40
65										END OF BORING 60ft	-45
											-50

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 50ft Rock: 10ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 10 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-3A
Inspector: N. Whetten	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 831812.39	
Start Date: 6-14-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1023957.88	
Finish Date: 6-14-16	Bridge No.:	Surface Elevation: 14.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size:	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations:

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)					
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %		
0	S1	5	31	45	56	24	18		Fill	Brown c-f SAND, some silt, little c-f gravel	10		
5	S2	17	18	16	16	24	15						
10	S3	4	2	5	5	24	12		Alluvium	Gray SILT, trace f sand	5		
15	S4	0	1	1	1	24	24						
20	S5	6	9	8	8	24	12					Gray SILT	0
25	S6	5	5	7	9	24	16						
30	S7	8	6	7	7	24	11					Gray c-f SAND, trace silt	-5
												Gray c-f SAND, trace silt	-10
									Gray c-f SAND, trace silt	-15			

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 38ft Rock: 2ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 8 No. of Core Runs: 0		

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-3A
Inspector: N. Whetten	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 831812.39	
Start Date: 6-14-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1023957.88	
Finish Date: 6-14-16	Bridge No.:	Surface Elevation: 14.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size:	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations:

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	22	34	38	48	24	16		Glacial Till (con't)	Red brown c-f SAND, some silt, little to some c-f gravel, Weathered bedrock in tip	-20
40									Weathered Rock		WEATHERED BEDROCK
45											-30
50										END OF BORING 40ft	-35
55											-40
60											-45
65											-50

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 38ft Rock: 2ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 8 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-4
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832154.3	
Start Date: 5-25-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024175.77	
Finish Date: 5-25-16	Bridge No.:	Surface Elevation: 25.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	5	14	13	14	24	20		Topsoil Fill	TOPSOIL (6") Brown c-f SAND, trace m-f gravel, trace silt	25
5	S2	10	11	14	17	24	10			Brown c-f SAND, little m-f gravel, trace silt	20
10	S3	3	3	2	2	24	14		Alluvium	Gray SILT, little f sand	15
15	S4	7	6	5	7	24	10			Gray f SAND, trace silt	10
20	S5	10	7	6	7	24	10			Gray f SAND, trace silt	5
25	S6	5	5	8	7	24	14			Gray f SAND, trace silt	0
30	S7	5	4	3	3	24	12			Gray c-f SAND, trace f gravel, trace silt	-5

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 50ft Rock: 10ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 10 No. of Core Runs: 1		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-4
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832154.3	
Start Date: 5-25-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024175.77	
Finish Date: 5-25-16	Bridge No.:	Surface Elevation: 25.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	12	4	5	5	24	6		Alluvium (con't) Lacustrine	Gray c-f SAND, little f gravel, trace silt Brown CLAYEY SILT	-10
40	S9	WOH	3	6	6	24	4		Glacial Till	Brown CLAYEY SILT Brown SILTY CLAY, little m-f gravel	-15
45	S10	13	40	59	100	24				Brown c-f SAND, some m-f gravel, some silt, trace clay	-20
50									Weathered Rock	WEATHERED BEDROCK	
55	C-1					60	19	31	Bedrock	Brown ARKOSE, moderately fractured, medium strong, (3-4-4-3-4)	-25
60	C-2					60	38	37		Brown ARKOSE, moderately fractured, medium strong, (3-3-3-4-4)	-30
65										END OF BORING 60ft	-35
											-40

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 50ft Rock: 10ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 10 No. of Core Runs: 1		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-5
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832344.84	
Start Date: 5-11-16	Route No.: 15SB	Easting: 1024258.28	
Finish Date: 5-11-16	Bridge No.:	Surface Elevation: 13.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @7.8 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	4	11	14	7	24	18		Topsoil Fill	TOPSOIL (6") Brown c-f SAND, little c-f gravel, trace silt, trace organics	10
5	S2	2	1	1	2	24	12			Brown c-f SAND, little silt, little c-f gravel, trace wood and glass	5
10	S3	WOH/18"3	0	3		24	16			Brown to gray f SAND and SILT	0
15	S4		5	6	8	4	24	10	Alluvium	Brown to gray c-f SAND, trace silt	-5
20	S5		5	5	8	8	24	12		Gray c-f SAND, trace silt	-10
25	S6		3	3	7	7	24	14		Gray f SAND, trace silt	-15
30	S7		4	5	8	13	24	12		Gray c SAND, trace f gravel, trace silt	-20
									Lacustrine		

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 50ft Rock: 10ft	NOTES: Casing to 15'	Sheet 1 of 2
No. of Soil Samples: 13	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-5
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832344.84	
Start Date: 5-11-16	Route No.: 15SB	Easting: 1024258.28	
Finish Date: 5-11-16	Bridge No.:	Surface Elevation: 13.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @7.8 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)											
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %								
35	S8	7	2	3	4	24	24												
	UD-1					30	30												-25
40	UD-2					30	18												
	S8	2	3	5	5	24	24												-30
45	UD-3					30	30												
	S10	4	12	24	100/5"	23	16												-35
50	C-1					60	34	15											-40
55	C-2					60	58	15											-45
60																			-50
65																			

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 50ft Rock: 10ft	NOTES: Casing to 15'	Sheet 2 of 2
No. of Soil Samples: 13	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S1-1
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832451.18	
Start Date: 5-23-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024244.72	
Finish Date: 5-24-16	Bridge No.:	Surface Elevation: 16.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	10	31	44	56	24	16		Topsoil Fill	TOPSOIL (4") Brown c-f SAND, little m-f gravel, little silt	15
5	S2	11	16	25	26	24	12			Brown c-f SAND, little m-f gravel, trace silt	10
10	S3	3	3	3	5	24	18		Alluvium	Gray SILT, trace f sand	5
15	S4	1	1	1	2	24	22			Gray f SAND, some silt Gray f SAND, little silt	0
20	S5	7	5	4	7	24	12			Gray c-f SAND, trace silt	-5
25	S6	3	4	9	9	24	10			Gray c-f SAND, trace f gravel	-10
30	S7	4	4	8	11	24	16			Gray c-f SAND, trace silt	-15

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 55ft Rock: 10ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 13 No. of Core Runs: 3		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S1-1
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832451.18	
Start Date: 5-23-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024244.72	
Finish Date: 5-24-16	Bridge No.:	Surface Elevation: 16.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	4	7	10	15	24	10		Alluvium (con't)	Gray c-f SAND, trace f gravel, trace silt	-20
40	S9	wor	wor	2	2	24	24		Lacustrine	Brown SILTY CLAY	-25
	UP-1					30	30				
45	S10	wor	woh	3	5	24	24			Brown SILTY CLAY	-30
	UP-2					30	12				
50	S11	15	11	15	100/3"	21	10		Glacial Till	No recovery in tube at bottom 6", tip of tube bent indicating glacial till Brown c-f SAND, some silt, little c-f gravel	-35
									Weathered Rock	WEATHERED BEDROCK	
55	C-1					60	36	0	Bedrock	Brown ARKOSE, highly fractured, medium strong	-40
60	C-2					24	24	0		Brown ARKOSE, highly fractured, medium strong	-45
	C-3					36	36	0		Brown SANDSTONE, thickly banded, highly fractured, medium strong	
65										END OF BORING 65ft	-50

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 55ft Rock: 10ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 13 No. of Core Runs: 3		SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: S1-2
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832436.06	
Start Date: 5-10-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024305.33	
Finish Date: 5-10-16	Bridge No.:	Surface Elevation: 14.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @9.0' ATD, @7.1 (24 hrs)

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	5	25	32	28	24	22		Topsoil Fill	TOPSOIL (5") Brown c-f SAND, some c-f gravel, little silt	
5	S2	8	8	15	14	24	14			Brown c-f SAND, little silt, trace m-f gravel	10
10	S3	6	3	3	4	24	0			Brown to olive SILT, little f SAND, trace f gravel, 12" recovery on second attempt using a 3" spoon	5
15	S4	9	8	7	7	24	15		Alluvium	Brown to gray c SAND, trace silt	0
20	S5	7	6	5	6	24	11			Gray c-f SAND, trace silt	-5
25	S6	9	10	9	8	24	12			Gray c-f SAND, trace silt	-10
30	S7	7	6	8	13	24	8			Gray c-f SAND, trace m-f gravel, trace silt	-15

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 53ft Rock: 11ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 11 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: S1-2
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 832436.06	
Start Date: 5-10-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024305.33	
Finish Date: 5-10-16	Bridge No.:	Surface Elevation: 14.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @9.0' ATD, @7.1 (24 hrs)

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	16	15	11	14	24	7		Alluvium (con't)	Gray c-f SAND, trace silt	-20
40	S9	woh	woh	woh	4	24	24		Lacustrine	Brown SILTY CLAY	-25
45	S10	3	4	4	4	24	24			Brown SILTY CLAY	-30
50	S11	5	5	5	10	24	2			Brown CLAYEY SILT, trace f gravel Brown CLAYEY SILT, little f gravel (change in stratum at bottom 6 inches of spoon)	-35
55	C-1					60	38	0	Glacial Till		-40
60	C-2					60	48	27	Weathered Rock Bedrock	Brown SANDY ARKOSE, highly fractured, 2" recovery with 1" being arkose and the other similar to sandstone, strong	-45
65										END OF BORING 64ft	-50

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 53ft Rock: 11ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 11 No. of Core Runs: 2		SM-001-M REV. 1/02



Freeman Companies

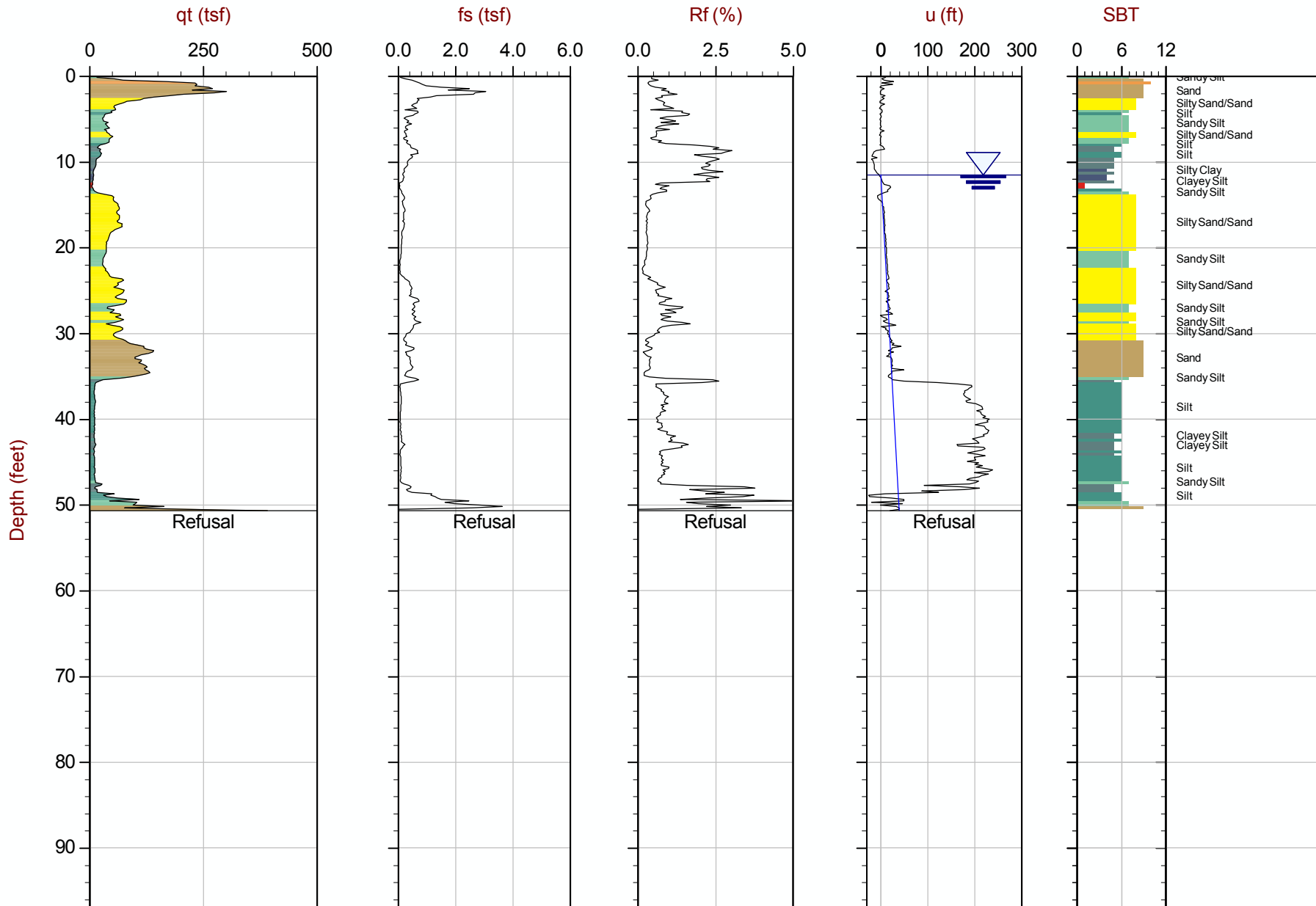
Job No: 16-53057

Date: 06:13:16 03:02

Site: I-91 Interchange 29, Hartford, CT

Sounding: CPT16-RW-5

Cone: 419:T1500F15U500



Max Depth: 15.450 m / 50.69 ft
Depth Inc: 0.050 m / 0.164 ft

File: 16-53057_CPRW-5.DRF

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 18 N: 4624151m E: 694479m

— Hydrostatic Line ● Ueq ● Assumed Ueq ◁ PPD, Ueq achieved ◁ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

WALL 104 LOGS

Draft

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: S1-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833258.98	
Start Date: 5-2-16	Route No.: 15 SB	Easting: 1024586.35	
Finish Date: 5-5-16	Bridge No.:	Surface Elevation: 37.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 3-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @18.5 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0						Asphalt	ASPHALT (12")	35	
	S1	31	38	55	51	24	16		Base
									Fill
5	S2	38	48	81	99	24	10	Brown c-f SAND, some c-f gravel, little silt	30
10	S3	120/5"				5	4	Brown c-f SAND, some c-f gravel, little silt	25
15	S4	37	41	55	53	24	8	Brown m-f GRAVEL, little c-f sand, trace silt	20
20	S5	12 120/3"				9	4	Brown c-f SAND and m-f GRAVEL, trace silt Casing encountered obstruction at 20.5'. Difficult to advance.	15
25	S6	7	21	27	21	24	7	Brown c-f SAND, little c-f gravel, trace silt	10
								Alluvium	
30	S7	6	5	5	9	24	14	Gray f SAND, little silt	5

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 84.5ft Rock: 5ft	NOTES: Core barrel jammed up three different attempts. Water would not flow out of the core barrel bottom preventing further coring. Boring Terminated at 89.5 feet.	Sheet 1 of 3
No. of Soil Samples: 20	No. of Core Runs: 1	SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: S1-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833258.98	
Start Date: 5-2-16	Route No.: 15 SB	Easting: 1024586.35	
Finish Date: 5-5-16	Bridge No.:	Surface Elevation: 37.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 3-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @18.5 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)				
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %	
35	S8	6	6	5	6	24	15		Alluvium (con't)	Gray f SAND, trace silt	0	
40	S9	6	7	11	11	24	18				Brown to gray c-f SAND, trace silt	-5
45	S10	6	9	12	12	24	12		Lacustrine	Brown to gray c-f SAND, trace silt	-10	
50	S11	10	10	10	10	24	8				Gray c-f SAND, trace silt	-15
55	S12	10	7	12	13	24	8		Lacustrine	Brown SILTY CLAY	-20	
60	S13	3	3	3	4	24	8				Brown SILTY CLAY (TV = 0.2 tsf, PP = 0.25 tsf)	-25
	UP-1					30	30					Brown SILTY CLAY
65	S13	woh	woh	woh	4	24	24				Brown SILTY CLAY	
	UP-2					30	30		Brown SILTY CLAY (TV = 0.275 tsf, PP = 0.5 tsf)			

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 84.5ft Rock: 5ft	NOTES: Core barrel jammed up three different attempts. Water would not flow out of the core barrel bottom preventing further coring. Boring Terminated at 89.5 feet.	Sheet 2 of 3 SM-001-M REV. 1/02
No. of Soil Samples: 20 No. of Core Runs: 1		

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: S1-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833258.98	
Start Date: 5-2-16	Route No.: 15 SB	Easting: 1024586.35	
Finish Date: 5-5-16	Bridge No.:	Surface Elevation: 37.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 3-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @18.5 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
70	UP-3					30	30		Lacustrine (con't)	Brown SILTY CLAY (TV = 0.3 tsf, PP = 0.75 tsf)	-35
75	S14	14	17	21	16	24	5		Glacial Till	Brown c-f SAND, some c-f gravel, some silt	-40
80	S15	51	32	24	31	24	21			Brown c-f SAND, some silt, little m-f gravel	-45
85	S16	120/0"				6	4		Bedrock	Brown c-f SAND, some c-f gravel, little silt	-50
	C-1					60	46	25		Brown ARKOSE, moderately weathered, moderately fractured, medium strong	-55
90										END OF BORING 89.5ft	-60
95											
100											

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 84.5ft Rock: 5ft	NOTES: Core barrel jammed up three different attempts. Water would not flow out of the core barrel bottom preventing further coring. Boring Terminated at 89.5 feet.	Sheet 3 of 3
No. of Soil Samples: 20	No. of Core Runs: 1	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S1-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833238.29	
Start Date: 5-16-16	Route No.: 15 NB	Easting: 1024644.04	
Finish Date: 5-17-16	Bridge No.:	Surface Elevation: 40.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @19.0 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
0							Asphalt	40		
	S1	57	85	109	25	24	18		Base	GRAVEL BASE (12")
									Fill	Brown c-f SAND, little c-f gravel, little silt
5	S2	17	18	20	16	24	18			Brown c-f SAND, some m-f gravel, little silt Wood observed in wash water
10	S3	20	29	27	29	24	16			Brown c-f SAND, little m-f gravel, little silt
15	S4	24	24	22	22	24	12			Brown to gray c-f SAND, little f gravel, little silt 1' void from 17' to 18'
20	S5	13	15	25	28	24	18		Fill	Brown c-f SAND, some f gravel, little silt Gray f SAND, some silt
25	S6	14	19	22	18	24	14			Gray f SAND, some silt, trace wood
30	S7	wor	woh	5	5	24	22		Alluvium	Brown to gray f SAND and SILT

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80.5ft Rock: 14.5ft	NOTES:	Sheet 1 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller:	P. Labossier	Connecticut DOT Boring Report		Hole No.:	S1-12
Inspector:	T. Ta	Town:	Hartford	Stat./Offset:	
Engineer:	N. Whetten	Project No.:	DOT Project No. 63-703	Northing:	833238.29
Start Date:	5-16-16	Route No.:	15 NB	Easting:	1024644.04
Finish Date:	5-17-16	Bridge No.:		Surface Elevation:	40.7

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type:	4-in. Casing	Sampler Type/Size:	1-3/4 inch ID	Core Barrel Type:	NX
Hammer Wt.:	300lb	Fall:	30in.	Hammer Wt.:	140lb
		Fall:	30in.		

Groundwater Observations: @19.0 after 24 hours

Depth (ft)	Sample Type/No.	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
		Blows on Sampler per 6 inches				Pen. (in.)			
35	S8	5	2	2	6	24		Alluvium (con't) Brown to gray f SAND and SILT	-5
40	S9	8	15	15	19	24	16	Alluvium Gray f SAND and SILT Gray c SAND, trace silt	0
45	S10	8	6	9	11	24	10	Gray c-f SAND, trace silt	-5
50	S11	10	18	18	17	24	12	Gray f SAND, trace silt, 4" seam of orange coarse sand	-10
55	S12	7	5	7	8	24	4	Lacustrine Brown c-f SAND and m-f GRAVEL, gravel from wash pushed down on clay layer	-15
60	S13	wor	wor	woh	0	24	24	Brown SILTY CLAY	-20
65	S14	wor	wor	woh	3	24	24	Brown SILTY CLAY	-25

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80.5ft Rock: 14.5ft	NOTES:	Sheet 2 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S1-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833238.29	
Start Date: 5-16-16	Route No.: 15 NB	Easting: 1024644.04	
Finish Date: 5-17-16	Bridge No.:	Surface Elevation: 40.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @19.0 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches		Pen. (in.)	Rec. (in.)				RQD %
70	S15	wor woh	4 4	24	24	Lacustrine (con't)	Brown SILTY CLAY	-30	
75	S16	15 11 13 35		24	4	Glacial Till	Brown c-f SAND and SILT, little m-f gravel	-35	
80	S17	66 100/2"		8	4	Weathered Rock	Brown c-f SAND, some m-f gravel, little silt, trace rock fragments	-40	
85	C-1			60	58	50	Bedrock	Brown ARKOSE, Moderately weathered, moderately fractured, medium strong	-45
90	C-2			60	48	60		Brown ARKOSE, moderately weathered, slightly fractured, medium strong	-50
95								END OF BORING 95ft	-55
100									-60

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80.5ft Rock: 14.5ft	NOTES:	Sheet 3 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-7
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833419.83	
Start Date: 5-2-16	Route No.: 15SB	Easting: 1024653.74	
Finish Date: 5-3-16	Bridge No.:	Surface Elevation: 43.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @13.8 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
0						Asphalt	ASPHALT (12")			
	S1	78	98	100/5"	17	12	Base	GRAVEL BASE (12")	40	
							Fill	Brown c-f SAND, some m-f gravel, some silt		
5	S2	46	45	53 65	24	16		Brown c-f SAND and SILT, trace c-f gravel	35	
10	S3	100/5"				5	5		Brown c-f SAND and c-f GRAVEL, some silt (very dense, no grinding)	30
15	S4	56	100/4"		10	8		Brown c-f SAND, some m-f gravel, some silt (very dense, no grinding)	25	
20	S5	100/5"				5	5		Brown c-f SAND, some m-f gravel, some silt (very dense, no grinding)	20
25	S6	72	63	100/2"	14	10		Brown c-f SAND, some c-f gravel, little silt, 1" layer of asphalt at tip of spoon Possible previous road	15	
30	S7	6	6	6 6	24	20		Gray SILT, trace f sand, trace wood	10	
							Alluvium			

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 87ft Rock: 7.5ft	NOTES: Pump on drill rig broke, used portable pump	Sheet 1 of 3
No. of Soil Samples: 18	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-7
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833419.83	
Start Date: 5-2-16	Route No.: 15SB	Easting: 1024653.74	
Finish Date: 5-3-16	Bridge No.:	Surface Elevation: 43.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @13.8 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
35	S8	6	5	6	7	24	11		
40	S9	4	1	2	4	24	20		
45	S10	7	7	14	14	24	12		
50	S11	8	9	12	12	24	12		
55	S12	12	15	20	18	24	12		
60	S13	14	20	9	6	24	14		
65	S14	wor	woh/12" 3			24	24		

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 87ft Rock: 7.5ft	NOTES: Pump on drill rig broke, used portable pump	Sheet 2 of 3
No. of Soil Samples: 18 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-7
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833419.83	
Start Date: 5-2-16	Route No.: 15SB	Easting: 1024653.74	
Finish Date: 5-3-16	Bridge No.:	Surface Elevation: 43.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @13.8 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches		Pen. (in.)	Rec. (in.)				RQD %	
70	S15	wor/12"	2	5	24	24	Lacustrine (con't) Brown to gray SILTY CLAY, 3" varves of gray silt	-25		
75	S16	wor	1/12"	2	24	24		Brown SILTY CLAY, 0.5" varves of gray clayey silt	-30	
80	S17	wor	2	4	3	24	24	Brown CLAYEY SILT	-35	
85	S18	31	73	95	100	24	14	Glacial Till Brown SILT, some f-c gravel, trace f gravel	-40	
90	C-1					48	48	0	Weathered Rock Bedrock Brown Arkose, severely weathered, medium strong	-45
95	C-2					30	30	0	Brown Arkose, moderately weathered, medium strong	-50
100									END OF BORING 94.5ft	-55

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 87ft Rock: 7.5ft	NOTES: Pump on drill rig broke, used portable pump	Sheet 3 of 3
No. of Soil Samples: 18 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-8
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833377.29	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024758.88	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @14.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Topsoil	TOPSOIL (8")	
	S1	2	8	14	20	24	24	Brown c-f SAND, little c-f gravel, little silt	25
5									
	S2	12	14	18	29	24	19	Brown c-f SAND, some silt, little c-f gravel	20
10									
	S3	39	29	30	30	24	16	Brown to gray c-f SAND, some c-f gravel, little silt	15
15									
	S4	11	21	19	25	24	19	Brown f SAND, little m-f gravel, little silt	10
20								Brown to gray f SAND, some silt	5
	S5	5	6	8	9	24	11	Brown to gray f SAND, little silt	0
25									
	S6	3	1	5	2	24	20	Brown to gray f SAND, little silt	-5
30									
	S7	5	8	10	17	24	16	Gray c-f SAND, trace silt	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80ft Rock: 10ft	NOTES:	Sheet 1 of 3
No. of Soil Samples: 16 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-8
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833377.29	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024758.88	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @14.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	5	5	7	9	24	9		Alluvium (con't)	Gray c-f SAND, trace silt	-10
40	S9	12	11	15	10	24	5				
45	S10	25	5	8	6	24	19		Lacustrine	Brown SILTY CLAY	-20
50	S11	woh/18"		3		24	24			Brown SILTY CLAY	-25
55	S12	woh/12"		2	4	24	24			Brown SILTY CLAY	-30
60	S13	wowoh/12"		4		24	24			Brown SILTY CLAY	-35
65	S14	1/12"		3	4	24	24			Brown SILTY CLAY	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80ft Rock: 10ft	NOTES:	Sheet 2 of 3
No. of Soil Samples: 16 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-8
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833377.29	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024758.88	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @14.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
70	S15	1	2	3	4	24	24		Lacustrine (con't)	Brown SILTY CLAY, trace f sand	-40
75	S16	30	17	17	14	24	9		Glacial Till	Brown c-f SAND, some silt, little m-f gravel	-45
80									Weathered Rock	WEATHERED BEDROCK	-50
85	C-1					60	28	0	Bedrock	Brown ARKOSE, highly fractured, weak, (4-5-4-3-5)	-55
90	C-2					60	52	10		Brown ARKOSE, highly fractured, weak, Small sections in core run appear to be highly weathered (4-4-5-4-4)	-60
95										END OF BORING 90ft	-65
100											-70

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80ft Rock: 10ft	NOTES:	Sheet 3 of 3
No. of Soil Samples: 16 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: RW-9
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833480.56	
Start Date: 5-17-16	Route No.: 15 NB	Easting: 1024741.36	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 52.0	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @39.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
0							Asphalt	50		
							Base			
	S1	49	55	71	33	24	11		Fill	
5	S2	15	14	17	16	24	15		45	
10	S3	5	6	5	4	24	6		40	
15	S4	12	8	12	24	24	12		35	
20	S5	17	21	24	25	24	16		30	
25	S6	14	9	8	9	24	8		25	
30	S7	21	12	13	11	24	8		20	
35	S8	100/0"				0	0			15

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 95ft Rock: 13ft	NOTES: Core barrel jammed causing rig to spark and lose power. Unable to continue, boring terminated at 103'.	Sheet 1 of 3
No. of Soil Samples: 22 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: RW-9
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833480.56	
Start Date: 5-17-16	Route No.: 15 NB	Easting: 1024741.36	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 52.0	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @39.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
40	S9	48	17	11	11	24	8		15
								Fill (cont)	End of obstruction at 38'
								Alluvium	Gray to olive f SAND and SILT
45	S10	11	3	3	2	24	12		10
									Olive f SAND, some silt
50	S11	5	7	8	10	18	12		5
									Gray f SAND, little silt
55	S12	11	12	16	17	24	12		0
									Gray f SAND, trace silt
60	S13	11	15	17	21	24	0		-5
									No recovery, wash color was still gray
65	S14	2	2	1	2	24	18		-10
									Gray c-f SAND, trace f gravel, trace silt
	UD-1					30	28	Lacustrine	Brown SILTY CLAY
70	UD-2					30	30		-15
									-20

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 95ft Rock: 13ft	NOTES: Core barrel jammed causing rig to spark and lose power. Unable to continue, boring terminated at 103'.	Sheet 2 of 3
No. of Soil Samples: 22 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: RW-9
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833480.56	
Start Date: 5-17-16	Route No.: 15 NB	Easting: 1024741.36	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 52.0	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @39.0' ATD

Depth (ft)	SAMPLES						Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches			Pen. (in.)	Rec. (in.)				RQD %
75	S15	2	2	4	4	24	24	Lacustrine (con't)	Brown SILTY CLAY	
	UD-3					30	30			-25
80	S16	wor/18"	0	0	4	24	24		Brown SILTY CLAY	-30
85	S17	wor/24"	0	0	0	24	24		Brown SILTY CLAY	-35
90	S18	wor	3	4	3	24	24		Brown SILTY CLAY	-40
95								Weathered Rock	Slower drilling WEATHERED BEDROCK	
	S19	100/0"				0	0	10	No Recovery	-45
100	C-1					48	30	10	Brown ARKOSE, moderately fractured, medium strong, (9-7-7-6)	
	C-2					23.09	7	25	Brown ARKOSE, moderately fractured, medium strong, Some sand in bedrock, (5-5)	-50
105									END OF BORING 103ft	-55
110										

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 95ft Rock: 13ft	NOTES: Core barrel jammed causing rig to spark and lose power. Unable to continue, boring terminated at 103'.	Sheet 3 of 3
No. of Soil Samples: 22	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: RW-10
Inspector: N. Whetten	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833534.01	
Start Date: 6-6-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024815.83	
Finish Date: 6-8-16	Bridge No.:	Surface Elevation: 36.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	3	7	21	25	24	18		Topsoil Fill	TOPSOIL (8") Brown c-f SAND, little m-f gravel, little silt	35
5	S2	15	15	10	15	24	19			Brown c-f SAND, some silt, little m-f gravel	30
10	S3	14	25	100/1"		13	5			Brown f SAND, trace silt	25
15	S4	3	5	8	12	24	14		Alluvium	Gray f SAND, some silt Gray c-f SAND, trace silt	20
20	S5	5	8	9	8	24	18			Gray f SAND, some silt	15
25	S6	2	3	4	4	24	21			Brown to gray SILT and f SAND	10
30	S7	2	3	3	5	24	20			Gray f SAND, little silt	5

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 83.9ft Rock: 11.1ft	NOTES:	Sheet 1 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: RW-10
Inspector: N. Whetten	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833534.01	
Start Date: 6-6-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024815.83	
Finish Date: 6-8-16	Bridge No.:	Surface Elevation: 36.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	12	14	10	14	24	16		Alluvium (cont)	Brown to gray c-f SAND, trace silt	0
40	S9	3	9	97	100/1"	19	10			Gray c-f SAND, little c-f gravel, trace silt	-5
45	S10	6	28	66	9	24	12			Gray c-f SAND, some m gravel, trace silt	-10
50	S11	1	1	1	4	24	24		Lacustrine	Brown SILTY CLAY	-15
55	S12	wor/18"		4		24	24			Brown SILTY CLAY	-20
60	S13	wor/24"				24	24			Brown SILTY CLAY	-25
65	S14	wor/12"	3	4		24	24			Brown SILTY CLAY, 1/32" gray silt varves	-30

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 83.9ft Rock: 11.1ft	NOTES:	Sheet 2 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: RW-10
Inspector: N. Whetten	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833534.01	
Start Date: 6-6-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024815.83	
Finish Date: 6-8-16	Bridge No.:	Surface Elevation: 36.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches		Pen. (in.)	Rec. (in.)				RQD %
70	S15	wor/18"	6	24	24	Lacustrine (con't)	Brown SILTY CLAY, 1/32" gray silt varves	-35	
75	S16	wor/24"		24	24				
80	S17	25 36 27 16		24	6	Glacial Till	Brown c-f SAND and SILT, some c-f gravel	-45	
85	C-1			60	27	0	Weathered Rock Bedrock	Brown ARKOSE, fine, medium strong, 15° bedding angle, (2-3-2-2-2)	-50
90	C-2			60	35	9		Brown ARKOSE, fine, medium strong, 15° bedding angle, 91.5 ft coarse grained sandstone (3-2-2-2-3)	-55
95								END OF BORING 95ft	-60
100									-65

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 83.9ft Rock: 11.1ft	NOTES:	Sheet 3 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833635.78	
Start Date: 5-18-16	Route No.: 15 NB	Easting: 1024819.69	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 58.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @47.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt	ASPHALT (12")	
	S1	45	56	84	39	24	14		GRAVEL BASE (12")
									Brown c-f SAND, some m-f gravel, little silt
5	S2	35	48	33	36	24	16		Brown c-f SAND, some m-f gravel, some silt
10	S3	32	40	46	38	24	18		Brown f SAND, some silt, trace f gravel, trace cinder
15	S4	27	25	21	33	24	18		Brown f SAND and SILT
20	S5	23	28	100/4"		16	12		Brown f SAND and SILT, little c-f gravel, trace gray clayey silt
25	S6	10	4	13	21	24	12		Brown c-f SAND, little silt, trace f gravel
30	S7	31	100/3"			9	4		Brown c-f SAND, some silt, little f gravel

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 107ft Rock: 13ft	NOTES: 4" casing to 70', 3" telescoped down	Sheet 1 of 4
No. of Soil Samples: 23	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833635.78	
Start Date: 5-18-16	Route No.: 15 NB	Easting: 1024819.69	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 58.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @47.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	85	29	36	34	24	18		Fill (con't) Fill	Brown c-f SAND, trace silt Gray f SAND, some silt	20
40	S9	14	23	26	24	24	12				
45	S10	7	6	8	11	24	24		Alluvium	Gray f SAND, some silt	10
50	S11	1	2	3	4	24	20			Gray f SAND, some silt	5
55	S12	4	8	9	13	24	16			Gray f SAND, some silt	0
60	S13	7	18	17	26	24	18			Gray f SAND, little silt	-5
65	S14	21	29	26	28	24	10		Alluvium	Gray c-f SAND, trace silt	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 107ft Rock: 13ft	NOTES: 4" casing to 70', 3" telescoped down	Sheet 2 of 4
No. of Soil Samples: 23	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833635.78	
Start Date: 5-18-16	Route No.: 15 NB	Easting: 1024819.69	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 58.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @47.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
70	S15	19	29	42	66	24	16		Alluvium (con't)	Gray c-f SAND, trace silt	-10
75	S16	wor	3	3	9	24	24		Lacustrine	Smooth drilling Brown SILTY CLAY	-15
80	S17	wor	wor	woh	woh	24	24			Brown SILTY CLAY	-20
85	S18	wor	wor	woh	woh	24	24			Brown SILTY CLAY, Two 0.1" silt varves within sample	-25
90	S19	wor	woh	woh	woh	24	24			Brown SILTY CLAY	-30
95	S20	wor	wor	4	5	24	24			Brown SILTY CLAY	-35
100	S21	wor	wor	4	5	24	24			Brown SILTY CLAY	-40

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 107ft Rock: 13ft	NOTES: 4" casing to 70', 3" telescoped down	Sheet 3 of 4
No. of Soil Samples: 23	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833635.78	
Start Date: 5-18-16	Route No.: 15 NB	Easting: 1024819.69	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 58.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @47.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
105	S22	4	8	3	6	24	5		Lacustrine (con't) Glacial Till	Change in drilling action to denser soil	-45
	S23	100/5"				5	3		Weathered Rock	Brown c-f SAND and SILT, some f gravel Slow drilling, rock fragments in wash WEATHERED BEDROCK	-50
110	C-1					60	58	50	Bedrock	Brown ARKOSE, moderately weathered, slightly fractured, medium strong, (3-4-4-5-4)	-55
115	C-2					60	50	67		Brown ARKOSE, moderately weathered, slightly fractured, medium strong, (3-4-4-5-4)	-60
120										END OF BORING 120ft	-65
125											-70
130											-75
135											

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 107ft Rock: 13ft	NOTES: 4" casing to 70', 3" telescoped down	Sheet 4 of 4
No. of Soil Samples: 23	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833680.04	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024924.1	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	7	17	21	9	24	18		Topsoil Fill	TOPSOIL (6") Brown c-f SAND, trace silt	25
5	S2	12	10	10	12	24	18			Brown f SAND and SILT	20
10	S3	13	21	16	12	24	14		Alluvium	Brown f SAND, some silt	15
15	S4	8	14	19	15	24	16			Gray f SAND, some silt	10
20	S5	2	3	3	3	24	19			Gray f SAND and SILT	5
25	S6	1	1	1	2	24	20			Brown to gray f SAND and SILT	0
30	S7	1	2	3	6	24	24		Alluvium	Gray c-f SAND, trace m-f gravel, trace silt	-5

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 88ft Rock: 12ft	NOTES:	Sheet 1 of 3
No. of Soil Samples: 18 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833680.04	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024924.1	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
35	S8	5	5	8	10	24	12		-10	
40	S9	15	14	8	13	24	12			
45	S10	14	19	19	19	24	14			-15
50	S11	woh	woh	1	2	24	24	Lacustrine		-20
55	S12	woh	woh	woh	3	24	24		-25	
60	S13	woh	woh	5	2	24	24		-30	
65	S14	woh	woh	woh	woh	24	24		-35	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 88ft Rock: 12ft	NOTES:	Sheet 2 of 3
No. of Soil Samples: 18 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833680.04	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024924.1	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
70	S15	wor	wor	wor	6	24	24		Lacustrine (con't)	Brown SILTY CLAY	-40
75	S16	wor	wor	wor	6	24	24			Brown SILTY CLAY	-45
80	S17	3	12	9	17	24	20		Glacial Till	Brown SILTY CLAY Brown CLAYEY SILT, little f gravel	-50
85	S18	53	60	41	52	24	20			Brown c-f SAND, some silt, little c-f gravel	-55
90									Weathered Rock	WEATHERED BEDROCK	-60
95	C-1					60	58	51	Bedrock	Brown ARKOSE, slightly fractured, medium strong, small cavities 0.1" observed on side of core run (3-3-4-5-5)	-65
100	C-2					60	51	23		ARKOSE, highly fractured, medium strong, Small sections on core run appear to be highly weathered (4-4-5-5-4)	-70
										END OF BORING 100ft	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 88ft Rock: 12ft	NOTES:	Sheet 3 of 3
No. of Soil Samples: 18		No. of Core Runs: 2

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S2-1
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833791.48	
Start Date: 6-1-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024985.35	
Finish Date: 6-6-16	Bridge No.: 06000A	Surface Elevation: 29.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @11.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0						Asphalt	ASPHALT (12")	
	S1	23	24	31	33	24	16	25
5						Fill	Brown c-f SAND, little m-f gravel, little silt	
	S2	9	19	20	14			24
10						Alluvium	Brown c-f SAND and m-f GRAVEL, some silt	20
	S3	13	23	19	11			24
15						Alluvium	Brown c-f SAND, little m-f gravel, little silt	15
	S4	28	19	18	16			24
20						Alluvium	Gray f SAND and SILT	10
	S5	10	12	13	12			24
25						Alluvium	Brown to gray f SAND, some silt	5
	S6	3	1	1	2			24
30						Alluvium	Brown SILT and f SAND	0
	S7	1	1	1	4			24

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 90ft Rock: 10ft	NOTES: 4" casing to 55', telescoped 3"	Sheet 1 of 3
No. of Soil Samples: 21 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S2-1
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833791.48	
Start Date: 6-1-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024985.35	
Finish Date: 6-6-16	Bridge No.: 06000A	Surface Elevation: 29.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @11.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	9	10	13	14	24	12		Alluvium (con't)	Gray c-f SAND, trace silt	-5
40	S9	12	15	19	17	24	8				
45	S10	16	25	26	26	24	12		Lacustrine	Brown SILTY CLAY	-15
50	S11	woh	woh	woh	4	24	24				
55	UP-1					30	30		Brown SILTY CLAY	Brown SILTY CLAY (Torvane = 0.25 tsf and Pocket Pen. = 0.75 tsf)	-25
60	S12	wor	wor	woh	woh	24	24				
65	S13	wor	wor	3	2	24	24		Brown SILTY CLAY	Brown SILTY CLAY (Torvane = 0.25 tsf and Pocket Pen. = 0.75 tsf)	-35
	UP-2					30	28				
	S14	wor	wor	woh	woh	24	24			Brown SILTY CLAY	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 90ft Rock: 10ft	NOTES: 4" casing to 55', telescoped 3"	Sheet 2 of 3
No. of Soil Samples: 21 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S2-1
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833791.48	
Start Date: 6-1-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024985.35	
Finish Date: 6-6-16	Bridge No.: 06000A	Surface Elevation: 29.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @11.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
70	S15	wor	wor	wor	wor	24	24		Lacustrine (con't)	Brown SILTY CLAY	-40
	UP-3					30	30				
75	S16	wor	wor	4	6	24	24		Glacial Till	Brown SILTY CLAY	-45
80	S17	wor	wor	woh	2	24	24		Weathered Rock	Brown SILTY CLAY	-50
85	S18	7	19	12	43	24	8		Bedrock	Brown c-f SAND, some c-f gravel, some silt	-55
90	C-1					60	28	0	Bedrock	WEATHERED BEDROCK	-60
95	C-2					60	60	28	Bedrock	Brown ARKOSE, highly weathered, medium banded, highly fractured, medium strong.	-65
100										Brown ARKOSE, medium banded, moderately fractured, medium strong.	-70
										END OF BORING 100ft	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

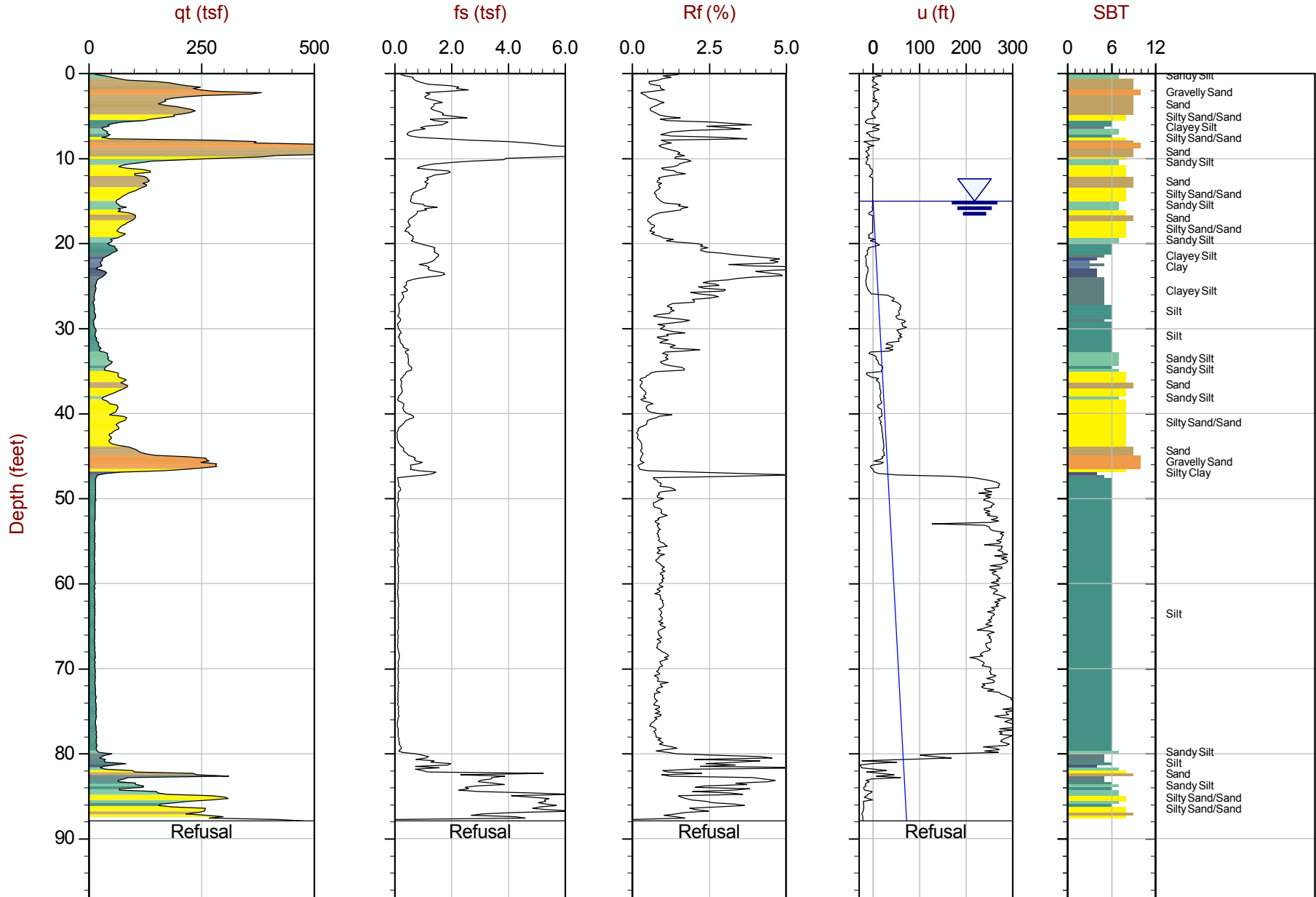
Total Penetration in Earth: 90ft Rock: 10ft	NOTES: 4" casing to 55', telescoped 3"	Sheet 3 of 3
No. of Soil Samples: 21	No. of Core Runs: 2	SM-001-M REV. 1/02



Freeman Companies

Job No: 16-53057
Date: 06:13:16 01:33
Site: I-91 Interchange 29, Hartford, CT

Sounding: CPT16-RW-10
Cone: 419:T1500F15U500



Max Depth: 26.800 m / 87.93 ft
Depth Inc: 0.050 m / 0.164 ft

File: 16-53057_CPRW-10.DRF

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 18 N: 4624519m E: 694651m

— Hydrostatic Line ● Ueq ● Assumed Ueq ◁ PPD, Ueq achieved ◁ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

WALL 105 LOGS

Draft

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S1-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833238.29	
Start Date: 5-16-16	Route No.: 15 NB	Easting: 1024644.04	
Finish Date: 5-17-16	Bridge No.:	Surface Elevation: 40.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @19.0 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0							Asphalt	40
	S1	57	85	109	25	24	18	
							Base	
							Fill	
5	S2	17	18	20	16	24	18	35
10	S3	20	29	27	29	24	16	30
15	S4	24	24	22	22	24	12	25
20	S5	13	15	25	28	24	18	20
							Fill	
25	S6	14	19	22	18	24	14	15
30	S7	wor	woh	5	5	24	22	10
							Alluvium	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80.5ft Rock: 14.5ft	NOTES:	Sheet 1 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S1-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833238.29	
Start Date: 5-16-16	Route No.: 15 NB	Easting: 1024644.04	
Finish Date: 5-17-16	Bridge No.:	Surface Elevation: 40.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @19.0 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
35	S8	5	2	2	6	24			5	Alluvium (con't) Brown to gray f SAND and SILT
40	S9	8	15	15	19	24	16		0	Alluvium Gray f SAND and SILT Gray c SAND, trace silt
45	S10	8	6	9	11	24	10		-5	Gray c-f SAND, trace silt
50	S11	10	18	18	17	24	12		-10	Gray f SAND, trace silt, 4" seam of orange coarse sand
55	S12	7	5	7	8	24	4		-15	Lacustrine Brown c-f SAND and m-f GRAVEL, gravel from wash pushed down on clay layer
60	S13	wor	wor	woh	0	24	24		-20	Brown SILTY CLAY
65	S14	wor	wor	woh	3	24	24		-25	Brown SILTY CLAY

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80.5ft Rock: 14.5ft	NOTES:	Sheet 2 of 3
No. of Soil Samples: 17		No. of Core Runs: 2

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S1-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833238.29	
Start Date: 5-16-16	Route No.: 15 NB	Easting: 1024644.04	
Finish Date: 5-17-16	Bridge No.:	Surface Elevation: 40.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @19.0 after 24 hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches		Pen. (in.)	Rec. (in.)				RQD %
70	S15	wor woh	4 4	24	24	Lacustrine (con't)	Brown SILTY CLAY	-30	
75	S16	15 11 13 35		24	4	Glacial Till	Brown c-f SAND and SILT, little m-f gravel	-35	
80	S17	66 100/2"		8	4	Weathered Rock	Brown c-f SAND, some m-f gravel, little silt, trace rock fragments	-40	
85	C-1			60	58	50	Bedrock	Brown ARKOSE, Moderately weathered, moderately fractured, medium strong	-45
90	C-2			60	48	60		Brown ARKOSE, moderately weathered, slightly fractured, medium strong	-50
95								END OF BORING 95ft	-55
100									-60

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80.5ft Rock: 14.5ft	NOTES:	Sheet 3 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-8
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833377.29	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024758.88	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @14.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0							Topsoil	25
	S1	2	8	14	20	24	24	20
5								
	S2	12	14	18	29	24	19	15
10								
	S3	39	29	30	30	24	16	10
15								
	S4	11	21	19	25	24	19	5
20								
	S5	5	6	8	9	24	11	0
25								
	S6	3	1	5	2	24	20	-5
30								
	S7	5	8	10	17	24	16	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80ft Rock: 10ft	NOTES:	Sheet 1 of 3
No. of Soil Samples: 16 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-8
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833377.29	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024758.88	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @14.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	5	5	7	9	24	9		Alluvium (con't)	Gray c-f SAND, trace silt	-10
40	S9	12	11	15	10	24	5				
45	S10	25	5	8	6	24	19		Lacustrine	Brown SILTY CLAY	-20
50	S11	woh/18"		3		24	24			Brown SILTY CLAY	-25
55	S12	woh/12"		2	4	24	24			Brown SILTY CLAY	-30
60	S13	wowoh/12"		4		24	24			Brown SILTY CLAY	-35
65	S14	1/12"		3	4	24	24			Brown SILTY CLAY	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80ft Rock: 10ft	NOTES:	Sheet 2 of 3
No. of Soil Samples: 16 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-8
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833377.29	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024758.88	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @14.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
70	S15	1	2	3	4	24	24		Lacustrine (con't)	Brown SILTY CLAY, trace f sand	-40
75	S16	30	17	17	14	24	9		Glacial Till	Brown c-f SAND, some silt, little m-f gravel	-45
80									Weathered Rock	WEATHERED BEDROCK	-50
85	C-1					60	28	0	Bedrock	Brown ARKOSE, highly fractured, weak, (4-5-4-3-5)	-55
90	C-2					60	52	10		Brown ARKOSE, highly fractured, weak, Small sections in core run appear to be highly weathered (4-4-5-4-4)	-60
95										END OF BORING 90ft	-65
100											-70

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 80ft Rock: 10ft	NOTES:	Sheet 3 of 3
No. of Soil Samples: 16 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: RW-9
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833480.56	
Start Date: 5-17-16	Route No.: 15 NB	Easting: 1024741.36	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 52.0	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @39.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
0							Asphalt	50		
							Base			
	S1	49	55	71	33	24	11		Fill	
5	S2	15	14	17	16	24	15		45	
10	S3	5	6	5	4	24	6		40	
15	S4	12	8	12	24	24	12		35	
20	S5	17	21	24	25	24	16		30	
25	S6	14	9	8	9	24	8		25	
30	S7	21	12	13	11	24	8		20	
35	S8	100/0"				0	0			15

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 95ft Rock: 13ft	NOTES: Core barrel jammed causing rig to spark and lose power. Unable to continue, boring terminated at 103'.	Sheet 1 of 3
No. of Soil Samples: 22 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: RW-9
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833480.56	
Start Date: 5-17-16	Route No.: 15 NB	Easting: 1024741.36	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 52.0	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @39.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
40	S9	48	17	11	11	24	8		15
								Fill (cont)	End of obstruction at 38'
								Alluvium	Gray to olive f SAND and SILT
45	S10	11	3	3	2	24	12		10
									Olive f SAND, some silt
50	S11	5	7	8	10	18	12		5
									Gray f SAND, little silt
55	S12	11	12	16	17	24	12		0
									Gray f SAND, trace silt
60	S13	11	15	17	21	24	0		-5
									No recovery, wash color was still gray
65	S14	2	2	1	2	24	18		-10
									Gray c-f SAND, trace f gravel, trace silt
	UD-1					30	28	Lacustrine	Brown SILTY CLAY
70	UD-2					30	30		-15
									-20

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 95ft Rock: 13ft	NOTES: Core barrel jammed causing rig to spark and lose power. Unable to continue, boring terminated at 103'.	Sheet 2 of 3
No. of Soil Samples: 22 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: G. Twombly	Connecticut DOT Boring Report		Hole No.: RW-9
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833480.56	
Start Date: 5-17-16	Route No.: 15 NB	Easting: 1024741.36	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 52.0	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @39.0' ATD

Depth (ft)	SAMPLES						Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches			Pen. (in.)	Rec. (in.)				RQD %
75	S15	2	2	4	4	24	24	Lacustrine (con't)	Brown SILTY CLAY	
	UD-3					30	30			-25
80	S16	wor/18"	0	0	4	24	24		Brown SILTY CLAY	-30
85	S17	wor/24"	0	0	0	24	24		Brown SILTY CLAY	-35
90	S18	wor	3	4	3	24	24		Brown SILTY CLAY	-40
95								Weathered Rock	Slower drilling WEATHERED BEDROCK	
	S19	100/0"				0	0	10	No Recovery	-45
100	C-1					48	30	10	Brown ARKOSE, moderately fractured, medium strong, (9-7-7-6)	
	C-2					23.09	7	25	Brown ARKOSE, moderately fractured, medium strong, Some sand in bedrock, (5-5)	-50
105									END OF BORING 103ft	-55
110										

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 95ft Rock: 13ft	NOTES: Core barrel jammed causing rig to spark and lose power. Unable to continue, boring terminated at 103'.	Sheet 3 of 3
No. of Soil Samples: 22	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: RW-10
Inspector: N. Whetten	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833534.01	
Start Date: 6-6-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024815.83	
Finish Date: 6-8-16	Bridge No.:	Surface Elevation: 36.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	3	7	21	25	24	18		Topsoil Fill	TOPSOIL (8") Brown c-f SAND, little m-f gravel, little silt	35
5	S2	15	15	10	15	24	19			Brown c-f SAND, some silt, little m-f gravel	30
10	S3	14	25	100/1"		13	5			Brown f SAND, trace silt	25
15	S4	3	5	8	12	24	14		Alluvium	Gray f SAND, some silt Gray c-f SAND, trace silt	20
20	S5	5	8	9	8	24	18			Gray f SAND, some silt	15
25	S6	2	3	4	4	24	21			Brown to gray SILT and f SAND	10
30	S7	2	3	3	5	24	20			Gray f SAND, little silt	5

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 83.9ft Rock: 11.1ft	NOTES:	Sheet 1 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: RW-10
Inspector: N. Whetten	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833534.01	
Start Date: 6-6-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024815.83	
Finish Date: 6-8-16	Bridge No.:	Surface Elevation: 36.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	12	14	10	14	24	16		Alluvium (cont)	Brown to gray c-f SAND, trace silt	0
40	S9	3	9	97	100/1"	19	10			Gray c-f SAND, little c-f gravel, trace silt	-5
45	S10	6	28	66	9	24	12			Gray c-f SAND, some m gravel, trace silt	-10
50	S11	1	1	1	4	24	24		Lacustrine	Brown SILTY CLAY	-15
55	S12	wor/18"		4		24	24			Brown SILTY CLAY	-20
60	S13	wor/24"				24	24			Brown SILTY CLAY	-25
65	S14	wor/12"	3	4		24	24			Brown SILTY CLAY, 1/32" gray silt varves	-30

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 83.9ft Rock: 11.1ft	NOTES:	Sheet 2 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: RW-10
Inspector: N. Whetten	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833534.01	
Start Date: 6-6-16	Route No.: 15 SB / Exit 86 Off Ramp	Easting: 1024815.83	
Finish Date: 6-8-16	Bridge No.:	Surface Elevation: 36.5	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @16.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches		Pen. (in.)	Rec. (in.)				RQD %
70	S15	wor/18"	6	24	24	Lacustrine (con't)	Brown SILTY CLAY, 1/32" gray silt varves	-35	
75	S16	wor/24"		24	24				
80	S17	25 36 27 16		24	6	Glacial Till	Brown c-f SAND and SILT, some c-f gravel	-45	
85	C-1			60	27	0	Weathered Rock Bedrock	Brown ARKOSE, fine, medium strong, 15° bedding angle, (2-3-2-2-2)	-50
90	C-2			60	35	9		Brown ARKOSE, fine, medium strong, 15° bedding angle, 91.5 ft coarse grained sandstone (3-2-2-2-3)	-55
95								END OF BORING 95ft	-60
100									-65

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 83.9ft Rock: 11.1ft	NOTES:	Sheet 3 of 3
No. of Soil Samples: 17 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833635.78	
Start Date: 5-18-16	Route No.: 15 NB	Easting: 1024819.69	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 58.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @47.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt	ASPHALT (12")	
	S1	45	56	84	39	24	14		GRAVEL BASE (12")
									Brown c-f SAND, some m-f gravel, little silt
5	S2	35	48	33	36	24	16		Brown c-f SAND, some m-f gravel, some silt
10	S3	32	40	46	38	24	18		Brown f SAND, some silt, trace f gravel, trace cinder
15	S4	27	25	21	33	24	18		Brown f SAND and SILT
20	S5	23	28	100/4"		16	12		Brown f SAND and SILT, little c-f gravel, trace gray clayey silt
25	S6	10	4	13	21	24	12		Brown c-f SAND, little silt, trace f gravel
30	S7	31	100/3"			9	4		Brown c-f SAND, some silt, little f gravel

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 107ft Rock: 13ft	NOTES: 4" casing to 70', 3" telescoped down	Sheet 1 of 4
No. of Soil Samples: 23	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833635.78	
Start Date: 5-18-16	Route No.: 15 NB	Easting: 1024819.69	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 58.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @47.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	85	29	36	34	24	18		Fill (con't) Fill	Brown c-f SAND, trace silt Gray f SAND, some silt	20
40	S9	14	23	26	24	24	12				
45	S10	7	6	8	11	24	24		Alluvium	Gray f SAND, some silt	10
50	S11	1	2	3	4	24	20			Gray f SAND, some silt	5
55	S12	4	8	9	13	24	16			Gray f SAND, some silt	0
60	S13	7	18	17	26	24	18			Gray f SAND, little silt	-5
65	S14	21	29	26	28	24	10		Alluvium	Gray c-f SAND, trace silt	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 107ft Rock: 13ft	NOTES: 4" casing to 70', 3" telescoped down	Sheet 2 of 4
No. of Soil Samples: 23	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833635.78	
Start Date: 5-18-16	Route No.: 15 NB	Easting: 1024819.69	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 58.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @47.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
70	S15	19	29	42	66	24	16		Alluvium (con't)	Gray c-f SAND, trace silt	-10
75	S16	wor	3	3	9	24	24		Lacustrine	Smooth drilling Brown SILTY CLAY	-15
80	S17	wor	wor	woh	woh	24	24			Brown SILTY CLAY	-20
85	S18	wor	wor	woh	woh	24	24			Brown SILTY CLAY, Two 0.1" silt varves within sample	-25
90	S19	wor	woh	woh	woh	24	24			Brown SILTY CLAY	-30
95	S20	wor	wor	4	5	24	24			Brown SILTY CLAY	-35
100	S21	wor	wor	4	5	24	24			Brown SILTY CLAY	-40

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 107ft Rock: 13ft	NOTES: 4" casing to 70', 3" telescoped down	Sheet 3 of 4
No. of Soil Samples: 23	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-11
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833635.78	
Start Date: 5-18-16	Route No.: 15 NB	Easting: 1024819.69	
Finish Date: 5-20-16	Bridge No.:	Surface Elevation: 58.2	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @47.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
105	S22	4	8	3	6	24	5		Lacustrine (con't) Glacial Till	Change in drilling action to denser soil	-45
	S23	100/5"				5	3		Weathered Rock	Brown c-f SAND and SILT, some f gravel Slow drilling, rock fragments in wash WEATHERED BEDROCK	-50
110	C-1					60	58	50	Bedrock	Brown ARKOSE, moderately weathered, slightly fractured, medium strong, (3-4-4-5-4)	-55
115	C-2					60	50	67		Brown ARKOSE, moderately weathered, slightly fractured, medium strong, (3-4-4-5-4)	-60
120										END OF BORING 120ft	-65
125											-70
130											-75
135											

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 107ft Rock: 13ft	NOTES: 4" casing to 70', 3" telescoped down	Sheet 4 of 4
No. of Soil Samples: 23	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833680.04	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024924.1	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	7	17	21	9	24	18		Topsoil Fill	TOPSOIL (6") Brown c-f SAND, trace silt	25
5	S2	12	10	10	12	24	18			Brown f SAND and SILT	20
10	S3	13	21	16	12	24	14		Alluvium	Brown f SAND, some silt	15
15	S4	8	14	19	15	24	16			Gray f SAND, some silt	10
20	S5	2	3	3	3	24	19			Gray f SAND and SILT	5
25	S6	1	1	1	2	24	20			Brown to gray f SAND and SILT	0
30	S7	1	2	3	6	24	24		Alluvium	Gray c-f SAND, trace m-f gravel, trace silt	-5

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 88ft Rock: 12ft	NOTES:	Sheet 1 of 3
No. of Soil Samples: 18 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833680.04	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024924.1	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)					
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %		
35	S8	5	5	8	10	24	12		Alluvium (con't)	Gray c-f SAND, trace f gravel, trace silt	-10		
40	S9	15	14	8	13	24	12					Gray c SAND, trace f gravel, trace silt	-15
45	S10	14	19	19	19	24	14						
50	S11	woh	woh	1	2	24	24					Lacustrine	Brown SILTY CLAY
55	S12	woh	woh	woh	3	24	24		Brown SILTY CLAY	-30			
60	S13	woh	woh	5	2	24	24				Brown SILTY CLAY		
65	S14	woh	woh	woh	woh	24	24		Brown SILTY CLAY				

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 88ft Rock: 12ft	NOTES:	Sheet 2 of 3
No. of Soil Samples: 18 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: RW-12
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833680.04	
Start Date: 5-31-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024924.1	
Finish Date: 6-1-16	Bridge No.:	Surface Elevation: 28.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
70	S15	wor	wor	wor	6	24	24		Lacustrine (con't)	Brown SILTY CLAY	-40
75	S16	wor	wor	wor	6	24	24			Brown SILTY CLAY	-45
80	S17	3	12	9	17	24	20		Glacial Till	Brown SILTY CLAY Brown CLAYEY SILT, little f gravel	-50
85	S18	53	60	41	52	24	20			Brown c-f SAND, some silt, little c-f gravel	-55
90									Weathered Rock	WEATHERED BEDROCK	-60
95	C-1					60	58	51	Bedrock	Brown ARKOSE, slightly fractured, medium strong, small cavities 0.1" observed on side of core run (3-3-4-5-5)	-65
100	C-2					60	51	23		ARKOSE, highly fractured, medium strong, Small sections on core run appear to be highly weathered (4-4-5-5-4)	-70
										END OF BORING 100ft	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 88ft Rock: 12ft	NOTES:	Sheet 3 of 3
No. of Soil Samples: 18		No. of Core Runs: 2

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S2-1
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833791.48	
Start Date: 6-1-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024985.35	
Finish Date: 6-6-16	Bridge No.: 06000A	Surface Elevation: 29.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @11.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	9	10	13	14	24	12		Alluvium (con't)	Gray c-f SAND, trace silt	-5
40	S9	12	15	19	17	24	8				
45	S10	16	25	26	26	24	12		Lacustrine	Brown SILTY CLAY	-15
50	S11	woh	woh	woh	4	24	24				
55	UP-1					30	30		Lacustrine	Brown SILTY CLAY	-25
60	S12	wor	wor	woh	woh	24	24				
65	S13	wor	wor	3	2	24	24		Lacustrine	Brown SILTY CLAY	-35
	UP-2					30	28				
	S14	wor	wor	woh	woh	24	24			Brown SILTY CLAY	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 90ft Rock: 10ft	NOTES: 4" casing to 55', telescoped 3"	Sheet 2 of 3
No. of Soil Samples: 21 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S2-1
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 833791.48	
Start Date: 6-1-16	Route No.: 15 NB / Exit 89 Off Ramp	Easting: 1024985.35	
Finish Date: 6-6-16	Bridge No.: 06000A	Surface Elevation: 29.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @11.5' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
70	S15	wor	wor	wor	wor	24	24		Lacustrine (con't)	Brown SILTY CLAY	-40
	UP-3					30	30				
75	S16	wor	wor	4	6	24	24		Glacial Till	Brown SILTY CLAY (Torvane = 0.275 tsf and Pocket Pen. = 0.9 tsf)	-45
80	S17	wor	wor	woh	2	24	24		Weathered Rock	Brown SILTY CLAY	-50
85	S18	7	19	12	43	24	8		Bedrock	Brown c-f SAND, some c-f gravel, some silt	-55
90	C-1					60	28	0	Bedrock	WEATHERED BEDROCK	-60
95	C-2					60	60	28	Bedrock	Brown ARKOSE, highly weathered, medium banded, highly fractured, medium strong.	-65
100										Brown ARKOSE, medium banded, moderately fractured, medium strong.	-70
										END OF BORING 100ft	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 90ft Rock: 10ft	NOTES: 4" casing to 55', telescoped 3"	Sheet 3 of 3
No. of Soil Samples: 21	No. of Core Runs: 2	SM-001-M REV. 1/02



Freeman Companies

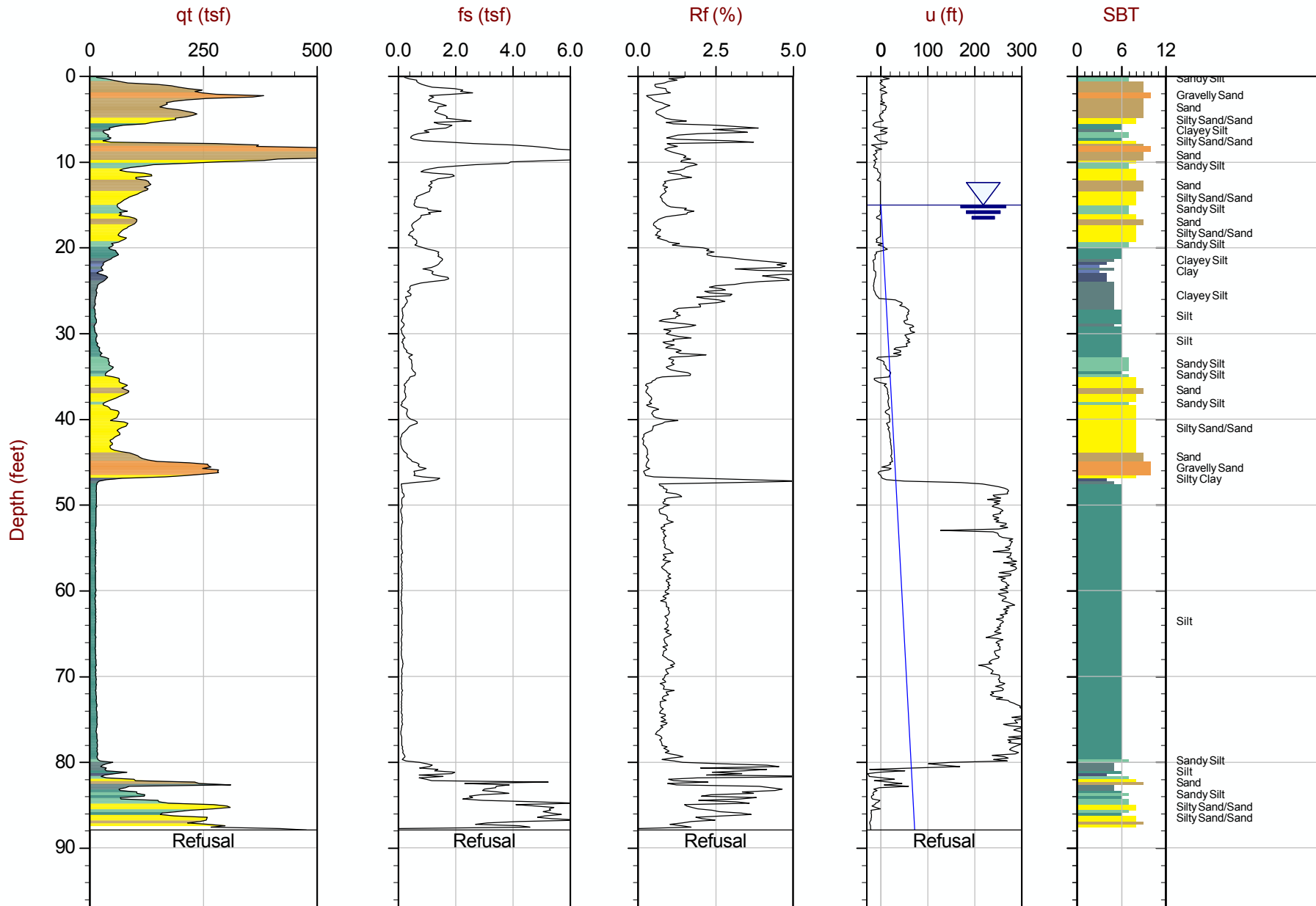
Job No: 16-53057

Date: 06:13:16 01:33

Site: I-91 Interchange 29, Hartford, CT

Sounding: CPT16-RW-10

Cone: 419:T1500F15U500



Max Depth: 26.800 m / 87.93 ft
Depth Inc: 0.050 m / 0.164 ft

File: 16-53057_CPRW-10.DRF

SBT: Robertson and Campanella, 1986
Coords: UTM Zone 18 N: 4624519m E: 694651m

— Hydrostatic Line ● Ueq ● Assumed Ueq ◁ PPD, Ueq achieved ◁ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

WALL 106 LOGS

Draft

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-6043-1 OW
Inspector: J. Herpich	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837092.58	
Start Date: 5-21-16	Route No.: 15 NB over Rt 5	Easting: 1029049.01	
Finish Date: 5-24-16	Bridge No.: 06043	Surface Elevation: 39.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.6' on 9/20/2016

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							FILL	ASPHALT (1") GRAVEL BASE (11") Red to Brown c-f SAND, little gravel, trace silt	
	S1	83	38	28	21	24	12		
5									35
	S2	11	11	17	23	24	20		
10								ALLUVIUM	30
	S3	10	7	7	8	24	12		
15									25
	S4	8	3	3	2	24	18		
20								LACUSTRINE	20
	S5	6	6	6	7	24	18		
25									15
	S6	4	3	5	3	24	16		
30									10
	S7	2	2	2	3	24	24		

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 179ft Rock: 10ft	NOTES: Observation well installed. Screen from 10 to 20 feet backfilled with filter sand. Bentonite seal from 1 to 3 feet; roadway box at ground surface.	Sheet 1 of 6
No. of Soil Samples: 34	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-6043-1 OW
Inspector: J. Herpich	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837092.58	
Start Date: 5-21-16	Route No.: 15 NB over Rt 5	Easting: 1029049.01	
Finish Date: 5-24-16	Bridge No.: 06043	Surface Elevation: 39.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.6' on 9/20/2016

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches			Pen. (in.)				Rec. (in.)	RQD %	
35	S8	wor	2	1	1	24	24		LACUSTRINE (con't)	Gray SILT and CLAY, gray silt varves of 1/16"	-5
40	S9	woh	woh	woh	1	24	24			Gray SILT and CLAY, gray silt varves of 1/8" to 1/16"	-0
45	UP-1					24	24				-5
	S10	wor	wor	wor	wor	24	24			Brown SILT and CLAY, 1/16" varved gray to red silt	
50	S11	wor	wor	wor	3	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-10
	UP-2					24	24				-15
	S12	wor	wor	wor	wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	
60	S13	wor	wor	wor	wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-20
65	S14	wor	wor	wor	wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-25

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 179ft Rock: 10ft	NOTES: Observation well installed. Screen from 10 to 20 feet backfilled with filter sand. Bentonite seal from 1 to 3 feet; roadway box at ground surface.	Sheet 2 of 6
No. of Soil Samples: 34	No. of Core Runs: 2	SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-6043-1 OW
Inspector: J. Herpich	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837092.58	
Start Date: 5-21-16	Route No.: 15 NB over Rt 5	Easting: 1029049.01	
Finish Date: 5-24-16	Bridge No.: 06043	Surface Elevation: 39.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.6' on 9/20/2016

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches		Pen. (in.)	Rec. (in.)				RQD %		
70	S15	wor	wor	wor	wor	24	24		LACUSTRINE (con't)	Gray SILT and CLAY, 1/16" varved gray to red silt	-30
75	S16	wor	wor	woh	woh	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-35
80	S17	wor	wor	wor	wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-40
85	S18	wor	wor	wor	wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-45
90	S19	wor	wor	wor	wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-50
95	S20	wor	wor	1	3	24	4			Gray SILT and CLAY, 1/16" varved gray to red silt	-55
100	S21	wor	wor	5	3	24	4			Gray SILT and CLAY, 1/16" varved gray to red silt	-60

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 179ft Rock: 10ft	NOTES: Observation well installed. Screen from 10 to 20 feet backfilled with filter sand. Bentonite seal from 1 to 3 feet; roadway box at ground surface.	Sheet 3 of 6
No. of Soil Samples: 34 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-6043-1 OW
Inspector: J. Herpich	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837092.58	
Start Date: 5-21-16	Route No.: 15 NB over Rt 5	Easting: 1029049.01	
Finish Date: 5-24-16	Bridge No.: 06043	Surface Elevation: 39.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.6' on 9/20/2016

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
105	S22	wor wor wor wor	24	24		LACUSTRINE (con't)	Gray SILT and CLAY, 1/16" varved gray to red silt	-65
110	S23	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-70
115	S24	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-75
120	S25	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-80
125	S26	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-85
130	S27	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-90
135							Gray SILT and CLAY, 1/16" varved gray to red	-95

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 179ft Rock: 10ft	NOTES: Observation well installed. Screen from 10 to 20 feet backfilled with filter sand. Bentonite seal from 1 to 3 feet; roadway box at ground surface.	Sheet 4 of 6
No. of Soil Samples: 34 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-6043-1 OW
Inspector: J. Herpich	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837092.58	
Start Date: 5-21-16	Route No.: 15 NB over Rt 5	Easting: 1029049.01	
Finish Date: 5-24-16	Bridge No.: 06043	Surface Elevation: 39.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.6' on 9/20/2016

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
140	S28	wor wor wor wor	24	24		LACUSTRINE (con't)	silt	-100
145	S29	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-105
150	S30	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-110
155	S31	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-115
160	S32	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-120
165	S33	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-125
170	S34	wor wor wor wor	24	24			Gray SILT and CLAY, 1/16" varved gray to red silt	-130
							Significant increase in drilling resistance	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 179ft Rock: 10ft	NOTES: Observation well installed. Screen from 10 to 20 feet backfilled with filter sand. Bentonite seal from 1 to 3 feet; roadway box at ground surface.	Sheet 5 of 6
No. of Soil Samples: 34 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-6043-1 OW
Inspector: J. Herpich	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837092.58	
Start Date: 5-21-16	Route No.: 15 NB over Rt 5	Easting: 1029049.01	
Finish Date: 5-24-16	Bridge No.: 06043	Surface Elevation: 39.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @10.6' on 9/20/2016

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
170						GLACIAL TILL (con't)	indicates Glacial Till	
175						WEATHERED BEDROCK	WEATHERED BEDROCK Red-brown, slightly weathered, strong, ARKOSE, bedding joints parallel to bedding at 15 degrees, with occasional fractured zones	-135
180	C-1		60	58	45	BEDROCK		-140
185	C-2		60	60	60		Red-brown, slightly weathered, strong, ARKOSE, bedding joints parallel to bedding at 15 degrees, with occasional fractured zones	-145
190							END OF BORING 189ft	-150
195								-155
200								-160

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 179ft Rock: 10ft	NOTES: Observation well installed. Screen from 10 to 20 feet backfilled with filter sand. Bentonite seal from 1 to 3 feet; roadway box at ground surface.	Sheet 6 of 6
No. of Soil Samples: 34 No. of Core Runs: 2		SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: SRW-7
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837372.14	
Start Date: 5-26-16	Route No.: 15 NB	Easting: 1029634.62	
Finish Date: 5-26-16	Bridge No.:	Surface Elevation: 52.7	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 2.25-in. HSA	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: Fall: in.	Hammer Wt.: 140 Fall: 30in.	

Groundwater Observations: after No Observed hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
0							Asphalt	ASPHALT (12") GRAVEL BASE (6") Brown c-f SAND, little m-f gravel, trace silt	50	
	S1	29	19	22	27	24	14			Base Fill
5	S2	32	31	23	19	24	16			Brown c-f SAND, trace silt
10	S3	9	7	5	5	24	12	Brown c-f SAND, trace silt	40	
15	S4	9	7	5	9	24	12	Alluvium Brown c-f SAND, trace f gravel, trace silt	35	
20	S5	14	11	12	12	24	12	Brown c-f SAND, trace silt	30	
25								END OF BORING 22ft	25	
30									20	

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 22ft Rock: 0ft	NOTES:	Sheet 1 of 1
No. of Soil Samples: 5 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: R-15
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837425.22	
Start Date: 5-26-16	Route No.: 15 NB / Exit 91	Easting: 1029771.34	
Finish Date: 5-26-16	Bridge No.:	Surface Elevation: 49.9	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 2.25-in. HSA	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: Fall: in.	Hammer Wt.: 140 Fall: 30in.	

Groundwater Observations: @19.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches						
0							Asphalt	ASPHALT (12") GRAVEL BASE (8") Brown c-f SAND, trace f gravel, trace silt
	S1	23	22	27	24	18	Base	
							Fill	
5	S2	41	23	49	77	24	18	Brown c-f SAND, little c-f gravel, little cobbles, little silt Grinding on probable boulder at 7'
10	S3	27	21	14	9	24	2	Brown c-f SAND, little m-f gravel, trace silt
15	S4	3	7	7	8	24	18	Brown f SAND, trace silt
20	S5	5	7	8	9	24	18	Gray c-f SAND, trace f gravel, trace silt
25								END OF BORING 22ft
30								

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 22ft Rock: 0ft	NOTES:	Sheet 1 of 1
No. of Soil Samples: 5 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: C. Dupis	Connecticut DOT Boring Report		Hole No.: R-16
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837473.89	
Start Date: 5-26-16	Route No.: 15 NB / Exit 91	Easting: 1029906.07	
Finish Date: 5-26-16	Bridge No.:	Surface Elevation: 48.0	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 2.25-in. HSA	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: Fall: in.	Hammer Wt.: 140 Fall: 30in.	

Groundwater Observations: @19.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
0							Asphalt	ASPHALT (18")		
	S1	14	34	37	56	24	18	Base	GRAVEL BASE (12")	45
								Fill	Brown c-f SAND, little m-f gravel, trace silt	
5	S2	31	20	22	15	24	18		Brown c-f SAND, little c-f gravel, little silt	40
10	S3	10	5	5	6	24	20	Alluvium	Brown f SAND, trace silt	35
15	S4	4	6	8	9	24	18		Brown to gray c-f SAND, trace silt	30
20	S5	6	6	6	6	24	24		Gray c-f SAND, trace f gravel, trace silt	25
25									END OF BORING 22ft	20
30										15

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 22ft Rock: 0ft	NOTES:	Sheet 1 of 1
No. of Soil Samples: 5 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: SRW-8
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837583.85	
Start Date: 5-26-16	Route No.: 15 NB / Exit 91 Off Ramp	Easting: 1030240.34	
Finish Date: 5-26-16	Bridge No.:	Surface Elevation: 49.4	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 2.25-in. HSA	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: Fall: in.	Hammer Wt.: 140 Fall: 30in.	

Groundwater Observations: @21.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt Base Fill	ASPHALT (8") GRAVEL BASE (6") Brown c-f SAND, little c-f gravel, little silt	
5	S1	22	37	27	32	24	18		45
	S2	41	27	23	27	24	16	Brown c-f SAND, little c-f gravel, little silt, trace cobbles	
10									40
	S3	12	5	7	9	24	10	Alluvium Brown c-f SAND, little f gravel, trace silt	
15									35
	S4	10	8	8	10	24	18	Brown to gray c-f SAND, trace silt	
20									30
	S5	6	6	7	6	24	16	Gray c-f SAND, trace silt	
25								END OF BORING 22ft	25
30									20

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 22ft Rock: 0ft	NOTES:	Sheet 1 of 1
No. of Soil Samples: 5 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: R-17
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837634.48	
Start Date: 5-27-16	Route No.: 15 NB / Exit 91 Off Ramp	Easting: 1030432.69	
Finish Date: 5-27-16	Bridge No.:	Surface Elevation: 49.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

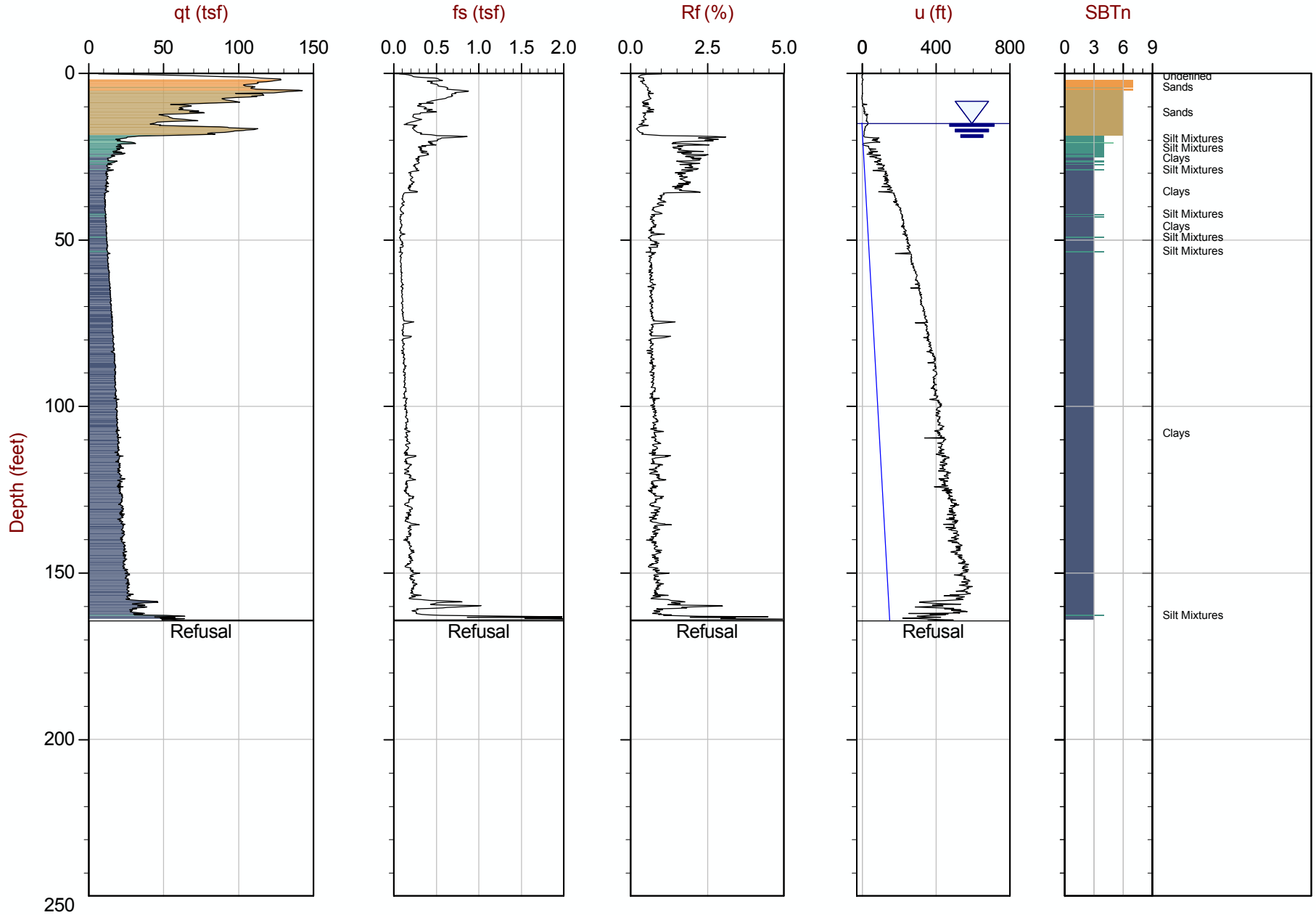
Casing Size/Type: 2.25-in. HSA	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: Fall: in.	Hammer Wt.: 140 Fall: 30in.	

Groundwater Observations: @22.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt	ASPHALT (12")	
	S1	20	32	39	32	24	22	Base	GRAVEL BASE (12")
								Fill	Brown c-f SAND, little c-f gravel, trace silt
5									Brown c-f SAND, little m-f gravel, trace silt, trace construction debris (asphalt)
	S2	16	7	5	5	24	12	Alluvium	Brown c-f SAND, trace m-f gravel, trace silt
10									Brown c-f SAND, little f gravel, trace cobbles, trace silt
	S3	7	6	7	8	24	14		
15									Brown to gray f SAND, trace silt
	S4	9	9	8	8	24	18		
20									Gray c-f SAND, trace f gravel, trace silt, Wet at very tip of spoon
	S5	7	6	8	11	24	18		
25									END OF BORING 22ft
30									

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 22ft Rock: 0ft	NOTES:	Sheet 1 of 1
No. of Soil Samples: 5 No. of Core Runs: 0		SM-001-M REV. 1/02



Max Depth: 50.100 m / 164.37 ft
 Depth Inc: 0.050 m / 0.164 ft

File: 16-53057_CP6043-2.DRF

SBT: Robertson, 1990

Coords: UTM Zone 18 N: 4625625m E: 695870m

— Hydrostatic Line ● Ueq ● Assumed Ueq ◁ PPD, Ueq achieved ◁ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

WALL 107 LOGS

Draft

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: R-17
Inspector: T. Ta	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837634.48	
Start Date: 5-27-16	Route No.: 15 NB / Exit 91 Off Ramp	Easting: 1030432.69	
Finish Date: 5-27-16	Bridge No.:	Surface Elevation: 49.6	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 2.25-in. HSA	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: Fall: in.	Hammer Wt.: 140 Fall: 30in.	

Groundwater Observations: @22.0' ATD

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0							Asphalt	ASPHALT (12")	
	S1	20	32	39	32	24	22	Base	GRAVEL BASE (12")
								Fill	Brown c-f SAND, little c-f gravel, trace silt
5									Brown c-f SAND, little m-f gravel, trace silt, trace construction debris (asphalt)
	S2	16	7	5	5	24	12	Alluvium	Brown c-f SAND, trace m-f gravel, trace silt
10									Brown c-f SAND, little f gravel, trace cobbles, trace silt
	S3	7	6	7	8	24	14		
15									Brown to gray f SAND, trace silt
	S4	9	9	8	8	24	18		
20									Gray c-f SAND, trace f gravel, trace silt, Wet at very tip of spoon
	S5	7	6	8	11	24	18		
25									END OF BORING 22ft
30									

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 22ft Rock: 0ft	NOTES:	Sheet 1 of 1
No. of Soil Samples: 5 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: SRW-10
Inspector: N. Whetten	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837824.18	
Start Date: 6-21-16	Route No.: 15 NB	Easting: 1030573.84	
Finish Date: 6-21-16	Bridge No.:	Surface Elevation: 57.4	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations:

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)		
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)
0							Asphalt	Asphalt 12"		
	S-1	41	37	63	38	24	14	Fill	Brown to black c-f SAND, little c-f gravel, trace silt	55
5										
	S-2	24	31	40	43	24	18		Red brown c-f SAND, some silt, little c-f gravel	50
10										
	S-3	6	8	8	5	24	8		Red brown c-f SAND, little c-f gravel, little silt	45
15										
	S-4	5	6	16	15	24	10	Alluvium	Brown c-f SAND, little silt, little f gravel	40
20										
	S-5	11	12	13	13	24	12		Brown c-f SAND, little silt, trace f gravel	35
25										
	S-6	13	14	22	21	24	12		Brown to tan c-f SAND, trace silt	30
30										
	S-7	6	6	11	17	24	14		Light brown c-f SAND, trace silt	25

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 37ft Rock: 0ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 8 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report	Hole No.: SRW-10
Inspector: N. Whetten	Town: Hartford	Stat./Offset:
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 837824.18
Start Date: 6-21-16	Route No.: 15 NB	Easting: 1030573.84
Finish Date: 6-21-16	Bridge No.:	Surface Elevation: 57.4

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations:

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
35	S-8	6 7 10 11	24	20		Alluvium (con't)	Light brown c-f SAND, little f gravel, trace silt	20
40							END OF BORING 37ft	15
45								10
50								5
55								0
60								-5
65								-10

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 37ft Rock: 0ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 8 No. of Core Runs: 0		

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: SRW-11
Inspector: A. McCauliffe	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838016.53	
Start Date: 6-16-16	Route No.: 15 NB	Easting: 1030797.44	
Finish Date: 6-16-16	Bridge No.:	Surface Elevation: 60.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations:

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)
0						Asphalt	12" ASPHALT	60	
	S-1	31	36	36	37	24	18		7" GRAVEL BASE
									Red brown c-f SAND, little c-f gravel, little silt
5	S-2	14	24	30	26	24	18	Red brown c-f SAND, little m-f gravel, little silt	55
10	S-3	7	4	3	5	24	6	Brown c-f SAND, little m-f gravel, little silt	50
15	S-4	6	15	15	15	24	10	Red brown c-f SAND, little c-f gravel, little silt, change to Brown c-f SAND, little silt, trace c-f gravel	45
20	S-5	8	8	12	11	24	4	Red brown c-f SAND, little silt	40
25	S-6	8	9	10	15	24	13	Brown c-f SAND, little silt, trace c-f gravel, change to Tan f SAND, trace silt	35
30	S-7	13	12	14	20	24	14	Brown c-f SAND, trace silt	30

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 47ft Rock: 0ft	NOTES:	Sheet 1 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: SRW-11
Inspector: A. McCauliffe	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838016.53	
Start Date: 6-16-16	Route No.: 15 NB	Easting: 1030797.44	
Finish Date: 6-16-16	Bridge No.:	Surface Elevation: 60.8	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/8 inch ID	Core Barrel Type: NX
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations:

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)						
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %			
35	S-8	13	14	13	13	24	20		Alluvium (con't)	Brown c-f SAND, trace silt	25			
40	S-9	9	13	10	12	24	12						Brown c-f SAND, trace silt	20
45	S-10	wor	wor	5	7	24	20						Brown c-f SAND, trace silt	15
50										END OF BORING 47ft		10		
55												5		
60												0		
65												-5		

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
 Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 47ft Rock: 0ft	NOTES:	Sheet 2 of 2
No. of Soil Samples: 10 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-5796-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838256.16	
Start Date: 5-9-16	Route No.: Silver Lane	Easting: 1031077.32	
Finish Date: 5-13-16	Bridge No.: 05796	Surface Elevation: 36.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.0 after ADT hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
0	S1	8	26	28	16	24	24		Topsoil Fill	Brown c-f SAND, some silt, trace c-f gravel, moist	35
5	S2	31	16	14	21	24	24		Alluvium	Brown c-f SAND, some silt, some c-f gravel, moist	30
10	S3	18	13	13	14	24	10			Brown c-f SAND, some c-f gravel, little silt, wet	25
15	S4	28	34	43	32	24	12			Brown c-f SAND, some silt, little c-f gravel	20
20	S5	12	13	16	17	24	11			Brown c-f SAND, little silt, trace f gravel	15
25	S6	8	9	15	17	24	16			Brown c-f SAND, some silt, trace f gravel	10
30	S7	19	19	21	27	24	18			Gray f SAND and SILT	5

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 319ft Rock: 0ft	NOTES:	Sheet 1 of 10
No. of Soil Samples: 59 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-5796-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838256.16	
Start Date: 5-9-16	Route No.: Silver Lane	Easting: 1031077.32	
Finish Date: 5-13-16	Bridge No.: 05796	Surface Elevation: 36.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.0 after ADT hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
35	S8	16	12	16	15	24	12		Alluvium (con't)	Gray f SAND and SILT	0
40	S9	14	15	17	24	24	18				
45	S10	9	11	14	17	24	18		Lacustrine	Gray f SAND and SILT	-10
50	S11	13	9	8	11	24	24			Gray SILT, some f sand	-15
55	S12	7	6	7	8	24	18			Gray SILT, little f sand	-20
60	S13	5	6	6	5	24	24			Gray SILT and CLAY, little f sand	-25
65	S14	3	3	3	3	24	24			Gray silty CLAY, trace f sand	-30

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 319ft Rock: 0ft	NOTES:	Sheet 2 of 10
No. of Soil Samples: 59 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-5796-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838256.16	
Start Date: 5-9-16	Route No.: Silver Lane	Easting: 1031077.32	
Finish Date: 5-13-16	Bridge No.: 05796	Surface Elevation: 36.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.0 after ADT hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)	
	Sample Type/No.	Blows on Sampler per 6 inches			Pen. (in.)				Rec. (in.)
70	UP-1				24	24	Lacustrine (con't)	Gray silty CLAY	-35
	S15	woh	3	3	3	24			
75									
	S16	woh	3	3	3	24	24	Gray silty CLAY, trace f sand	-40
	UP-2				24	24		Gray silty CLAY	
80	S17	woh	1	1	2	24	24	Gray silty CLAY, trace f sand, with red lenses	-45
85	UP-3				24	24		Gray silty CLAY	-50
	S18	woh	woh	8	5	24	24	Gray silty CLAY, trace f sand	
90									-55
95	S19	woh	woh	woh	2	24	24	Gray silty CLAY, trace f sand	-60
100	S20	woh	woh	woh	3	24	24	Gray silty CLAY, trace f sand	-65

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 319ft Rock: 0ft	NOTES:	Sheet 3 of 10
No. of Soil Samples: 59 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-5796-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838256.16	
Start Date: 5-9-16	Route No.: Silver Lane	Easting: 1031077.32	
Finish Date: 5-13-16	Bridge No.: 05796	Surface Elevation: 36.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.0 after ADT hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
105	S21	woh woh woh woh	24	24		Lacustrine (con't)	Gray silty CLAY, trace f sand	-70
110	S22	woh woh woh 1	24	24			Gray silty CLAY, trace f sand	-75
115	S23	woh woh woh 2	24	24			Gray silty CLAY, trace f sand	-80
120	S24	woh 3 3 4	24	24			Gray silty CLAY, trace f sand	-85
125	S25	woh woh woh 4	24	24			Gray silty CLAY, trace f sand	-90
130	S26	woh woh woh 2	24	24			Gray and red silty CLAY, varved	-95
135								

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 319ft Rock: 0ft	NOTES:	Sheet 4 of 10
No. of Soil Samples: 59 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-5796-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838256.16	
Start Date: 5-9-16	Route No.: Silver Lane	Easting: 1031077.32	
Finish Date: 5-13-16	Bridge No.: 05796	Surface Elevation: 36.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.0 after ADT hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches			Pen. (in.)				Rec. (in.)	RQD %	
140	S27	woh	2	3	3	24	24		Lacustrine (con't)	Gray and red silty CLAY, varved	-100
145	S28	woh	6	7	8	24	24			No Recovery	-105
150	S29	woh	3	3	4	24	24			Gray and red silty CLAY, varved	-110
155	S30	woh	woh	2	3	24	24			Gray and red silty CLAY, little c gravel, varved	-115
160	S31	woh	woh	2	2	24	24			Gray and red silty CLAY, varved	-120
165	S32	woh	woh	woh	4	24	24			Gray and red silty CLAY, varved	-125
170	S33	woh	woh	woh	5	24	24			Gray and red silty CLAY, varved	-130

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 319ft Rock: 0ft	NOTES:	Sheet 5 of 10
No. of Soil Samples: 59		No. of Core Runs: 0

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-5796-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838256.16	
Start Date: 5-9-16	Route No.: Silver Lane	Easting: 1031077.32	
Finish Date: 5-13-16	Bridge No.: 05796	Surface Elevation: 36.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.0 after ADT hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
170	S34	woh woh woh 2	24	24		Lacustrine (con't)	Gray and red silty CLAY, varved	-135
175	S35	woh woh woh 5	24	24			Gray and red silty CLAY, varved	-140
180	S36	woh woh woh 4	24	24			Gray and red silty CLAY, varved	-145
185	S37	woh woh woh 4	24	24			Gray and red silty CLAY, varved	-150
190	S38	woh woh woh 3	24	24			Red brown silty CLAY, varved	-155
195	S39	woh woh woh 4	24	24			Red brown silty CLAY, varved	-160
200	S40	woh woh woh 3	24	24			Red brown silty CLAY, varved	-165

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 319ft Rock: 0ft	NOTES:	Sheet 6 of 10
No. of Soil Samples: 59 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-5796-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838256.16	
Start Date: 5-9-16	Route No.: Silver Lane	Easting: 1031077.32	
Finish Date: 5-13-16	Bridge No.: 05796	Surface Elevation: 36.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.0 after ADT hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)
	Sample Type/No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %			
205	S41	woh woh woh 2	24	24		Lacustrine (con't)	Red brown silty CLAY, varved	-170
210	S42	wor wor wor wor	24	24			Red brown silty CLAY, varved, TV 0.2 tsf PP 0.5 tsf	-175
215	S43	wor wor wor wor	24	24			Red brown silty CLAY, varved	-180
220	S44	wor wor wor wor	24	24			Red brown silty CLAY, varved	-185
225	S45	wor wor wor wor	24	24			Red brown clayey SILT, varved	-190
230	S46	wor wor wor wor	24	24			Red brown clayey SILT, varved	-195
235	S47	wor wor wor wor	24	24			Brown to red clayey SILT, varved	-200

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 319ft Rock: 0ft	NOTES:	Sheet 7 of 10
No. of Soil Samples: 59 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-5796-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838256.16	
Start Date: 5-9-16	Route No.: Silver Lane	Easting: 1031077.32	
Finish Date: 5-13-16	Bridge No.: 05796	Surface Elevation: 36.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.0 after ADT hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
240	S48	wor	wor	wor	wor	24	24		Lacustrine (con't)	Brown to red clayey SILT, varved	-205
245	S49	wor	wor	wor	wor	24	24			Brown to red clayey SILT, varved	-210
250	S50	wor	wor	wor	wor	24	24			Brown to red clayey SILT, varved	-215
255	S51	wor	wor	wor	wor	24	24			Brown to red clayey SILT, varved, PP 0.75 tsf TV 0.3tsf	-220
260	S52	wor	wor	7	10	24	24			Red silty CLAY	-225
265	S53	wor	35	56	70	24	20			Red clayey SILT, varved	-230
270	S54	wor	40	46	61	24	15			Red clayey SILT, varved	-235

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 319ft Rock: 0ft	NOTES:	Sheet 8 of 10
No. of Soil Samples: 59 No. of Core Runs: 0		SM-001-M REV. 1/02

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-5796-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838256.16	
Start Date: 5-9-16	Route No.: Silver Lane	Easting: 1031077.32	
Finish Date: 5-13-16	Bridge No.: 05796	Surface Elevation: 36.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.0 after ADT hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches							Pen. (in.)	Rec. (in.)	RQD %
275	S55	35	38	45	56	24	18		Lacustrine (con't)	Red clayey SILT, varved	-240
280	S56	60	61	78	97	24	18				
285	S57	58	63	71	91	24	16			Red SILT	-250
290	S58	40	42	49	68	24	16			Glacial Till	Red c-f SAND, little silt
295											-260
300											-265
305											

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 319ft Rock: 0ft	NOTES:	Sheet 9 of 10
No. of Soil Samples: 59		No. of Core Runs: 0

Driller: P. Labossier	Connecticut DOT Boring Report		Hole No.: S-5796-1
Inspector: B. Cote	Town: Hartford	Stat./Offset:	
Engineer: N. Whetten	Project No.: DOT Project No. 63-703	Northing: 838256.16	
Start Date: 5-9-16	Route No.: Silver Lane	Easting: 1031077.32	
Finish Date: 5-13-16	Bridge No.: 05796	Surface Elevation: 36.1	

Project Description: Relocation of I-91 NB Interchange 29 & Widening

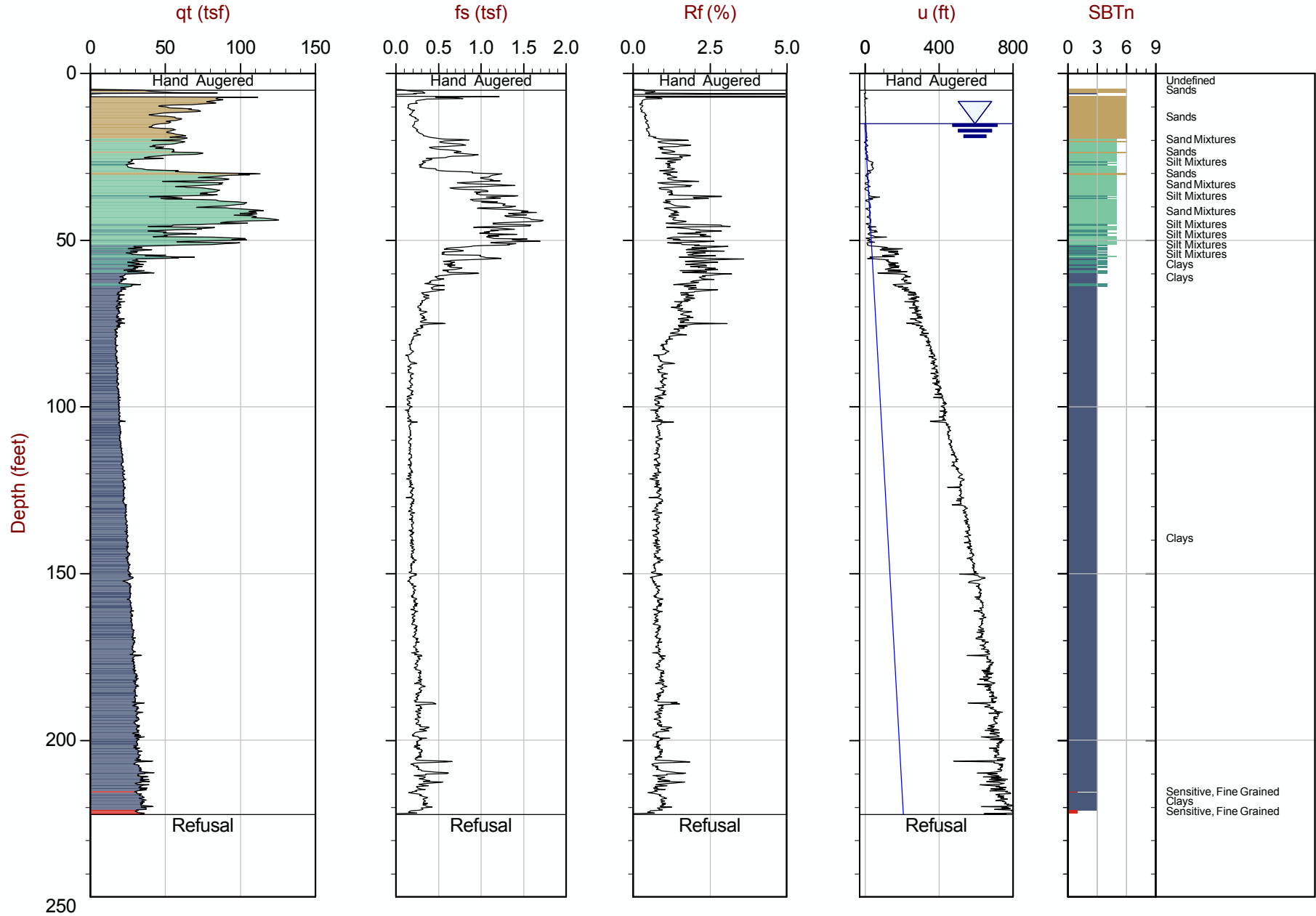
Casing Size/Type: 4-in. Casing	Sampler Type/Size: 1-3/4 inch ID	Core Barrel Type:
Hammer Wt.: 300lb Fall: 30in.	Hammer Wt.: 140lb Fall: 30in.	

Groundwater Observations: @8.0 after ADT hours

Depth (ft)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft)			
	Sample Type/No.	Blows on Sampler per 6 inches			Pen. (in.)				Rec. (in.)	RQD %	
310	S59	56	45	54	59	24	16		Glacial Till (con't)	Red c-f SAND, little silt	-270
315										Rig chatter at 315 ft, roller bit to 319 ft	-280
320										Assumed bedrock at 319' based on roller bit action	-285
325										END OF BORING 319ft	-290
330											-295
335											-300
340											

Sample Type: S = Split Spoon C = Core UP = Undisturbed Piston V = Vane Shear Test
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 319ft Rock: 0ft	NOTES:	Sheet 10 of 10
No. of Soil Samples: 59 No. of Core Runs: 0		SM-001-M REV. 1/02



Max Depth: 67.750 m / 222.27 ft
 Depth Inc: 0.050 m / 0.164 ft

File: 16-53057_CP5796-1.DRF

SBT: Robertson, 1990

Coords: UTM Zone 18 N: 4625982m E: 696494m

— Hydrostatic Line ● Ueq ● Assumed Ueq ◁ PPD, Ueq achieved ◁ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

APPENDIX B

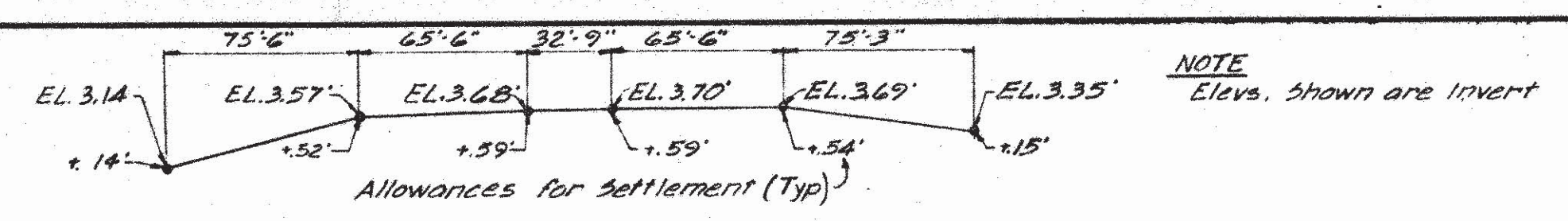
LOGS OF PREVIOUS TEST BORINGS

Draft

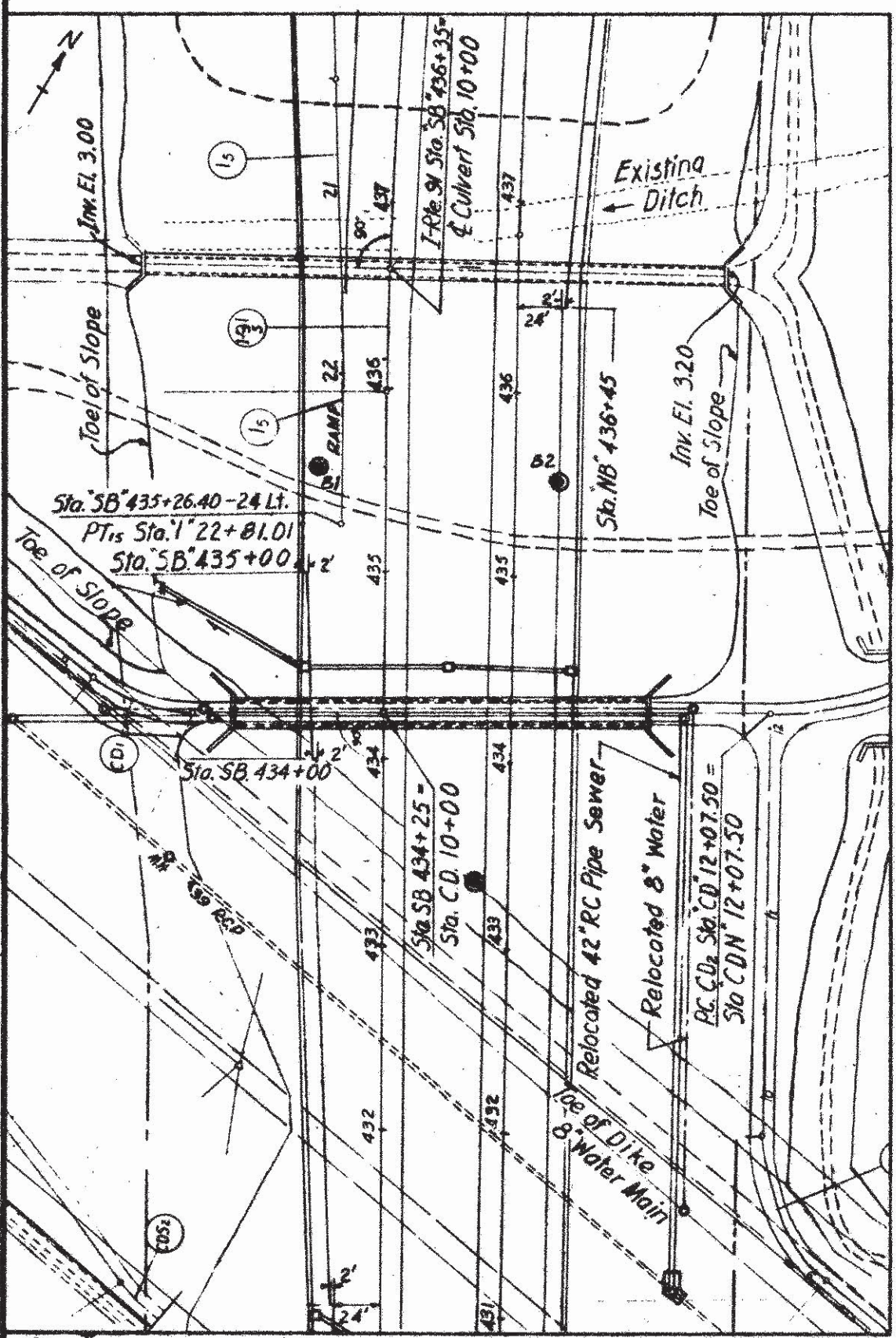
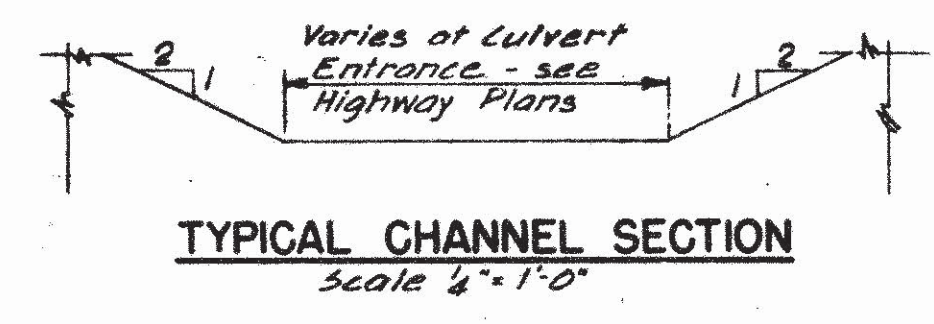
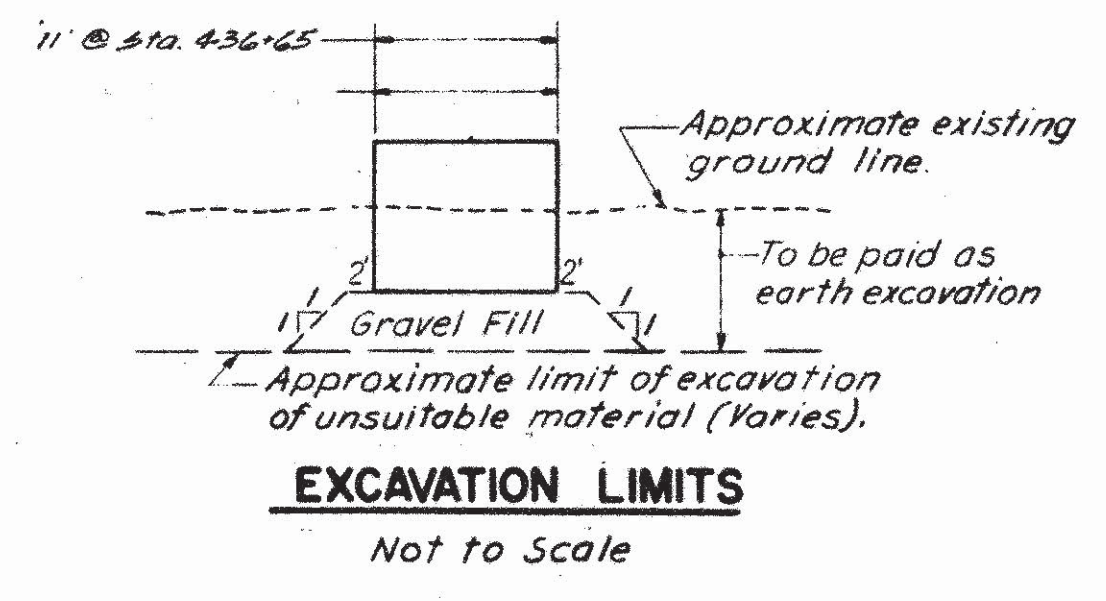
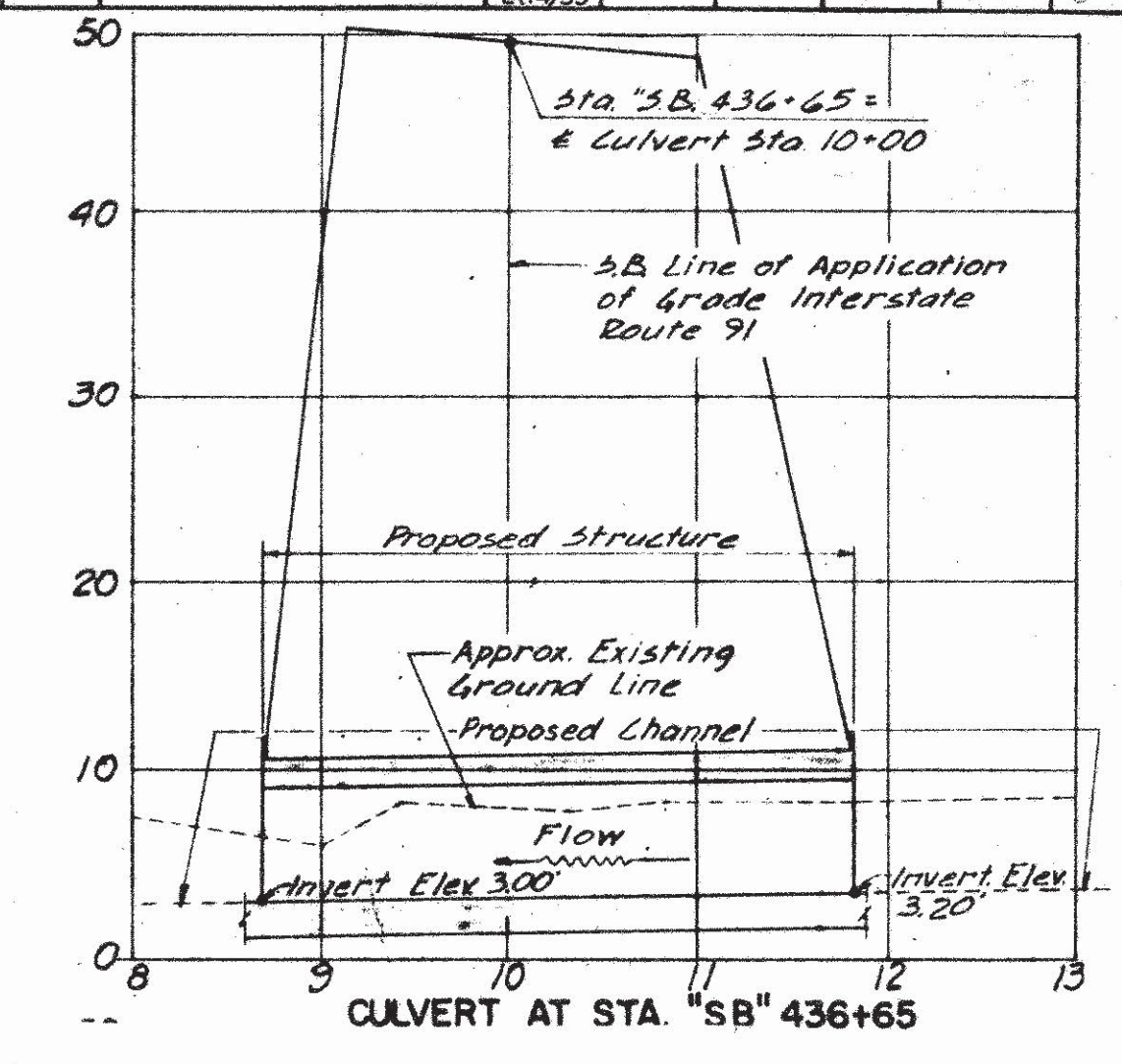
PREVIOUS LOGS WALL 101

Draft

PUB. ROAD DIV. NO.	STATE	TOWN	FED. AID PROJ. NO.	PROJ. NO.	YEAR	ROUTE NO.	SHEET NO.	TOTAL SHEETS
1	CONN.	HARTFORD	EA-1-91-2(14)35	63-171	1961	I-91	153	343



THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE TRUE CONDITIONS OR ACTUAL QUANTITIES OR DISTRIBUTION OF QUANTITIES OF WORK WHICH WILL BE REQUIRED.



ESTIMATED QUANTITIES FOR CULVERT @ STA. SB 436+65

DESCRIPTION	UNIT	QUANTITY
STRUCTURE EXCAVATION (COMPLETE)	C. Y.	1,250
CLASS "A" CONCRETE	C. Y.	670
1/2" PREFORMED EXPANSION JOINT FILLER FOR BRIDGES	S. F.	555
DEFORMED STEEL BARS	L.B.	119,500
DAMP PROOFING	S. Y.	940
GRAVEL FILL	C. Y.	100
PERVIOUS STRUCTURE BACKFILL	C. Y.	1,300

GENERAL NOTES

SPECIFICATIONS: CONN. STATE HIGHWAY DEPARTMENT FORM 808 (JAN. 1955) AND SPECIAL PROVISIONS.

DESIGN SPECIFICATIONS: STD. SPEC. FOR HWY. BRIDGES (AASHTO 1957) EXCEPT AS MODIFIED BY THE BUREAU OF PUBLIC ROADS "POLICY ON INTERSTATE SYSTEM PROJECTS" (AUG. 1956) AND AS SUPPLEMENTED BY THE CONN. STATE HWY. DEPT. BRIDGE MANUAL, FEB. 1956

LIVE LOAD: H20-S16-44. ALT. 24000# DUAL AXLE AT 4'-0" O.C.

ELEVATIONS: ALL ELEVATIONS ARE BASED ON U.S.C. & G.S. DATUM.

CLASS "A" CONCRETE: CLASS "A" CONCRETE SHALL BE USED THROUGHOUT. SEE SPECIAL PROVISIONS.

DEFORMED STEEL BARS: FOR GRADES OF DEFORMED STEEL BARS, SEE SPECIAL PROVISIONS.

ALL SPLICES OF MAIN REINFORCEMENT SHALL BE 35 BAR DIAMETERS, DISTRIBUTION AND TEMPERATURE REINFORCEMENT SHALL BE 20 BAR DIAMETERS, UNLESS OTHERWISE SHOWN.

ALL REINFORCEMENT SHALL HAVE 2" COVER EXCEPT BOTTOM BARS OF BOTTOM SLAB WHERE COVER SHALL BE 3"

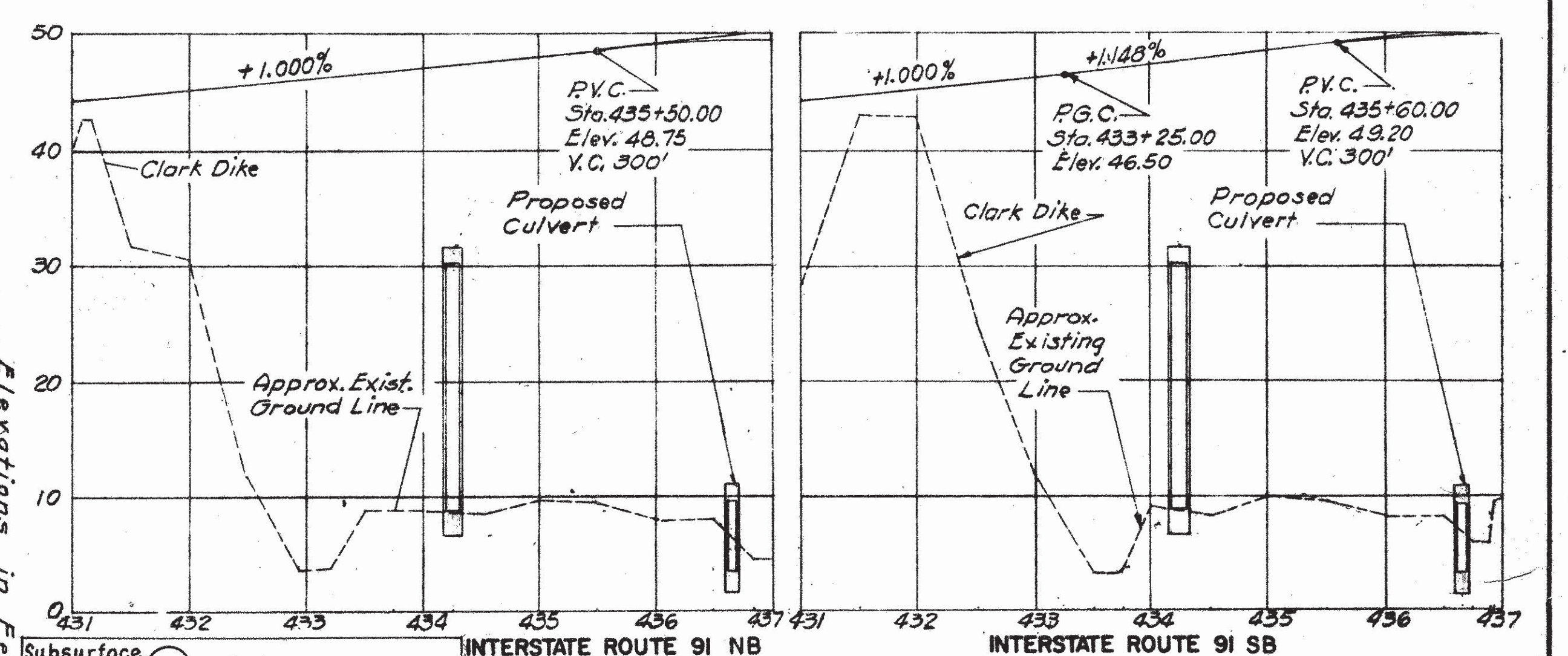
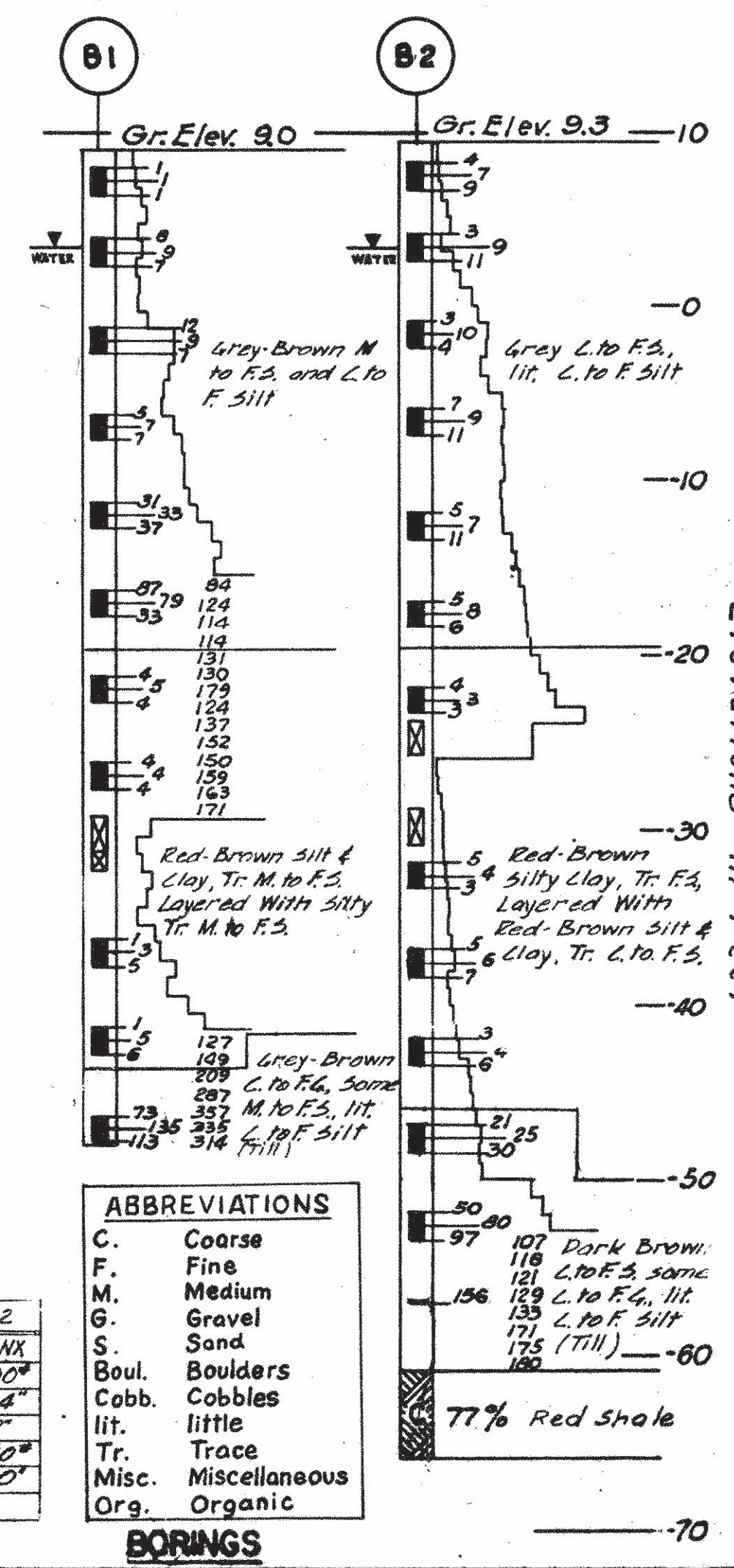
EXPOSED EDGES: EXPOSED EDGES SHALL BE BEVELED 1" x 1" UNLESS DIMENSIONED OTHERWISE.

JOINT SEAL: JOINT SEAL SHALL BE INCLUDED IN THE ITEM FOR CLASS "A" CONCRETE. SEE SPECIAL PROVISIONS.

COBBLES AND STONES AT WEEPHOLES: THE COST OF FURNISHING AND PLACING COBBLES AND SMALLER STONES AT WEEPHOLES SHALL BE INCLUDED IN THE ITEM FOR PERVIOUS STRUCTURE BACKFILL.

WEEPHOLES: COST OF WEEPHOLES SHALL BE INCLUDED IN THE ITEM FOR CLASS "A" CONCRETE.

GRAVEL FILL: FOR THE USE OF GRAVEL FILL UNDER DRAINAGE STRUCTURES SEE GENERAL CONSTRUCTION NOTES.



CONNECTICUT STATE HIGHWAY DEPARTMENT TOWN OF HARTFORD INTERSTATE ROUTE 91

8'-6" x 6'-0" REINF. CONCRETE BOX CULVERT AT STA. SB 436+65

DESIGNED BY LEONARD S. WEGMAN CO., CONTRACTING ENGINEER

SCALES AS SHOWN

MADE BY GP DATE 1-16-61

CHECKED BY UK DATE 1-16-61

APPROVED [Signature] DATE 1-16-61

PROJECT NO. 63-171

BRIDGE SHEET NO. 1 OF 2

PREVIOUS LOGS WALL 103

Draft

B. MASON
 BORING CREW LEADER
 C. HARRIMAN
 INSPECTOR
 WILEY & ALDRICH, INC.
 SOILS ENGINEER

FORM 884-1 REV. 8/63
 STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF HIGHWAYS
 BORING REPORT
 TOWN HARTFORD-EAST HARTFORD, CT.
 PROJECT NAME CHARTER OAK BRIDGE
 PROJECT NO. 63-384

SHEET 1 OF 2 NO.
 LOCATION RET WALL 101
 GUILD DRILLING CO., INC.
 BORING CONTRACTOR
 STEINMAN
 DESIGN ENGINEER

LOCATION *RET WALL 101*
 SURFACE ELEV. _____ AUGER CASING SAMPLER CORE BAR HOLE NO. **B 185**
 DATE FINISHED **1-16-77** TYPE _____ HW, NW SS NV Z LINE & STATION
 GROUND WATER OBSERVATIONS SIZE I.D. _____ 4.3" 1 1/2" 2" OFFSET
 AT FT. AFTER HRS. HAMMER WT. _____ 300# 140# BIT H. COORDINATE
 AT FT. AFTER HRS. HAMMER FALL _____ 24" 30" E. COORDINATE

DEPTH	CASING BLOWS PER FOOT	SAMPLE				BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		PEN. NO.	REC. INCH	TYPE	0-6	6-12			12-18
		FROM	TO								
		00-1.5'	1	18	14	D	3	4	2	1.0'	Loose, Brown, f. SAND, some silt, trace c-m sand and organic m. Loose Red Brn m-f SAND, little silt, trace c. sand
5		4-5.5'	2	18	18	D	5	5	6	8.0'	
10		9-10.5'	3	18	17	D	3	4	4		Med stiff Gray SILT, little fine sand
		14-15.5'	4	18	17	D	2	3	5		(Same as D4) SILT
20		19-20.5'	5	18	15	D	7	9	10	19.0'	Med dense, Gray m-f SAND, little silt - ALLUVIUM -
25		24-25.5'	6	18	17	D	9	10	11		Med dense, Gray m-f SAND, little silt, (isolated pockets of silt occur)
30		29-30.5'	7	18	16	D	7	9	13		Med dense Gray m-f SAND, little silt, trace organic matter (wood chips)
35		34-35.5'	8	18	17	D	26	40	57	34.0'	Hard Red Brn SILT and fine SAND, little c-m sand and f. gravel, trace clay - GLACIAL TILL -

FROM GROUND SURFACE TO 34 FEET USED 4 INCH CASING THEN 5 INCH CASING FOR 48 FEET

FOOTAGE IN EARTH 43 FOOTAGE IN ROCK 5 NO. OF SAMPLES 9 HOLE NO. B 185

SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

A. Mason
BORING CREW LEADER
C. Hamra
INSPECTOR
WILEY & ALDRICH, INC.
SOILS ENGINEER

STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF HIGHWAYS
 BORING REPORT
 TOWN HARTFORD-EAST HARTFORD, CT
 PROJECT NAME CHARTER OAK BRIDGE
 PROJECT NO. 63-384

LOCATION *Ref Wall No. 101*
GUILD DRILLING CO., INC.
 BORING CONTRACTOR
STEINMAN
 DESIGN ENGINEER

LOCATION		AUGER	CASING	SAMPLER	CORE BAR	HOLE NO.	<i>B 185</i>
SURFACE ELEV.						LINE & STATION	
DATE FINISHED		TYPE				OFFSET	
GROUND WATER OBSERVATIONS		SIZE I.D.				N. COORDINATE	
AT	FT.	AFTER	MRS.	HAMMER WT.	BIT	E. COORDINATE	
AT	FT.	AFTER	MRS.	HAMMER FALL			

DEPTH	CASING BELOW PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTH IN FEET FROM - TO		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
<i>40</i>		<i>39.5-40.5</i>	<i>9</i>	<i>19</i>	<i>18</i>	<i>D</i>	<i>33</i>	<i>55</i>	<i>70</i>	<i>41.0'</i>	<i>Hard Red Brn SILT, some c-a sand, trace fine gravel, clay. Decomposed Bedrock. (Rotter Bt from 11-43 ft.)</i>	
		<i>43-48'</i> <i>(ROD = 8%)</i>	<i>2</i>	<i>60</i>	<i>46</i>	<i>C</i>				<i>43.0'</i>		
<i>45</i>											<i>Mod hard Red Brn f. ground sandy SILTSTONE. Joints close occas. very close, shallow dipping; occas. steeply dipping. Bedding very thin. Rock slightly weathered, mod. fractured.</i>	

ON GROUND SURFACE TO *34* FEET USED *4* INCH CASING THEN *3* INCH CASING FOR *43* FEET

FOOTAGE IN EARTH *43* FOOTAGE IN ROCK *5* NO. OF SAMPLES *9* HOLE NO. *B 185*

SAMPLE TYPE CODES: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-N% LITTLE=10-20% SOME=20-60% AND=75-95%

A. MASON
 BORING CREW LEADER
C. HARRIMAN
 INSPECTOR
 WILEY & ALDRICH, INC.
 SOILS ENGINEER

STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF HIGHWAYS
 BORING REPORT
 TOWN HARTFORD—EAST HARTFORD, CT.
 PROJECT NAME CHARTER OAK BRIDGE
 PROJECT NO. 63-384

LOCATION *Reynolds Well No. 101*
 GUILD DRILLING CO., INC.
 BORING CONTRACTOR
 STEINMAN
 DESIGN ENGINEER

LOCATION *Reynolds Well No. 101*
 SURFACE ELEV. _____ AUGER CASING SAMPLER CORE BAR HOLE NO. **B 186**
 DATE FINISHED **31 DEC -86** TYPE _____ IN. NW 55 N. VI. LINE & STATION
 GROUND WATER OBSERVATIONS SIZE I.D. 4" J" 1 3/4" 2" OFFSET
 AT 5 1/2 FT. AFTER 0 HRS. HAMMER WT. 3016 14216 BIT H. COORDINATE
 AT FT. AFTER HRS. HAMMER FALL 24" 30" DIA E. COORDINATE

DEPTH	SAMPLE						BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
	DRAINAGE HOLES PER FOOT	DEPTH IN FEET FROM TO		NO.	PBL. INCH	REC. INCH	TYPE	0-6 6-12 12-18				
		0-6 6-12 12-18										
1	1	00-1.5	1	18	17	D	2	4	3	4.0	MED STIFF BRN SILT, SOME F SAND TRACE F. GRAVEL, GLASS - FILL -	
3												
5	1	40-5.5	2	18	16	D	3	3	3	7.5	MED STIFF GRAY SILT, LITTLE F. SAND, TRACE ORGANIC MATERIAL (WOOD CHIPS), GRASS, COAL, - FILL -	
7												
9												
11												
13												
15	10	70-10.5	3	18	12	D	5	6	5	16.0	STIFF OLIVE GRAY TO GRAY SILT, TRACE F. SAND, NOTE: <u>Sample contaminated - odor.</u> - ALLUVIUM -	
17												
19												
21												
23												
25												
27												
29												
31	10	140-15.5	4	18	14	D	4	4	6	16.0	(SAME AS D5)	
33												
35												
37												
39	10	180-20.5	5	18	14	D	7	9	12	33.0	MED. DENSE GRAY MED TO FINE SAND, TRACE SILT	
41												
43												
45												
47												
49												
51												
53	10	240-25.5	6	18	14	D	6	8	9	33.0	(SAME AS D5)	
55												
57												
59												
61												
63												
65												
67												
69												
71												
73	10	280-30.5	7	18	16	D	5	7	9	33.0	Med dense, M-F SAND, trace silt, <u>organic material.</u> (wood chips) - ALLUVIUM -	
75												
77												
79												
81												
83												
85												
87												
89												
91												
93	10	340-35.5	8	18	16	D	12	16	19	37.0	DENSE, GRAY TO RED BRN MED TO FINE SAND, LITTLE SILT, TRACE MED TO FINE GRAVEL - ALLUVIUM -	
95												
97												
99												
101												
103												
105												

FROM GROUND SURFACE TO 39 FEET USED 4 INCH CASING THEN 3 INCH CASING FOR 62 FEET

FOOTAGE IN EARTH 62 FOOTAGE IN ROCK 5 NO. OF SAMPLES 11 HOLE NO. B 186

SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

A. MASON
BORING CREW LEADER
C. HARRIMAN
SUPERVISOR
HALEY & ALDRICH, INC.
SOILS ENGINEER

FORM 84-1 REV. 8/83
 STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF HIGHWAYS
 BORING REPORT
 TOWN HARTFORD-EAST HARTFORD, CT.
 PROJECT NAME CHARTER OAK BRIDGE
 PROJECT NO. 63-384

SHEET 2 OF 2
 LOCATION R.T. WALL # 101
 GUILD DRILLING CO., INC.
 BORING CONTRACTOR
 STEINMAN
 DESIGN ENGINEER

LOCATION	REF. MAP				AUGER	CASING	SAMPLER	CODE BAR	HOLE NO.	B 186
SURFACE ELEV.										
DATE FINISHED	12-31-86				TYPE		4 1/2" NW	S3	NVZ	LINE & STATION
GROUND WATER OBSERVATIONS					SIZE I.D.		4" 3"	1 3/4"	2"	OFFSET
AT 5 FT. 3" AFTER	9 HRS.				HANDER WT.		300 lb	140 lb	BT	N. COORDINATE
AT FT. AFTER					HANDER FALL		24"	30"	D/A	E. COORDINATE

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET FROM TO		NO.	PER. INCH	REC. INCH	TYPE	0-6	6-12			12-18
40		38-40.5	9	18	17	D	2	3	4	41.0	MED STIFF RED BRN VARIED CLAY AND SILTY CLAY	
45		44-45.5	10	18	16	D	29	37	68		HARD RED BRN C-F SAND and SILT, little MED TO FINE GRAVEL, trace clay	
50		49-50.5	7	0	0	D	130				- GLACIAL TILL -	
55		54-55.5	11	12	12	D	42	95		57.0	Hard Red brown SILT, some C-F Sand, little gravel, trace clay	
60		57-60.5	-	0	0	D	125			59.0	Lightly weathered bedrock Note: Roller bitted from 59.0-62.0 ft. Decomposed bedrock	
65		62-67.0 (ROD=377)	1	60	60	C	7	9	9		Mod. hard, red brown, fine grained sandy SILTSTONE. Joints close, occas very close. shallow dipping, occas. steeply dipping. Bedding very thin. Rock slightly weathered, moderately to slightly fractured.	
70												
75											Bottom of Exploration at 67.0 ft.	

ON GROUND SURFACE TO 37 FEET USED 4 INCH CASING THEN 5 INCH CASING FOR 62 FEET
 FOOTAGE IN EARTH 62 FOOTAGE IN ROCK 5 NO. OF SAMPLES 11 HOLE NO. B 186

SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-25% SOME=25-65% AWD=75-85%

J. Doner BORING CREW LEADER G. Ozark INSPECTOR HALEY & ALDRICH, INC. SOILS ENGINEER	FORM SM-1 REV. 1/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT TOWN HARTFORD, CT PROJECT NAME CHARTER OAK BRIDGE PROJECT NO. 63-384	SHEET 1 OF 1 LOCATION RET. WALL NO. 101 GENERAL BORINGS, INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
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LOCATION RETAINING WALL NO. 101 ALONG I-91 NB			
SURFACE ELEV. 19.2		AUGER CASING SAMPLER CORE BAR	
DATE FINISHED 2/17/87		HOLE NO. B241	
GROUND WATER OBSERVATIONS		TYPE HSA SS	
SIZE I.D. 2-1/2"		LINE & STATION I-91 NB122+28.0	
7.0 FT. AFTER 0 HRS. HAMMER WT.		OFFSET 21.9L	
30" FT. AFTER HRS. HAMMER FALL		N. COORDINATE 331940.4	
		E. COORDINATE 623967.2	

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)		
		DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18	
		FROM	TO										
		0.0	2.0	1	24	18	D	11	8	5			
		2.0	4.0	2	24	18	D	7	4	5			
5		4.0	6.0	3	24	11	D	5	4	4			
		6.0	8.0	4	24	8	D	2	3	3	7.0'		
		8.0	10.0	5	24	8	D	11	15	17	9.0'		
10													
15		15.0	17.0	6	24	16	D	2	1	2			
20		20.0	22.0	7	24	8	D	16	9	9			
25													
30													
35													
40													

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR
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FOOTAGE IN EARTH	FOOTAGE IN ROCK	NO. OF SAMPLES	HOLE NO.
22.0'		7	B241

SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST

PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-30% AND=35-50%

PRELIMINARY

S. Ramsdell BORING CREW LEADER G. Ozark INSPECTOR HALEY & ALDRICH, INC. SOILS ENGINEER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT	SHEET 1 OF 1 LOCATION RET. WALL NO. 101 GENERAL BORINGS, INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
TOWN HARTFORD, CT		PROJECT NAME CHARTER OAK BRIDGE
PROJECT NO. 63-384		LOCATION RETAINING WALL NO. 101 ALONG I-91 NB

DATE FINISHED 2/17/87	TYPE HSA	AUGER	CASING	SAMPLER SS	CORE BAR	HOLE NO. B242
GROUND WATER OBSERVATIONS		SIZE I.D. 2-1/2"		1-3/8"		LINE & STATION I-91NB 120+05.2
AT 8.0 FT. AFTER 0 HRS.	HAMMER WT.			140 lbs.	BIT	OFFSET 0.4L
AT FT. AFTER HRS.	HAMMER FALL			30"		N. COORDINATE 331733.2
						E. COORDINATE 623880.7

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET FROM - TO		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
		0.0 - 2.0	1	24	17	D	6	4	6		2.0 inches FROST. Loose, light brown SILT, little fine sand, trace gravel, organic material, brick, glass. Medium dense, red-brown medium-fine SAND, some silt, trace gravel, glass, concrete. - FILL - Very stiff, black-gray SILT, little fine sand, trace glass, concrete, wood. Medium stiff, gray SILT, trace fine sand, clay. - FILL - Medium stiff, gray fine SAND, little silt. Stiff, gray medium-fine SAND, trace coarse sand, silt. - ALLUVIUM - (Same as D6.) Bottom of Exploration at 22.0 Feet	
		2.0 - 4.0	2	24	13	D	7	10	8	5.5'		
5		4.0 - 6.0	3	24	15	D	10	10	11	7.0'		
		6.0 - 8.0	4	24	15	D	2	2	2	9.0'		
		8.0 - 10.0	5	24	16	D	5	4	5			
10									4			
15		15.0 - 17.0	6	24	22	D	2	4	8			
									7			
20		20.0 - 22.0	7	24	24	D	2	3	3			
									4			
25												
30												
35												
40												

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
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FOOTAGE IN EARTH 22.0'	FOOTAGE IN ROCK	NO. OF SAMPLES 7	HOLE NO. B242
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SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-85% AND=85-100%

S. Ramsdell
BORING CREW LEADER
G. Ozark
INSPECTOR

FORM SM-1 REV. 8/83
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS
BORING REPORT

SHEET 1 OF 1
LOCATION RET. WALL NO. 101
GENERAL BORINGS, INC.
BORING CONTRACTOR
STEINMAN
DESIGN ENGINEER

TOWN HARTFORD CT
PROJECT NAME CHARTER OAK BRIDGE
PROJECT NO. 63-384

HALEY & ALDRICH, INC.
SOILS ENGINEER

LOCATION RETAINING WALL NO. 101/I-91 NB
SURFACE ELEV. 16.0
DATE FINISHED 2/19/87
GROUND WATER OBSERVATIONS
AT 9.0 FT. AFTER 0 HRS.
AT FT. AFTER HRS.

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL. REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		PEN. NO.	REC. INCH	TYPE	0-6	6-12	12-18			
		FROM	TO									
									0.3'	0.3' Blacktop		
		0.5 - 2.5		1	24	13	D	17	10	11	Medium dense, red-brown medium-fine SAND, little gravel, trace silt, coarse sand. (Same as D1.) Loose, red-brown fine SAND, little silt, trace medium-coarse sand. (Same as D3.) Loose, red-brown medium-fine SAND, little silt, trace coarse sand. - FILL -	
		2.5 - 4.5		2	24	14	D	12	11	12		
		4.5 - 6.5		3	24	18	D	5	4	5		
		6.5 - 8.5		4	24	20	D	3	2	1		
		8.5 - 10.5		5	24	22	D	1	2	2		
											12.0'	
		15.0 - 17.0		6	24	18	D	1	1	2	Soft, gray SILT and fine SAND.	
											- ALLUVIUM -	
		20.0 - 22.0		7	24	16	D	2	3	4	Loose, gray fine SAND, some silt, trace coarse-medium sand.	
											Bottom of Exploration at 22.0 Feet	

FROM GROUND SURFACE TO FEET USED INCH CASING THEN INCH CASING FOR FEET
FOOTAGE IN EARTH 22.0 FOOTAGE IN ROCK NO. OF SAMPLES 7 HOLE NO. B243

SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

PREVIOUS LOGS WALL 104

Draft

D. C. Holley
BORING FOREMAN
Gregory Ozark
INSPECTOR
Haley & Aldrich, Inc.
SOILS ENGINEER

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS
BORING REPORT
TOWN Hartford - East Hartford, Conn.
PROJECT NAME Charter Oak Bridge
PROJECT NO. 63-384

SHEET 1 OF 3
LOCATION See Plan
Guild Drilling Co., Inc.
BORING CONTRACTOR
S. B. G. & B.
CONTRACTING ENGINEER

LOCATION I-91, Hartford, Conn.
SURFACE ELEV. 16.3
DATE FINISHED 3/26/86
GROUND WATER OBSERVATIONS AT 4.8 FT. AFTER 24 HRS.
TYPE AUGER CASING SAMPLER CORE BAR HOLE NO. B-2
LINE & STATION See Plan
SIZE I.D. 4" 1-3/8" 2" OFFSET
HAMMER WT. 300# 140# BIT N. COORDINATE 333737
HAMMER FALL 24" 30" Dia. E. COORDINATE 624813

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
		FROM	TO									
	-	0'-1.5'	1	18"	13"	D	1	2	3	1.5'	Very loose, Brown fine SAND, little medium sand, silt, trace organics (leaves, grass) - Topsoil -	
	-									El. 4.8		
	-											
5	-											
	13	5'-6.5'	2	18"	18"	D	2	2	2		Very loose Brown fine SAND and Silt -Fill-	
	8											
	10											
	9											
10	18	8.5'-10'	-	18"	0"	D	1	=	18"		Very soft Brown Gray SILT, little mottled clay, trace of fine sand -Fill-	
	17	10'-11.5'	3	18"	18"	D	1	=	18"			
	17											
	15											
15	22	14'-15.5'	4	18"	18"	D	1	=	18"		Very soft Brown Gray SILT, trace of mottled clay, trace of fine sand -Fill-	
	19											
	20											
	20											
	21									17'		
20	28	18.5'-20'	5	18"	18"	D	4	2	2	El.-0.7'	Very loose Gray slightly organic fine SAND, some silt, trace of medium sand, wood fibers, mild odor	
	27											
	31											
	39											
	29									23.5'		
25	27	24'-25.5'	6	18"	12"	D	3	5	6	El.-7.2'	Medium dense Brown medium to fine SAND, trace of coarse sand and silt	
	42											
	38											
	41											
	55											
30	48	28.5'-30'	7	18"	18"	D	5	8	13		Medium dense Gray medium to fine SAND, trace coarse sand and silt	
	68											
	77											
	72											
	50									33.5'		
35	40	34'-35.5'	8	18"	12"	D	Wt. of Ham.			El.-17.2'	Very soft Brown alternating 2" to 3" layers of CLAY and Silt- varved CLAY- * Casing blows not obtained, washing ahead of casing in clay strata.	
	57											
	60											
	51											
	50											
	*	38.5'-40.5'	UPI	24"	23"	UP						

FROM GROUND SURFACE TO 38.5 FEET USED 4 INCH CASING THEN 3 INCH CASING FOR 35 FEET
FOOTAGE IN EARTH 78' FOOTAGE IN ROCK 5' TYPE NX NO. OF SAMPLES 14 HOLE NO. B-2

SAMPLE TYPE CODING: D=DRY C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

BORING FOREMAN	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT	SHEET 2 OF 3
INSPECTOR	TOWN Hartford - East Hartford, Conn.	LOCATION
SOILS ENGINEER	PROJECT NAME Charter Oak Bridge	BORING CONTRACTOR
	PROJECT NO. 63-384	CONTRACTING ENGINEER

LOCATION		SURFACE ELEV.		AUGER		CASING		SAMPLER		CORE BAR		HOLE NO. B-2	
DATE FINISHED		TYPE										LINE & STATION	
GROUND WATER OBSERVATIONS		SIZE I.D.										OFFSET	
AT	FT.	AFTER	HRS.	HAMMER WT.								N. COORDINATE	
AT	FT.	AFTER	HRS.	HAMMER FALL								E. COORDINATE	

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL. REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)		
		DEPTHS		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18	
		FROM	TO										
		42.5' (Tip)	V1										
75		43'-44.5'	9	18"	18"	D	Wt. of Ham.				(See Vane Shear Report) Very soft Brown varved CLAY		
		46'-48'	UP2	24"	24"	UP							
50		50' (Tip)	V2										
		50'-51.5'	10	18"	18"	D	1 = 18"				(See Vane Shear Report) Very soft Brown varved CLAY		
35		53.5'-55.5'	UP3	24"	24"	UP							
60		58.5'-60'	11	18"	18"	D	Wt. of Ham.				(Same as S 10)		
65		63.5'-65'	12	18"	18"	D	Wt. of Ham.				(Same as S10)		
70		68.5'-70'	13	18"	18"	D	Wt. of Ham.				Very soft Brown varved CLAY (higher silt content)		
75		73.5'-75'	14	18"	18"	D	32	62	79	73.5'	El.-57.2		Very dense Red Brown GRAVEL, little coarse to fine sand and silt, trace of clay -Till-
		78'-83'	C1	60"	52"	C				78'	El.-61.7		Red interbedded, cross-stratified SILTSTONE and Sandstone ROD=65%

FROM: GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
FOOTAGE IN EARTH	FOOTAGE IN ROCK	TYPE	NO. OF SAMPLES	HOLE NO. B-2
SAMPLE TYPE CODING: D=DRY C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST				
PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%				

A. Mason BORING CREW LEADER E. Henderson INSPECTOR HALEY & ALDRICH, INC. SOILS ENGINEER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT TOWN HARTFORD-EAST HARTFORD, CT. PROJECT NAME CHARTER OAK BRIDGE PROJECT NO. 63-384	SHEET 1 OF 3 LOCATION West Abutment 3 W.S. GUILD DRILLING CO., INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
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LOCATION Exit 29 of Rt. 91 S, Island off Ramp to Charter Oak Bridge	AUGER	CASING	SAMPLER	CORE BAR	HOLE NO. B 106
DEPTH FINISHED 11/18/86	TYPE	HW-NW	S/S	NV II	LINE & STATION RT15 541+74.6
GROUND WATER OBSERVATIONS	SIZE I.D.	4" 3"	1-3/8"		OFFSET 6.6R
10 FT. 3" AFTER 0 HRS.	HAMMER WT.	300#	140#	BIT	N. COORDINATE 333891.85
FT. AFTER HRS.	HAMMER FALL	24"	30"		E. COORDINATE 624845.65

D H	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
		FROM	TO									
	P	0'-1.5'		1	18	18	D	1	2	4	2'	Medium stiff, Brown SILT, some fine sand, root matter -TOPSOIL-
	P											
	10											
	47										4.5'	Medium dense, Brown medium SAND, trace of silt -ALLUVIUM-
5	6	4'-5.5'		2	18	16	D	6	10	11		Stiff, Brown-Gray SILT, some fine sand, trace of organic material
	15											
	18											
	14											
	18											
10	14	9'-10.5'		3	18	18	D	1	1	1	13'	Very soft to soft, Gray-Brown SILT, little fine sand, trace of clay -ALLUVIUM-
	16											
	16											
	14											
	15											
5	27	14'-15.5'		4	18	18	D	2	2	2		Loose, Brown-Gray fine SAND and SILT
	35											
	35											
	30											
	36											
20	40	19'-20.5'		5	18	16	D	2	3	5		Loose, Gray fine SAND, little silt
	41											
	39											
	42											
	47											
5	44	24'-25.5'		6	18	12	D	4	2	2		Loose, Dark Gray fine SAND, some silt, trace of medium to coarse sand -ALLUVIUM-
	38											
	43											
	50											
	60											
30	49	29'-30.5'		7A	18	15	D	9	11	16	30.3'	Medium dense, Dark Gray fine SAND, trace of silt
	52			7B								Loose, Gray-Brown coarse to fine SAND, trace of silt.
	74											
	86											
	100											
35	57	34'-35.5'		8	18	15	D	10	19	18		Dense, Gray medium to fine SAND, trace of silt.
	58											
	60											
	63											
	64											
	53	39'-40.5'		9	18	16	D	WOR	1	1	38'	Very soft, Red-Brown VARVED CLAY and SILTY CLAY

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
FOOTAGE IN EARTH	FOOTAGE IN ROCK	NO. OF SAMPLES	HOLE NO. B 106	
SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST				
PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%				

M. McDonough BORING CREW LEADER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT TOWN HARTFORD-EAST HARTFORD, CT.	SHEET 1 OF 3
M. Germano INSPECTOR		LOCATION West Abutment 3, E.S.
HALEY & ALDRICH, INC. SOILS ENGINEER	PROJECT NAME CHARTER OAK BRIDGE	GUILD DRILLING CO., INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
	PROJECT NO. 63-384	

LOCATION West Bank of Conn. River - Hartford, Ct.	AUGER	CASING	SAMPLER	CORE BAR	HOLE NO. B 107
DEPTH FINISHED 11/7/86	TYPE	HW-NW	S/S	NV II	LINE & STATION RT15 541+68.8
GROUND WATER OBSERVATIONS	SIZE I.D.	4" 3"	1-3/8"		OFFSET 57.8R
8.5 FT. AFTER 48 HRS.	HAMMER WT.	300#	140#	BIT	N. COORDINATE 333857.56
FT. AFTER HRS.	HAMMER FALL	24"	30"		E. COORDINATE 624884.12

D H	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
		FROM	TO									
	14	0'-1.5'	1A	18	18	D	6	13	15	0.5'	Loose, Brown fine SAND, trace of coarse to medium sand, roots, wood, silt-FILL-	
	43		1B								Medium dense, Brown fine SAND, little silt, trace of coarse to medium sand, fine gravel -FILL-	
5	33	4'-5.5'	2	18	18	D	5	5	7	4'	Stiff, Gray Brown SILT and fine SAND, trace of medium sand -ALLUVIUM-	
	23											
	18											
	15											
10	20	9'-10.5'	3	18	18	D	1	1	2	7'	Very loose, Brown fine SAND, some silt	
	18											
	18											
	17											
5	37	14'-15.5'	4	18	18	D	1	2	2	18'	Very loose, Gray fine SAND, some silt, trace of wood fibers -ALLUVIUM-	
	30											
	31											
	39											
	45											
20	44	19'-20.5'	5	18	18	D	1	2	2	24'	Very loose, Gray medium to fine SAND, trace of coarse sand, fine gravel, silt -ALLUVIUM-	
	40											
	43											
	53											
	54											
5	28	24'-25.5'	6	18	18	D	2	2	5	34'	Loose, Gray fine SAND, little silt, trace of medium sand and wood	
	34											
	36											
	50											
	65											
30	48	29'-30.5'	7	18	18	D	5	12	16	34'	Medium dense, Gray fine SAND, trace of medium sand, silt, wood -ALLUVIUM-	
	58											
	85											
	67											
	80											
15		34'-35.5'	8	18	18	D	Wt. of Ham.				Very soft, Red-Brown VARVED CLAY and SILTY CLAY	
		39'-40.5'	9	18	18	D	2	2	3		Medium stiff, Red-Brown VARVED CLAY and SILTY CLAY	

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
FOOTAGE IN EARTH	FOOTAGE IN ROCK	NO. OF SAMPLES	HOLE NO. B 107	
SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST				
PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%				

M. McDonough BORING CREW LEADER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS	SHEET 2 OF 3
M. Germano INSPECTOR	BORING REPORT TOWN HARTFORD-EAST HARTFORD, CT.	LOCATION West Abutment. 3, E.S
HALEY & ALDRICH, INC. SOILS ENGINEER	PROJECT NAME CHARTER OAK BRIDGE	GUILD DRILLING CO., INC. BORING CONTRACTOR STEINMAN
	PROJECT NO. 63-384	DESIGN ENGINEER

LOCATION		SURFACE ELEV.		AUGER	CASING	SAMPLER	CORE BAR	HOLE NO.	B 107
DATE FINISHED		TYPE						LINE & STATION	
GROUND WATER OBSERVATIONS		SIZE I.D.						OFFSET	
AT	FT.	AFTER	HRS.	HAMMER WT.				BIT	N. COORDINATE
AT	FT.	AFTER	HRS.	HAMMER FALL					E. COORDINATE

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL. REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	ON SAMPLER				
		FROM	TO					0-6	6-12			12-18
5	P U S H E D	44'-45.5'	10	18	18	D	2	2	3	Medium stiff, Red-Brown VARVED CLAY and SILTY CLAY		
50		49'-50.5'	11	18	18	D	Wt. of Ham.			Very soft, (same as D10)		
55		54'-55.5'	12	18	18	D	2	2	2	Very soft, (same as D10)		
60		59'-60.5'	13	18	18	D	2	2	2	Soft, (same as D10)		
55		64'-65.5'	14	18	18	D	2	2	3	Medium stiff, (same as D10)		
70		69'-70.5'	15	18	18	D	3	3	3	Medium stiff, (same as D10)		
75		74'-75.5'	16	18	18	D	65	100/4"		Very dense, Red-Brown SILT and fine SAND, little coarse sand, fine gravel, trace of clay -GLACIAL TILL-		
		76'-81'	1	60	34	C	50/2"	75*		76'		
				(RQD=35%)			10	Drill Rate		Moderately hard, Brown-Red fine grained SILTSTONE, slightly weathered, very closely to closely jointed. Rock very thinly bedded.		
							8	Min/Ft				
							7					

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
* denotes 300# Weight on Spoon				
FOOTAGE IN EARTH	FOOTAGE IN ROCK	NO. OF SAMPLES	HOLE NO. B 107	
SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST				
PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%				

M. McDonough BORING CREW LEADER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT	SHEET 3 OF 3
M. Germano INSPECTOR		LOCATION West Abutment 3, E.S.
HALEY & ALDRICH, INC. SOILS ENGINEER	TOWN HARTFORD-EAST HARTFORD, CT.	GUILD DRILLING CO., INC. BORING CONTRACTOR
	PROJECT NAME CHARTER OAK BRIDGE	STEINMAN DESIGN ENGINEER
	PROJECT NO. 63-384	

LOCATION	AUGER	CASING	SAMPLER	CORE BAR	HOLE NO. B 107
SURFACE ELEV.	TYPE				LINE & STATION
DATE FINISHED	SIZE I.D.				OFFSET
GROUND WATER OBSERVATIONS	HAMMER WT.				N. COORDINATE
FT. AFTER HRS.	HAMMER FALL				E. COORDINATE

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL. REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET FROM - TO		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
		81'-83'	2	24	24	C		8		(Runs 2 and 3 - same description as Run 1)		
								9				
								8				
		83'-86'	3	36	36	C		8				
								10				
								8		Bottom of Exploration at 86'		

FROM GROUND SURFACE TO 34	FEET USED 4	INCH CASING THEN 3	INCH CASING FOR 76	FEET
FOOTAGE IN EARTH 76	FOOTAGE IN ROCK 10	NO. OF SAMPLES 16	HOLE NO. B 107	
SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST				
PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%				

PREVIOUS LOGS WALL 105

Draft

B. Pelkey BORING CREW LEADER D. Warren L. Dwyer INSPECTOR HALEY & ALDRICH, INC. SOILS ENGINEER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT TOWN HARTFORD, CT PROJECT NAME CHARTER OAK BRIDGE PROJECT NO. 63-384	SHEET 1 OF 1 LOCATION Ramp 5N-1 GENERAL BORINGS, INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
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LOCATION Rte. 15 NB To I-91 NB (Ramp SN-1)	AUGER	CASING	SAMPLER	CORE BAR	HOLE NO. B221A
SURFACE ELEV.					
DATE FINISHED 2/26/87	TYPE	HW	SS		LINE & STATION
GROUND WATER OBSERVATIONS	SIZE I.D.	4"	1-3/8"		OFFSET
AT 4.0 FT. AFTER 0 HRS. HAMMER WT.		300 lb	140 lb	BIT	N. COORDINATE
AT FT. AFTER HRS. HAMMER FALL		24"	30"		E. COORDINATE

DEPTH	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)		
	CASING BLOWS PER FOOT	DEPTHS IN FEET		PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18	
		FROM	TO				NO.					
		0.0 - 2.0		1	24	4	D	16	15	20	1.0'	TOPSOIL Hard, brown ORGANIC MATTER and SILT, some fine sand. Dense, brown fine SAND, some silt, little gravel, trace coarse-medium sand, brick. Medium dense, brown fine SAND, some silt. Medium dense, light brown, medium-fine SAND, little coarse sand, gravel, trace silt. Very stiff SILT, some fine sand, trace fine gravel, coarse sand. - FILL - Stiff, brown SILT, some fine sand. Soft, gray fine SILT and fine SAND. Medium dense, gray, medium-fine SAND, trace coarse sand, silt. - ALLUVIUM - Bottom of Exploration at 27.0 feet
		2.0 - 4.0		2	24	11	D	19	19	20		
5		4.0 - 6.0		3	24	16	D	13	8	10		
		6.0 - 8.0		4	24	24	D	8	11	14		
		8.0 - 10.0		5	24	24	D	10	9	12	10.0'	
10												
15		15.0 - 17.0		6	24	16	D	6	5	5		
										4		
20		18.0 - 20.0		1	24	22	UP					
		20.0 - 22.0		7	24	18	D	1	1	2		
										1		
25												
		25.0 - 27.0		8	24	14	D	6	15	14		
										13		
30												
35												

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
FOOTAGE IN EARTH 27'	FOOTAGE IN ROCK 0'		NO. OF SAMPLES 8	HOLE NO. B-221A

SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

J. Doner
BORING CREW LEADER

E. Henderson
INSPECTOR

HALEY & ALDRICH, INC.
SOILS ENGINEER

FORM SM-1 REV. 8/83
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS
BORING REPORT

TOWN HARTFORD, CT
PROJECT NAME CHARTER OAK BRIDGE
PROJECT NO. 63-384

SHEET 1 OF 1

LOCATION RAMP 5N-1

GENERAL BORINGS, INC.
BORING CONTRACTOR

STEINMAN

DESIGN ENGINEER

LOCATION U.S. ROUTE 5/15 NB TO I-91 NB (RAMP 5N-1)

SURFACE ELEV. AUGER CASING SAMPLER CORE BAR HOLE NO. B221B

DATE FINISHED 3/13/87 TYPE HA SS LINE & STATION

GROUND WATER OBSERVATIONS SIZE I.D. 2-1/2" 1-3/8" OFFSET

AT 2.0 FT. AFTER 0 HRS. HAMMER WT. 140 lbs BIT N. COORDINATE

AT FT. AFTER HRS. HAMMER FALL 38" E. COORDINATE

DEPTH M	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
	DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
	FROM	TO									
	0.0	2.0	1	24	4	D	4	100		Very dense, red-brown coarse-fine SAND, little silt, trace gravel, organic matter. Note: Drilled through gravel, cobbles, small boulders. - FILL - Loose, gray fine SAND, little silt, trace organic matter.	
	2.5	4.5	-	0	0	D	100	0"			
5	4.5	6.5	2	24	8	D	4	5	2		
	6.5	8.5	3	24	24	D	1/18"		1		
	8.5	10.5	4	24	24	D	1/18"		1		
10									2	Very loose, brown coarse-fine SAND, some gravel, little silt.	
										Very loose, green-brown fine SAND, little silt. - ALLUVIUM -	
15	15.0	17.0	5	24	24	D	17	29	20	Dense, brown coarse-fine SAND, trace silt, gravel. - ALLUVIUM - Bottom of Exploration at 17.0 Feet	
									10		
20										Note: Moved boring 2 times due to large boulders and concrete blocks encountered below the surface.	

FROM GROUND SURFACE TO FEET USED INCH CASING THEN INCH CASING FOR FEET
 FOOTAGE IN EARTH 17.0' FOOTAGE IN ROCK NO. OF SAMPLES 5 HOLE NO. B221B

SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

S. Ramsdell BORING CREW LEADER D. Warren INSPECTOR HALEY & ALDRICH, INC. SOILS ENGINEER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT	SHEET 1 OF 1 LOCATION RAMP 5N-1 GENERAL BORINGS, INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
	TOWN HARTFORD, CT	
	PROJECT NAME CHARTER OAK BRIDGE	
	PROJECT NO. 63-384	

LOCATION ROUTE 15N to I-91 NB (RAMP 5N-1)	SURFACE ELEV. 21.8	AUGER	CASING	SAMPLER	CORE BAR	HOLE NO. B222
DATE FINISHED 2/27/87	TYPE	HSA		SS		LINE & STATION (5N-1) 15+67.4
GROUND WATER OBSERVATIONS	SIZE I.D.	4-1/4"		1-3/8"		OFFSET 1.7 L
AT 9.0 FT. AFTER 0 HRS. HAMMER WT.				140 lbs.	BIT	N. COORDINATE 333065.9
AT FT. AFTER HRS. HAMMER FALL				30"		E. COORDINATE 624524.7

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	ON SAMPLER				
		FROM	TO					0-6	6-12			12-18
		0.0	2.0	1	24	18	D	6	10	11	0.5'	Very stiff, brown SILT and medium-fine SAND, little roots.
		2.0	4.0	2	24	18	D	11	14	15	7.0'	
5		4.0	6.0	3	24	18	D	24	14	13		Medium dense, red-brown medium-fine SAND, some silt, little coarse-medium sand, fine gravel.
		6.0	8.0	4	24	20	D	22	13	14	Medium dense, gray medium-fine SAND and GRAVEL, some silt, little coarse sand.	
10		8.0	10.0	5	24	24	D	6	6	5		Very stiff, red-brown SILT, some coarse-fine sand, little gravel, trace clay.
											- FILL -	
15												Very stiff gray SILT, some fine sand.
		15.0	17.0	6	24	24	D	1/12"		1	Stiff, gray SILT, trace clay, roots.	
										2		
20		20.0	22.0	7	24	24	D	1/12"		1	21.0'	Very loose, brown fine SAND, some silt.
				7A						2	- ALLUVIUM - Very loose, brown fine SAND and SILT. Brown SILT and fine SAND.	
25		25.0	27.0	8	24	20	D	7	7	7	Medium dense, gray medium-fine SAND, trace coarse sand, silt. - ALLUVIUM - Bottom of Exploration at 27.0 Feet	
										8		
30												
35												
40												

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
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FOOTAGE IN EARTH 27.0	FOOTAGE IN ROCK	NO. OF SAMPLES 8	HOLE NO. B222
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SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-50% AND=50-60%

J. Doner
BORING CREW LEADER

E. Henderson
INSPECTOR

HALEY & ALDRICH, INC.
SOILS ENGINEER

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS
BORING REPORT

TOWN HARTFORD, CT

PROJECT NAME CHARTER OAK BRIDGE

PROJECT NO. 63-384

LOCATION RAMP 5N -1

GENERAL BORINGS, INC.

BORING CONTRACTOR

STEINMAN

DESIGN ENGINEER

LOCATION U.S. ROUTE 5/15 NB TO I-91 NB (RAMP 5N-1)

SURFACE ELEV.

AUGER CASING SAMPLER CORE BAR HOLE NO. B277

DATE FINISHED 3/16/87

TYPE HA SS LINE & STATION

GROUND WATER OBSERVATIONS

SIZE I.D. 2-1/2" 1-3/8" OFFSET

AT * FT. AFTER 0 HRS. HAMMER WT. 140 lbs. BIT N. COORDINATE

AT FT. AFTER HRS. HAMMER FALL 30" E. COORDINATE

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTH IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
		FROM	TO									
		0.0 - 2.0		1	24	24	D	W	0	H	5.0'	Very loose, brown SILT, little fine sand, trace medium sand, abundant organic matter. Very loose, brown fine SAND, little silt, trace organic matter. - ALLUVIUM - Very loose, brown fine SAND, trace medium sand, silt. Very loose, brown medium-fine SAND, trace silt, organic matter. (Same as D3B.) - ALLUVIUM -
		2.0 - 4.0		2	24	24	D	1/24"				
6		4.0 - 6.0		3	24	18	D	1/12"	1			
		6.0 - 8.0		4	24	19	D	1	1	1		
		8.0 - 10.0		5	24	16	D	1	1	2		
10										2		
15		15.0 - 17.0		6	24	24	D	3	4	5	Bottom of Exploration at 17.0 Feet	
										6		
20												
25												
30												
35												

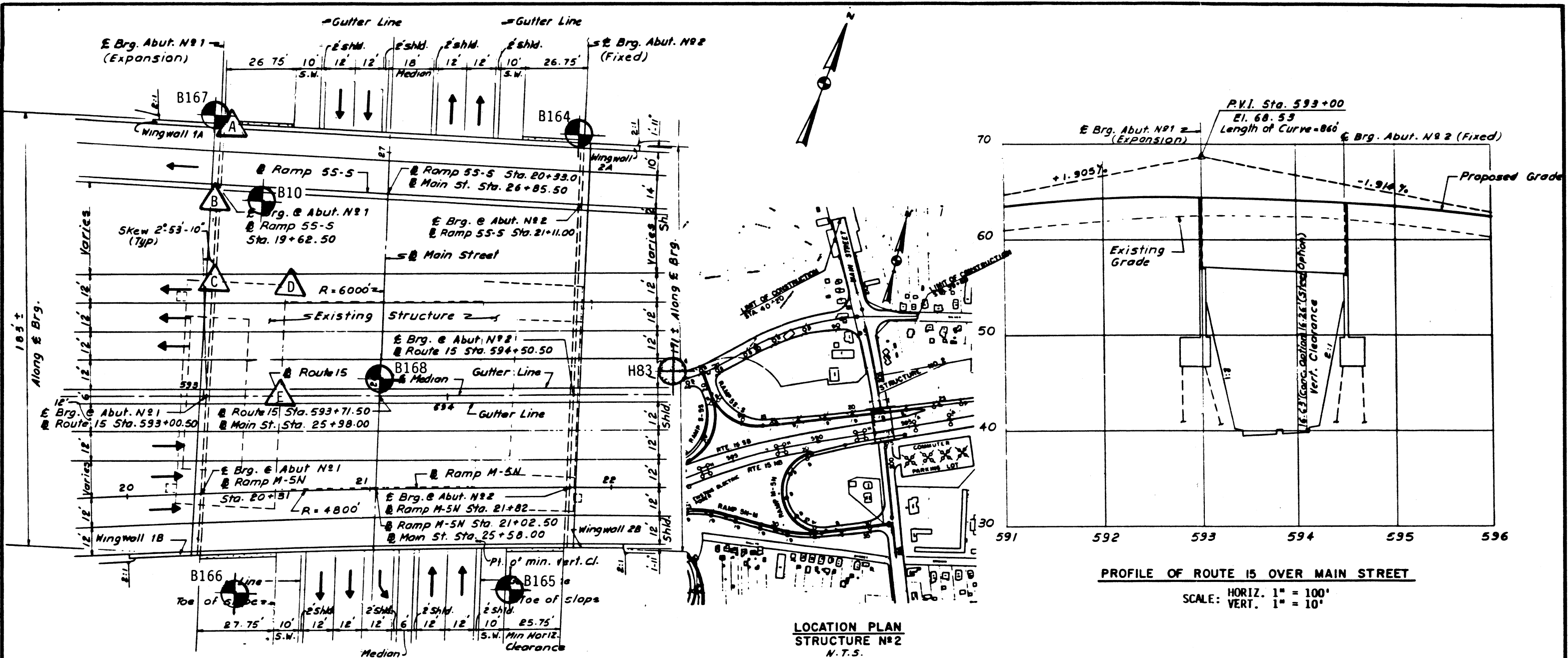
FROM GROUND SURFACE TO FEET USED INCH CASING THEN INCH CASING FOR FEET

FOOTAGE IN EARTH 17.0' FOOTAGE IN ROCK NO. OF SAMPLES 6 HOLE NO. B277

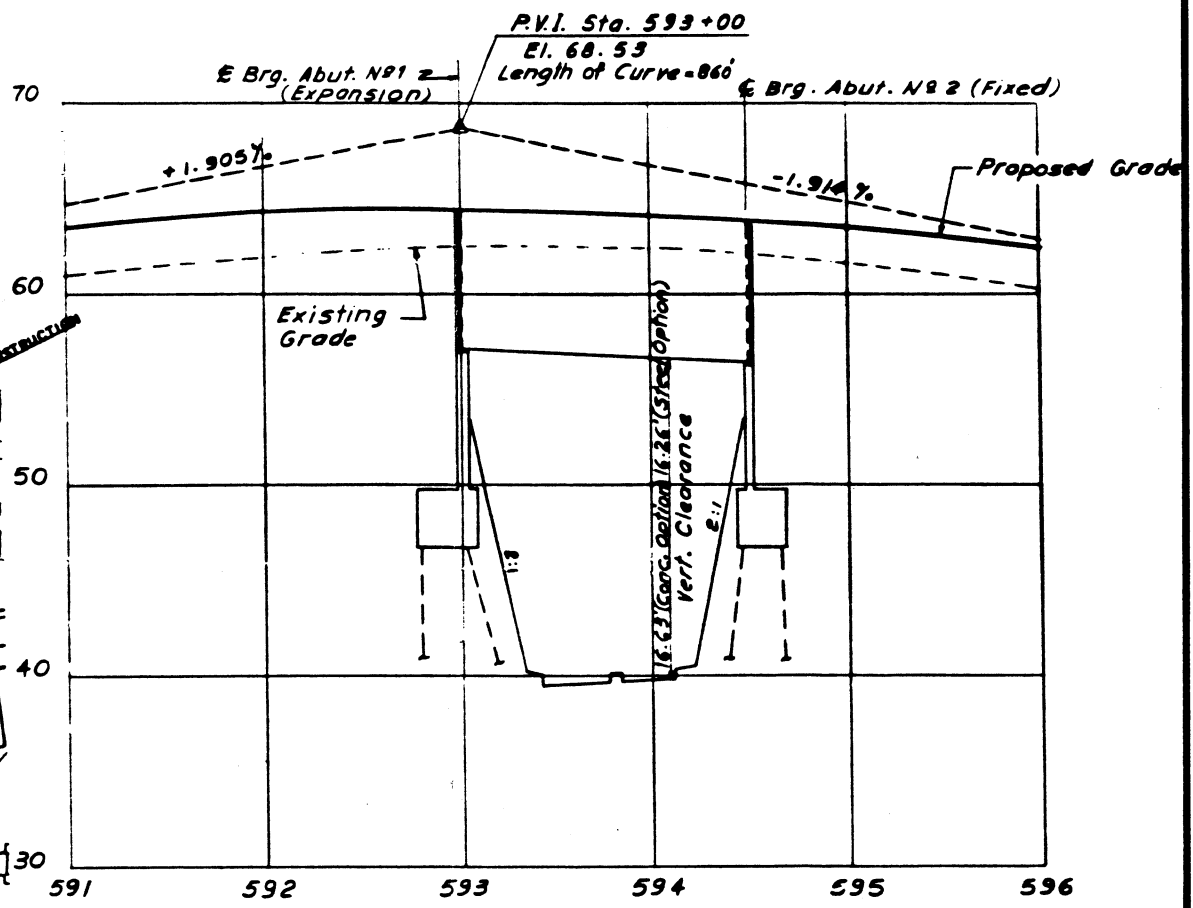
SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

PREVIOUS LOGS WALL 106

Draft



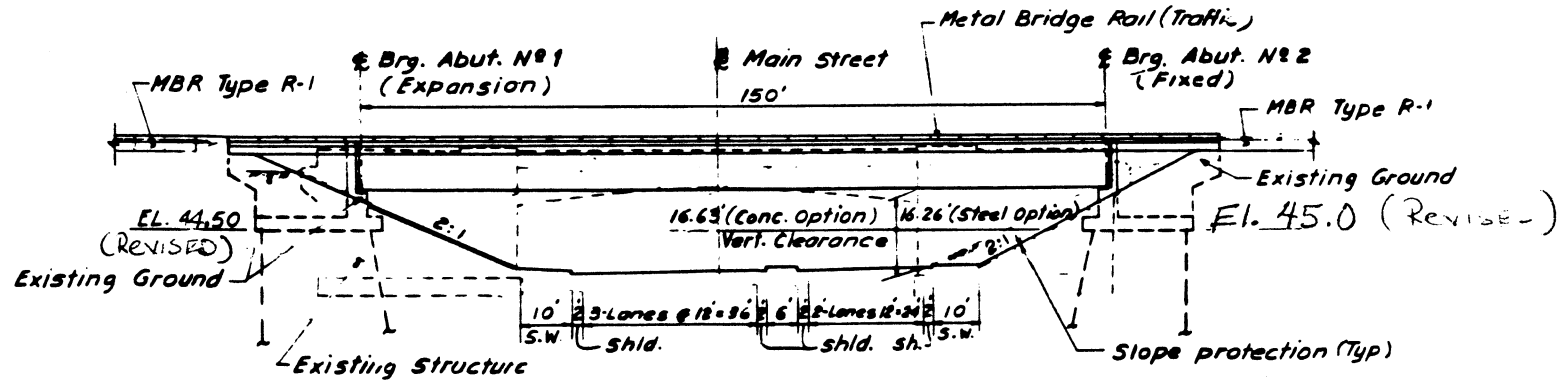
PLAN
N.T.S.



PROFILE OF ROUTE 15 OVER MAIN STREET
SCALE: HORIZ. 1" = 100'
VERT. 1" = 10'

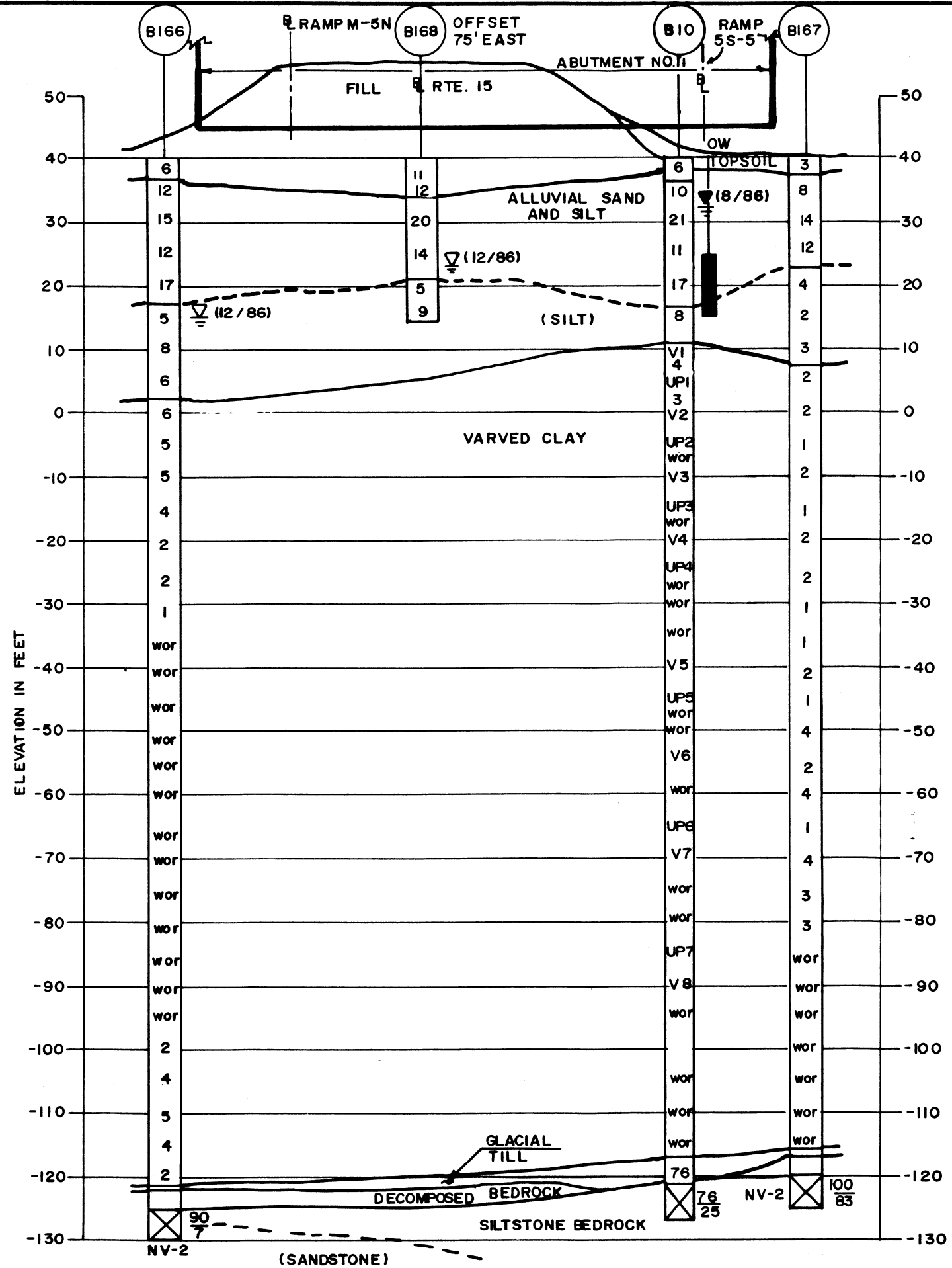
LOCATION PLAN
STRUCTURE NO. 2
N.T.S.

NOTE: BASE PLAN IS A 1" = 20' SCALE
DRAWING PREPARED BY
SALMON ASSOCIATES, P.C.



SOUTH ELEVATION
N.T.S.

	Haley & Aldrich, Inc. Consulting Geotechnical Engineers, Geologists and Hydrogeologists
	ROUTE 15 OVER MAIN STREET EAST HARTFORD, CONNECTICUT SITE AND SUBSURFACE EXPLORATION PLAN STRUCTURE NO. 2
SCALE: AS NOTED	DATE: MAY 1987



ABUTMENT NO. 1.

D. Holley BORING CREW LEADER H. Ernst INSPECTOR HALEY & ALDRICH, INC. SOILS ENGINEER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT TOWN HARTFORD-EAST HARTFORD, CT. PROJECT NAME CHARTER OAK BRIDGE PROJECT NO. 63-384	SHEET 1 OF 5 LOCATION Structure No. 2 GUILD DRILLING CO., INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
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LOCATION Structure No. 2 (Rt. 15 / Main St.)		SURFACE ELEV. 39.2 Approx.		AUGER		CASING		SAMPLER		CORE BAR		HOLE NO. B 165	
DATE FINISHED 1/5/87		TYPE		HW-NW		S/S		NV II		LINE & STATION		OFFSET	
GROUND WATER OBSERVATIONS		SIZE I.D.		4" 3"		1-3/8"				N. COORDINATE 337080.51		E. COORDINATE 628915.74	
AT 6 FT. AFTER 18 HRS. HAMMER WT.		HAMMER WT.		300#		140#		BIT					
AT FT. AFTER HRS. HAMMER FALL		HAMMER FALL		24"		30"							

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET FROM . TO		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
5		0'-2'	1	24	14	D	2	3	4	1'	-TOPSOIL-	
									5		Loose, Light Brown medium to fine SAND, trace of silt, coarse sand	
		4'-6'	2	24	12	D	5	6	8			
									9			
10		9'-11'	3	24	14	D	3	9	11	18'	(same as D2)	
									15		-ALLUVIUM-	
15		14'-16'	4	24	17	D	5	8	12	30'		(same as D2)
									15		Medium stiff, Brown-Gray SILT, little clay, trace of fine sand	
20		19'-21'	5	24	19	D	3	3	4	30'		Very soft, Gray VARVED CLAY and SILTY CLAY
									5			
25		24'-26'	1	24	24	UP				30'	(same as D6)	
30		29'-31'	6	24	24	D	1	1	1	30'	(See Vane Shear Report V1)	
									1			
35		34'-36'	7	24	24	D	Wt. of Ham.			30'	(See Vane Shear Report V1)	
		37.5'	V1									

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
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FOOTAGE IN EARTH	FOOTAGE IN ROCK	NO. OF SAMPLES	HOLE NO. B 165
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SAMPLE TYPE CODING:	D=DRIVE	C=CORE	A=AUGER	UP=UNDISTURBED, PISTON	V=VANE TEST
PROPORTIONS USED:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%	

D. Holley BORING CREW LEADER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS	SHEET 2 OF 5
C. Harriman INSPECTOR	BORING REPORT TOWN HARTFORD-EAST HARTFORD, CT.	LOCATION Structure No. 2
HALEY & ALDRICH, INC. SOILS ENGINEER	PROJECT NAME CHARTER OAK BRIDGE	GUILD DRILLING CO., INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
	PROJECT NO. 63-384	

LOCATION							
SURFACE ELEV.		AUGER		CASING	SAMPLER	CORE BAR	HOLE NO. B 165
DATE FINISHED		TYPE					LINE & STATION
GROUND WATER OBSERVATIONS		SIZE I.D.					OFFSET
AT	FT.	AFTER	HRS.	HAMMER WT.		BIT	N. COORDINATE
AT	FT.	AFTER	HRS.	HAMMER FALL			E. COORDINATE

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL. REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
		FROM	TO									
		39'-41'		2	24	24	UP					
45		44'-46'		8	24	24	D	Wt. of Rods			Very soft, Gray VARVED CLAY and SILTY CLAY (See Vane Shear Report V2) (same as D8)	
		47.5' (Tip)		V2								
50		49'-51'		9	24	24	D	Wt. of Rods				
		54'-56'		3	24	24	UP					
		57.5' (Tip)		V3								
60		59'-61'		10	24	24	D	Wt. of Rods			(See Vane Shear Report V3) (same as D8)	
		64'-66'		11	24	24	D	Wt. of Rods				
		67.5' (Tip)		V4								
70		69'-71'		4	24	24	UP				Very soft, Brown VARVED CLAY and SILTY CLAY (See Vane Shear Report V4)	
		74'-76'		12	24	24	D	Wt. of Rods				
		77.5' (Tip)		V5								

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
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FOOTAGE IN EARTH	FOOTAGE IN ROCK	NO. OF SAMPLES	HOLE NO. B 165
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SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

D. Holley BORING CREW LEADER C. Harriman INSPECTOR HALEY & ALDRICH, INC. SOILS ENGINEER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT TOWN HARTFORD-EAST HARTFORD, CT. PROJECT NAME CHARTER OAK BRIDGE PROJECT NO. 63-384	SHEET 3 OF 5 LOCATION Structure No. 2 GUILD DRILLING CO., INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
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LOCATION				
SURFACE ELEV.	AUGER	CASING	SAMPLER CORE BAR	HOLE NO. B 165
DATE FINISHED	TYPE			LINE & STATION
GROUND WATER OBSERVATIONS				OFFSET
AT	FT.	AFTER	HRS.	HAMMER WT.
AT	FT.	AFTER	HRS.	HAMMER FALL
				BIT
				N. COORDINATE
				E. COORDINATE

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET FROM TO		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
		Wt. of Rods										
		79'-81'	13	24	24	D	Wt. of Rods			Very soft, Brown to Red-Brown VARVED CLAY and SILTY CLAY (See Vane Shear Report V6) (same as D13) (same as D13) (See Vane Shear Report V7) Very soft, Red Brown to Brown VARVED CLAY and SILTY CLAY (See Vane Shear Report V8) (same as D16) (See Vane Shear Report V9)		
85		84'-86'	5	24	24	UP						
		87.5' (Tip)	V6									
90		89'-91'	14	24	24	D	Wt. of Rods					
		94'-96'	15	24	24	D	Wt. of Rods					
		97.5' (Tip)	V7									
100		99'-101'	6	24	24	UP						
		104'-106'	16	24	24	D	Wt. of Rods					
		107.5' (Tip)	V8									
110		109'-111'	17	24	24	D	Wt. of Rods					
		114'-116'	7	24	24	UP						
115		117.5' (Tip)	V9									

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
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FOOTAGE IN EARTH	FOOTAGE IN ROCK	NO. OF SAMPLES	HOLE NO. B 165
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SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

D. Holley BORING CREW LEADER C. Harriman INSPECTOR HALEY & ALDRICH, INC. SOILS ENGINEER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT TOWN HARTFORD-EAST HARTFORD, CT. PROJECT NAME CHARTER OAK BRIDGE PROJECT NO. 63-384	SHEET 4 OF 5 LOCATION Structure No. 2- GUILD DRILLING CO., INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
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LOCATION		AUGER	CASING	SAMPLER	CORE BAR	HOLE NO.	B 165
SURFACE ELEV.		TYPE				LINE & STATION	
DATE FINISHED		SIZE I.D.				OFFSET	
GROUND WATER OBSERVATIONS		HAMMER WT.				BIT	
AT	FT.	AFTER	HRS.			N. COORDINATE	
AT	FT.	AFTER	HRS.	HAMMER FALL		E. COORDINATE	

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET FROM - TO		NO.	PEN. INCH	REC. INCH	TYPE	SAMPLER				
								0-6	6-12			12-18
		119'-121'	18	24	24	D	Wt. of Rods			Very soft, Red-Brown VARVED CLAY and SILTY CLAY		
125		124'-126'	19	24	24	D	Wt. of Rods			(same as D18)		
		127.5' (Tip)	V10							(See Vane Shear Report V10)		
130		129'-131'	8	24	24	UP						
135		134'-136'	20	24	24	D	Wt. of Rods			(same as D18)		
		137.5' (Tip)	V11							(See Vane Shear Report V11)		
140		139'-141'	21	24	24	D	Wt. of Rods			Very soft, Red-Brown VARVED CLAY and SILTY CLAY		
145		144'-146'	9	24	24	UP						
		147.5' (Tip)	V12							(See Vane Shear Report V12)		
150		149'-151'	22	24	24	D	Wt. of Rods			(same as D21)		
155		154'-156'	23	24	24	D	Wt. of Rods			(same as D21)		

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
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FOOTAGE IN EARTH	FOOTAGE IN ROCK	NO. OF SAMPLES	HOLE NO. B 165
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SAMPLE TYPE CODING:	D=DRIVE	C=CORE	A=AUGER	UP=UNDISTURBED, PISTON	V=VANE TEST
PROPORTIONS USED:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%	

D. Holley BORING CREW LEADER C. Harriman INSPECTOR HALEY & ALDRICH, INC. SOILS ENGINEER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT TOWN HARTFORD-EAST HARTFORD, CT. PROJECT NAME CHARTER OAK BRIDGE PROJECT NO. 63-384	SHEET 5 OF 5 LOCATION Structure No. 2 GUILD DRILLING CO., INC. BORING CONTRACTOR STEINMAN DESIGN ENGINEER
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LOCATION						
SURFACE ELEV.	AUGER	CASING	SAMPLER	CORE BAR	HOLE NO.	B 165
DATE FINISHED	TYPE				LINE & STATION	
GROUND WATER OBSERVATIONS		SIZE I.D.			OFFSET	
AT FT. AFTER	HRS.	HAMMER WT.			BIT	
AT FT. AFTER	HRS.	HAMMER FALL			N. COORDINATE	
					E. COORDINATE	

DEPTH	CASING BLOWS PER FOOT	SAMPLE						BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	SAMPLER					
		FROM	TO					0-6	6-12	12-18			
		159'	-161'	24	24	24	D	Wt.	of	Rods		Very soft, Red-Brown VARVED CLAY and SILTY CLAY	
16		164'	-166'	25	24	24	D	1	2	20	165'	Hard, Red-Brown SILT, some coarse to fine sand, trace of fine gravel and clay -GLACIAL TILL-	
											142		
		167'	-172'	1	60	60	C					167'	Moderately hard, Gray to Brown fine grained sandy SILTSTONE, joints very close to close, shallow dipping, bedding very thin, rock moderate to slightly weathered, moderately fractured
17													Bottom of Exploration at 172'

FROM GROUND SURFACE TO 144 FEET USED 4 INCH CASING THEN 3 INCH CASING FOR 167 FEET

FOOTAGE IN EARTH 167 FOOTAGE IN ROCK 5 NO. OF SAMPLES 25 HOLE NO. B 165

SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

STRUCTURE NO. 2
ROUTE 15 OVER MAIN STREET

TABLE I
SUMMARY OF FIELD VANE SHEAR TEST RESULTS

Test No.	(3) Vane	Ground Surface Elev. (ft.)	Depth (ft.)	Test Elev. (ft.)	(1) Undisturbed Su (psf)	(1) Disturbed Su (psf)	(2) Sensitivity
B10/2	E	40.4	40.0	0.4	957	188	5.1
B10/3	E	40.4	50.0	-9.6	1084	166	6.5
B10/4	E	40.4	60.0	-19.6	1327	232	5.7
B10/5	F	40.4	80.0	-39.6	1187	432	2.7
B10/6	F	40.4	95.0	-54.6	1500	585	2.6
B10/7	F	40.4	109.5	-69.1	1755	739	2.3
B10/8	F	40.4	130.0	-89.6	2161	940	2.3
B165/1	O	39.2	37.5	1.7	1100	175	6.3
B165/2	O	39.2	47.5	-8.3	1275	244	5.2
B165/3	O	39.2	57.5	-18.3	1432	454	3.2
B165/4	O	39.2	67.5	-28.3	1519	471	3.2
B165/5	O	39.2	77.5	-38.3	1606	419	3.8
B165/6	O	39.2	87.5	-48.3	1868	594	3.2
B165/7	O	39.2	97.5	-58.3	1571	602	2.6
B165/8	O	39.2	107.5	-68.3	2174	681	3.2
B165/9	O	39.2	117.5	-78.3	1860	367	5.1
B165/10	O	39.2	127.5	-88.3	1781	1074	1.7
B165/11	O	39.2	137.5	-98.3	2540	655	3.9
B165/12	O	39.2	147.5	-108.3	3038	1362	2.2

Notes:

- (1) Su = Shear Strength
- (2) Sensitivity = Undisturbed/molded shear strength
- (3) See Table II for Vane Dimensions

M. Zork BORING CREW LEADER E. Henderson INSPECTOR HALEY & ALDRICH, INC. SOILS ENGINEER	FORM SM-1 REV. 8/83 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAYS BORING REPORT EAST HARTFORD, CT TOWN PROJECT NAME CHARTER OAK BRIDGE PROJECT NO. 63-384	SHEET 1 OF 1 LOCATION Rte.15 NB SOIL EXPLORATION CORPORATION BORING CONTRACTOR STEINMAN DESIGN ENGINEER
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LOCATION Rte. 15 NB		AUGER		CASING		SAMPLER		CORE BAR		HOLE NO. B-321	
SURFACE ELEV.		TYPE		HSA		SS				LINE & STATION	
DATE FINISHED 6/15/87		SIZE I.D.		3 1/2"		1-3/8"				OFFSET	
GROUND WATER OBSERVATIONS		HAMMER WT.				140#		BIT		N. COORDINATE	
AT NE FT. AFTER 0 HRS.		HAMMER FALL				30"				E. COORDINATE	

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
		FROM	TO									
5		0.5'	2.5'	1	24	17	D	13	15	17	0.5' Asphalt and traprock • Dense, red brown, coarse to fine SAND, little gravel, trace silt. • Dense, red brown, coarse to fine SAND, little gravel, trace silt. • Loose, red brown, medium to fine SAND, little silt, trace gravel, coarse sand. • Medium dense, brown to orange brown medium to fine SAND, some silt. • Medium dense, orange brown, medium to fine SAND, trace silt. (FILL.)	
		2.5'	4.5'	2	24	12	D	27	18	14		
										18		
		4.5'	6.5'	3	24	16	D	5	6	4		
										8		
	6.5'	8.5'	4	24	18	D	12	11	7			
									7			
	8.5'	10.5'	5	24	19	D	6	7	8			
									7			
10												
15												
20												
25												
30												
35												

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET
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FOOTAGE IN EARTH 10.5'	FOOTAGE IN ROCK	NO. OF SAMPLES 5	HOLE NO. B-321
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SAMPLE TYPE CODING:	D=DRIVE	C=CORE	A=AUGER	UP=UNDISTURBED, PISTON	V=VANE TEST
PROPORTIONS USED:	TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%	

J. Campbell
 BORING CREW LEADER
 E. Henderson
 INSPECTOR
 HALEY & ALDRICH, INC.
 SOILS ENGINEER

FORM SM-1 REV. 8/83
 STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF HIGHWAYS
 BORING REPORT
 EAST HARTFORD, CT
 TOWN
 PROJECT NAME CHARTER OAK BRIDGE
 PROJECT NO. 63-384

LOCATION Commuter Parking Lot		AUGER	CASING	SAMPLER	CORE BAR	HOLE NO. B-326
SURFACE ELEV.		TYPE		HSA	SS	LINE & STATION
DATE FINISHED 6/2/87		SIZE I.D.		4 1/2"	1-3/8"	OFFSET
GROUND WATER OBSERVATIONS		HAMMER WT.			140#	BIT
AT 8.6 FT.	AFTER 0 HRS.	HAMMER FALL			30"	N. COORDINATE
AT FT.	AFTER HRS.					E. COORDINATE

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12			12-18
		FROM	TO									
5		0.0'	2.0'	1	24	18	D	4	12	8	9.0'	<ul style="list-style-type: none"> Medium dense, red brown, fine SAND, little coarse to medium sand, silt. Medium dense, red brown, medium to fine SAND, trace coarse sand, silt. Medium dense, light brown, medium to fine SAND, trace silt. (FILL.) Medium dense, gray to light brown, GRAVEL and coarse to fine SAND, trace silt, concrete. * See below.
		2.0'	4.0'	2	24	22	D	6	8	8		
		4.0'	6.0'	3	24	20	D	6	5	5		
		6.0'	8.0'	4	24	18	D	17	15	12		
		8.0'	10.0'	5	24	12	D	12	7	13		
10				5A					5	6		Medium dense, light brown, medium to fine SAND, trace silt.
15		15.0'	17.0'	6	24	18	D	7	7	6		<ul style="list-style-type: none"> Medium dense, brown, coarse to fine SAND, trace silt. (ALLUVIUM.)
20												Bottom of Exploration at 17.0'
25												* 8.0' to 9.0': Medium dense, red brown, medium to fine SAND, trace gravel, coarse sand, silt, concrete.
30												
35												

FROM GROUND SURFACE TO	FEET USED	INCH CASING THEN	INCH CASING FOR	FEET		
FOOTAGE IN EARTH	17.0'	FOOTAGE IN ROCK	NO. OF SAMPLES	6 (1 split) HOLE NO. B-326		
SAMPLE TYPE CODING:		D=DRIVE	C=CORE	A=AUGER	UP=UNDISTURBED, PISTON	V=VANE TEST
PROPORTIONS USED:		TRACE=1-10%	LITTLE=10-20%	SOME=20-35%	AND=35-50%	

PREVIOUS LOGS WALL 107

Draft

B. Wilkins
BORING CREW LEADER
E. Henderson
INSPECTOR
HALEY & ALDRICH, INC.
SOILS ENGINEER

FORM SM-1 REV. 8/83
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS
BORING REPORT
TOWN EAST HARTFORD, CT
PROJECT NAME CHARTER OAK BRIDGE
PROJECT NO. 63-384

SHEET 1 OF 1
LOCATION Rte. 15 NB
SOIL EXPLORATION CORPORATION
BORING CONTRACTOR
STEINMAN
DESIGN ENGINEER

LOCATION Rte. 15 NB
SURFACE ELEV. _____ AUGER CASING SAMPLER CORE BAR HOLE NO. B-319
DATE FINISHED 6/15/87 TYPE HSA SS LINE & STATION
GROUND WATER OBSERVATIONS SIZE I.D. 4" 1-3/8" OFFSET
AT NE FT. AFTER 0 HRS. HAMMER WT. 140# BIT N. COORDINATE
AT FT. AFTER HRS. HAMMER FALL 30" E. COORDINATE

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER			STRATA CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOIL REMARKS (INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.)	
		DEPTHS IN FEET		NO.	PEN. INCH	REC. INCH	TYPE	ON SAMPLER				
		FROM	TO					0-6	6-12			12-18
5		0.5'	2.5'	1	24	13	D	21	13	12	0.5' Asphalt and traprock • Medium dense, red brown, coarse to fine SAND, little gravel, trace silt • Dense, red brown, medium to fine SAND, little silt, trace gravel, coarse sand. • D-2 (Same as D-3) • Dense, red brown, medium to fine SAND, little coarse sand, trace silt. (FILL) • Dense, red brown, medium to fine SAND, little coarse sand, trace silt, trace gravel.	
		2.5'	4.5'	2	24	14	D	17	25	24		
		4.5'	6.5'	3	24	15	D	23	21	20		
		6.5'	8.5'	4	24	15	D	14	21	27		
		8.5'	10.0'	5	18	18	D	6	6	6		
10												
15												
20												
25												
30												
35												

FROM GROUND SURFACE TO FEET USED INCH CASING THEN INCH CASING FOR FEET

FOOTAGE IN EARTH 10.0' FOOTAGE IN ROCK _____ NO. OF SAMPLES 5 HOLE NO. B-319

SAMPLE TYPE CODING: D=DRIVE C=CORE A=AUGER UP=UNDISTURBED, PISTON V=VANE TEST
 PROPORTIONS USED: TRACE=1-10% LITTLE=10-20% SOME=20-35% AND=35-50%

F.W.A. REGION	STATE	TOWN	FED. AID PROJ. NO.	PROJ. NO.	YEAR	ROUTE NO.	SHEET NO.	TOTAL SHEETS
1	CONN.	EAST HARTFORD	I-84-4(9)63	42-216	1983	I-84,15	502	807

22

N	E	STATION
PCC 337814.899	630416.865	88+21.933
PI 337988.586	630650.794	
PT 338219.397	630828.601	94+00.953
Δ 15°-47'-52.06"	T 291.358'	
D 2°-43'-42.13"	L 579.019'	
R 2100.000'		

24

N	E	STATION
PC 337565.257	629963.780	83+03.049
PI 337659.290	630207.286	
PCC 337814.899	630416.865	88+21.933
Δ 15°-28'-41.78"	T 261.032'	
D 2°-58'-58.76"	L 518.884'	
R 1920.750'		

25

N	E	STATION
PC 338234.984	630808.367	94+00.953
PI 338246.073	630816.909	
PT 338257.275	630825.300	94+28.946
Δ 00°-46'-23.39"	T 13.997'	
D 02°-45'-43.07"	L 27.993'	
R 2074.458'		

96

N	E	STATION
PCC 337828.987	630417.268	88+30.896
PI 337915.658	630528.838	
PCC 338014.820	630629.468	91+14.637
Δ 6°-44'-15.98"	T 141.278'	
D 2°-23'-14.37"	L 282.231'	
R 2400.000'		

99

N	E	STATION
PC 337561.333	629971.662	83+03.966
PI 337742.773	630441.514	
PCC 338125.108	630769.387	92+90.781
Δ 28°-16'-12.59"	T 503.667'	
D 02°-51'-53.24"	L 986.815'	
R 2000.000'		

INSPECTION OF FIELD WELDS
BRIDGE 42-216-4

METHOD	UNIT	QUANTITY
Radiographic or Ultrasonic	in.	0
Magnetic Particle	L.F.	0
Ultrasonic	in.	0

CONCRETE DISTRIBUTION
BRIDGE 42-216-4

ITEM	UNIT	QUANTITY
Superstructure	C.Y.	465
Substructure	C.Y.	1840
Footings	C.Y.	1140
TOTAL	C.Y.	3445

QUANTITIES
BRIDGE 42-216-4

ITEM	UNIT	QUANTITY
STRUCTURE EXCAVATION EARTH (COMPLETE)	C.Y.	6,100
GRAVEL FILL	C.Y.	34
PERVIOUS STRUCTURE BACKFILL	C.Y.	9,440
CALCIUM CHLORIDE STABILIZED BASE	TON	152
BITUMINOUS CONCRETE CLASS 1	TON	134
BITUMINOUS CONCRETE CLASS 12	TON	90
SHEAR CONNECTORS	L.S.	1
1/2" POLYVINYL CHLORIDE PLASTIC PIPE	L.F.	26
ELASTOMERIC BEARING PADS	C.I.	22,680
CLASS "A" CONCRETE	C.Y.	2,980
CLASS "F" CONCRETE	C.Y.	465
1/2" PREFORMED EXP. JOINT FILLER FOR BRIDGES	S.F.	970
REMOVAL OF SUPERSTRUCTURE SILVER LANE BRIDGE	L.S.	
DEFORMED STEEL BARS (EPOXY COATED)	Lbs.	62,800
DEFORMED STEEL BARS	Lbs.	318,000
STRUCTURAL STEEL BRIDGE NO. 42-216-4	L.S.	1
CONCRETE CYLINDER CURING BOX	EA.	1
6" C.C.M. OUTLETS FOR UNDERDRAIN	L.F.	200
MEMBRANE WATERPROOFING (SHEET)	S.Y.	1,560
DAMP PROOFING	S.Y.	1,970
BAGGED STONE	C.F.	144
CONCRETE BLOCK SLOPE PROTECTION	S.Y.	635
8"X16" SLOPED GRANITE STONE CURBING FOR BRIDGES	L.F.	1,046
PROTECTIVE COMPOUND FOR BRIDGES	S.Y.	530
37"X34 1/2" SPLIT CONCRETE MEDIAN CURB (BRIDGE)	L.F.	153
METAL BRIDGE RAIL (TRAFFIC)	L.F.	522
2" RIGID METAL CONDUIT IN BRIDGE	L.F.	885
18" X 12" X 8" C.I. JUNCTION BOX	EA.	7
STRUCT. MOUNTED NOISE BARRIER (ACOUSTIC)	S.F.	12,650
STAIN PROTECTION BRIDGE 42-216-4	L.S.	1
1 INCH CLOSED CELL ELASTOMER	C.I.	39,670
1/2 INCH CLOSED CELL ELASTOMER	C.I.	1,170

GENERAL NOTES

SPECIFICATIONS
Connecticut Department of Transportation Form 812(1980), and Special Provisions.

DESIGN SPECIFICATIONS
Standard Specifications for Highway Bridges (AASHTO 1977), with the interim specifications up to and including (1980), as supplemented by the Connecticut Department of Transportation Bridge Manual (1964).

ALLOWABLE DESIGN STRESSES
Class "A" and Class "F" Concrete based on $f'_c = 3000$ psi
Reinforcement (ASTM A615 GRADE 60). $f_s(\text{tensile}) = 24,000$ psi
Structural Steel
ASTM A588 Weathering $F_t = 27,000$ psi All thicknesses to 4" inclusive

LIVE LOAD
HS 20-44 24,000 # Dual axles at 4'-0" O.C.

FUTURE PAVING ALLOWANCE
None

COMPOSITE CONSTRUCTION
No temporary intermediate supports shall be used during the placing and setting of the concrete deck slab. Temporary supports may be used for structural steel erection only. Live and superimposed dead loads will be permitted when directed by the Engineer but not less than 10 days after the final portion of the deck slab has been placed.

CLASS "A" CONCRETE
Class "A" Concrete shall be used for the entire substructure and parapets of the U-Type Wings.

CLASS "F" CONCRETE
Class "F" Concrete shall be used for bridge decks including parapets.

JOINT SEAL
See Special Provisions.

PARAFFIN
The cost of furnishing and applying paraffin is included in the item for Class "F" Concrete.

EXPOSED EDGES
Exposed edges shall be beveled 1"x1" unless dimensioned otherwise.

STRUCTURAL STEEL
See Structure Sheet No. 14 of 24 for ASTM designations.

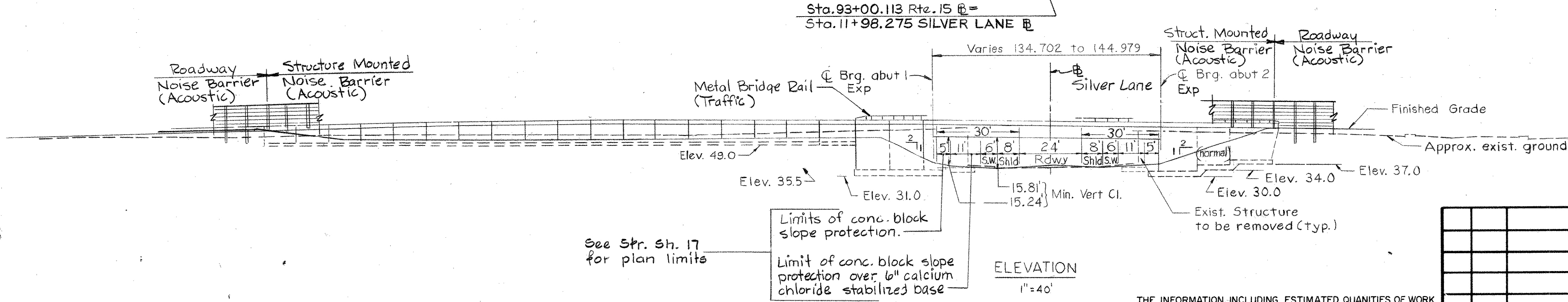
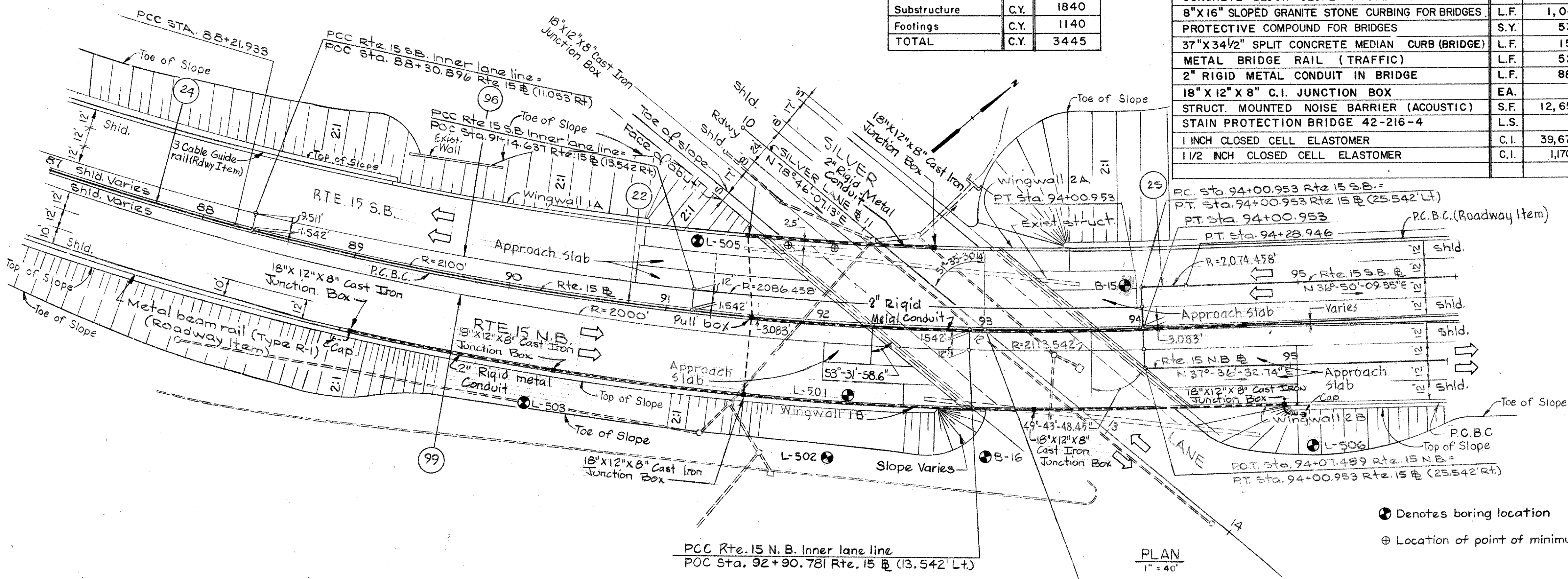
PAINT
NO painting of structural Steel required. Steel surfaces to be prepared for weathering in accordance to the specifications.

FOUNDATION PRESSURES
The various Group Loadings noted on the substructure plan sheets refer to the Group Loads as given in the AASHTO Standard Specifications for Highway Bridges.

CONSTRUCTION JOINTS
Construction joints, other than those shown on the plans, will not be permitted without prior approval of the Engineer.

DECIMAL DIMENSIONS
When dimensions are given to less than three decimal places, the omitted digits shall be assumed to be zeros.

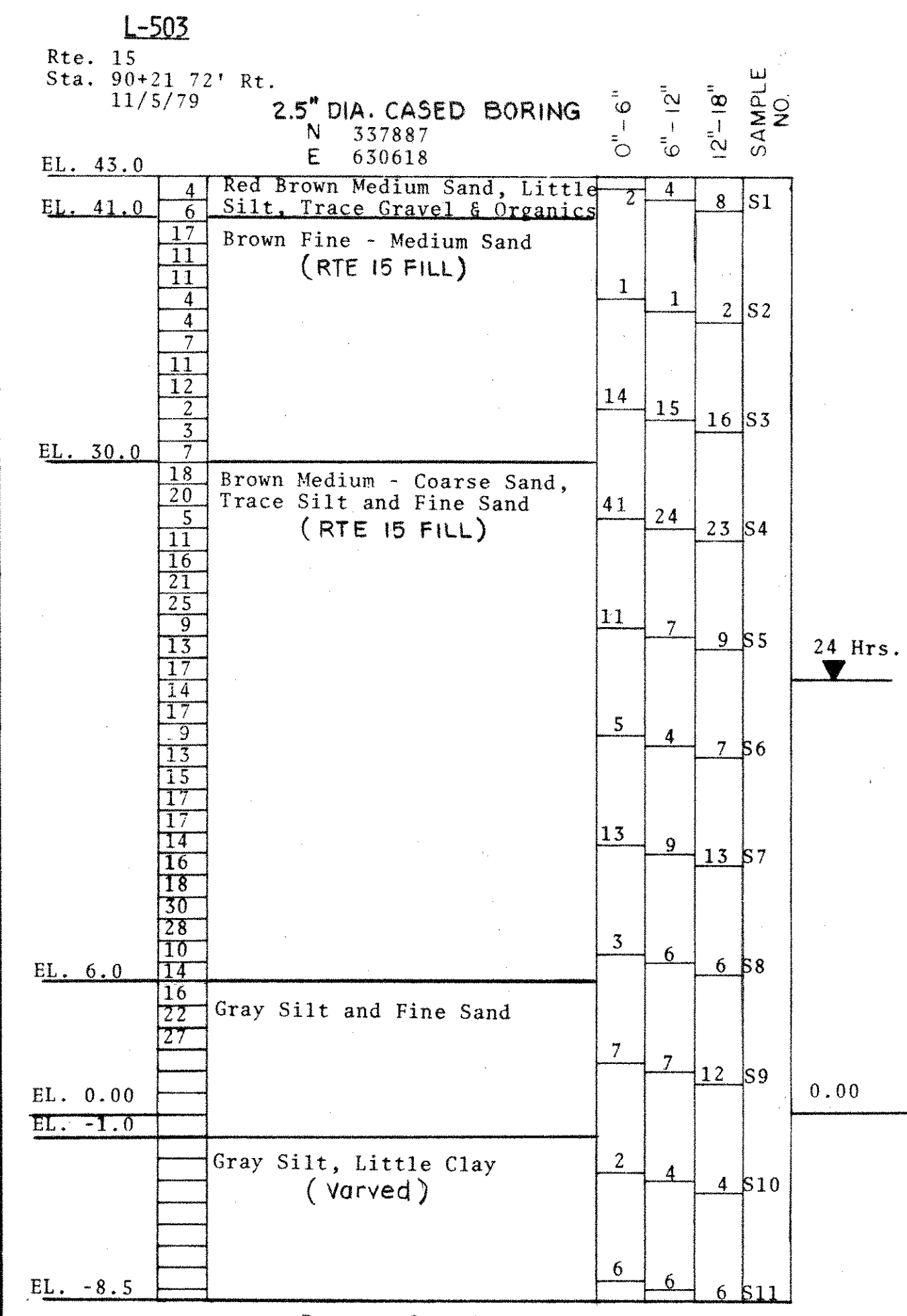
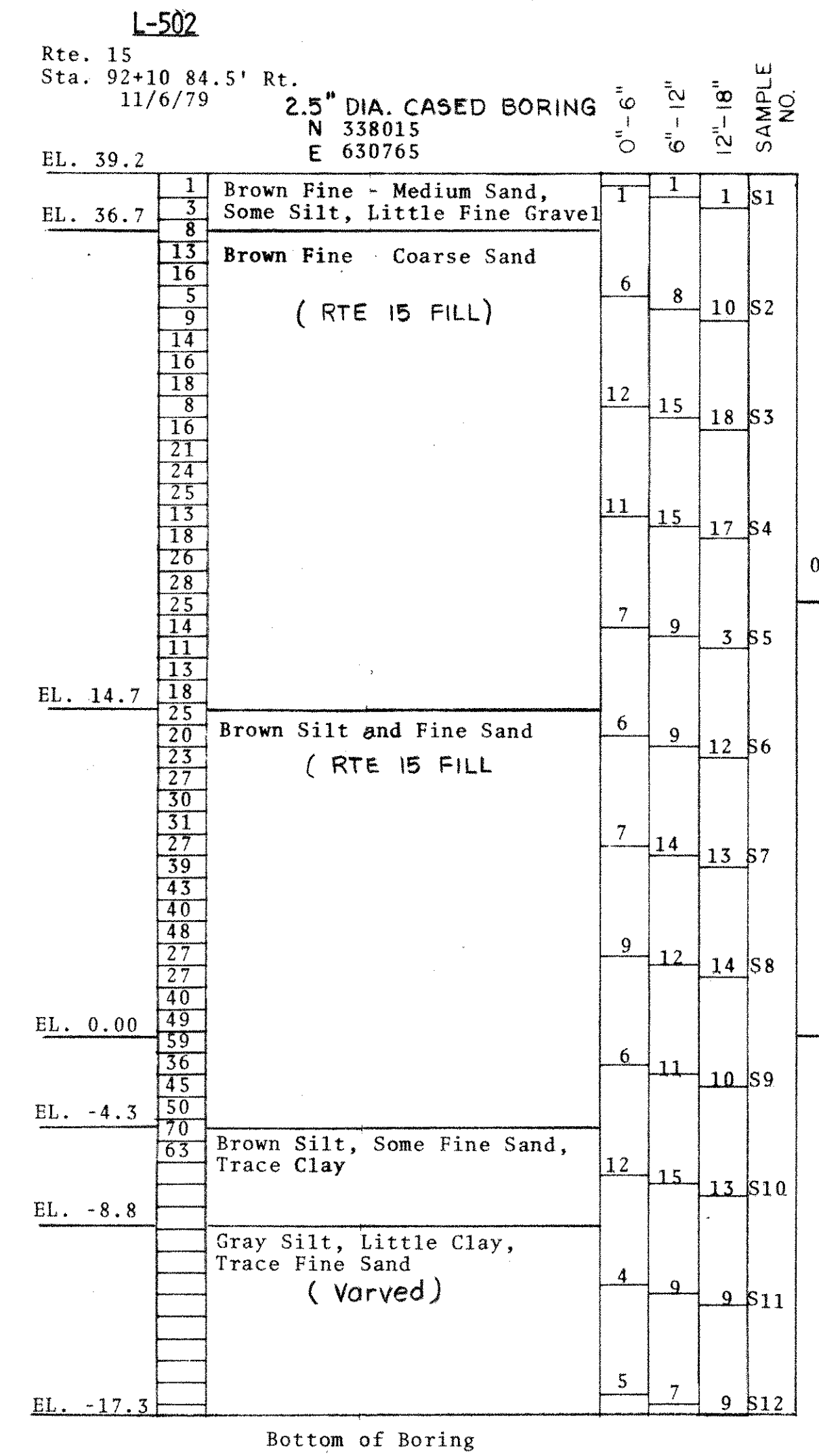
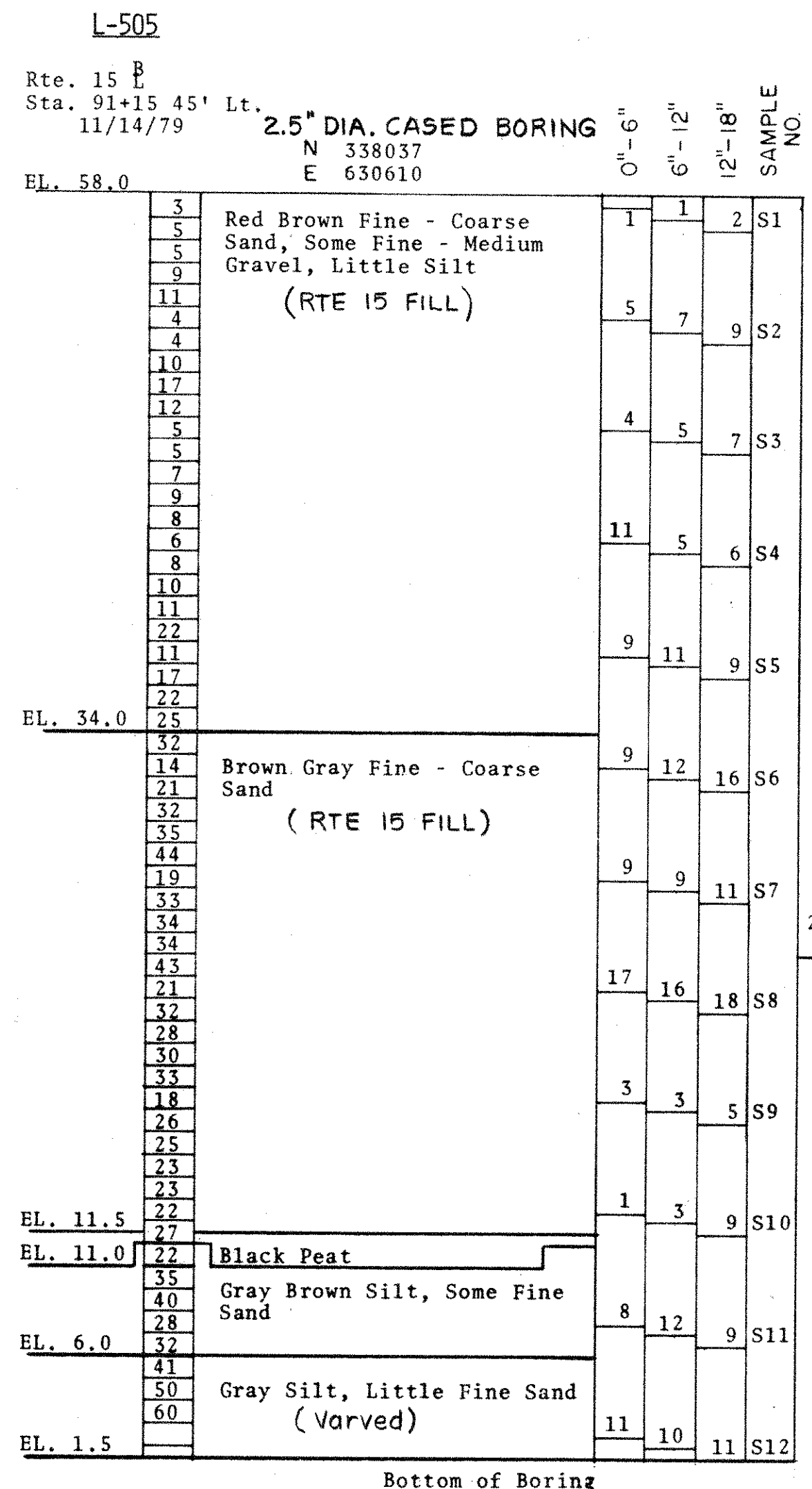
FELT
The cost of Furnishing and placing 15 lb. felt is included in the item for "Class "A" Concrete".



THIS SHEET NOT CORRECTED

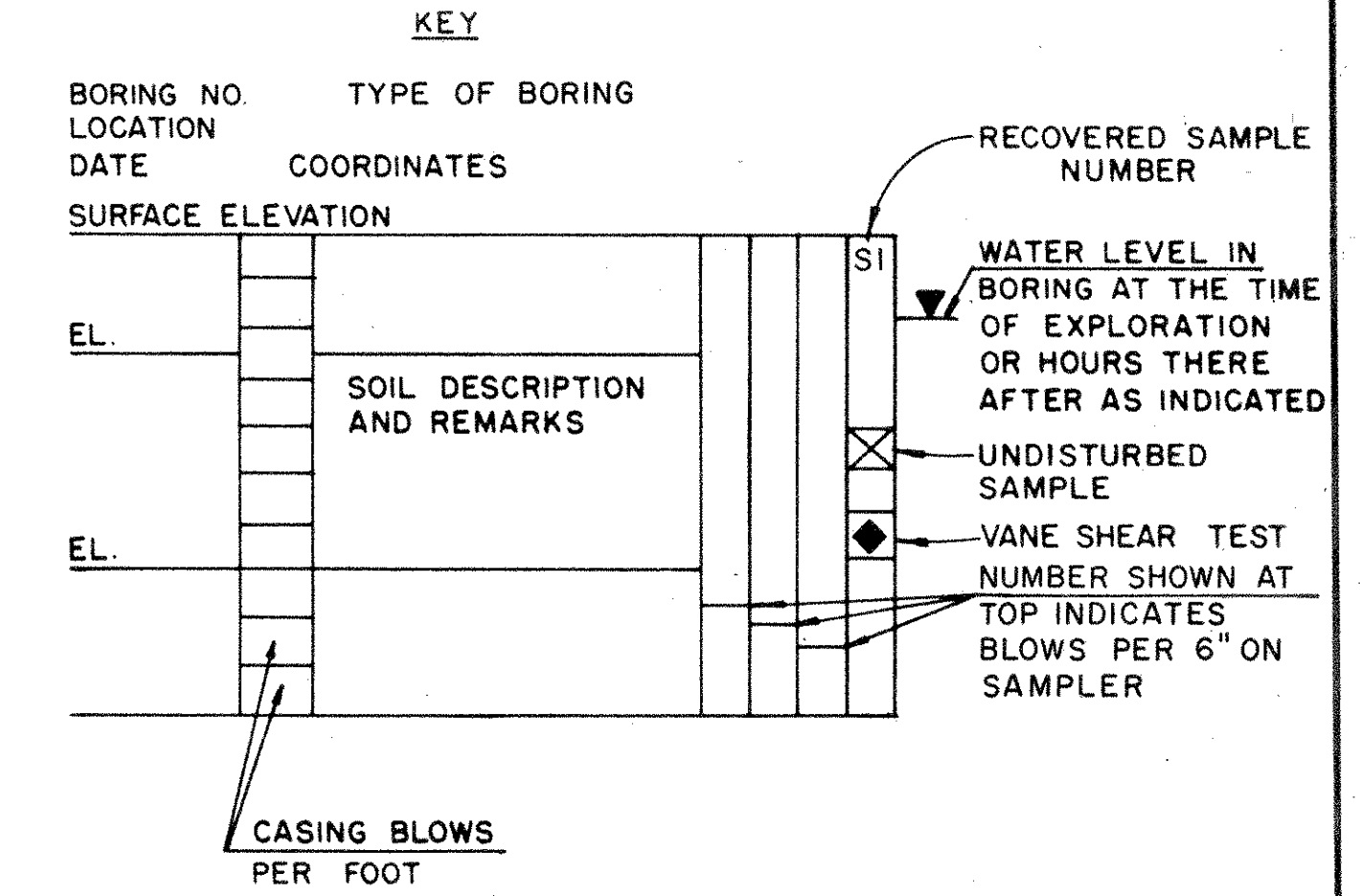
CONNECTICUT DEPARTMENT OF TRANSPORTATION			
EAST HARTFORD			
RECONSTRUCTION OF INTERSTATE ROUTE 84 ROUTE 15 N.B. AND ROUTE 15 S.B. OVER SILVER LANE			
GENERAL PLAN			
ENGINEER HAYDEN, HARDING AND BUCHANAN INC.			
DESIGNER MAK	DRAFTER H.B.	CHECKER RHC	
APPROVED <i>J.L. Hayden</i>	DATE 9-8-81		
REVISIONS		STRUCTURE NO. 42-216-4	BRIDGE LOG NO. 1 OF 24

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE TRUE CONDITIONS OR ACTUAL QUANTITIES OR DISTRIBUTION OF QUANTITIES OF WORK WHICH WILL BE REQUIRED.



NOTE: L-503
Uncased boring from EL. 3.0

NOTE: L-502
Uncased boring from EL. -5.8



CASING I.D. = 2.5"
HAMMER WT. = 300 LBS.
HAMMER FALL = 24"

SAMPLER I.D. = 1 3/8"
HAMMER WT. = 140 LBS.
HAMMER FALL = 30"

ABBREVIATIONS
C. COARSE
F. FINE
M. MEDIUM
LIT. LITTLE
TR. TRACE
BOUL. BOULDERS
COBB. COBBLES
MISC. MISCELLANEOUS
BR. BROWN

SCALE: 1" = 6'

CONNECTICUT
DEPARTMENT OF TRANSPORTATION
EAST HARTFORD

RECONSTRUCTION OF INTERSTATE ROUTE 84
ROUTE 15 N.B. AND ROUTE 15 S.B.
OVER
SILVER LANE

BORINGS SHEET 1 OF 3

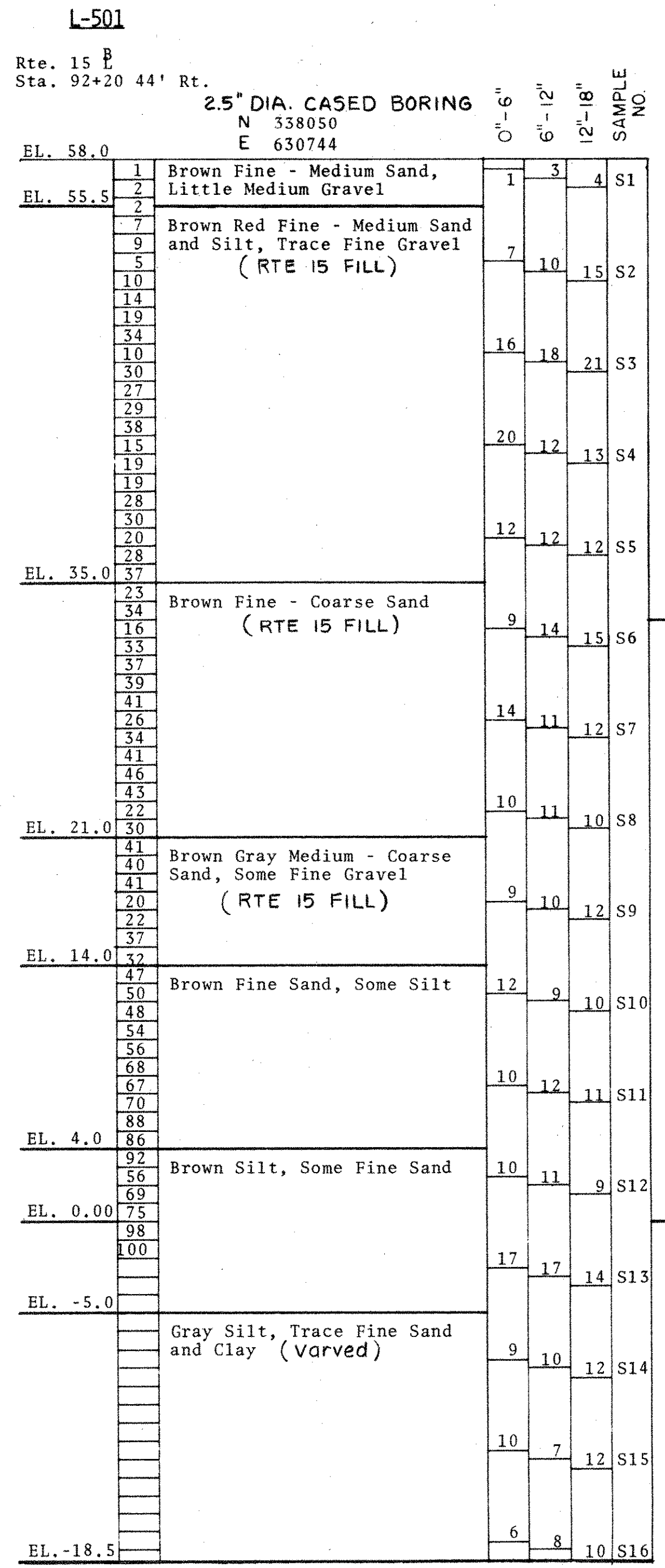
ENGINEER HAYDEN, HARDING & BUCHANAN INC.
DESIGNER DBV DRAFTSMAN GAF CHECKER DBV

NO.	DATE	DESCRIPTION	APPROVED	DATE
			<i>J.P. Hayden</i>	Dec 26 1979

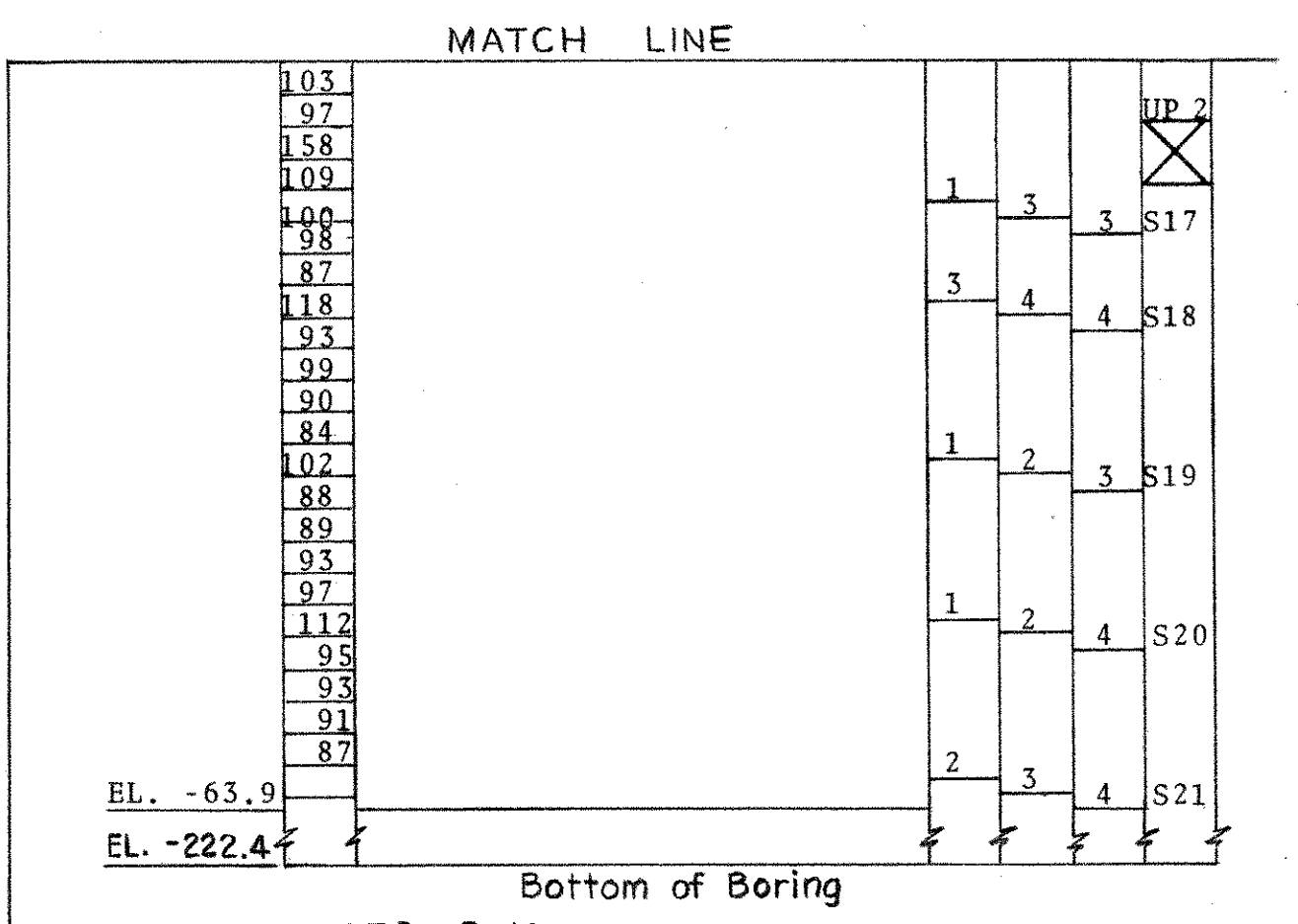
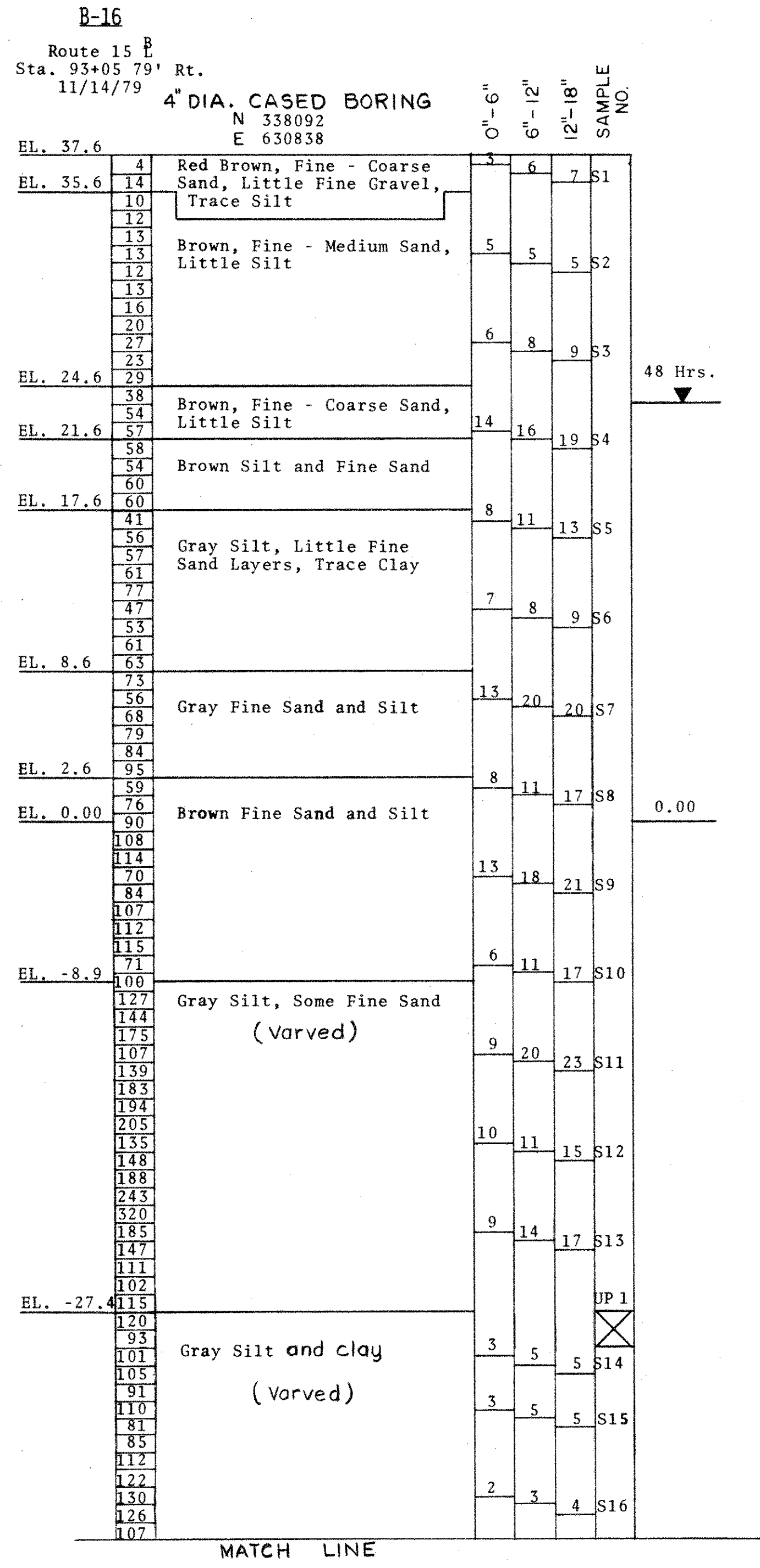
STRUCTURE NO. 42-216-4 BRIDGE LOG NO. 3 OF 24

THIS SHEET NOT CORRECTED

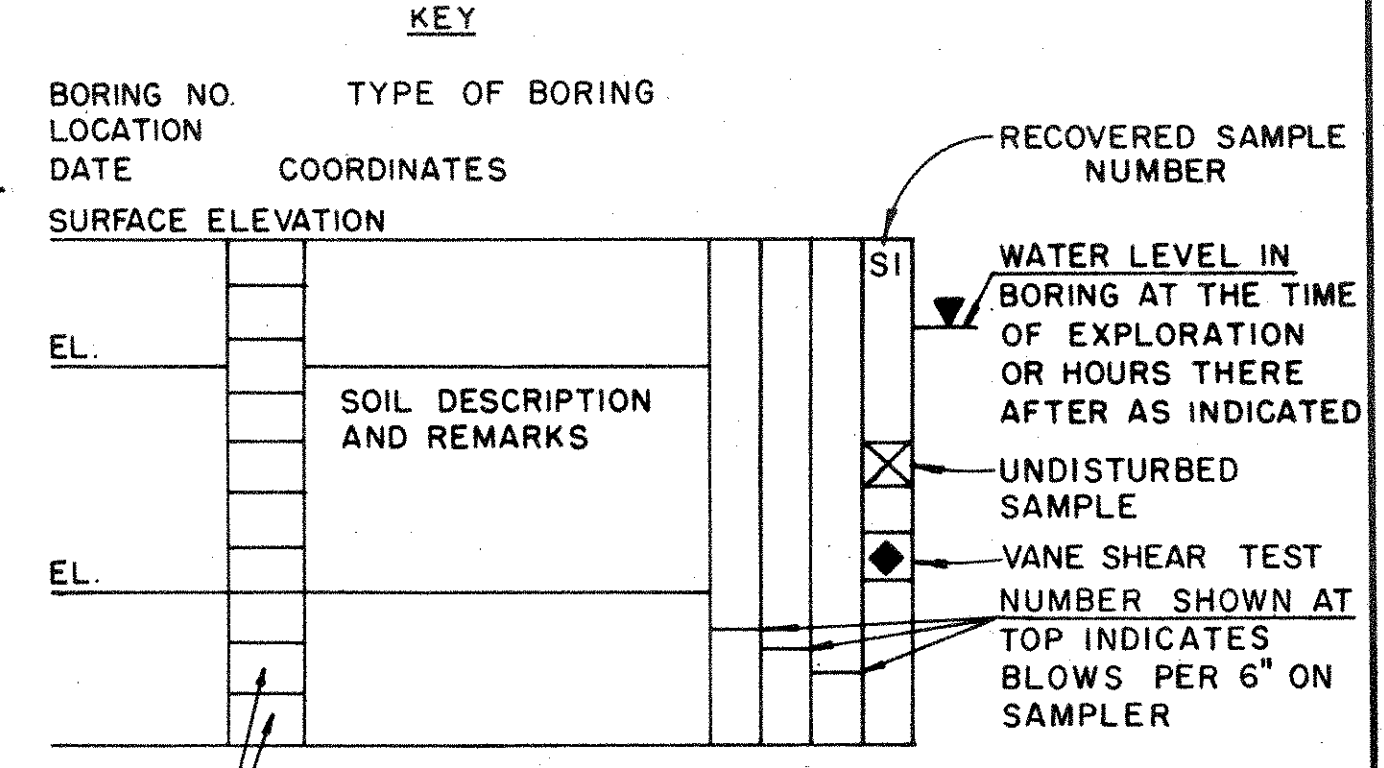
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE TRUE CONDITIONS OR ACTUAL QUANTITIES OR DISTRIBUTION OF QUANTITIES OF WORK WHICH WILL BE REQUIRED.



NOTE: L-501
 Uncased boring from EL. -2.0



NOTES: B-16
 Used 1 3/8" Sample Spoon.
 Washed ahead in 5' intervals then drove pipe from EL. -22.4 to EL. -27.4.
 Jetted from EL. -63.9 to EL. -222.4
 Started getting stiff at EL. -202.4
 Started grouting @ EL. -217.4
 Drove open end from EL. -217.4 to EL. -222.4
 No recovery.



CASING I.D. = 2.5" or 4.0" SAMPLER I.D. = 1 3/8"
 HAMMER WT. = 300 LBS. HAMMER WT. = 140 LBS.
 HAMMER FALL = 24" HAMMER FALL = 30"

ABBREVIATIONS
 C. COARSE
 F. FINE
 M. MEDIUM
 LIT. LITTLE
 TR. TRACE
 BOUL. BOULDERS
 COBB. COBBLES
 MISC. MISCELLANEOUS
 BR. BROWN

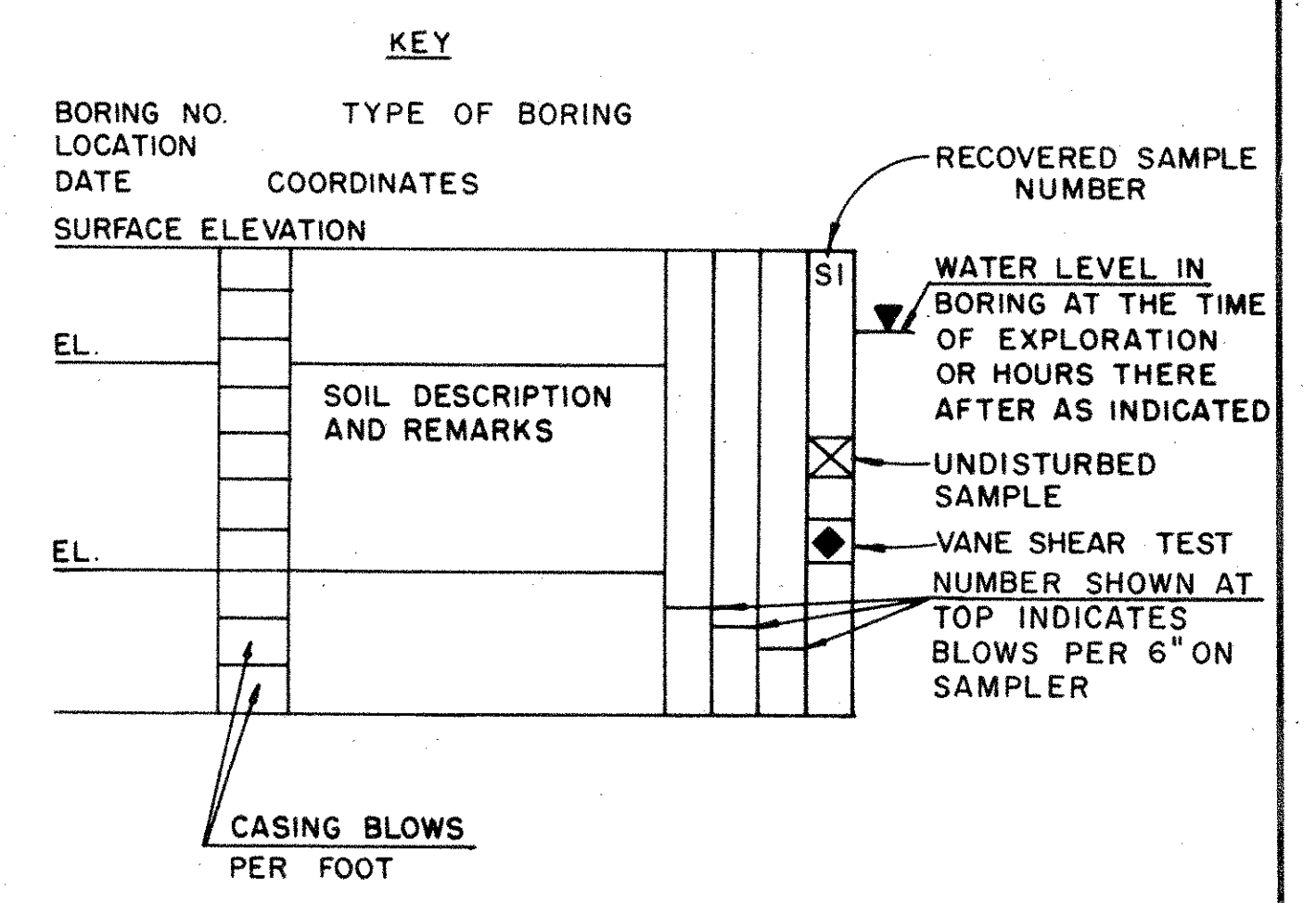
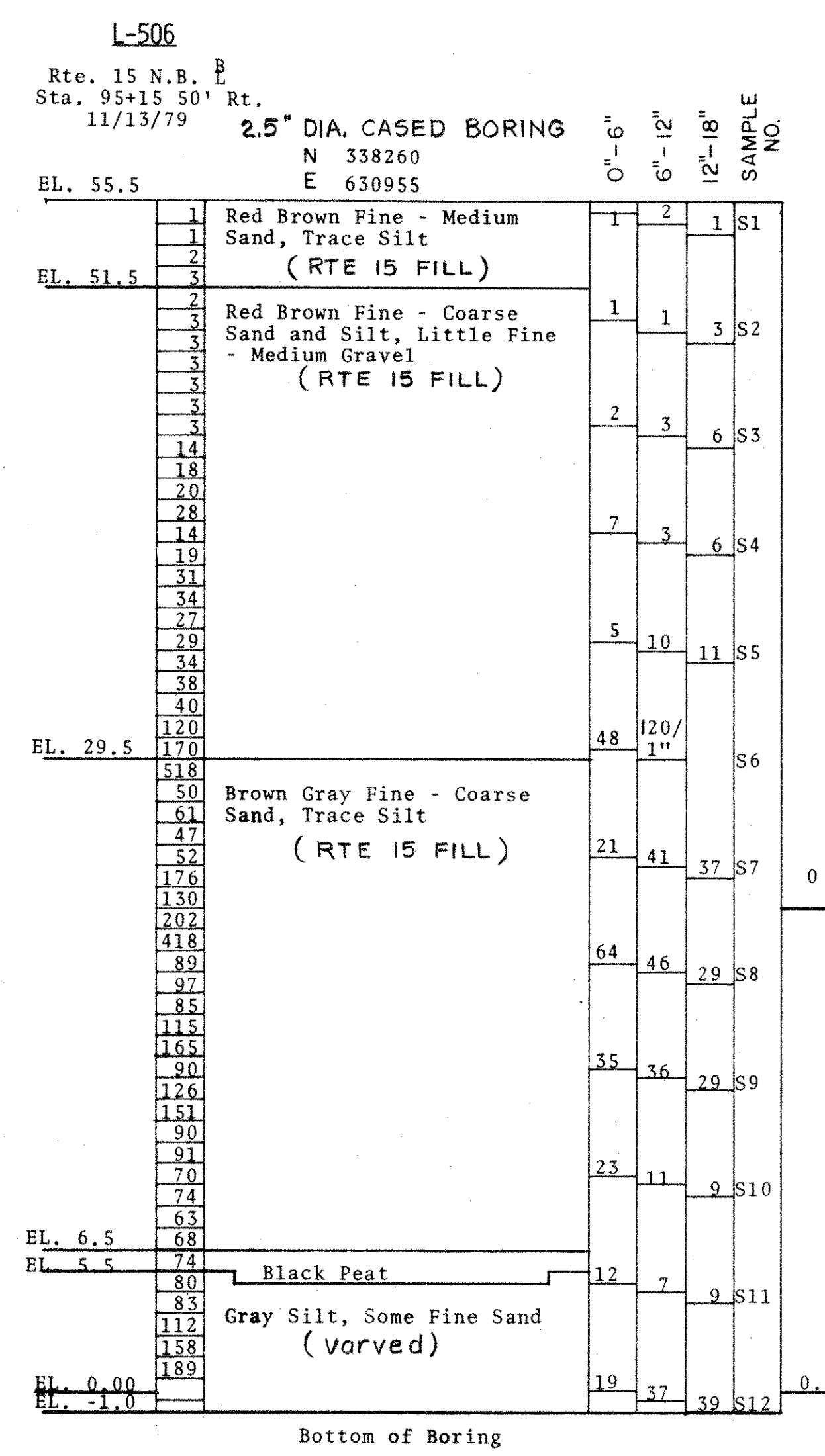
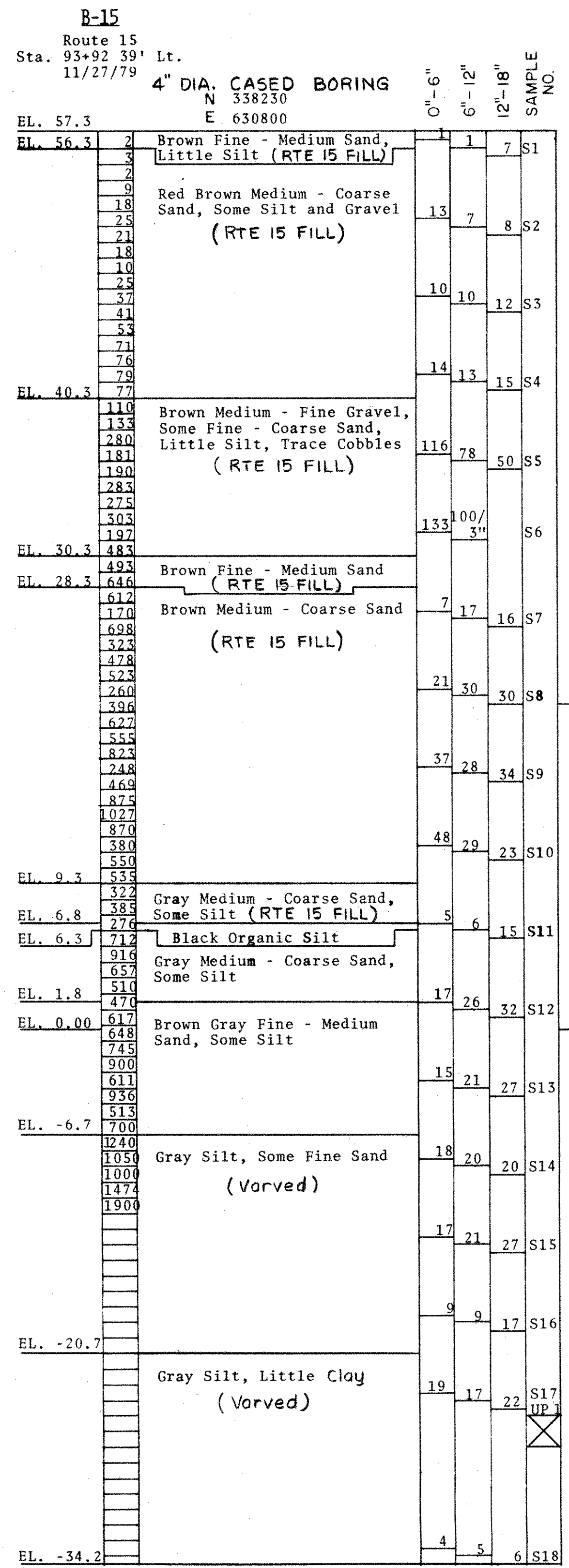
SCALE: 1" = 6'

CONNECTICUT
 DEPARTMENT OF TRANSPORTATION
EAST HARTFORD
RECONSTRUCTION OF INTERSTATE ROUTE 84
 ROUTE 15 N.B. AND ROUTE 15 S.B.
 OVER
 SILVER LANE
 BORINGS SHEET 2 OF 3

ENGINEER	HAYDEN, HARDING & BUCHANAN INC.
DESIGNER	DBV
DRAFTSMAN	DAF
CHECKER	DBV
APPROVED	DATE Dec. 26 1979
NO. DATE	DESCRIPTION
REVISIONS	STRUCTURE NO. 42-216-4
	4 24

THIS SHEET NOT CORRECTED

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CASING I.D. = 2.5" or 4.0" SAMPLER I.D. = 1 3/8"
HAMMER WT. = 300 LBS. HAMMER WT. = 140 LBS.
HAMMER FALL = 24" HAMMER FALL = 30"

- ABBREVIATIONS**
- C. COARSE
 - F. FINE
 - M. MEDIUM
 - LIT. LITTLE
 - TR. TRACE
 - BOUL. BOULDERS
 - COBB. COBBLES
 - MISC. MISCELLANEOUS
 - BR. BROWN

SCALE: 1" = 6'

CONNECTICUT			
DEPARTMENT OF TRANSPORTATION			
EAST HARTFORD			
RECONSTRUCTION OF INTERSTATE ROUTE 84			
ROUTE 15 N.B. AND ROUTE 15 S.B.			
OVER			
SILVER LANE			
BORINGS SHEET 3 OF 3			
ENGINEER HAYDEN, HARDING & BUCHANAN INC.			
DESIGNER DBV		DRAFTSMAN GAF	
CHECKER DBV		DATE Dec. 26 1979	
NO.	DATE	DESCRIPTION	APPROVED
REVISIONS		STRUCTURE NO. 42-216-4	BRIDGE LOG NO. 5 of 24

THIS SHEET NOT CORRECTED

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE TRUE CONDITIONS OR ACTUAL QUANTITIES OR DISTRIBUTION OF QUANTITIES OF WORK WHICH WILL BE REQUIRED.

APPENDIX C

RESULTS OF RECENT LABORATORY TESTING

Draft

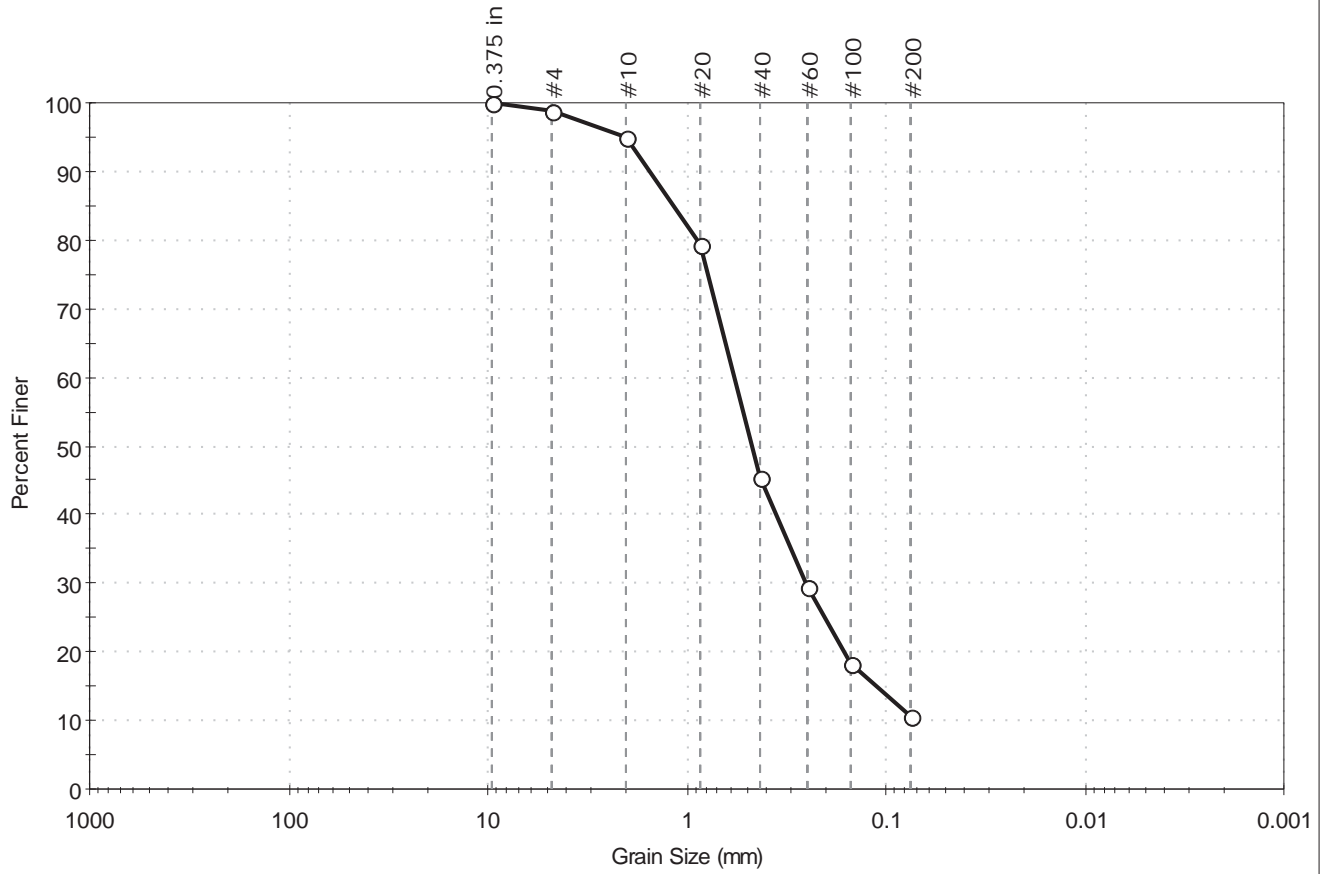
WALL 101 LAB TESTS

Draft



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	SRW-1	Sample Type:	jar
Sample ID:	S-3	Test Date:	08/03/16
Depth:	9-11 ft	Test Id:	384942
Test Comment:	---		
Visual Description:	Moist, reddish brown sand with silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	1.1	88.2	10.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	99		
#10	2.00	95		
#20	0.85	79		
#40	0.42	46		
#60	0.25	30		
#100	0.15	18		
#200	0.075	11		

<u>Coefficients</u>	
D ₈₅ = 1.1573 mm	D ₃₀ = 0.2539 mm
D ₆₀ = 0.5717 mm	D ₁₅ = 0.1116 mm
D ₅₀ = 0.4659 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

<u>Classification</u>	
<u>ASTM</u>	N/A
<u>AASHTO</u>	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---

WALL 103 LAB TESTS

Draft



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/01/16
Depth :	---	Test Id:	382146
		Tested By:	GA
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
S1-1	UP- 1 - Top	42-44	Moist, reddish brown clay	44.5
S1-1	UP- 1 - Top middle	42-44	Moist, reddish brown clay	39.4
S1-1	UP- 1 - Bottom middle	42-44	Moist, reddish brown clay	37.2
S1-1	UP- 1 - Bottom	42-44	Wet, reddish brown clay	47.0
RW-2	UP- 1 - Top	37-39	Moist, reddish brown clay	45.4
RW-2	UP- 1 - Top middle	37-39	Moist, reddish brown clay	51.1
RW-2	UP- 1 - Bottom middle	37-39	Moist, reddish brown clay	55.4
RW-2	UP- 1 - Bottom	37-39	Moist, reddish brown clay	49.5

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/01/16
Depth :	---	Test Id:	382134
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
S6043-1	UP- 1 - Top	43-45	Moist, gray clay	50.1
S6043-1	UP- 1 - Top middle	43-45	Moist, gray clay	49.3
S6043-1	UP- 1 - Bottom middle	43-45	Moist, dark gray clay	51.1
S6043-1	UP- 1 - Bottom	43-45	Moist, dark gray clay	47.7
RW-5	UP- 1 - Top	37-39	Moist, reddish brown clay	44.1
RW-5	UP- 1 - Top middle	37-39	Moist, reddish brown clay	48.2
RW-5	UP- 1 - Bottom middle	37-39	Moist, reddish brown clay	52.0
RW-5	UP- 1 - Bottom	37-39	Moist, reddish brown clay	50.2

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	06/24/16
Depth :	---	Test Id:	382021
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
RW-5	UP- 3 - Top	45-47	Moist, reddish brown clay	55.2
RW-5	UP- 3 - Top middle	45-47	Moist, reddish brown clay	40.9
RW-5	UP- 3 - Bottom middle	45-47	Moist, reddish brown silt	36.1
RW-5	UP- 3 - Bottom	45-47	Wet, reddish brown silt	40.4
S2-1	Tube 1 - Top	52-54	Moist, dark reddish gray clay	44.4
S2-1	Tube 1 - Top middle	52-54	Moist, dark reddish gray clay	52.7
S2-1	Tube 1 - Bottom middle	52-54	Moist, dark reddish brown clay	39.2
S2-1	Tube 1 - Bottom	52-54	Moist, dark reddish brown clay	38.8

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/26/16
Depth :	---	Test Id:	384878
		Tested By:	jbr
		Checked By:	emm

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
S1-2	S-2	4-6 ft	Moist, red sand with gravel	7.1	6.5
S1-5	S-3	10-12 ft	Moist, reddish brown silt with gravel	7.4	6.2
S1-S12	S-2	5-7 ft	Moist, reddish brown silt with gravel	8.1	7.2
S2-1	S-4	15-17 ft	Moist, reddish brown silt with gravel	6.8	6.6
S2-3	S-2	5-7 ft	Moist, reddish brown clay	7.5	7.3
S-0480-1	S-5	14-16 ft	Moist, olive brown silt	4.5	4.3
S-0480-2	S-3	9-11 ft	Moist, olive brown silt	6.3	6.0
S-06043-1	S-2	5-7 ft	Moist, brown sand	7.5	6.8

Notes: Sample Preparation: screened through #10 sieve
 Method A, pH meter used



Client:	Freeman Companies, LLC
Project:	Reconstruction of Exit Charter Oak Bridge
Location:	Hartford, CT
GTX#:	304831
Test Date:	07/26/16
Tested By:	jbr
Checked By:	emm

Laboratory Measurement of Soil Resistivity Using
the Wenner Four-Electrode Method by ASTM G57
(Laboratory Measurement)

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, (ohm-cm) ⁻¹
S1-2	S-2	4-6	Moist, red sand with gravel	4,442	2.25E-04
S1-5	S-3	10-12	Moist, reddish brown silt with gravel	3,099	3.23E-04
S1-S12	S-2	5-7	Moist, reddish brown silt with gravel	1,963	5.09E-04
S2-1	S-4	15-17	Moist, reddish brown silt with gravel	1,343	7.45E-04
S2-3	S-2	5-7	Moist, reddish brown clay	486	2.06E-03
S-0480-1	S-5	14-16	Moist, olive brown silt	3,099	3.23E-04
S-0480-2	S-3	9-11	Moist, olive brown silt	1,892	5.28E-04
S-06043-1	S-2	5-7	Moist, brown sand	15,496	6.45E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
 Water added to sample to create a thick slurry prior to testing (saturated condition).
 Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
 Test conducted in standard laboratory atmosphere: 68-73 F



6100 HILLCROFT
PHONE (713) 369-5400

HOUSTON, TEXAS 77081
FAX (713) 369-5518

RESULTS OF TESTS

PROJECT: RECONSTRUCTOION OF EXIT CHARTER OAK BRIDGE
(GTX 304831)

REPORT DATE: 08-01-16

FOR: GEOTESTING EXPRESS, INC.
125 NAGOG PARK ACTION, MA 01720

CLIENT NUMBER:
JOB NUMBER: 04.1115-0003

REPORTED TO: ETHAN MARRO

REPORT NUMBER:
DATE SAMPLED:
TIME SAMPLED:
SAMPLED BY: CLIENT

SOLUBLE SULFATE AASHTO T-290

DATE RECEIVED:
TIME RECEIVED:
RECEIVED BY:

SAMPLE ID	RESULTS	UNITS	LAB No.	TIME/DATE	ANALYST
S1-3 , S-2, 4 – 6'	< 30 *	mg/kg	0726052	1100/08-01-16	SD
S1-5, S-3, 10 – 12'	57 *	mg/kg	0726053	1100/08-01-16	SD
S1-12, S-2, 5 – 7'	< 50 *	mg/kg	0726054	1100/08-01-16	SD
S2-1, S-4, 15 – 17'	< 50 *	mg/kg	0726055	1100/08-01-16	SD
S2-3, S-2, 5 – 7'	297 *	mg/kg	0726056	1100/08-01-16	SD
S-0480-1, S-5, 14 – 16'	543 *	mg/kg	0726057	1100/08-01-16	SD
S-0480-2, S-3, 9 – 11'	355 *	mg/kg	0726058	1100/08-01-16	SD
S-06043-41, S-2, 5 – 7'	< 30*	mg/kg	0726059	1100/08-01-16	SD

SO4CL 069-16

Respectfully submitted,

* Dry weight basis

Steve DeGregorio
Chemist

SD

** WATER EXTRACTION PERFORMED BY USING A 1:10 RATIO OF SAMPLE AND REAGENT WATER FOLLOWED BY CENTRIFUGE AND VACUUME FILTRATION. THE WATER EXTRACT IS THEN ANALYZED USING THE ASTM D-512 AND D-516 METHODS.

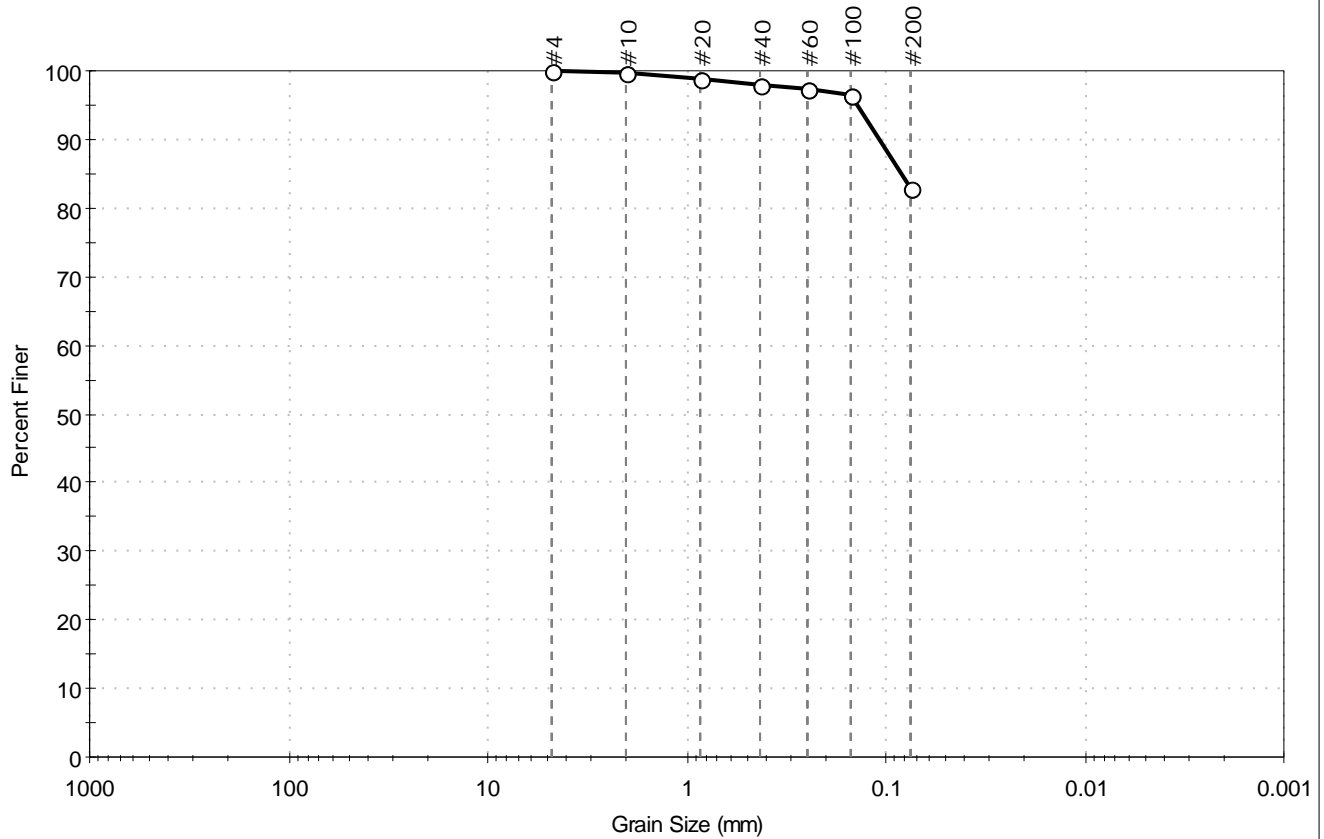
THE RESULTS RELATE AS TO THE LOCATION TESTED AND NO OTHER REFERENCE SHALL BE MADE.
THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF THE LABORATORY.

END OF REPORT



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-4	Sample Type:	jar
Sample ID:	S-3	Test Date:	08/02/16
Depth:	10-12 ft	Test Id:	384945
Test Comment:	---		
Visual Description:	Moist, olive clay with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	0.0	17.0	83.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	97		
#200	0.075	83		

<u>Coefficients</u>	
D ₈₅ = 0.0832 mm	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

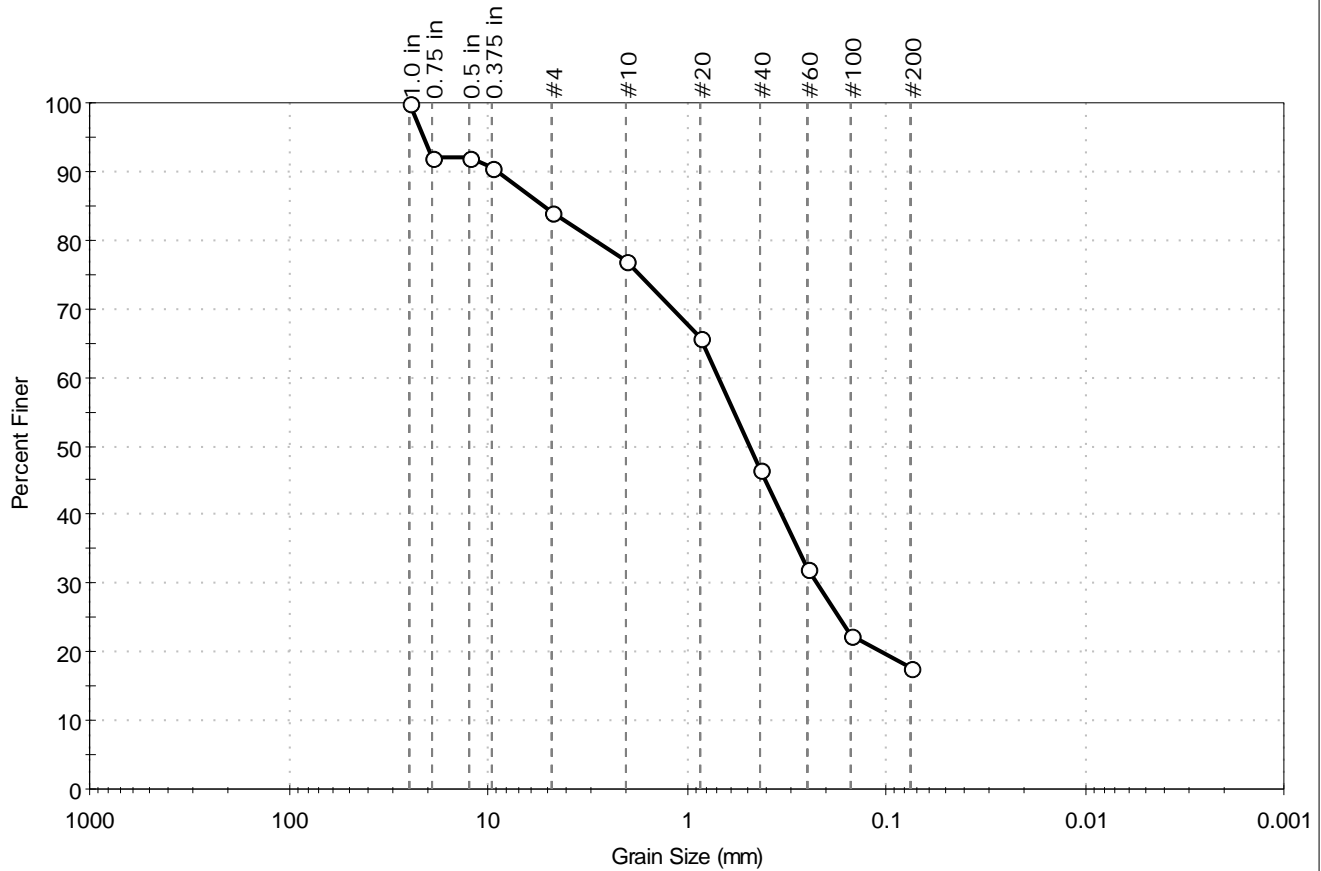
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-5	Sample Type:	jar
Sample ID:	S-2	Test Date:	08/02/16
Depth :	5-7 ft	Test Id:	384933
Test Comment:	---		
Visual Description:	Moist, reddish brown silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	15.9	66.5	17.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.0 in	25.00	100		
0.75 in	19.00	92		
0.5 in	12.50	92		
0.375 in	9.50	91		
#4	4.75	84		
#10	2.00	77		
#20	0.85	66		
#40	0.42	47		
#60	0.25	32		
#100	0.15	22		
#200	0.075	18		

<u>Coefficients</u>	
D ₈₅ = 5.2091 mm	D ₃₀ = 0.2221 mm
D ₆₀ = 0.6913 mm	D ₁₅ = N/A
D ₅₀ = 0.4820 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

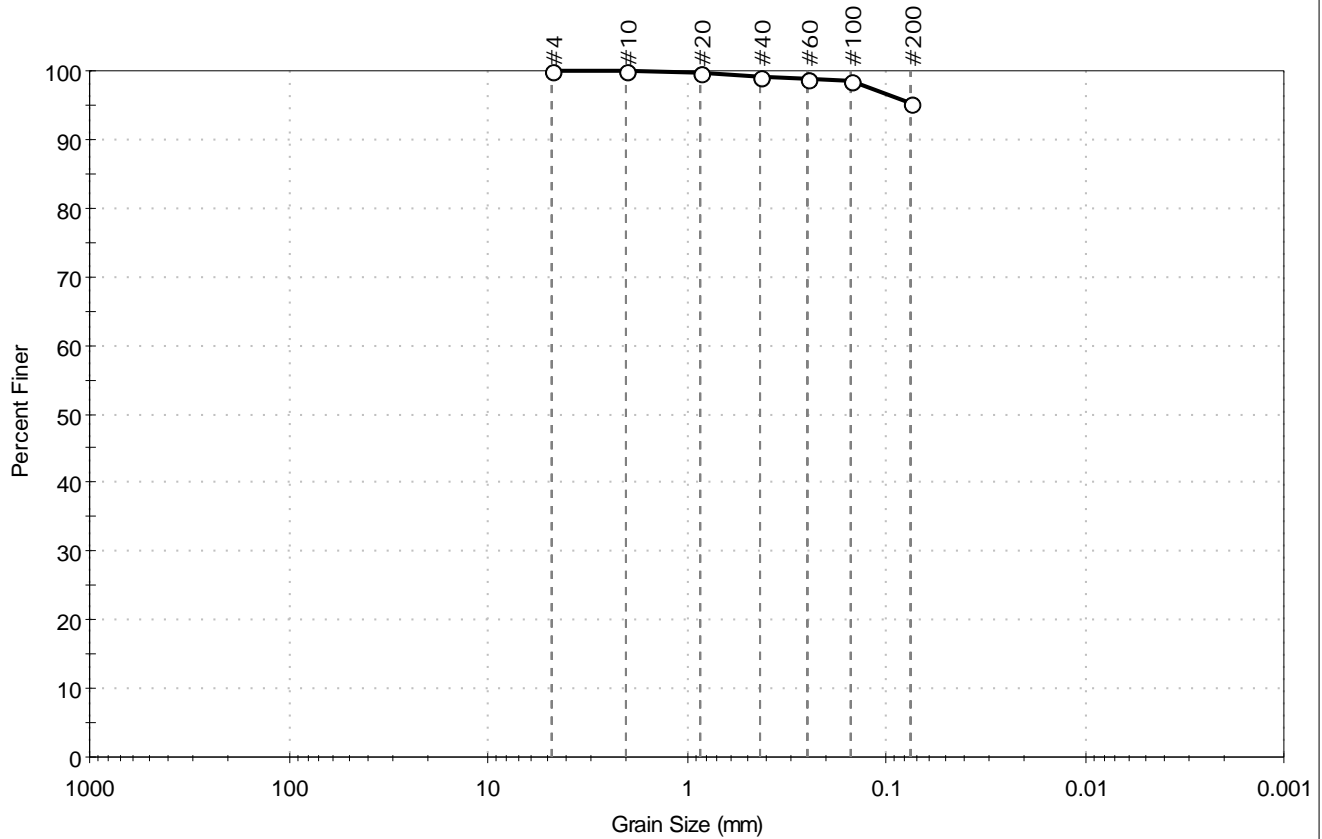
<u>Classification</u>	
<u>ASTM</u>	N/A
<u>AASHTO</u>	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S1-1	Sample Type:	jar
Sample ID:	S-3	Test Date:	08/03/16
Depth:	10-12 ft	Test Id:	384947
Test Comment:	---		
Visual Description:	Moist, olive gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	4.7	95.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	98		
#200	0.075	95		

<u>Coefficients</u>	
D ₈₅ = N/A	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

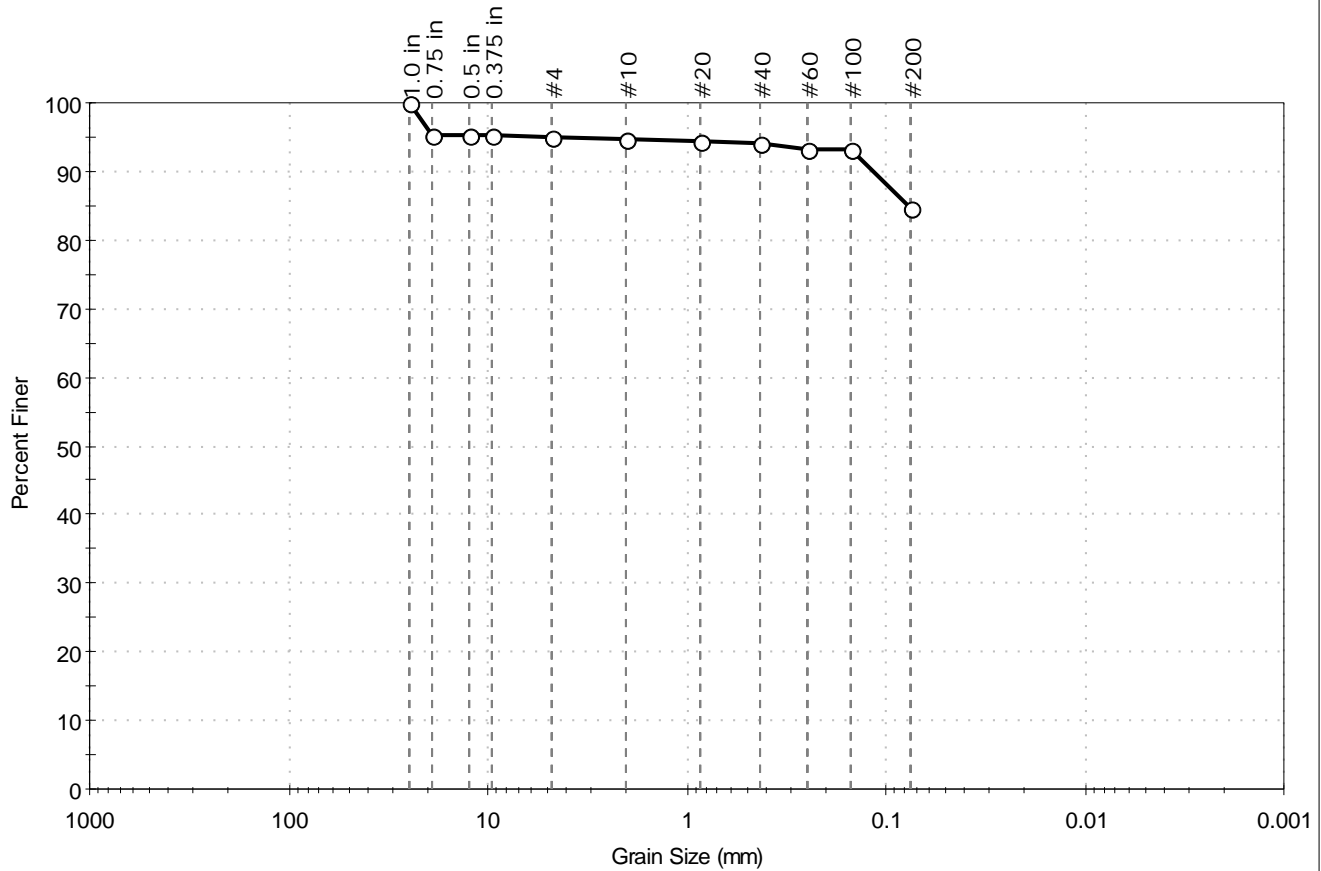
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S1-2	Sample Type:	jar
Sample ID:	S-3	Test Date:	08/03/16
Depth :	9-11 ft	Test Id:	384936
Test Comment:	---		
Visual Description:	Moist, olive silt with sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	5.0	10.3	84.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.0 in	25.00	100		
0.75 in	19.00	95		
0.5 in	12.50	95		
0.375 in	9.50	95		
#4	4.75	95		
#10	2.00	95		
#20	0.85	94		
#40	0.42	94		
#60	0.25	93		
#100	0.15	93		
#200	0.075	85		

<u>Coefficients</u>	
D ₈₅ = 0.0764 mm	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

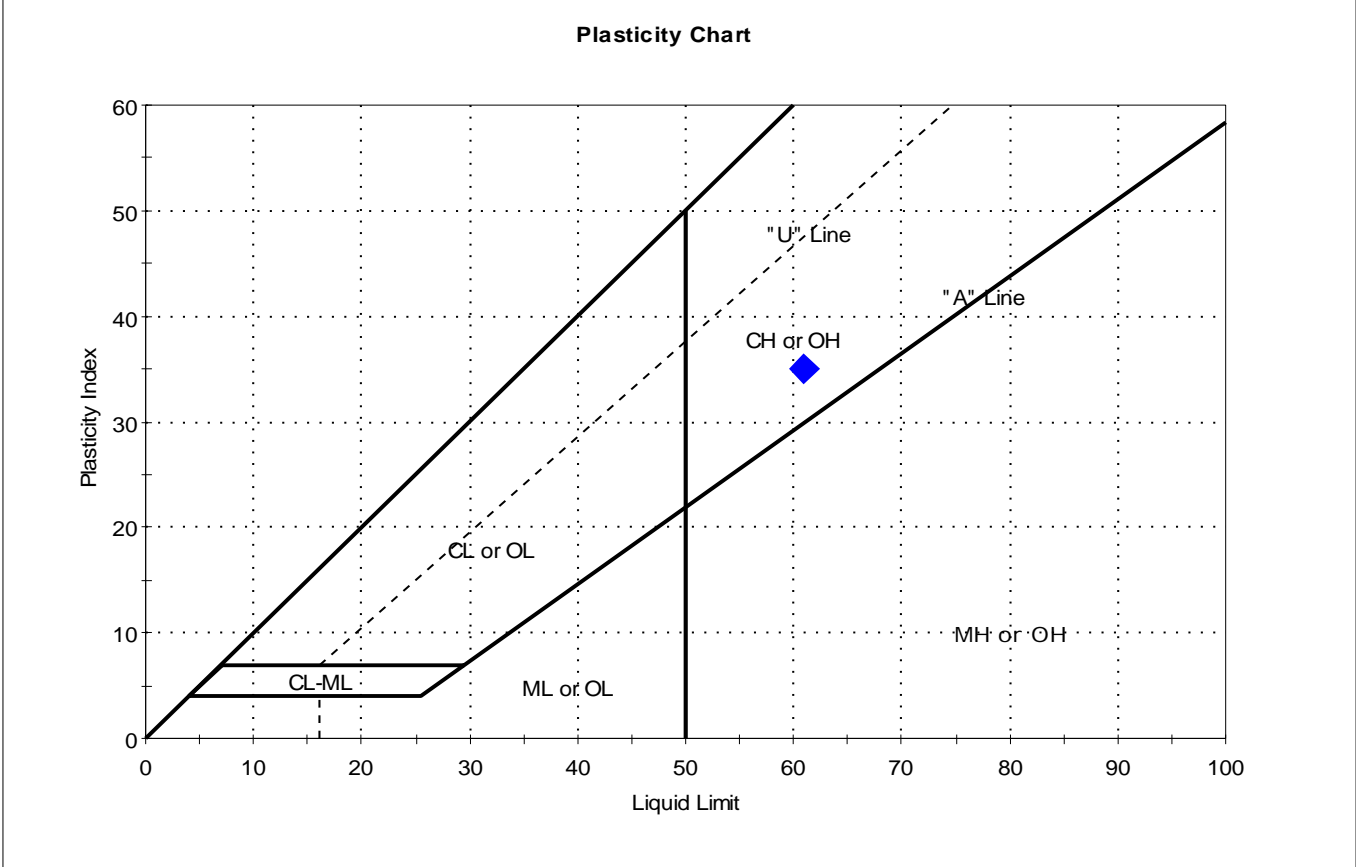
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>	
Sand/Gravel Particle Shape :	---
Sand/Gravel Hardness :	---



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-2	Sample Type:	tube
Sample ID:	UP-1 - Top middle	Test Date:	07/07/16
Depth :	37-39	Test Id:	382147
Test Comment:	---		
Visual Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Top middle	RW-2	37-39	51	61	26	35	0.7	

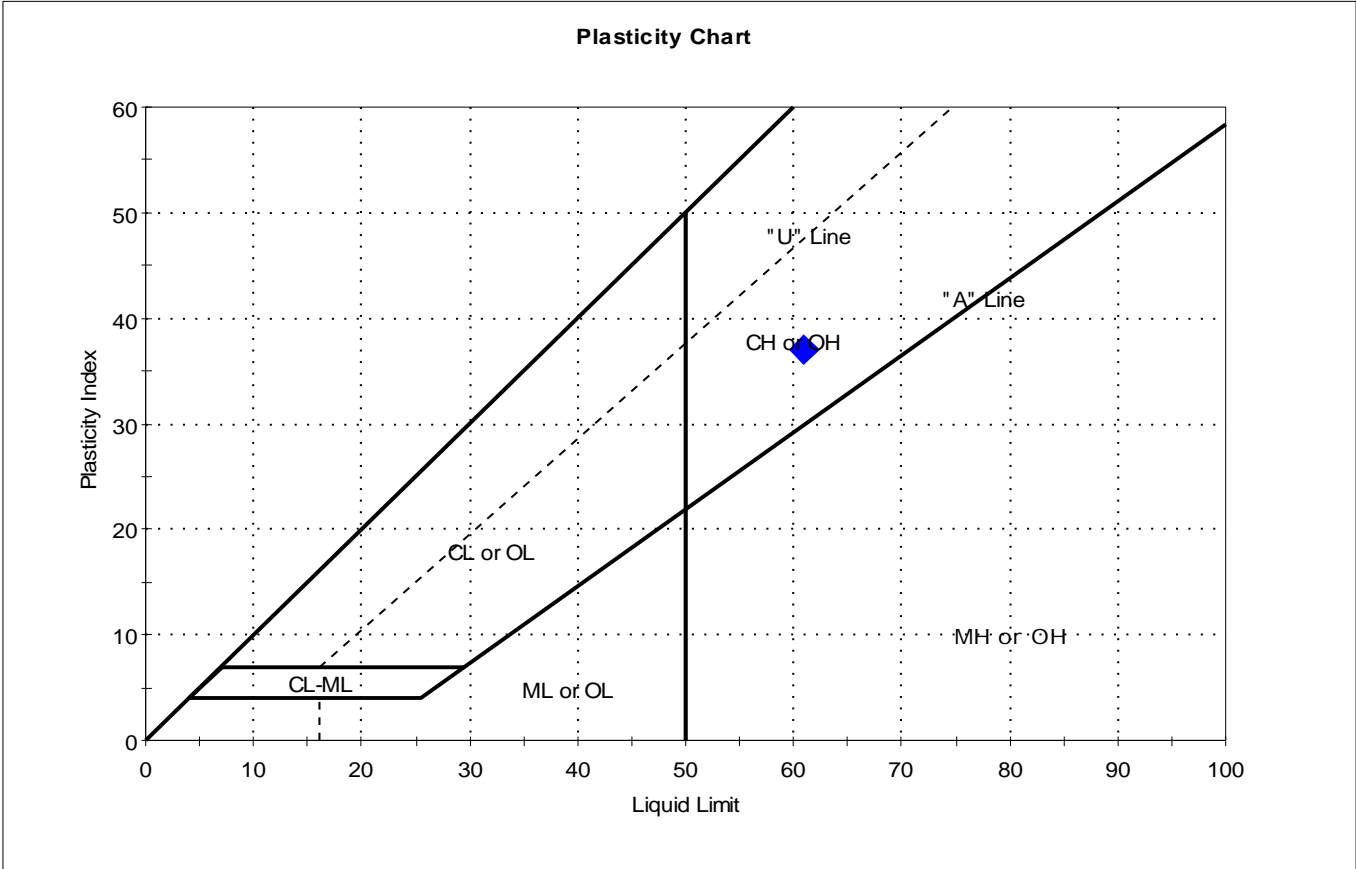
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	GA
Boring ID:	RW-2	Test Date:	07/07/16	Checked By:	emm
Sample ID:	UP-1 - Bottom	Test Id:	382145		
Depth :	37-39				
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Bottom	RW-2	37-39	50	61	24	37	0.7	

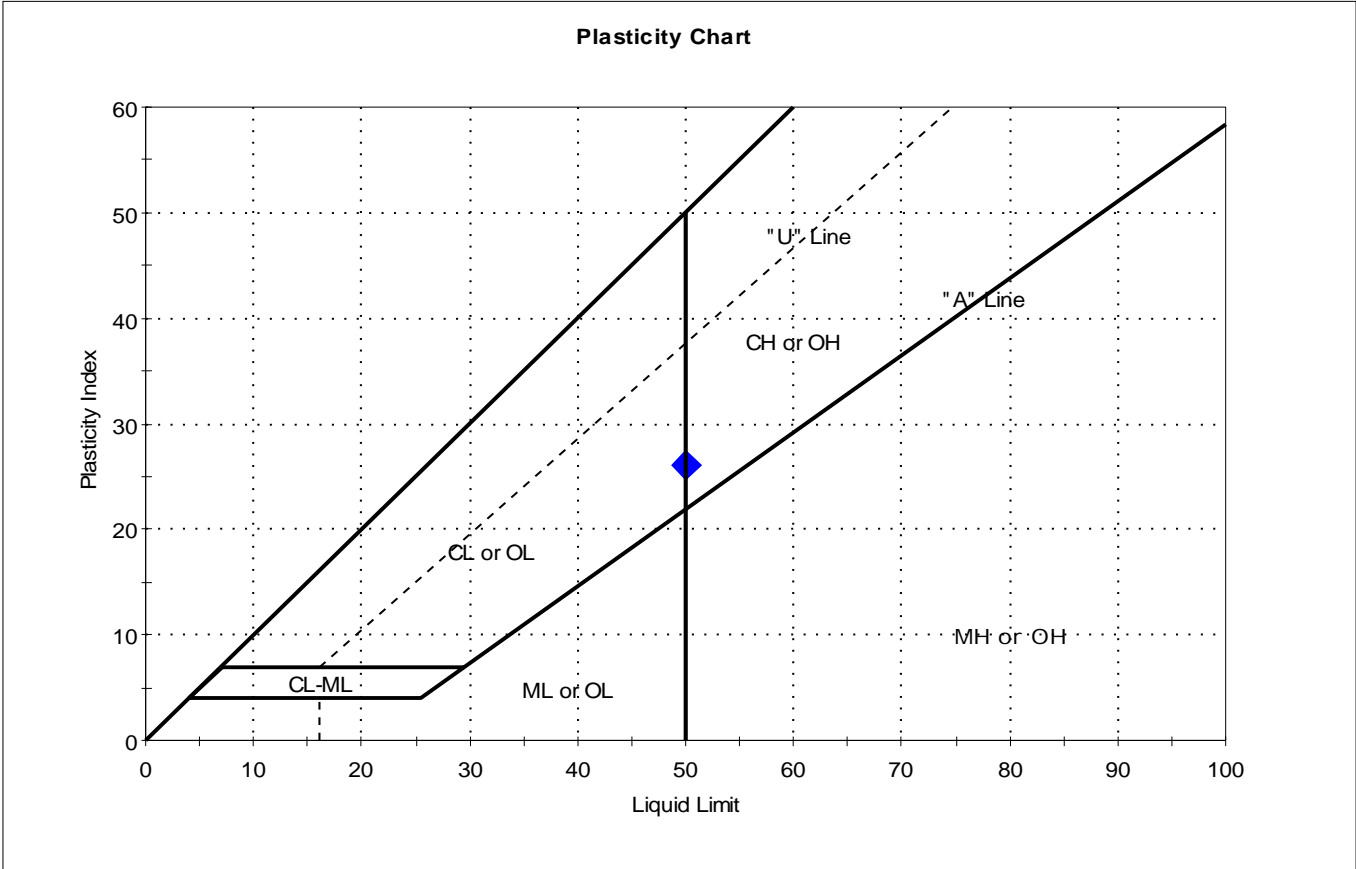
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	GA
Boring ID:	RW-5	Test Date:	07/11/16	Checked By:	emm
Sample ID:	UP-1 - Top middle	Test Id:	382135		
Depth :	37-39				
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Top middle	RW-5	37-39	48	50	24	26	0.9	

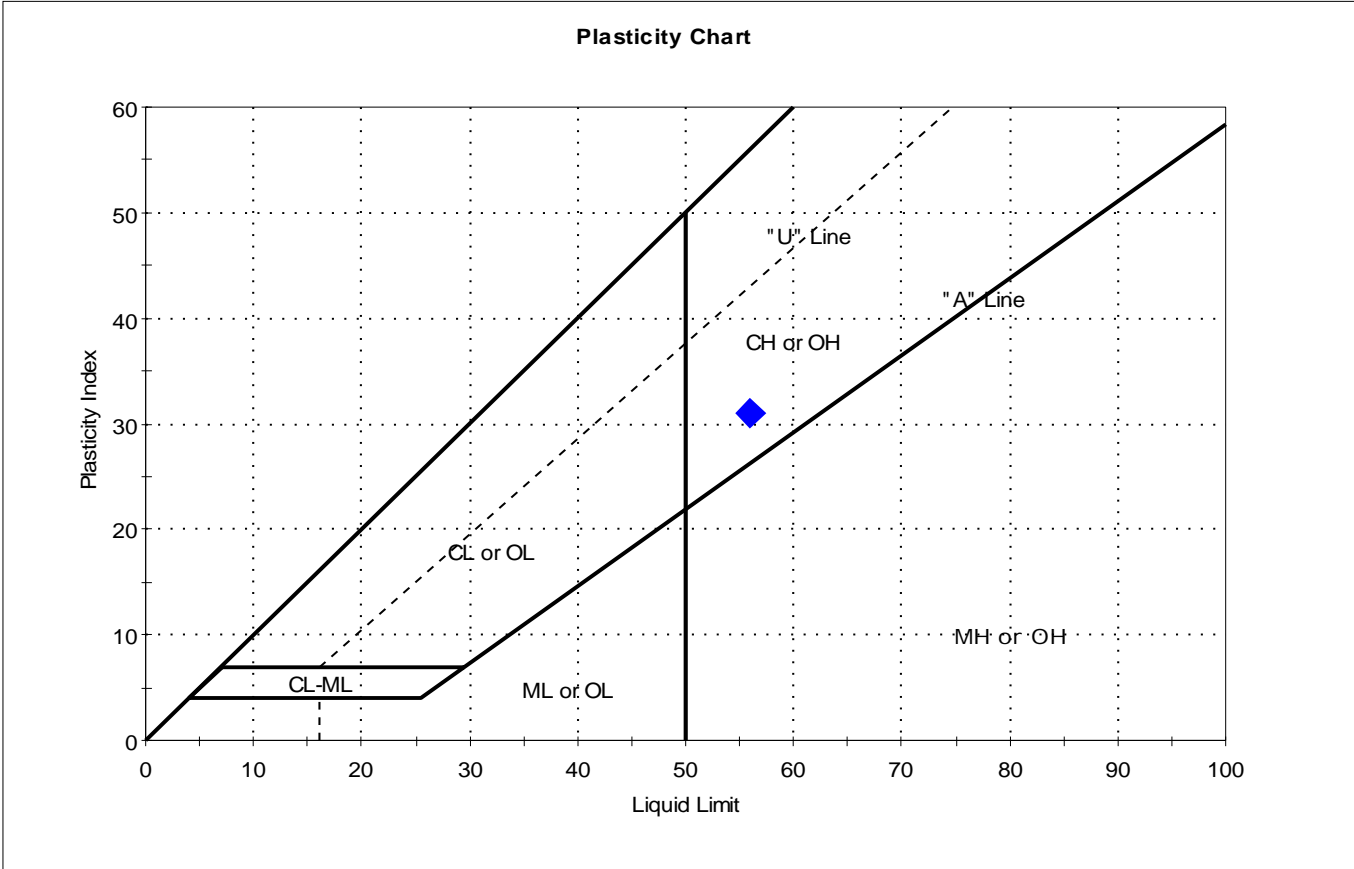
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: NONE
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	cam
Boring ID:	RW-5	Test Date:	07/07/16	Checked By:	emm
Sample ID:	UP-1 - Bottom	Test Id:	382133		
Depth :	37-39				
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Bottom	RW-5	37-39	50	56	25	31	0.8	

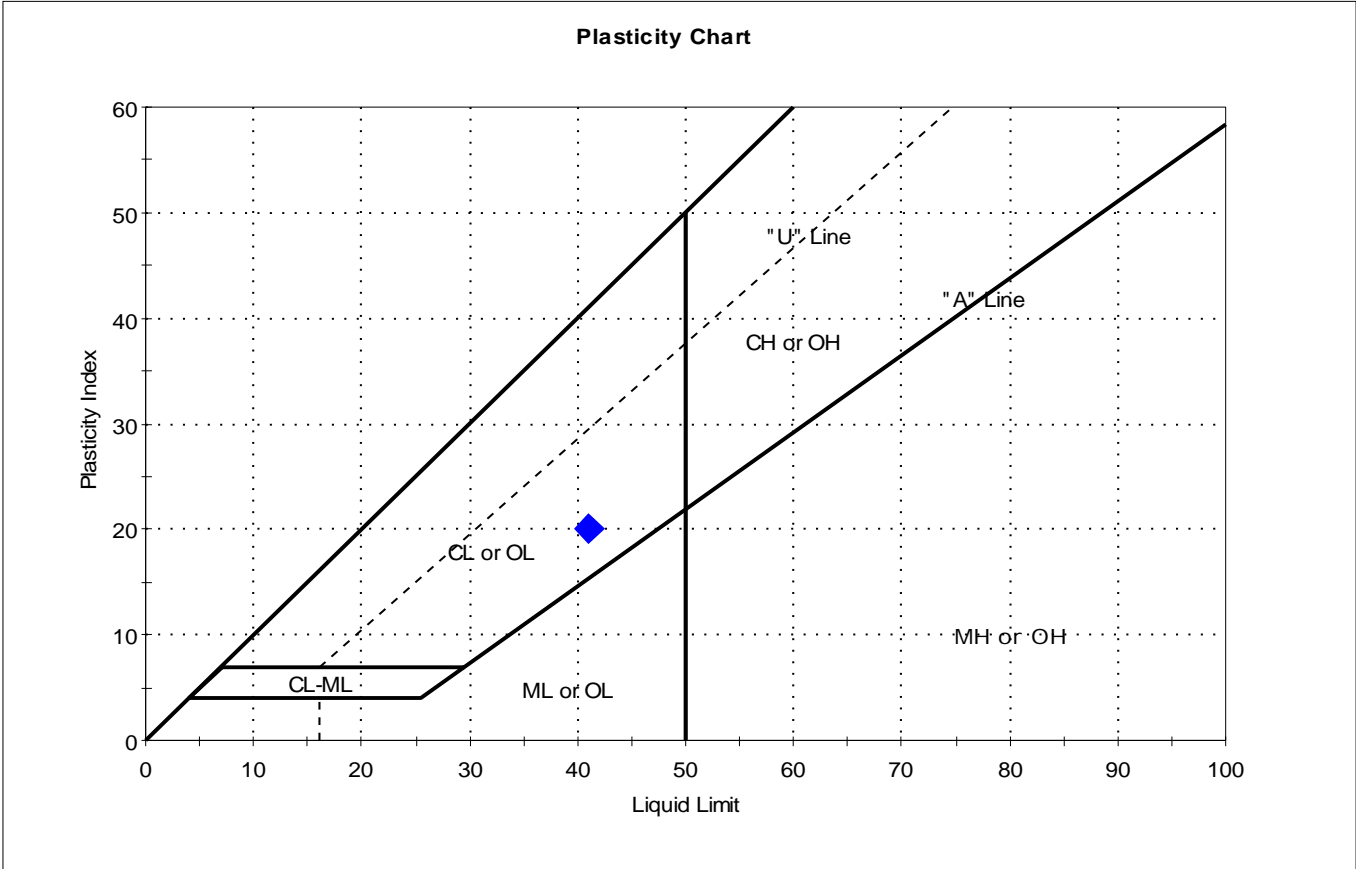
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: NONE
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-5	Sample Type:	tube
Sample ID:	UP-3 - Top middle	Test Date:	07/13/16
Depth :	45-47	Test Id:	382097
Test Comment:	---		
Visual Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-3 - Top middle	RW-5	45-47	41	41	21	20	1	

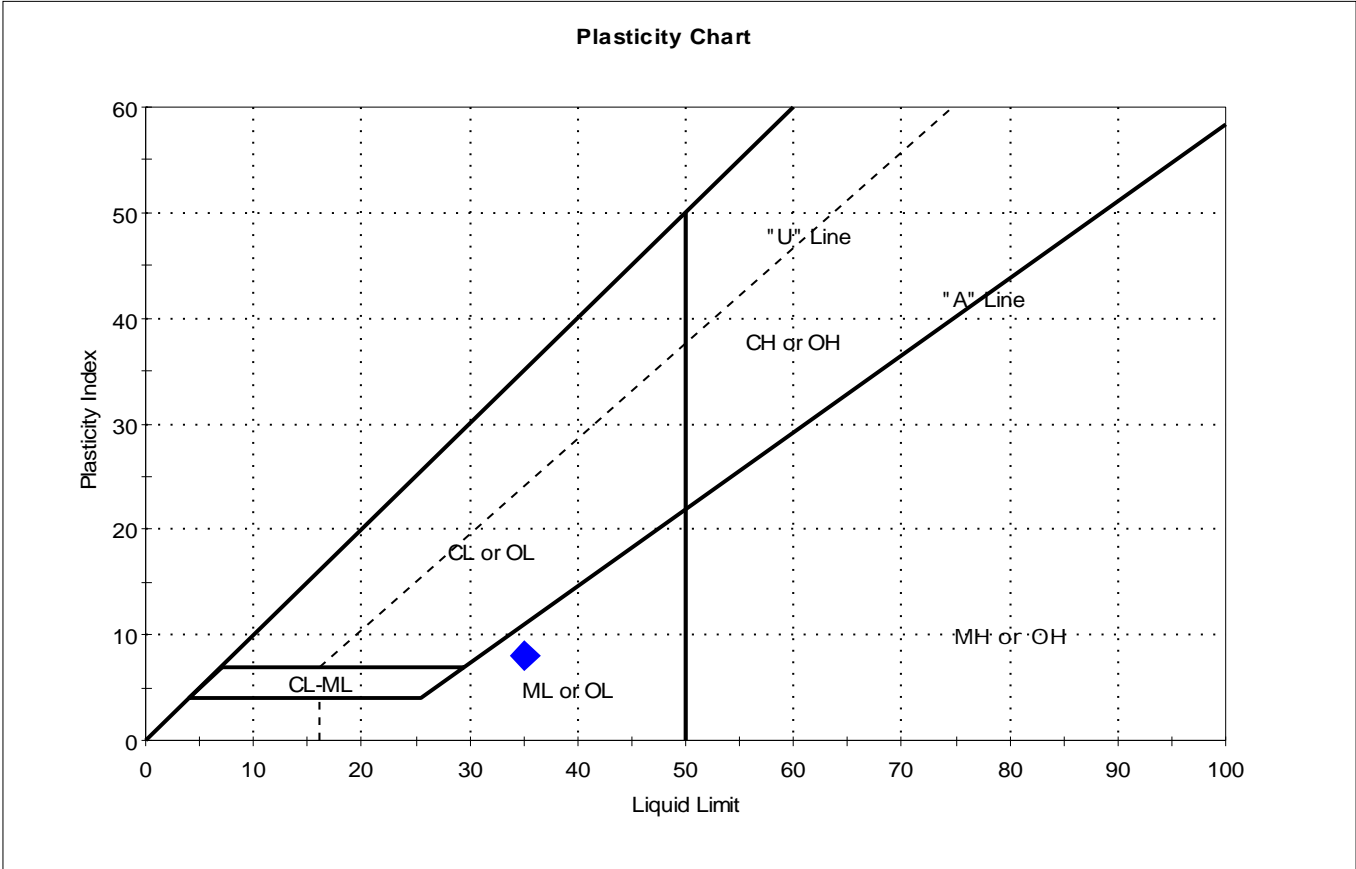
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	GA
Boring ID:	RW-5	Test Date:	07/13/16	Checked By:	emm
Sample ID:	UP-3 - Bottom	Test Id:	382095		
Depth :	45-47				
Test Comment:	---				
Visual Description:	Wet, reddish brown silt				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-3 - Bottom	RW-5	45-47	40	35	27	8	1.7	

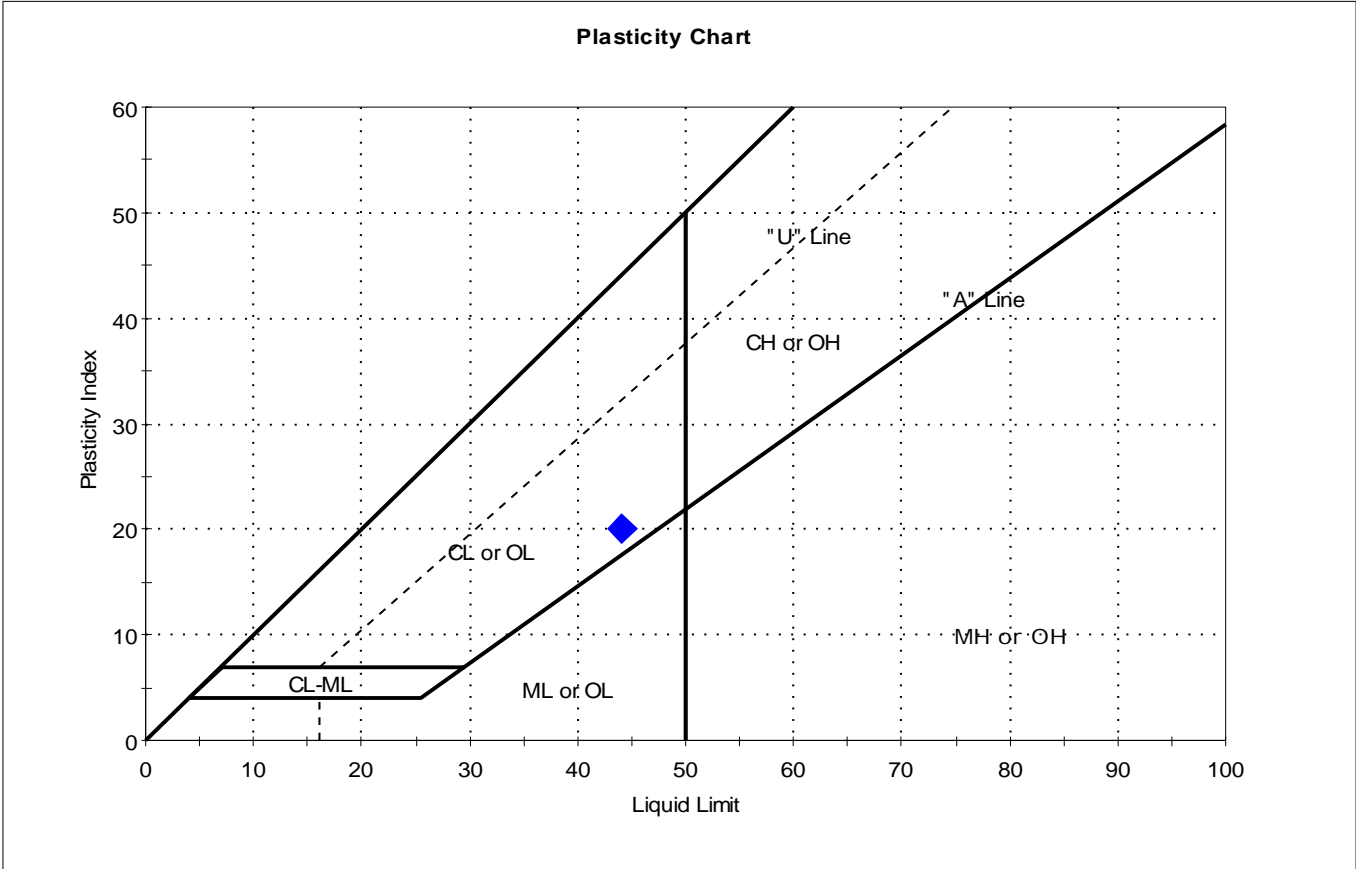
Sample Prepared using the WET method

Dry Strength: LOW
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	GA
Boring ID:	S1-1	Test Date:	07/14/16	Checked By:	emm
Sample ID:	UP-1 - Top middle	Test Id:	382153		
Depth :	42-44				
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	----				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Top middle	S1-1	42-44	39	44	24	20	0.8	

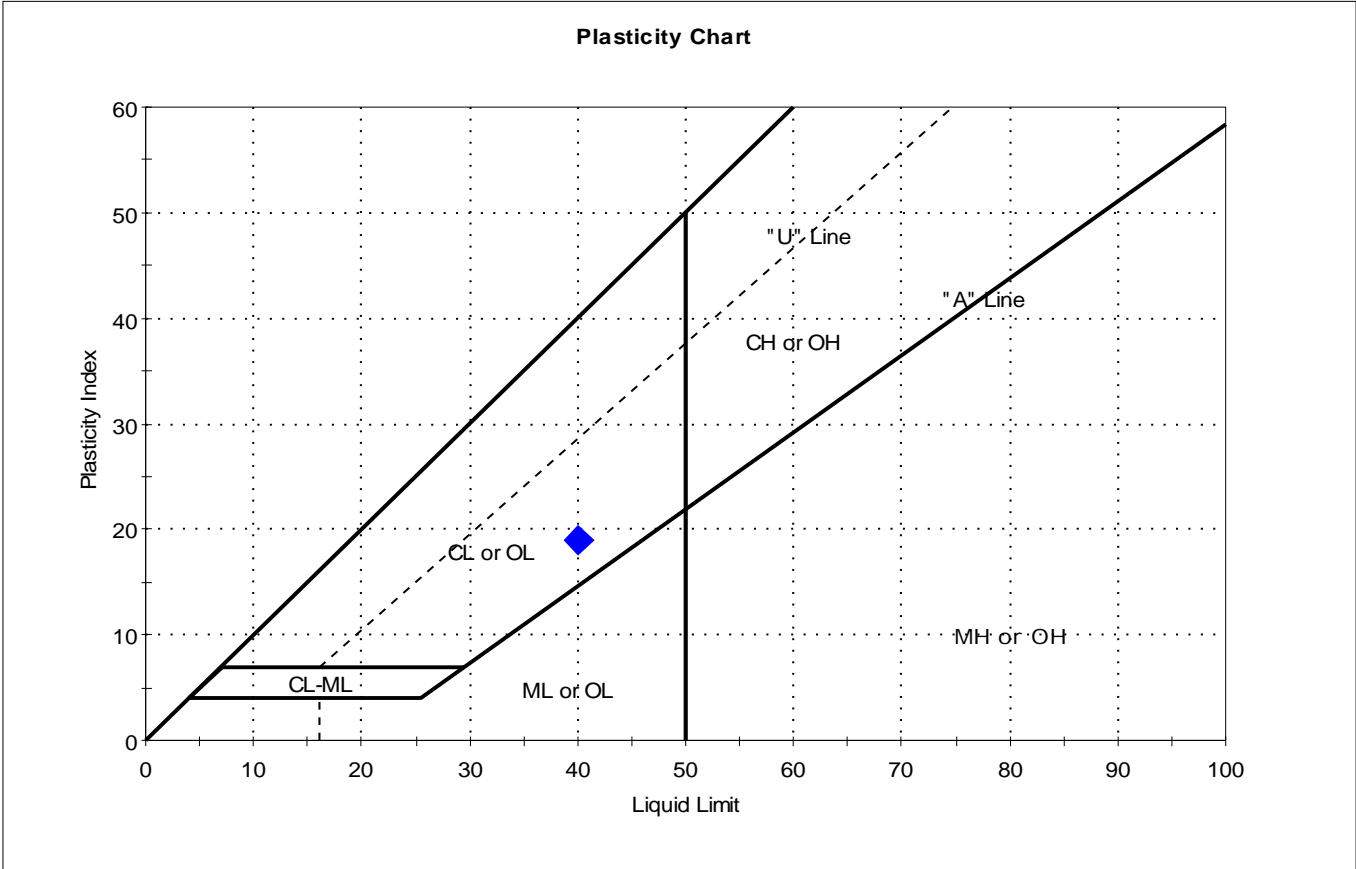
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	GA
Boring ID:	S1-1	Test Date:	07/13/16	Checked By:	emm
Sample ID:	UP-1 - Bottom	Test Id:	382151		
Depth :	42-44				
Test Comment:	---				
Visual Description:	Wet, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90

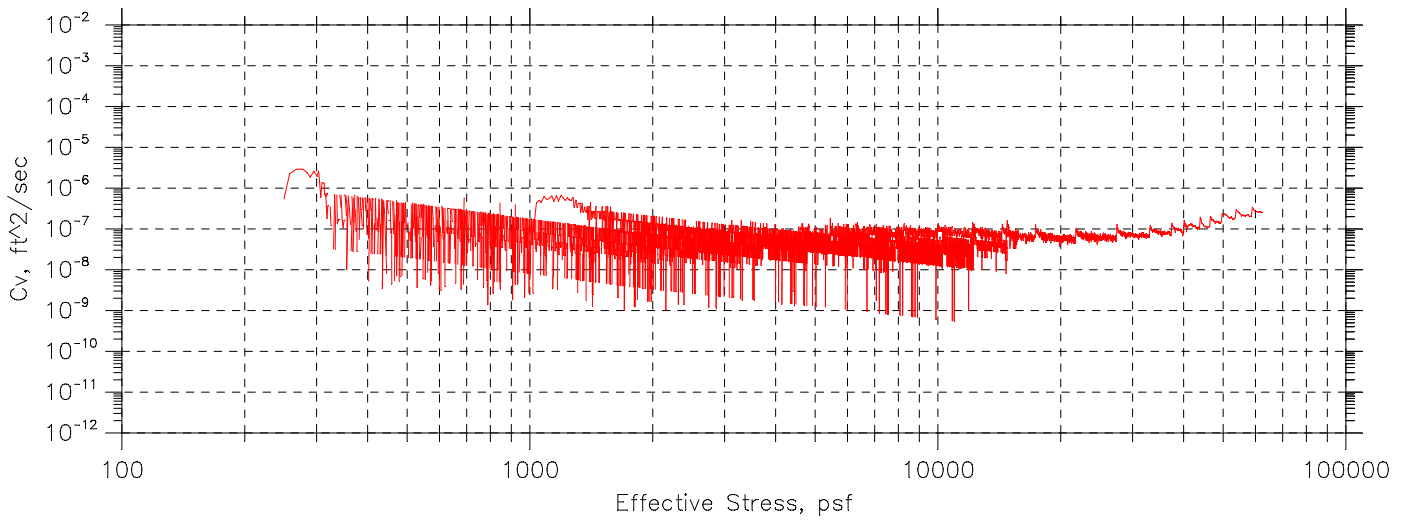
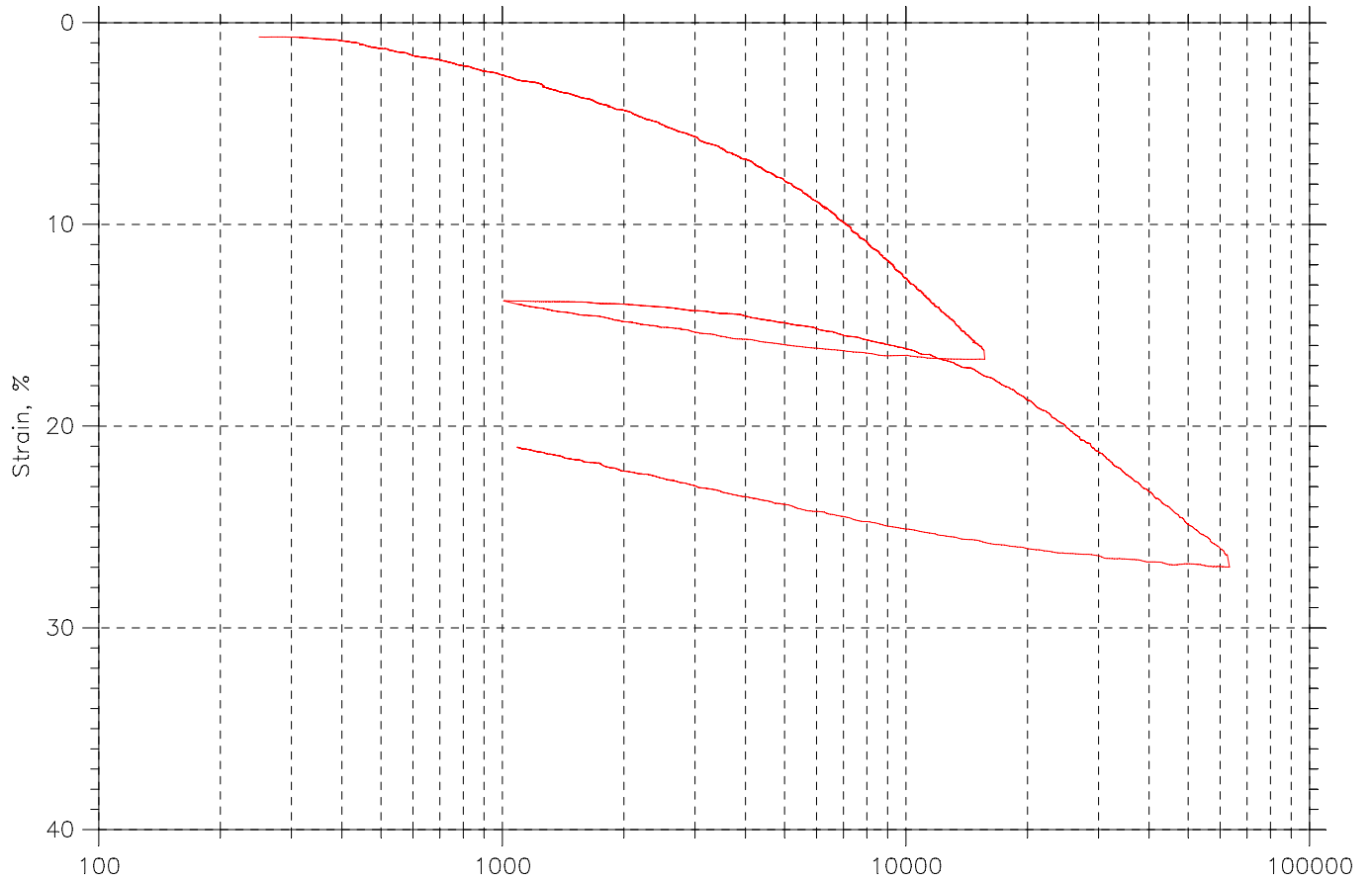


Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Bottom	S1-1	42-44	47	40	21	19	1.4	

Sample Prepared using the WET method

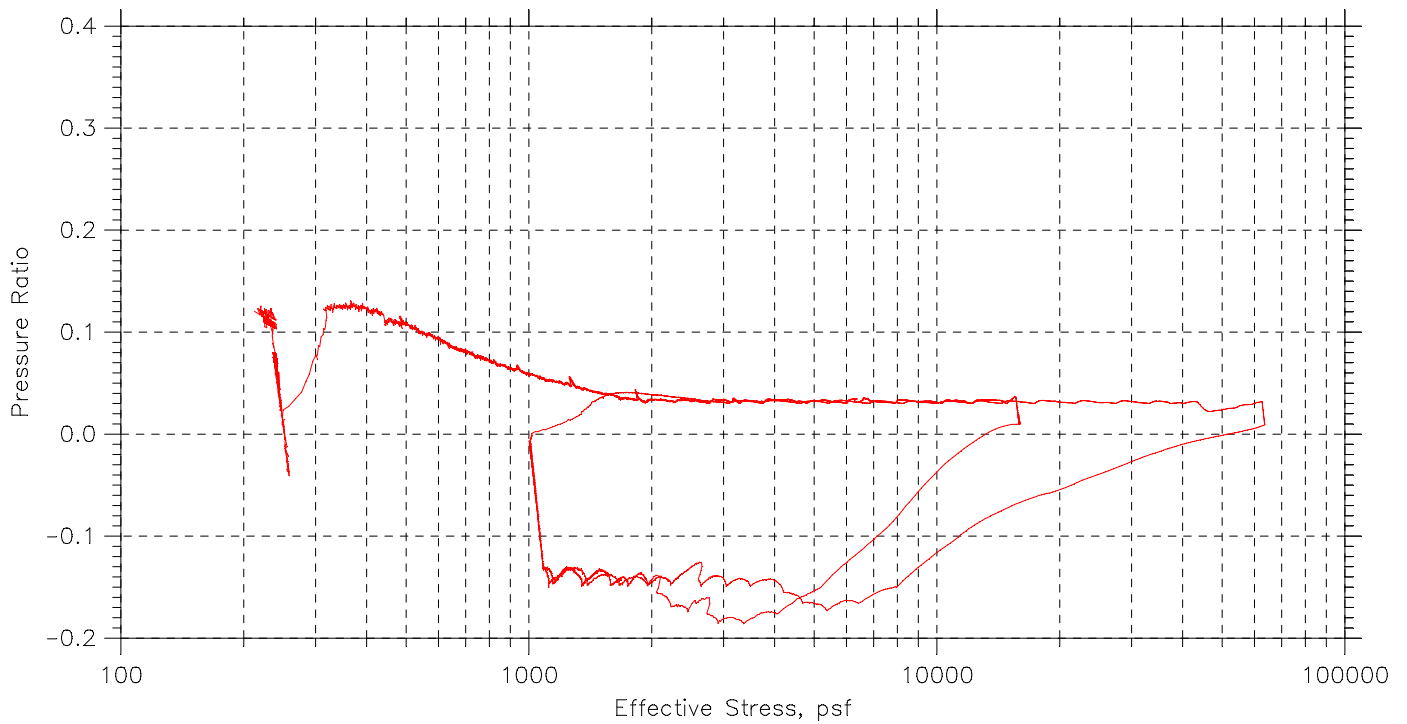
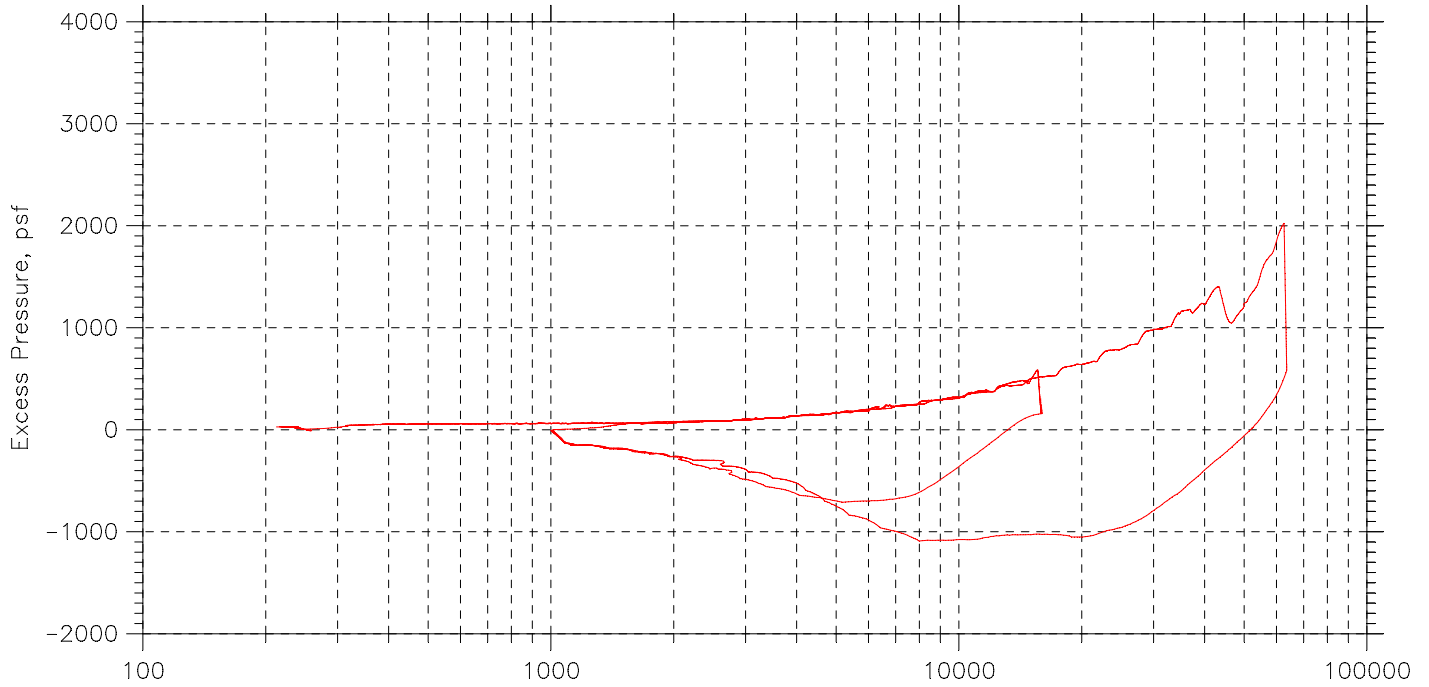
Dry Strength: HIGH
 Dilatancy: NONE
 Toughness: MEDIUM

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-2	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/09/16	Depth: 37-39 ft
Test No.: CRC-10	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System X		
Page 1 of 3		

Constant Rate of Consolidation
Constant Strain Rate by ASTM D4186
Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-2	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/09/16	Depth: 37-39 ft
Test No.: CRC-10	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System X		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: RW-2
 Sample No.: UP-1
 Test No.: CRC-10

Location: Hartford, CT
 Tested By: md
 Test Date: 06/09/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 37-39 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System X

Estimated Specific Gravity: 2.79
 Initial Void Ratio: 1.39
 Final Void Ratio: 0.963

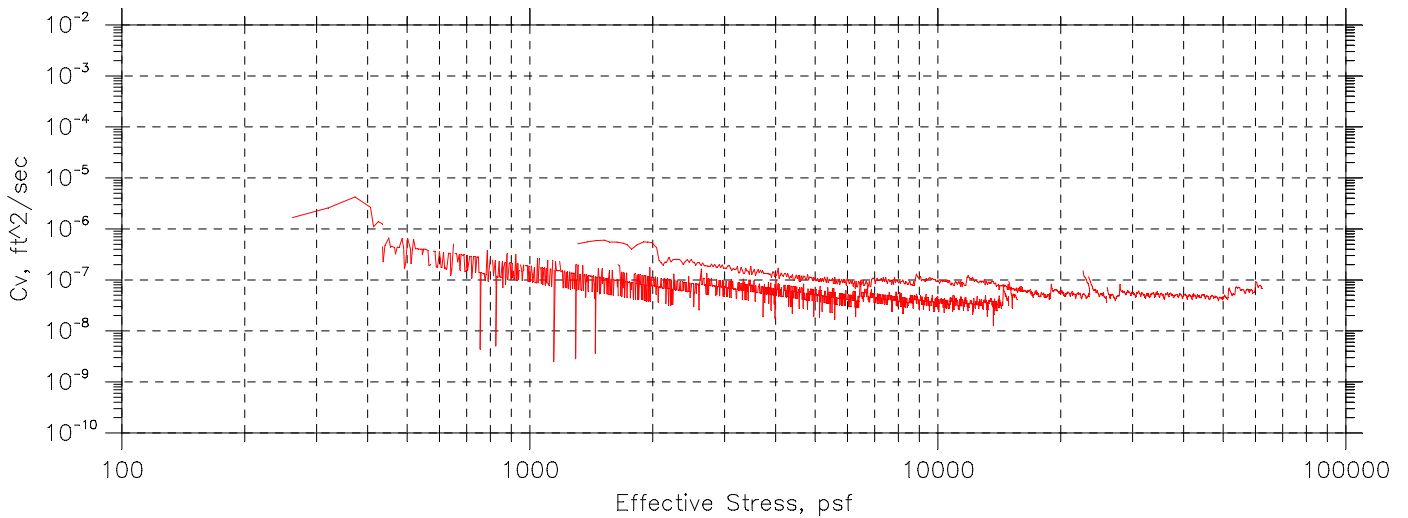
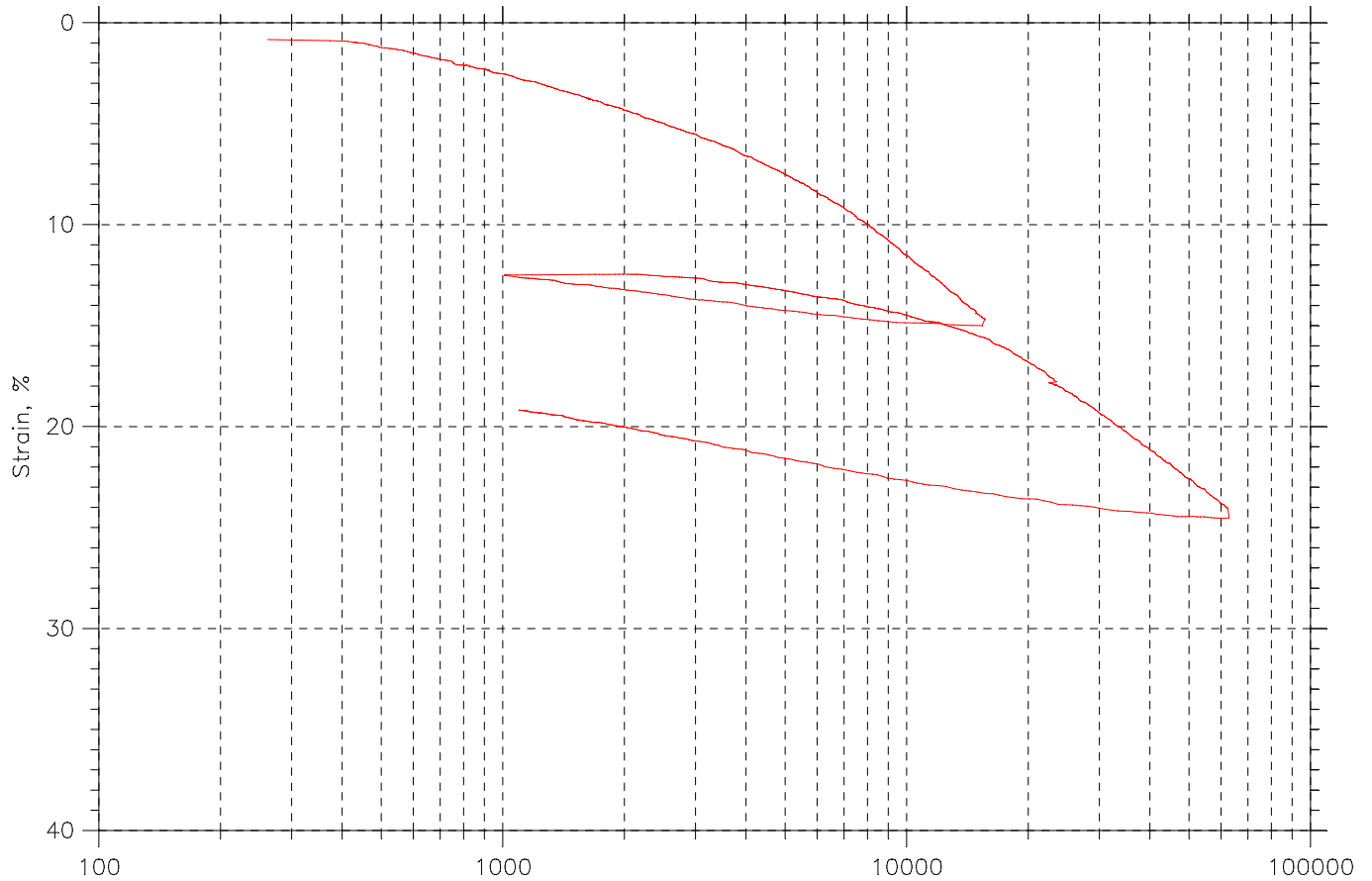
Liquid Limit: 61
 Plastic Limit: 24
 Plasticity Index: 37

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.82 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	A-885	RING		16654
Wt. Container + Wet Soil, gm	184.95	249.00	235.31	133.94
Wt. Container + Dry Soil, gm	126.51	202.95	202.95	101.72
Wt. Container, gm	8.5400	109.20	109.20	8.3900
Wt. Dry Soil, gm	117.97	93.746	93.746	93.330
Water Content, %	49.54	49.13	34.52	34.52
Void Ratio	---	1.39	0.963	---
Degree of Saturation, %	---	98.32	100.00	---
Dry Unit Weight, pcf	---	72.755	88.725	---

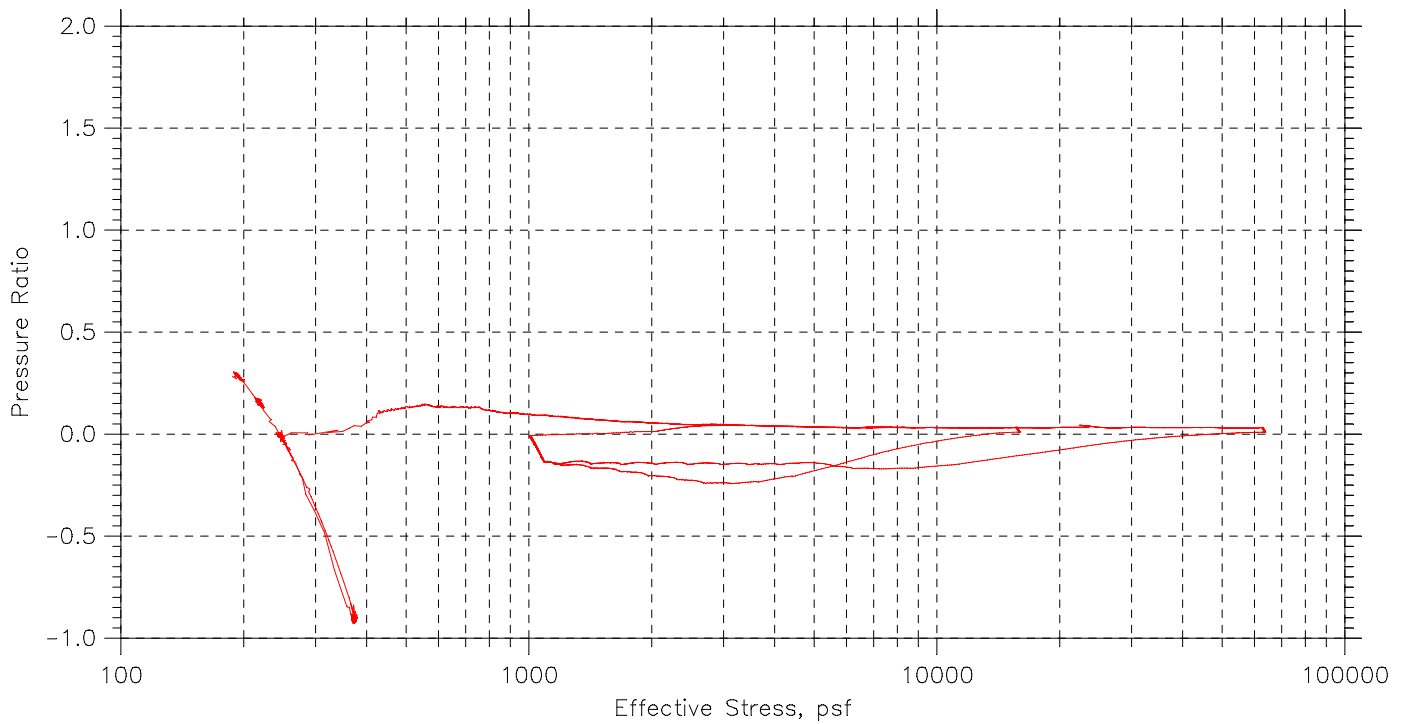
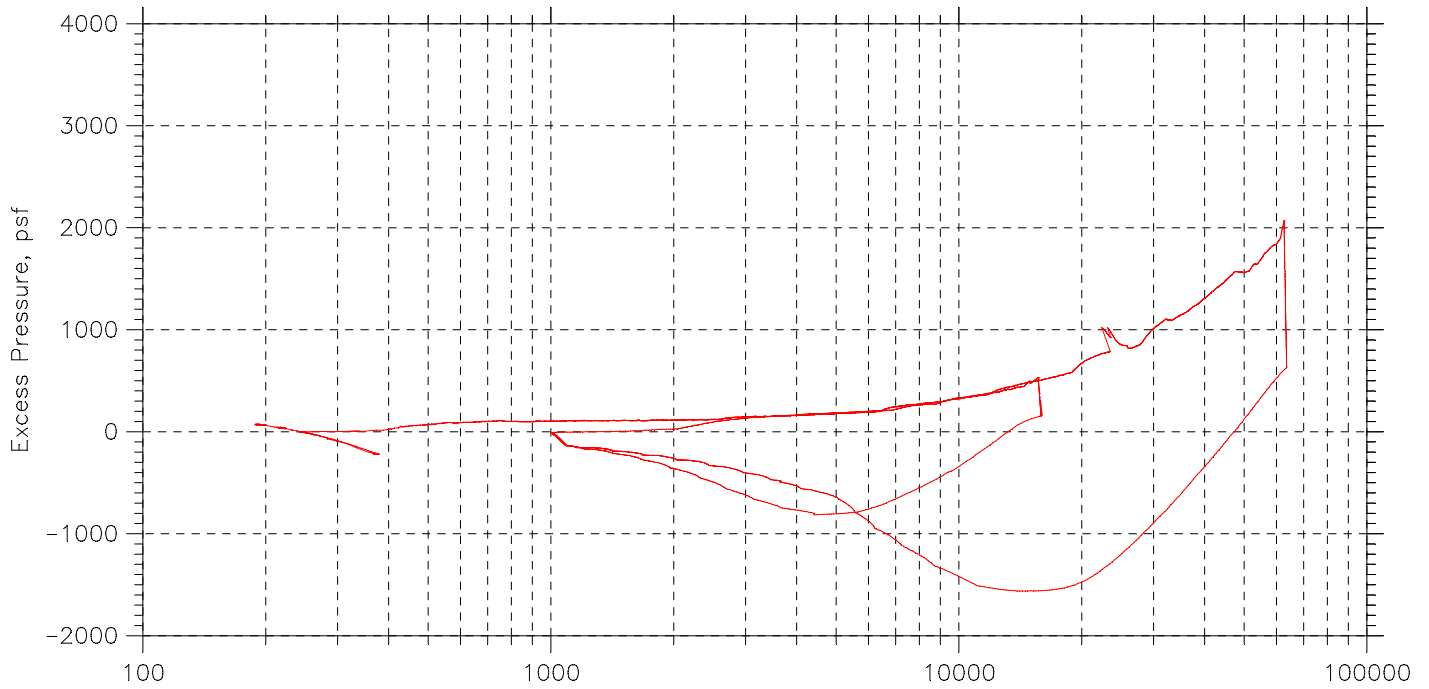
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-5	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/08/16	Depth: 37-39 ft
Test No.: CRC-8	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System K		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-5	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/08/16	Depth: 37-39 ft
Test No.: CRC-8	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System K		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: RW-5
 Sample No.: UP-1
 Test No.: CRC-8

Location: Hartford, CT
 Tested By: md
 Test Date: 06/08/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 37-39 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System K

Estimated Specific Gravity: 2.80
 Initial Void Ratio: 1.28
 Final Void Ratio: 0.911

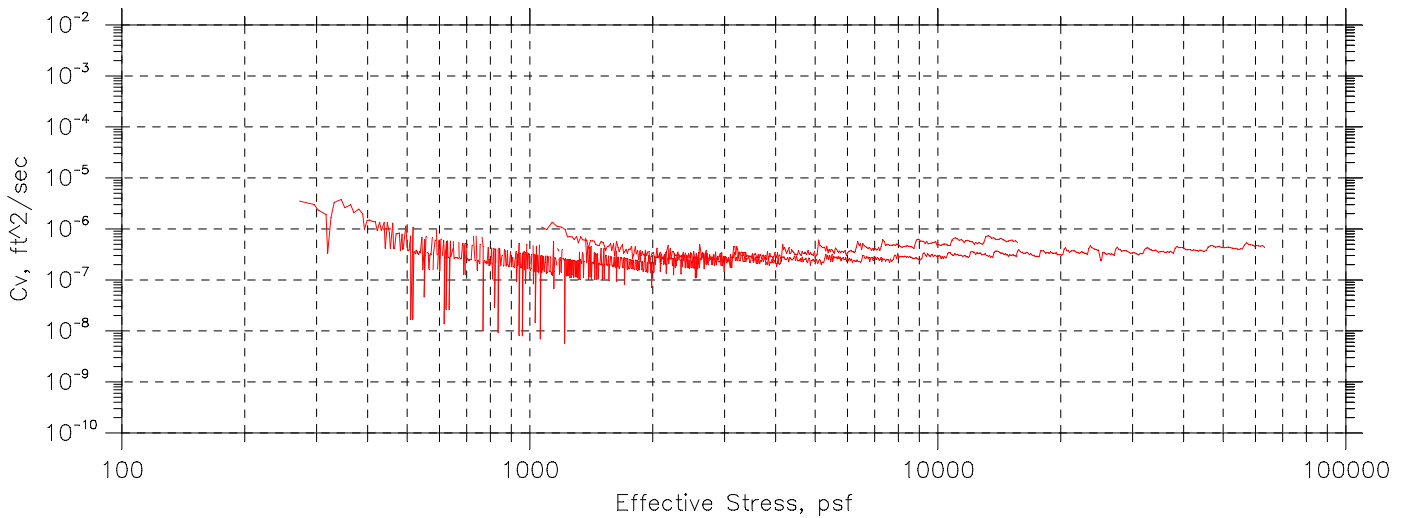
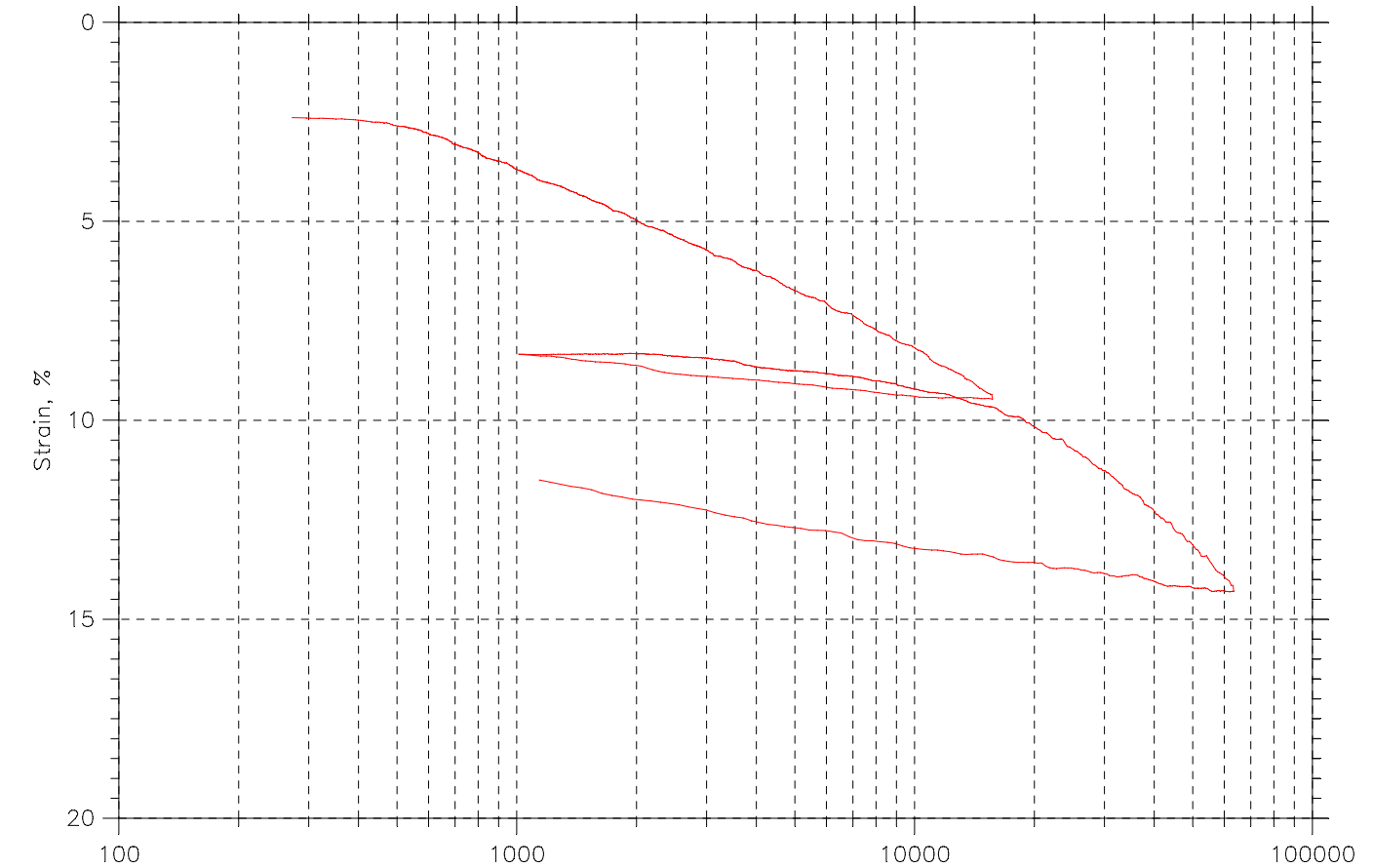
Liquid Limit: 56
 Plastic Limit: 25
 Plasticity Index: 31

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.84 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	B-566	RING		C1212
Wt. Container + Wet Soil, gm	188.85	354.98	342.24	138.98
Wt. Container + Dry Soil, gm	128.45	310.02	310.02	106.94
Wt. Container, gm	8.0200	210.98	210.98	8.4500
Wt. Dry Soil, gm	120.43	99.041	99.041	98.490
Water Content, %	50.15	45.39	32.53	32.53
Void Ratio	---	1.28	0.911	---
Degree of Saturation, %	---	99.71	100.00	---
Dry Unit Weight, pcf	---	76.864	91.505	---

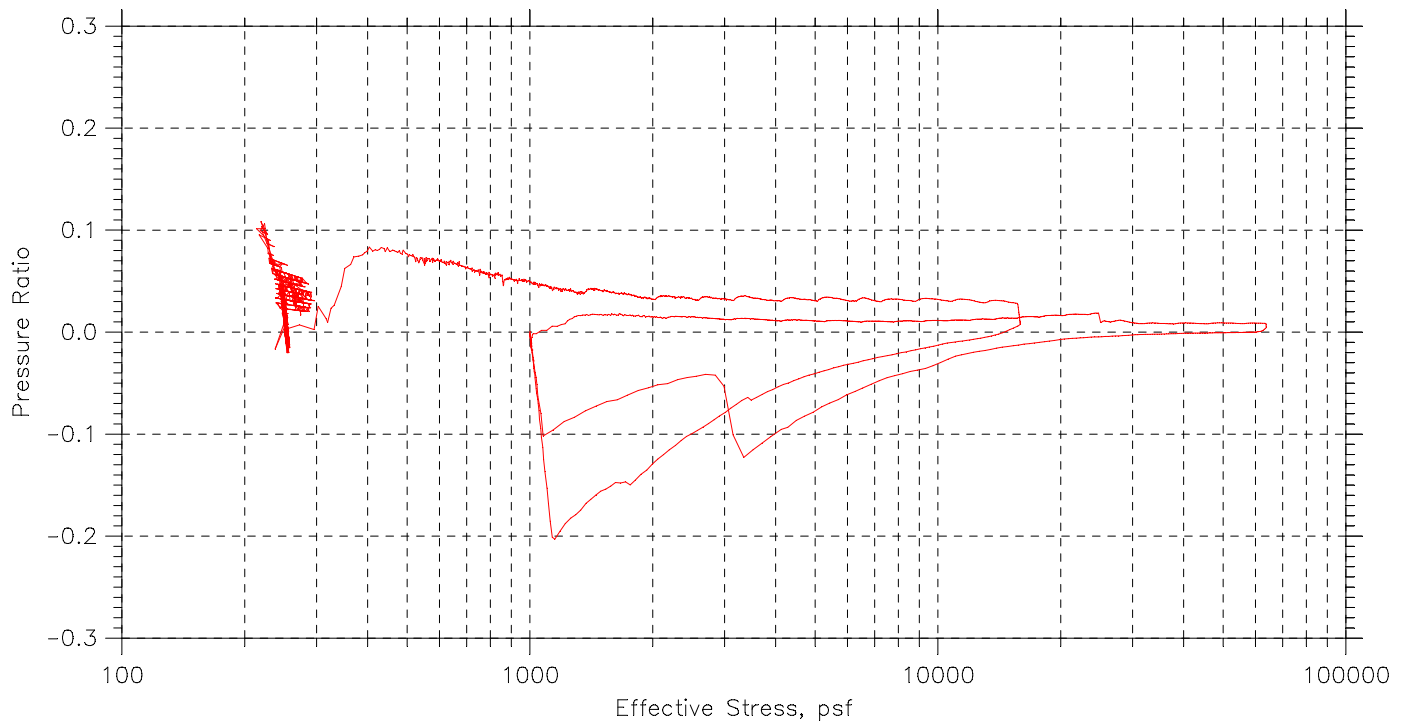
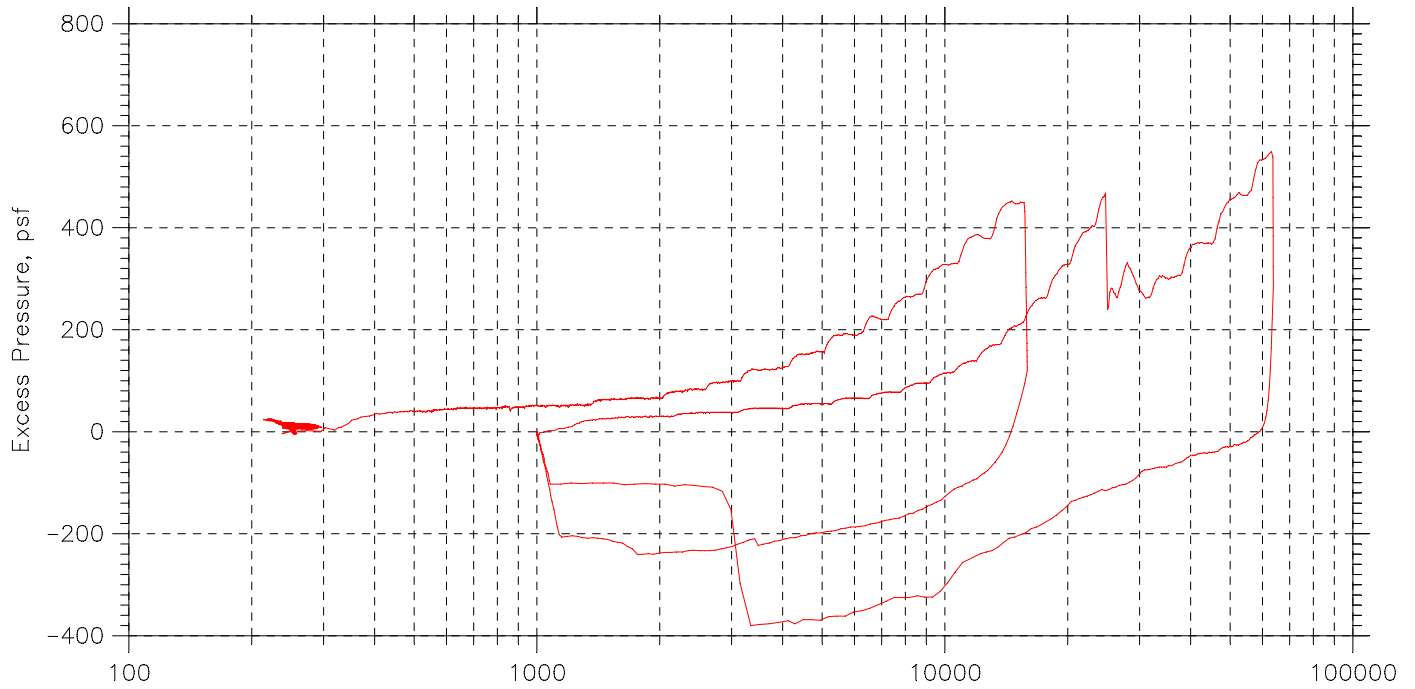
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-5	Tested By: md	Checked By: njh
Sample No.: UP-3	Test Date: 06/06/16	Depth: 45-47 ft
Test No.: CRC-11	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown silt		
Remarks: System S		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-5	Tested By: md	Checked By: njh
Sample No.: UP-3	Test Date: 06/06/16	Depth: 45-47 ft
Test No.: CRC-11	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown silt		
Remarks: System S		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: RW-5
 Sample No.: UP-3
 Test No.: CRC-11

Location: Hartford, CT
 Tested By: md
 Test Date: 06/06/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 45-47 ft
 Elevation: ---

Soil Description: Moist, reddish brown silt
 Remarks: System S

Estimated Specific Gravity: 2.80
 Initial Void Ratio: 1.08
 Final Void Ratio: 0.834

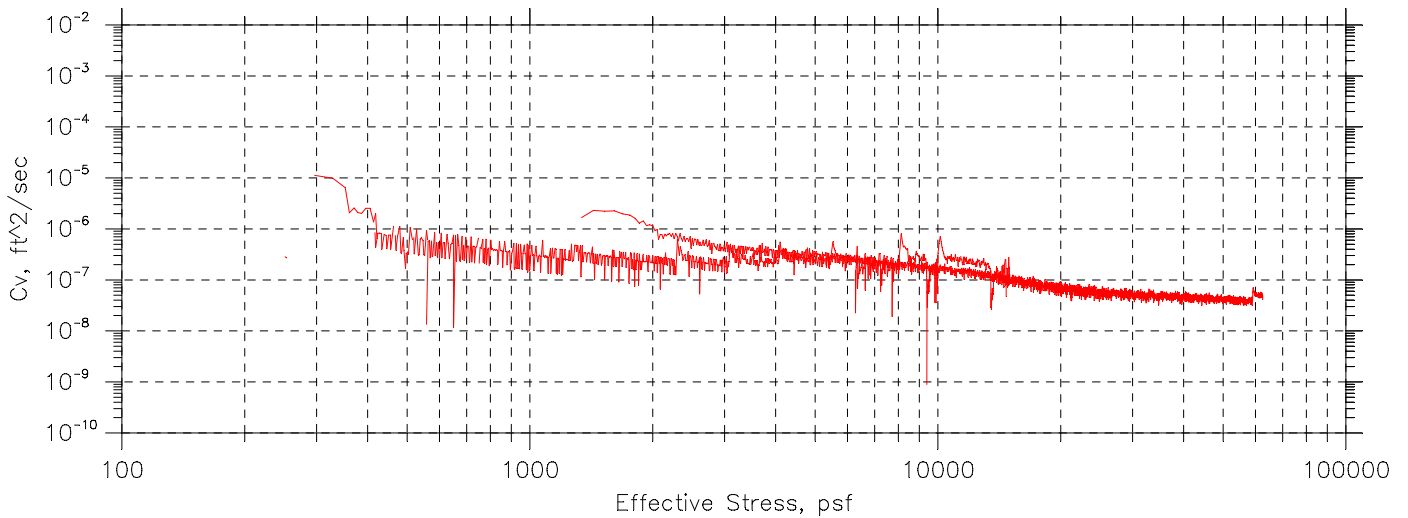
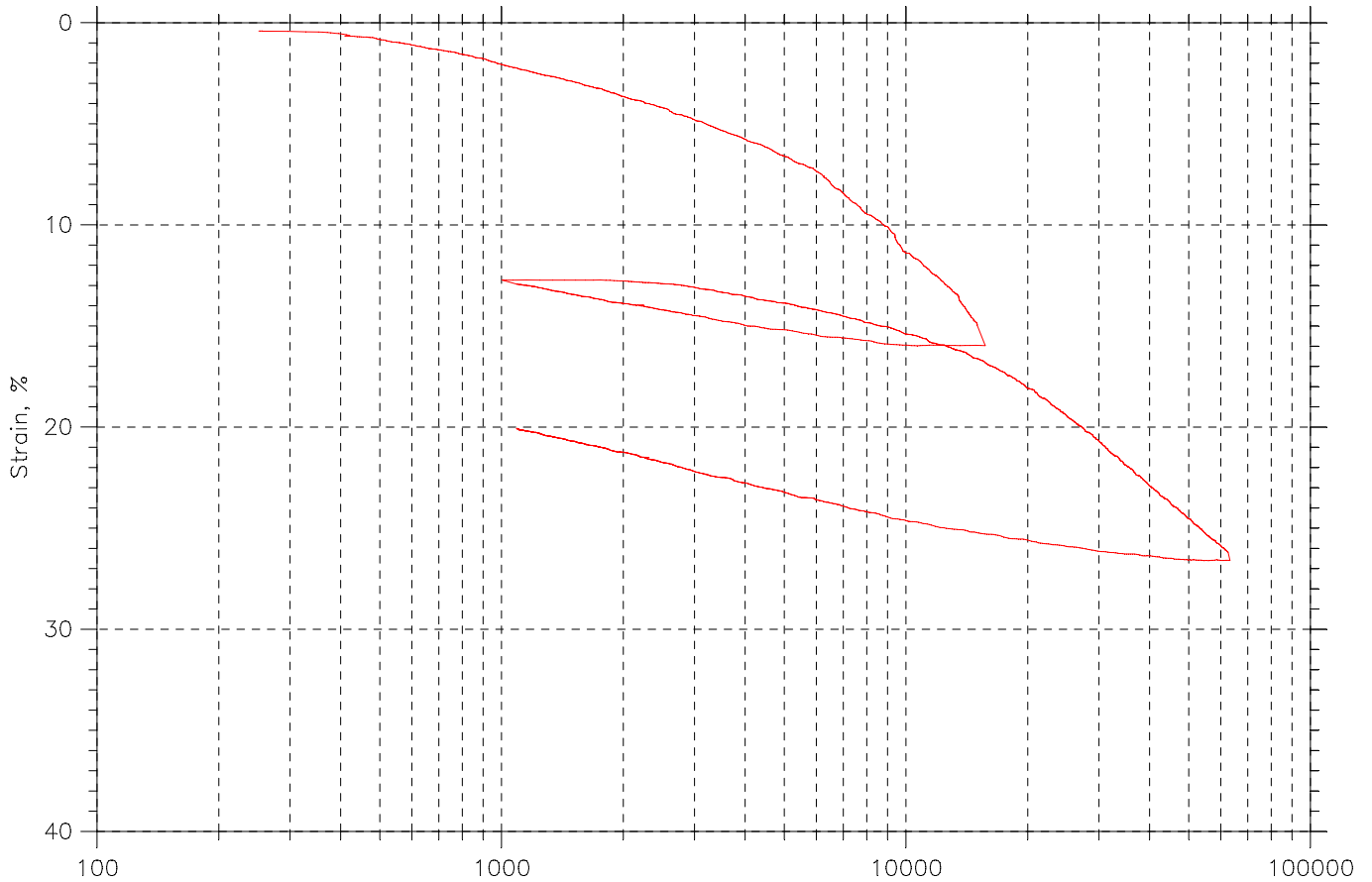
Liquid Limit: 35
 Plastic Limit: 27
 Plasticity Index: 8

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.88 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	16845	RING		A651
Wt. Container + Wet Soil, gm	216.96	258.05	248.44	147.97
Wt. Container + Dry Soil, gm	156.92	216.25	216.25	115.91
Wt. Container, gm	8.4500	108.28	108.28	8.3900
Wt. Dry Soil, gm	148.47	107.97	107.97	107.52
Water Content, %	40.44	38.72	29.82	29.82
Void Ratio	---	1.08	0.834	---
Degree of Saturation, %	---	99.90	100.00	---
Dry Unit Weight, pcf	---	83.791	95.217	---

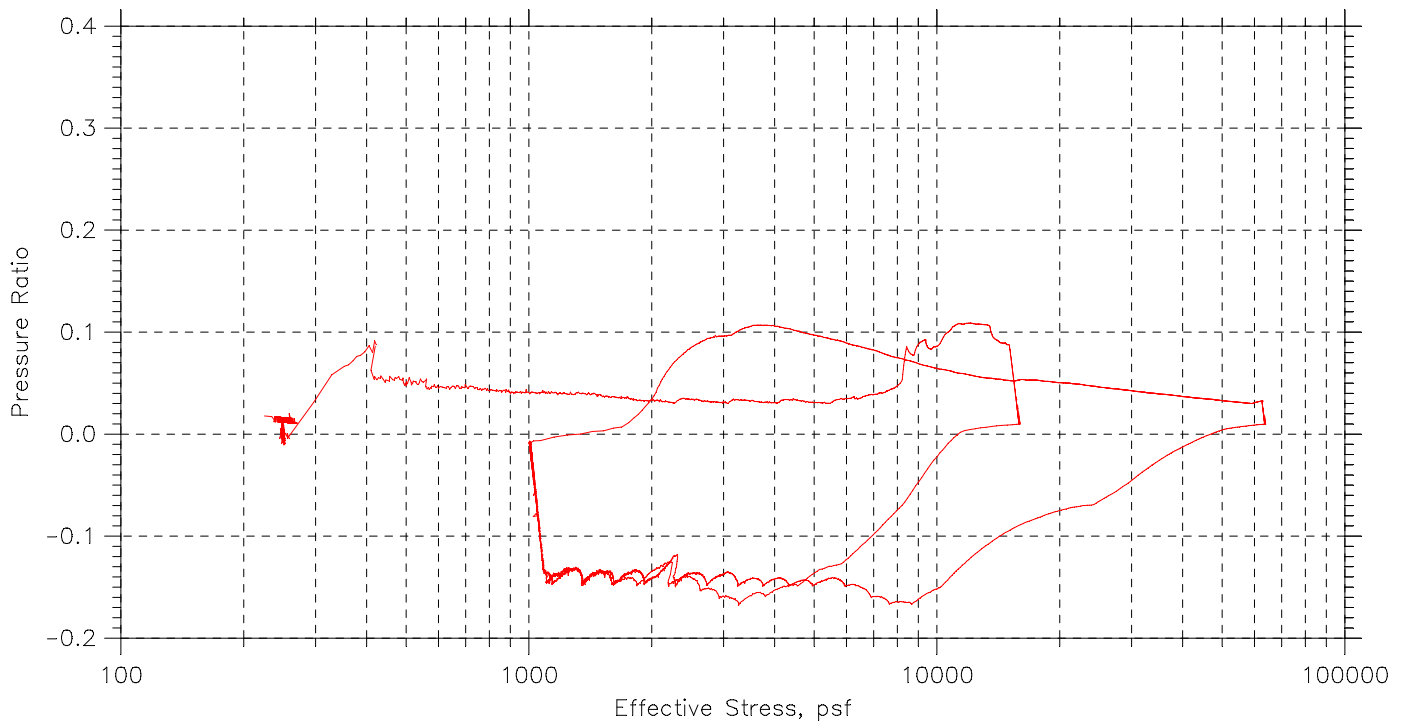
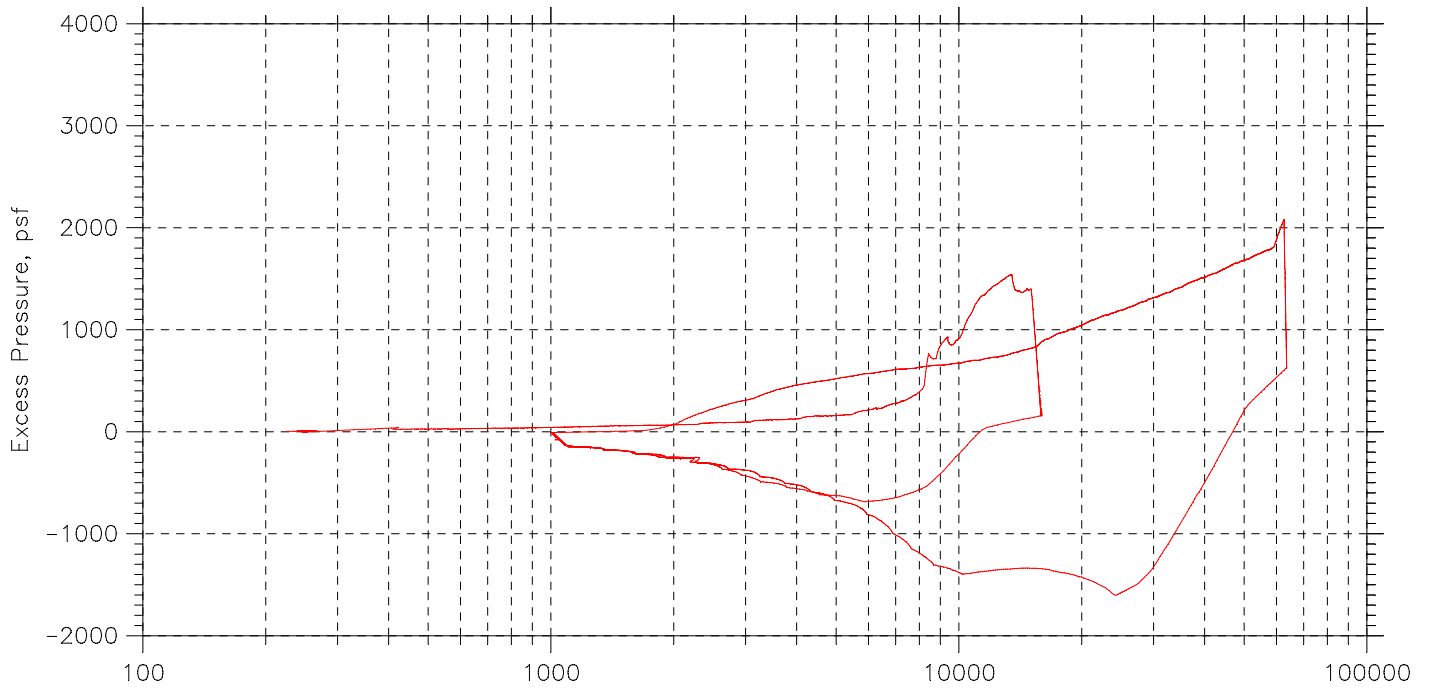
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S1-1	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/07/16	Depth: 42-44 ft
Test No.: CRC-6	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System X		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S1-1	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/07/16	Depth: 42-44 ft
Test No.: CRC-6	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System X		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: S1-1
 Sample No.: UP-1
 Test No.: CRC-6

Location: Hartford, CT
 Tested By: md
 Test Date: 06/07/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 42-44 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System X

Estimated Specific Gravity: 2.82
 Initial Void Ratio: 1.34
 Final Void Ratio: 0.897

Liquid Limit: 40
 Plastic Limit: 21
 Plasticity Index: 19

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.81 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	B-205	RING		a400
Wt. Container + Wet Soil, gm	362.36	251.18	236.65	136.74
Wt. Container + Dry Soil, gm	249.29	205.84	205.84	105.76
Wt. Container, gm	8.4700	109.10	109.10	8.4900
Wt. Dry Soil, gm	240.82	96.739	96.739	97.270
Water Content, %	46.95	46.87	31.85	31.85
Void Ratio	---	1.34	0.897	---
Degree of Saturation, %	---	98.37	100.00	---
Dry Unit Weight, pcf	---	75.078	92.688	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

WALL 104 LAB TESTS

Draft



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/01/16
Depth :	---	Test Id:	382158
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
RW-9	UP- 1 - Top	67-69	Moist, reddish brown clay	52.9
RW-9	UP- 1 - Top middle	67-69	Moist, reddish brown clay	47.4
RW-9	UP- 1 - Bottom middle	67-69	Moist, reddish brown clay	45.9
RW-9	UP- 1 - Bottom	67-69	Moist, reddish brown clay	50.8
S1-11	UP- 1 - Top	61-63	Moist, reddish brown clay	40.4
S1-11	UP- 1 - Top middle	61-63	Moist, reddish brown clay	46.0
S1-11	UP- 1 - Bottom middle	61-63	Moist, reddish brown clay	62.6
S1-11	UP- 1 - Bottom	61-63	Moist, reddish brown clay	57.1

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/01/16
Depth :	---	Test Id:	382102
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content %
RW-9	UP- 3 - Top	76-78	Moist, reddish brown clay	68.9
RW-9	UP- 3 - Top middle	76-78	Moist, reddish brown clay	46.2
RW-9	UP- 3 - Bottom middle	76-78	Moist, reddish brown clay	46.8
RW-9	UP- 3 - Bottom	76-78	Wet, reddish brown clay	53.8
S1-11	UP- 3 - Top	69-71	Moist, reddish brown clay	44.9
S1-11	UP- 3 - Top middle	69-71	Moist, red clay	45.8
S1-11	UP- 3 - Bottom middle	69-71	Moist, reddish brown clay	36.6
S1-11	UP- 3 - Bottom	69-71	Moist, reddish brown clay	36.5

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	06/24/16
Depth :	---	Test Id:	382021
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
RW-5	UP- 3 - Top	45-47	Moist, reddish brown clay	55.2
RW-5	UP- 3 - Top middle	45-47	Moist, reddish brown clay	40.9
RW-5	UP- 3 - Bottom middle	45-47	Moist, reddish brown silt	36.1
RW-5	UP- 3 - Bottom	45-47	Wet, reddish brown silt	40.4
S2-1	Tube 1 - Top	52-54	Moist, dark reddish gray clay	44.4
S2-1	Tube 1 - Top middle	52-54	Moist, dark reddish gray clay	52.7
S2-1	Tube 1 - Bottom middle	52-54	Moist, dark reddish brown clay	39.2
S2-1	Tube 1 - Bottom	52-54	Moist, dark reddish brown clay	38.8

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	06/24/16
Depth :	---	Test Id:	382023
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
S2-1	Tube 2 - Top	62-64	Moist, dark reddish brown clay	43.8
S2-1	Tube 2 - Top middle	62-64	Moist, dark reddish brown clay	51.0
S2-1	Tube 2 - Bottom middle	62-64	Moist, dark reddish brown clay	44.0
S2-1	Tube 2 - Bottom	62-64	Moist, dark reddish brown clay	41.9
S2-1	Tube 3 - Top	72-74	Moist, dark reddish brown clay	38.5
S2-1	Tube 3 - Top middle	72-74	Moist, dark reddish brown clay	47.4
S2-1	Tube 3 - Bottom middle	72-74	Moist, reddish brown clay	39.4
S2-1	Tube 3 - Bottom	72-74	Moist, reddish brown clay	45.3

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		Project No:	GTX-304831
Project:	Reconstruction of Exit Charter Oak Bridge			
Location:	Hartford, CT	Sample Type:	---	Tested By: jbr
Boring ID:	---	Test Date:	07/26/16	Checked By: emm
Sample ID:	---	Test Id:	384878	
Depth :	---			

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
S1-2	S-2	4-6 ft	Moist, red sand with gravel	7.1	6.5
S1-5	S-3	10-12 ft	Moist, reddish brown silt with gravel	7.4	6.2
S1-S12	S-2	5-7 ft	Moist, reddish brown silt with gravel	8.1	7.2
S2-1	S-4	15-17 ft	Moist, reddish brown silt with gravel	6.8	6.6
S2-3	S-2	5-7 ft	Moist, reddish brown clay	7.5	7.3
S-0480-1	S-5	14-16 ft	Moist, olive brown silt	4.5	4.3
S-0480-2	S-3	9-11 ft	Moist, olive brown silt	6.3	6.0
S-06043-1	S-2	5-7 ft	Moist, brown sand	7.5	6.8

Notes: Sample Preparation: screened through #10 sieve
Method A, pH meter used



Client:	Freeman Companies, LLC
Project:	Reconstruction of Exit Charter Oak Bridge
Location:	Hartford, CT
GTX#:	304831
Test Date:	07/26/16
Tested By:	jbr
Checked By:	emm

**Laboratory Measurement of Soil Resistivity Using
 the Wenner Four-Electrode Method by ASTM G57
 (Laboratory Measurement)**

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, (ohm-cm) ⁻¹
S1-2	S-2	4-6	Moist, red sand with gravel	4,442	2.25E-04
S1-5	S-3	10-12	Moist, reddish brown silt with gravel	3,099	3.23E-04
S1-S12	S-2	5-7	Moist, reddish brown silt with gravel	1,963	5.09E-04
S2-1	S-4	15-17	Moist, reddish brown silt with gravel	1,343	7.45E-04
S2-3	S-2	5-7	Moist, reddish brown clay	486	2.06E-03
S-0480-1	S-5	14-16	Moist, olive brown silt	3,099	3.23E-04
S-0480-2	S-3	9-11	Moist, olive brown silt	1,892	5.28E-04
S-06043-1	S-2	5-7	Moist, brown sand	15,496	6.45E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
 Water added to sample to create a thick slurry prior to testing (saturated condition).
 Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
 Test conducted in standard laboratory atmosphere: 68-73 F



6100 HILLCROFT
PHONE (713) 369-5400

HOUSTON, TEXAS 77081
FAX (713) 369-5518

RESULTS OF TESTS

PROJECT: RECONSTRUCTOION OF EXIT CHARTER OAK BRIDGE
(GTX 304831)

REPORT DATE: 08-01-16

FOR: GEOTESTING EXPRESS, INC.
125 NAGOG PARK ACTION, MA 01720

CLIENT NUMBER:
JOB NUMBER: 04.1115-0003

REPORTED TO: ETHAN MARRO

REPORT NUMBER:
DATE SAMPLED:
TIME SAMPLED:
SAMPLED BY: CLIENT
DATE RECEIVED:
TIME RECEIVED:
RECEIVED BY:

SOLUBLE SULFATE AASHTO T-290

SAMPLE ID	RESULTS	UNITS	LAB No.	TIME/DATE	ANALYST
S1-S, S-2, 4 – 6'	< 30 *	mg/kg	0726052	1100/08-01-16	SD
S1-5, S-3, 10 – 12'	57 *	mg/kg	0726053	1100/08-01-16	SD
S1-12, S-2, 5 – 7'	< 50 *	mg/kg	0726054	1100/08-01-16	SD
S2-1, S-4, 15 – 17'	< 50 *	mg/kg	0726055	1100/08-01-16	SD
S2-3, S-2, 5 – 7'	297 *	mg/kg	0726056	1100/08-01-16	SD
S-0480-1, S-5, 14 – 16'	543 *	mg/kg	0726057	1100/08-01-16	SD
S-0480-2, S-3, 9 – 11'	355 *	mg/kg	0726058	1100/08-01-16	SD
S-06043-41, S-2, 5 – 7'	< 30*	mg/kg	0726059	1100/08-01-16	SD

SO4CL 069-16

Respectfully submitted,

* Dry weight basis

Steve DeGregorio
Chemist

SD

** WATER EXTRACTION PERFORMED BY USING A 1:10 RATIO OF SAMPLE AND REAGENT WATER FOLLOWED BY CENTRIFUGE AND VACUUME FILTRATION. THE WATER EXTRACT IS THEN ANALYZED USING THE ASTM D-512 AND D-516 METHODS.

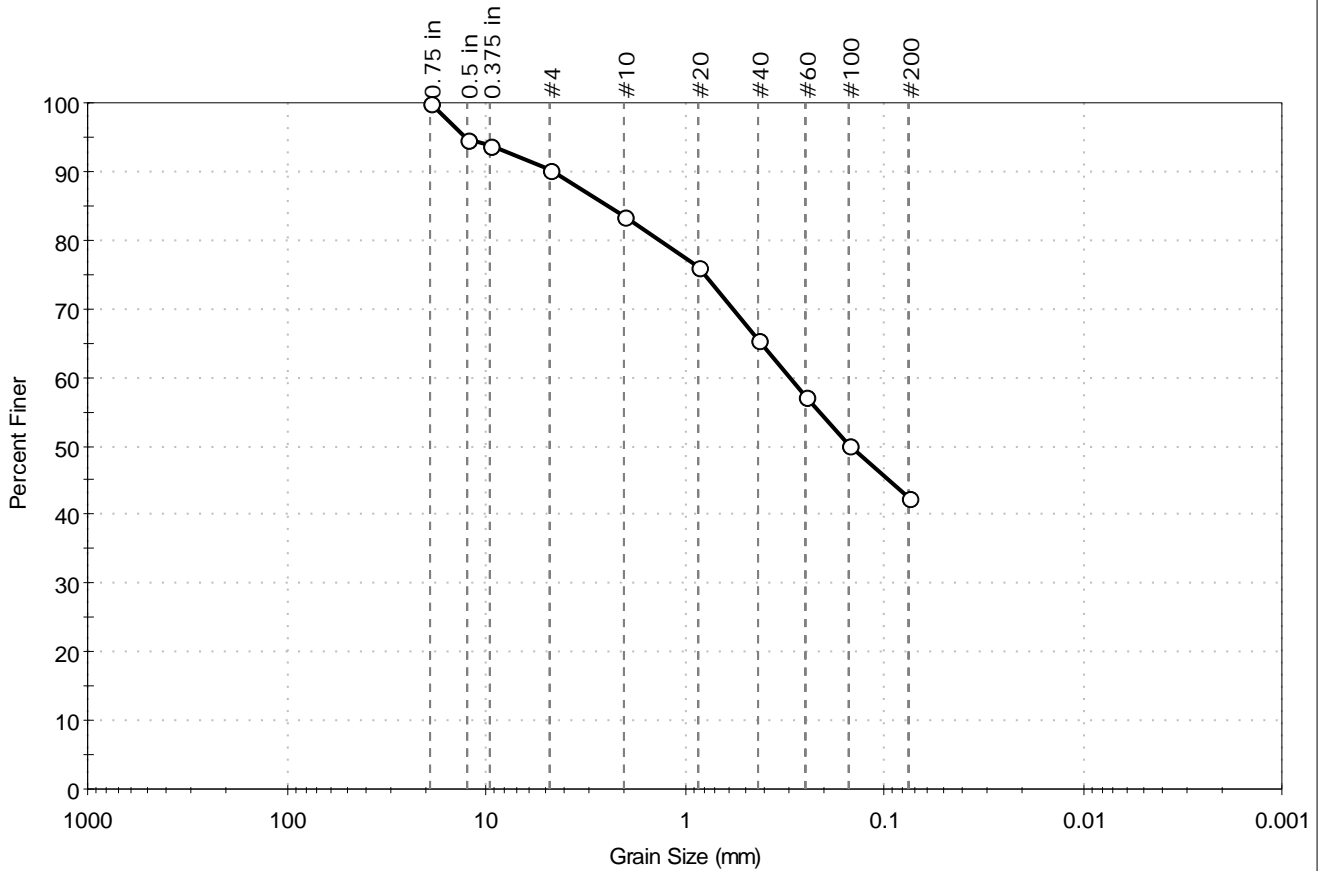
THE RESULTS RELATE AS TO THE LOCATION TESTED AND NO OTHER REFERENCE SHALL BE MADE.
THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF THE LABORATORY.

END OF REPORT



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-7	Sample Type:	jar
Sample ID:	S-2	Test Date:	08/02/16
Depth :	5-7 ft	Test Id:	384934
Test Comment:	---		
Visual Description:	Moist, dark reddish brown silty sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	9.7	47.9	42.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	95		
0.375 in	9.50	94		
#4	4.75	90		
#10	2.00	84		
#20	0.85	76		
#40	0.42	65		
#60	0.25	57		
#100	0.15	50		
#200	0.075	42		

<u>Coefficients</u>	
D ₈₅ = 2.4026 mm	D ₃₀ = N/A
D ₆₀ = 0.2977 mm	D ₁₅ = N/A
D ₅₀ = 0.1493 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

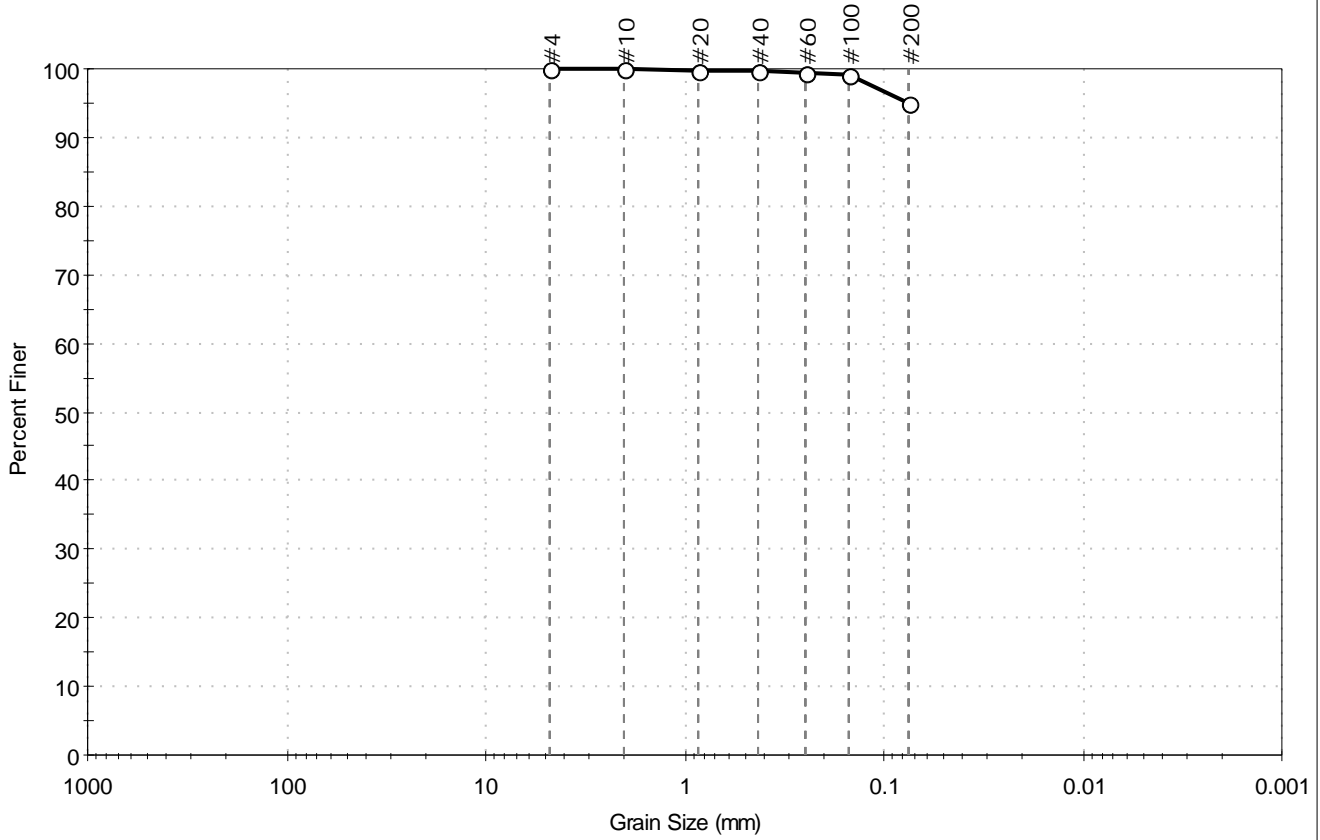
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-7	Sample Type:	jar
Sample ID:	S-7	Test Date:	08/02/16
Depth:	30-32 ft	Test Id:	384935
Test Comment:	---		
Visual Description:	Moist, olive gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	5.0	95.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	99		
#200	0.075	95		

<u>Coefficients</u>	
D ₈₅ = N/A	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

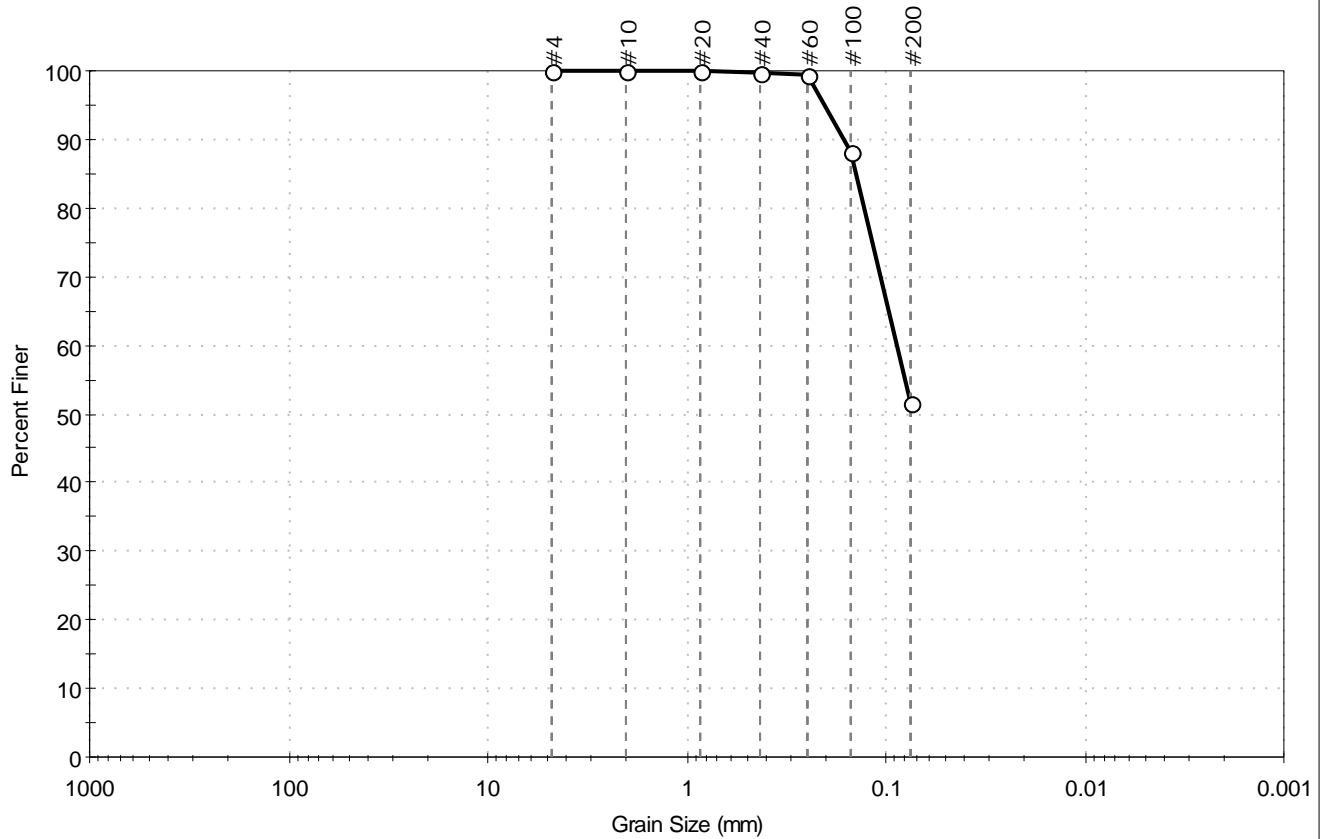
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-7	Sample Type:	jar
Sample ID:	S-8	Test Date:	08/03/16
Depth:	35-37 ft	Test Id:	384946
Test Comment:	---		
Visual Description:	Moist, olive brown sandy silt		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	48.5	51.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	88		
#200	0.075	52		

<u>Coefficients</u>	
D ₈₅ = 0.1409 mm	D ₃₀ = N/A
D ₆₀ = 0.0880 mm	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

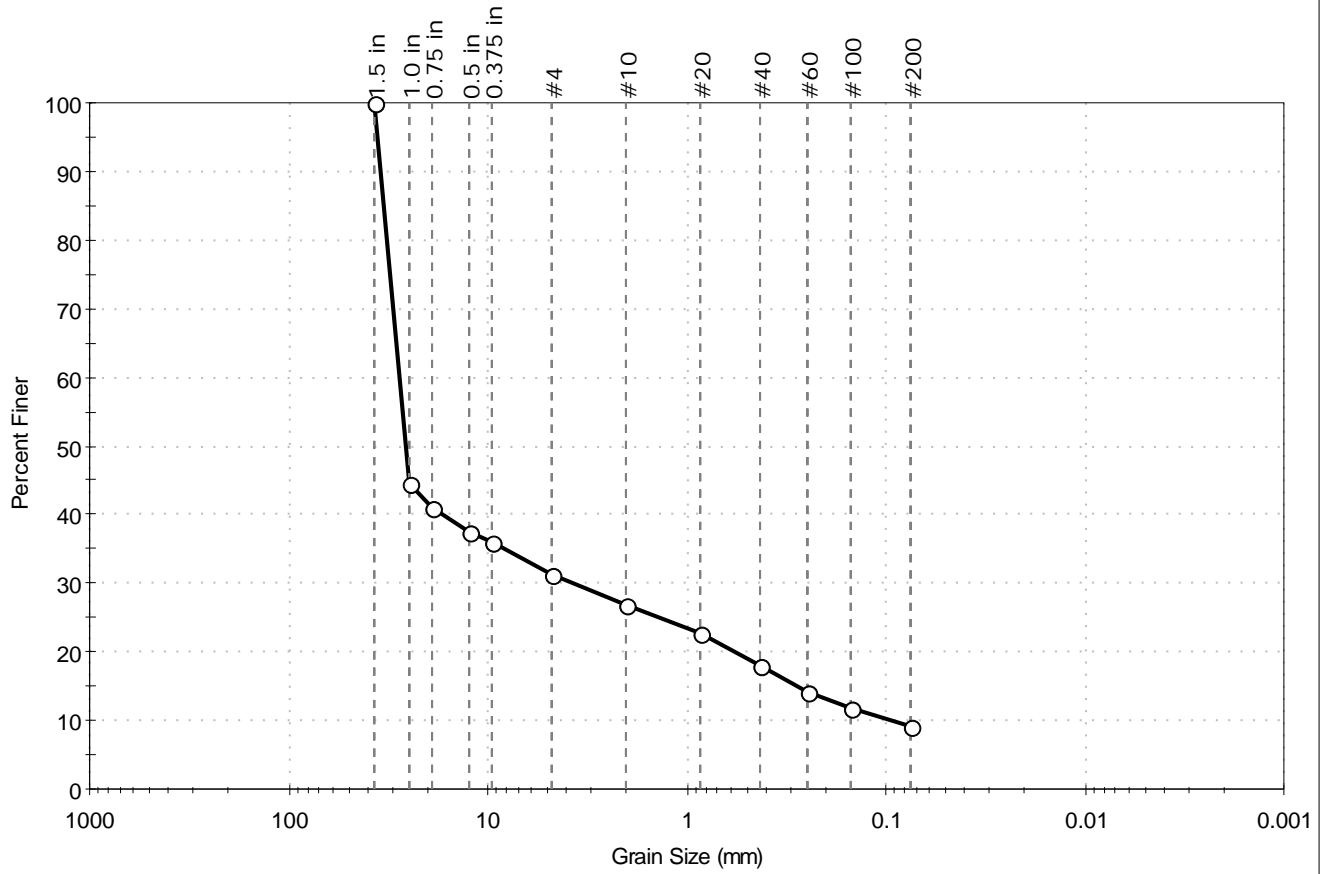
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S1-11	Sample Type:	jar
Sample ID:	S-4	Test Date:	08/03/16
Depth :	14-16 ft	Test Id:	384939
Test Comment:	---		
Visual Description:	Moist, reddish brown gravel with clay and sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	68.6	22.2	9.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1.0 in	25.00	45		
0.75 in	19.00	41		
0.5 in	12.50	38		
0.375 in	9.50	36		
#4	4.75	31		
#10	2.00	27		
#20	0.85	23		
#40	0.42	18		
#60	0.25	14		
#100	0.15	12		
#200	0.075	9.2		

<u>Coefficients</u>	
D ₈₅ = 33.6033 mm	D ₃₀ = 3.6264 mm
D ₆₀ = 27.9877 mm	D ₁₅ = 0.2793 mm
D ₅₀ = 26.0136 mm	D ₁₀ = 0.0945 mm
C _u = 296.166	C _c = 4.972

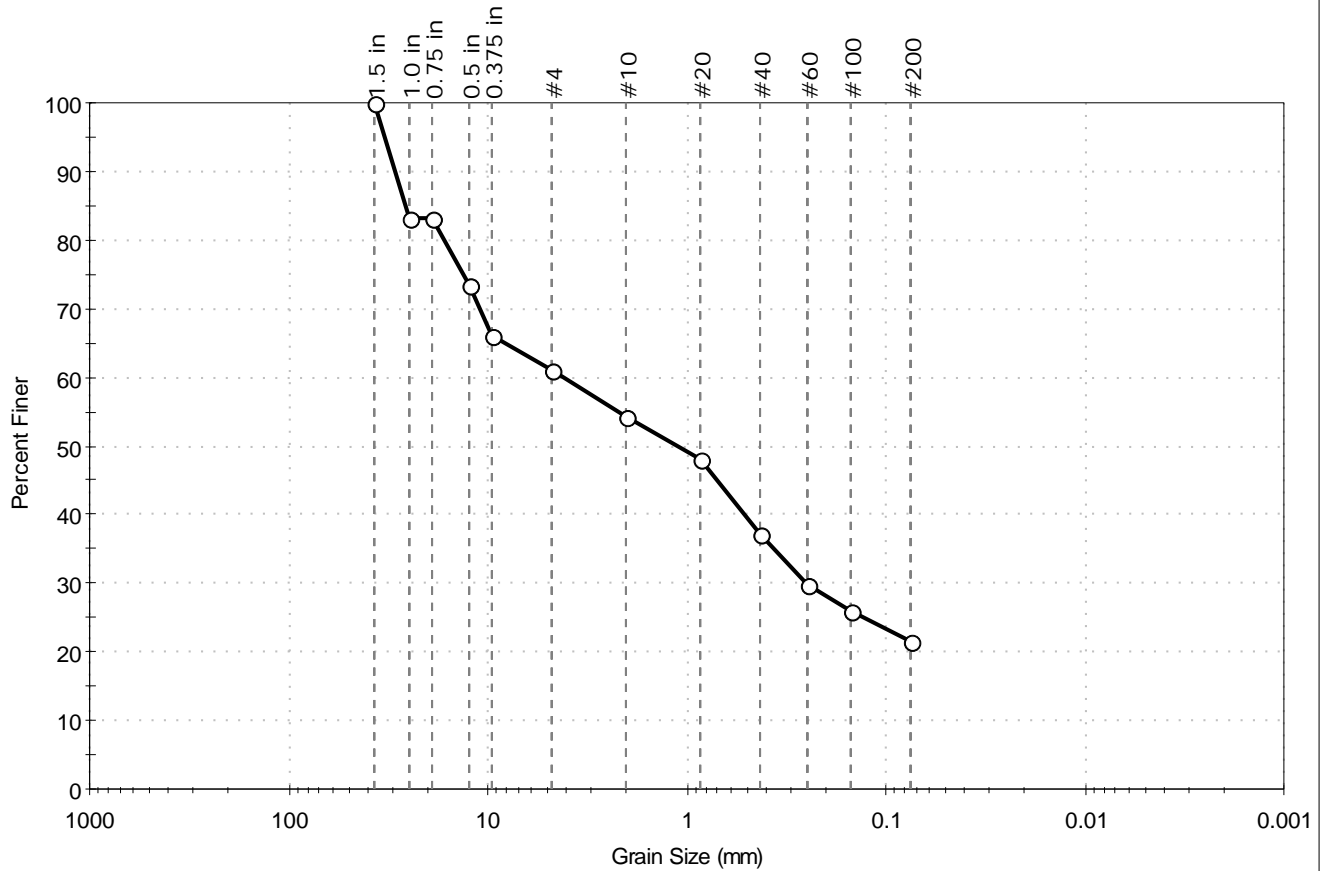
<u>Classification</u>	
<u>ASTM</u>	N/A
<u>AASHTO</u>	Stone Fragments, Gravel and Sand (A-1-a (1))

<u>Sample/Test Description</u>	
Sand/Gravel Particle Shape :	ANGULAR
Sand/Gravel Hardness :	HARD



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S2-1	Sample Type:	jar
Sample ID:	S-3	Test Date:	08/02/16
Depth :	10-12 ft	Test Id:	384940
Test Comment:	---		
Visual Description:	Moist, dark reddish brown clayey sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	38.8	39.6	21.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1.0 in	25.00	83		
0.75 in	19.00	83		
0.5 in	12.50	73		
0.375 in	9.50	66		
#4	4.75	61		
#10	2.00	54		
#20	0.85	48		
#40	0.42	37		
#60	0.25	30		
#100	0.15	26		
#200	0.075	22		

<u>Coefficients</u>	
D ₈₅ = 26.1716 mm	D ₃₀ = 0.2527 mm
D ₆₀ = 4.1015 mm	D ₁₅ = N/A
D ₅₀ = 1.0976 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

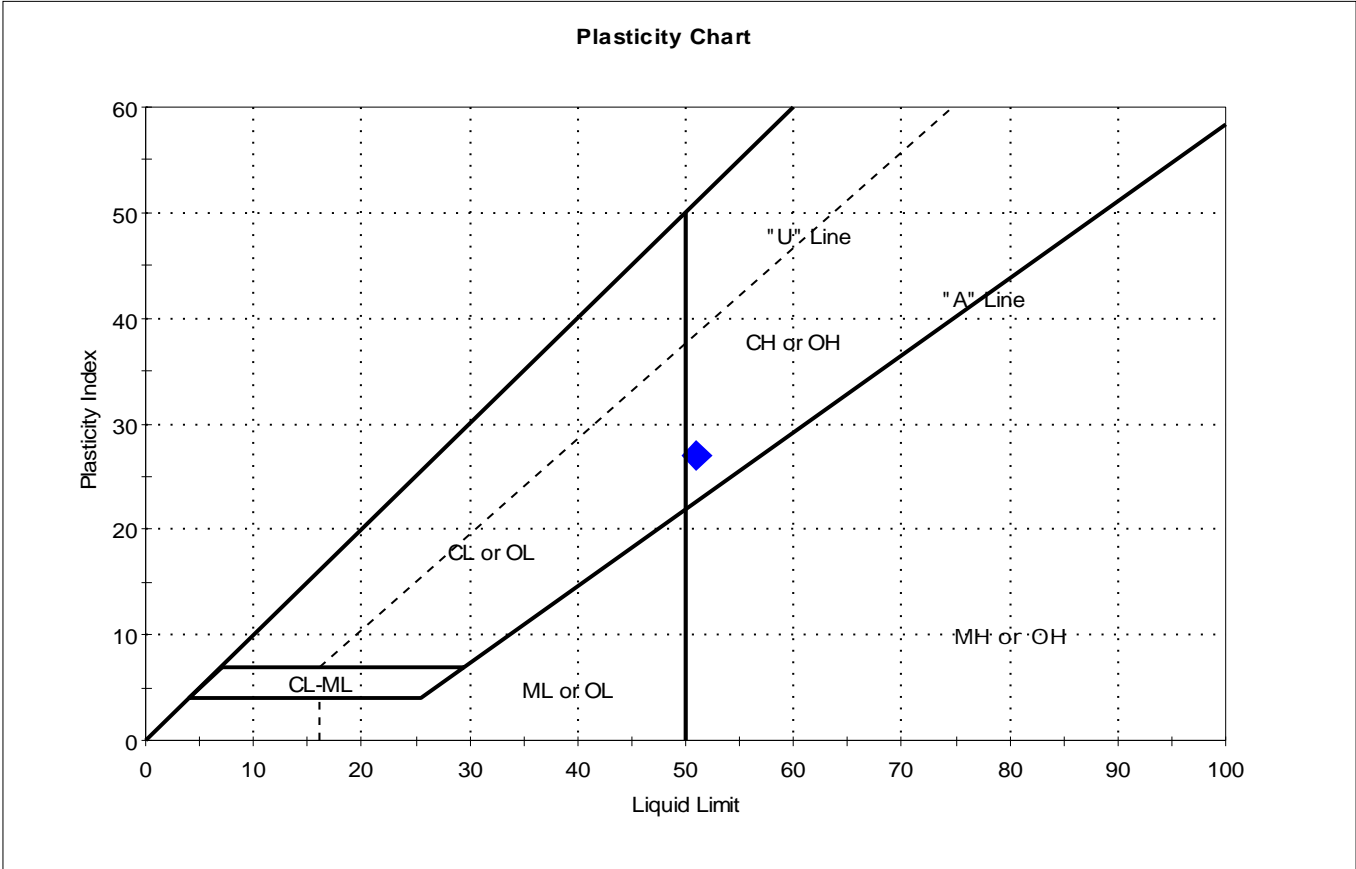
<u>Classification</u>	
<u>ASTM</u>	N/A
<u>AASHTO</u>	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-9	Sample Type:	tube
Sample ID:	UP-1 - Top middle	Test Date:	07/12/16
Depth :	67-69	Test Id:	382165
Test Comment:	---		
Visual Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Top middle	RW-9	67-69	47	51	24	27	0.9	

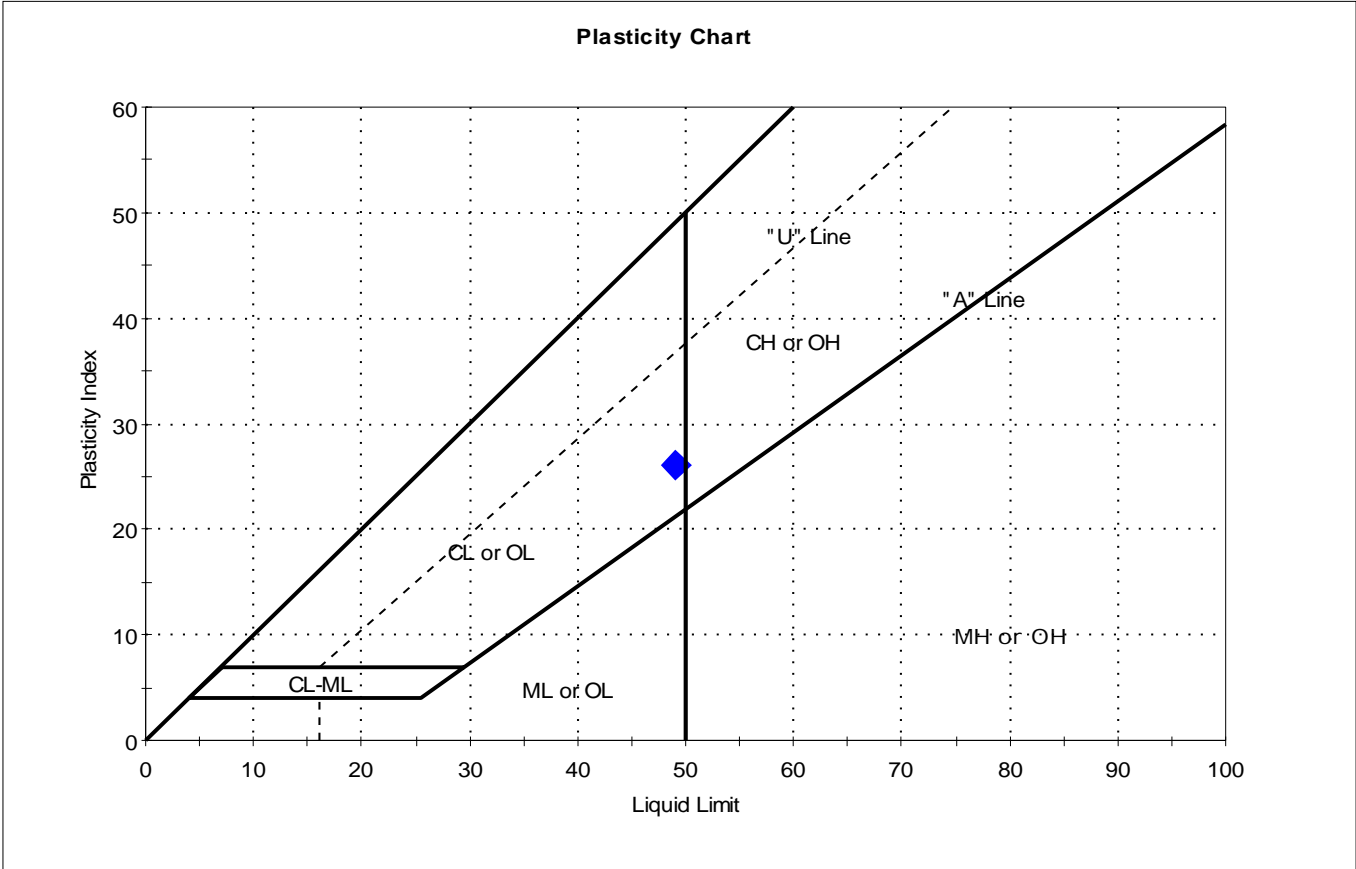
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	cam
Boring ID:	RW-9	Test Date:	07/08/16	Checked By:	emm
Sample ID:	UP-1 - Bottom	Test Id:	382163		
Depth :	67-69				
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Bottom	RW-9	67-69	51	49	23	26	1.1	

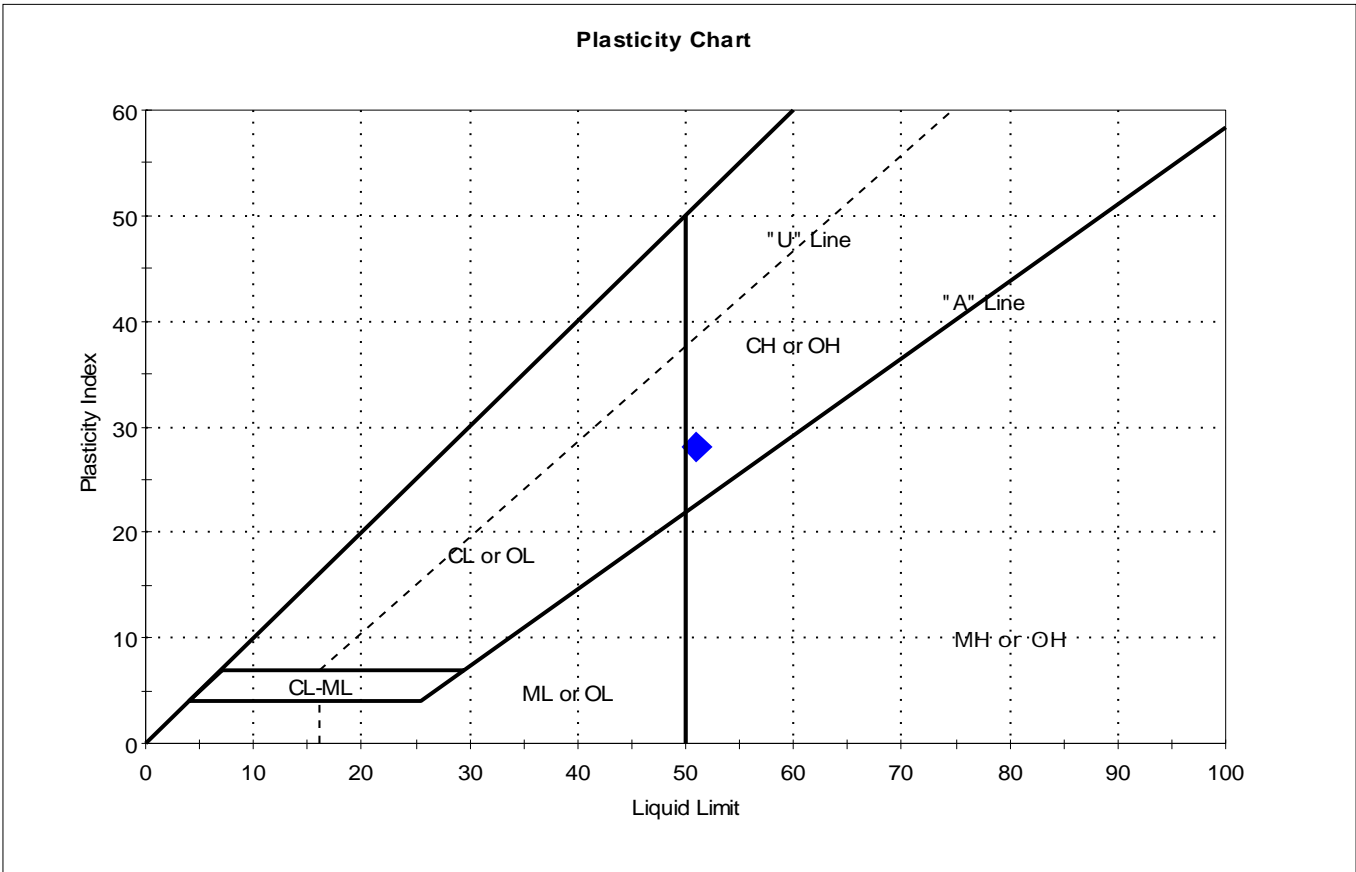
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-9	Sample Type:	tube
Sample ID:	UP-3 - Top middle	Test Date:	07/13/16
Depth :	76-78	Test Id:	382111
Test Comment:	---		
Visual Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-3 - Top middle	RW-9	76-78	46	51	23	28	0.8	

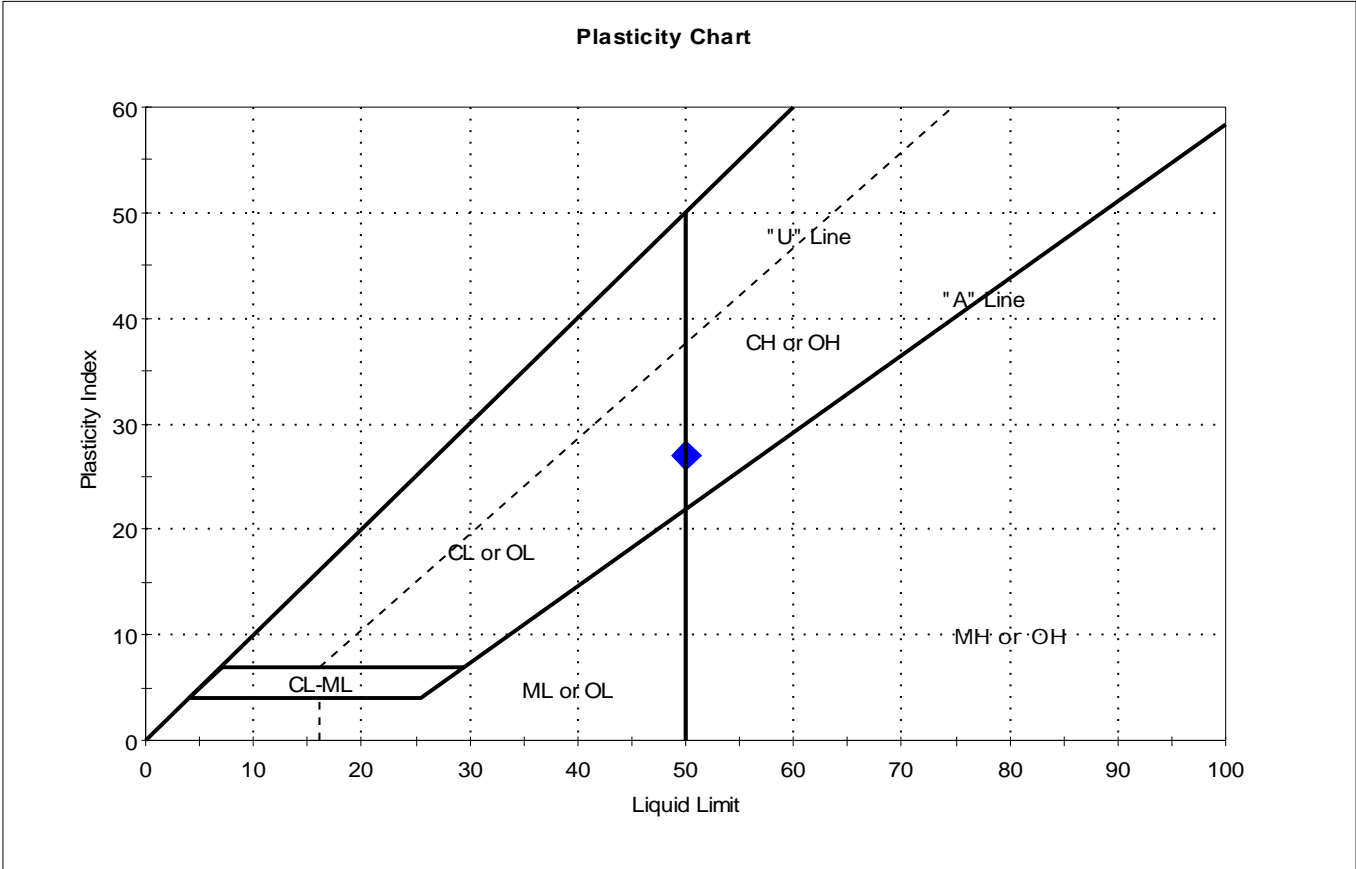
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-9	Sample Type:	tube
Sample ID:	UP-3 - Bottom	Test Date:	07/13/16
Depth :	76-78	Test Id:	382107
Test Comment:	---		
Visual Description:	Wet, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-3 - Bottom	RW-9	76-78	54	50	23	27	1.1	

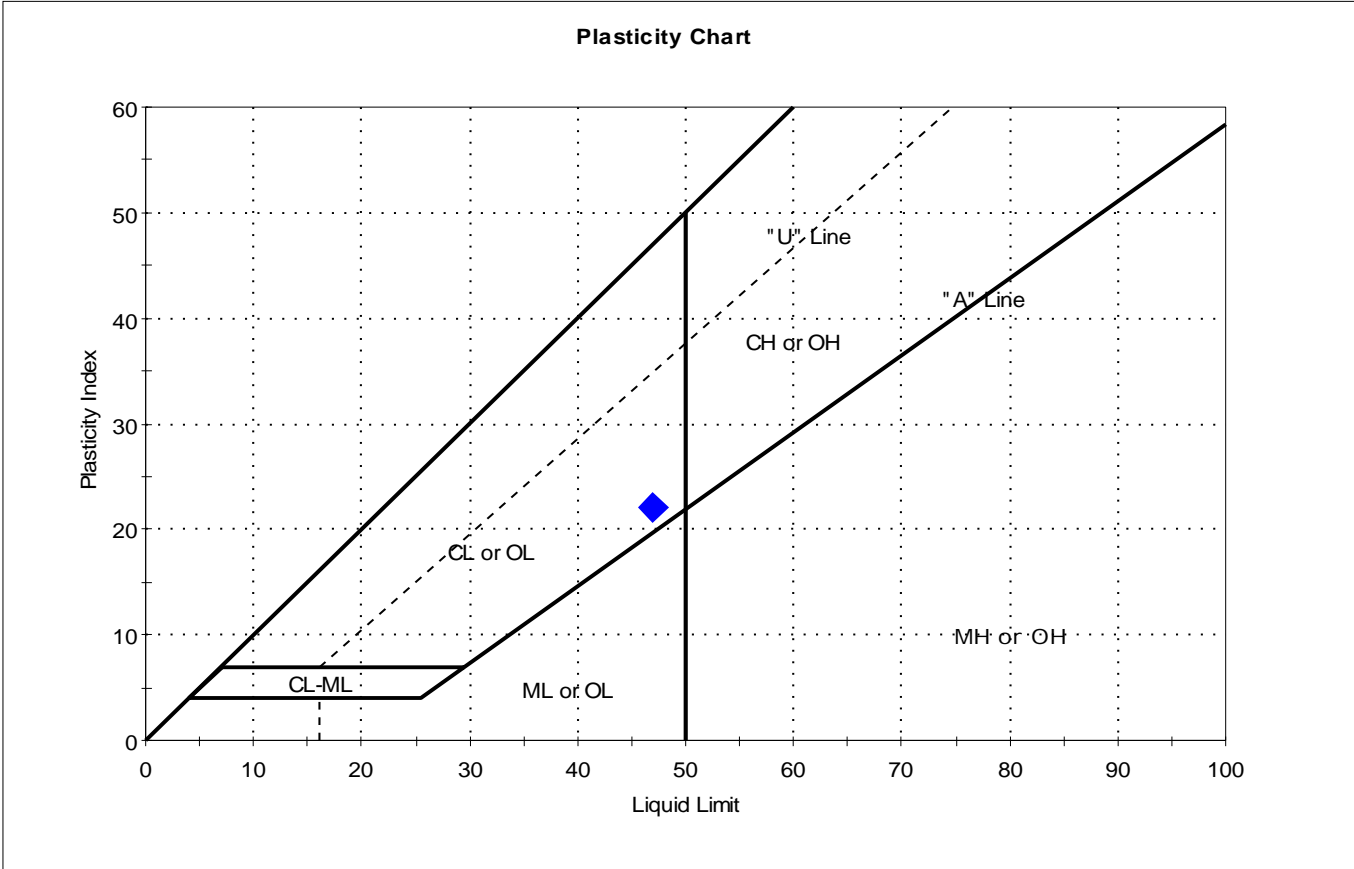
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: NONE
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S1-11	Sample Type:	tube
Sample ID:	UP-1 - Top middle	Test Date:	07/14/16
Depth :	61-63	Test Id:	382159
Test Comment:	---		
Visual Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Top middle	S1-11	61-63	46	47	25	22	1	

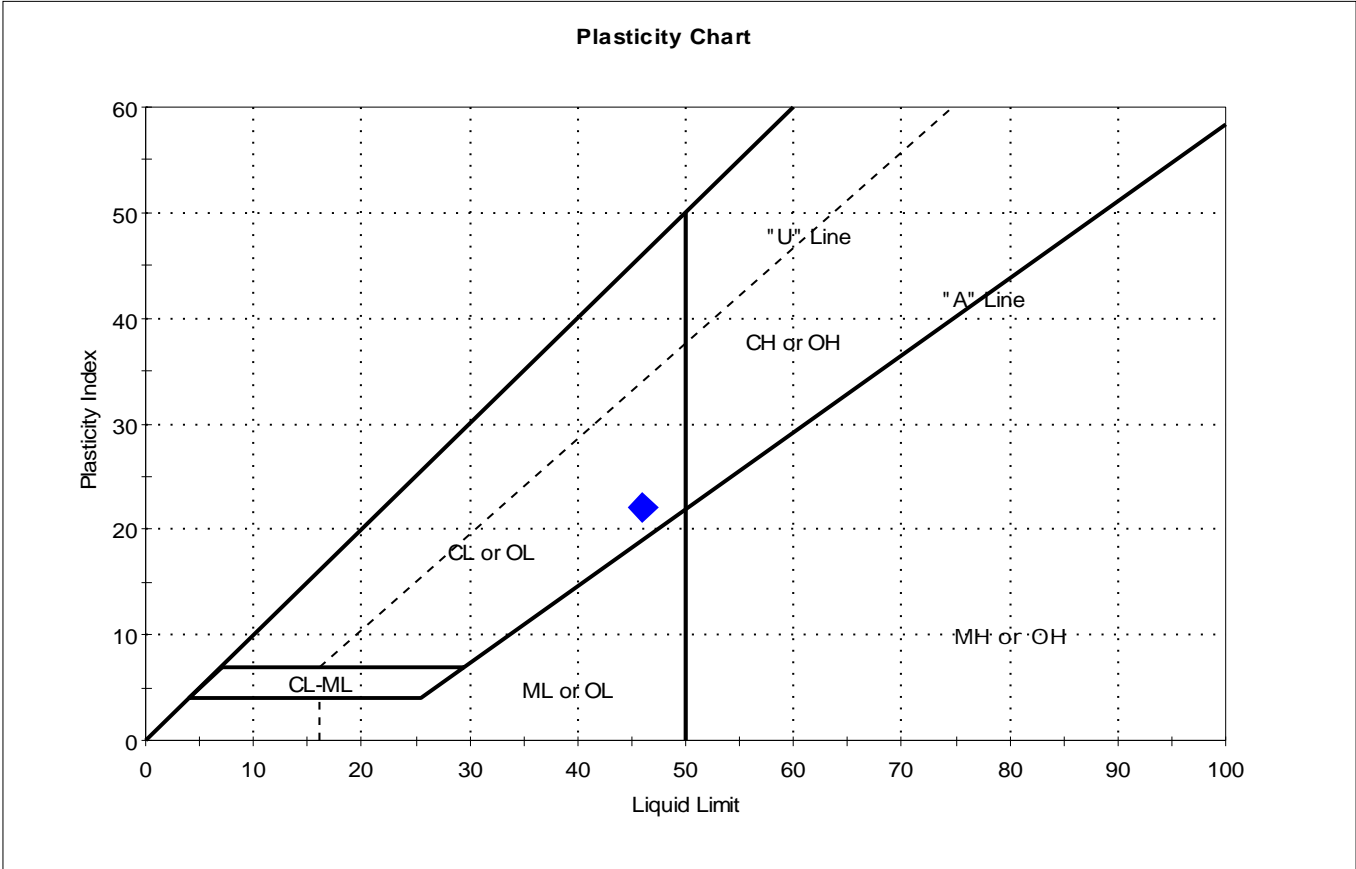
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	GA
Boring ID:	S1-11	Test Date:	07/13/16	Checked By:	emm
Sample ID:	UP-1 - Bottom	Test Id:	382157		
Depth :	61-63				
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Bottom	S1-11	61-63	57	46	24	22	1.5	

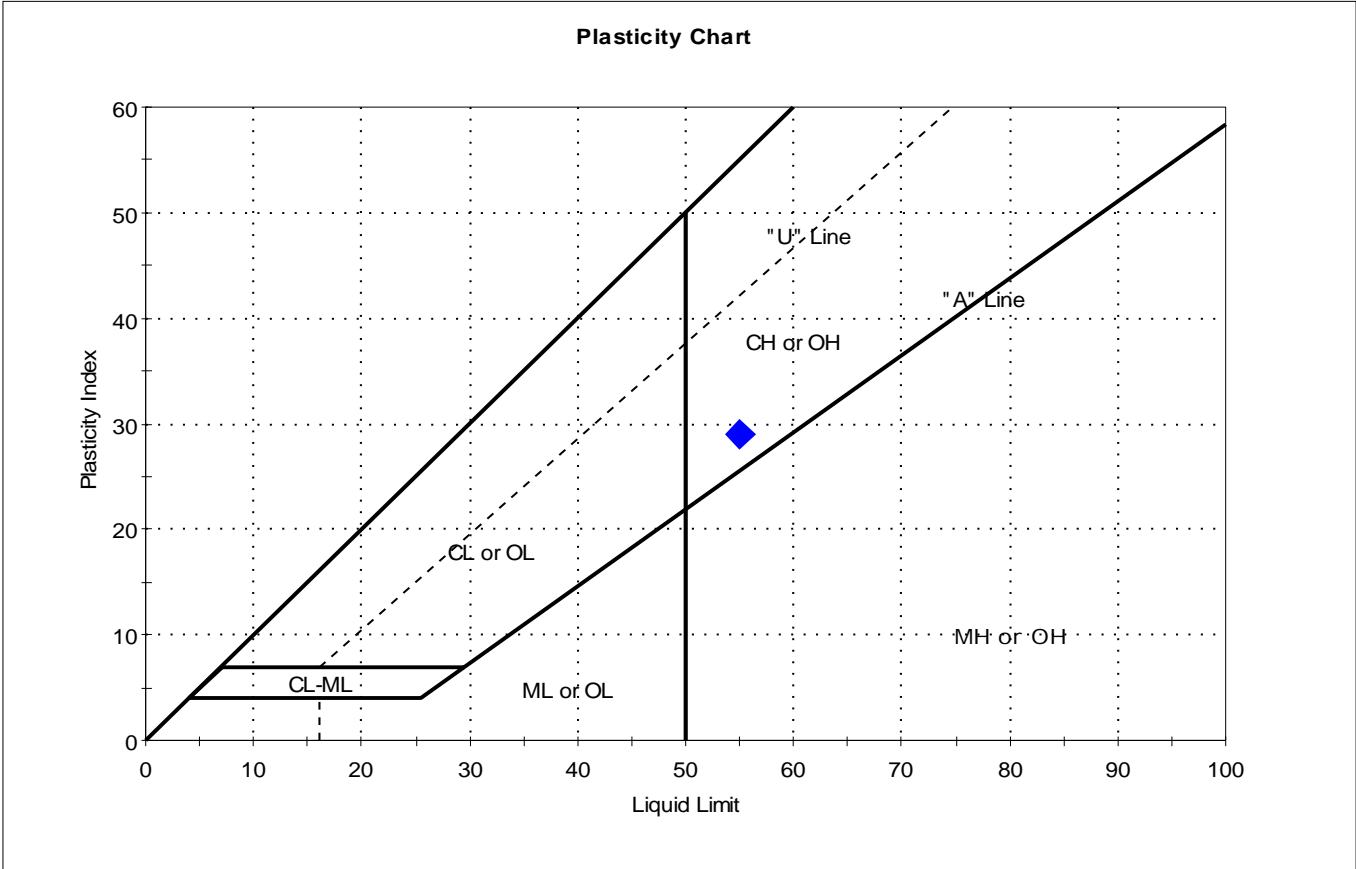
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: NONE
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S1-11	Sample Type:	tube
Sample ID:	UP-3 - Top middle	Test Date:	07/14/16
Depth :	69-71	Test Id:	382105
Test Comment:	---		
Visual Description:	Moist, red clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-3 - Top middle	S1-11	69-71	46	55	26	29	0.7	

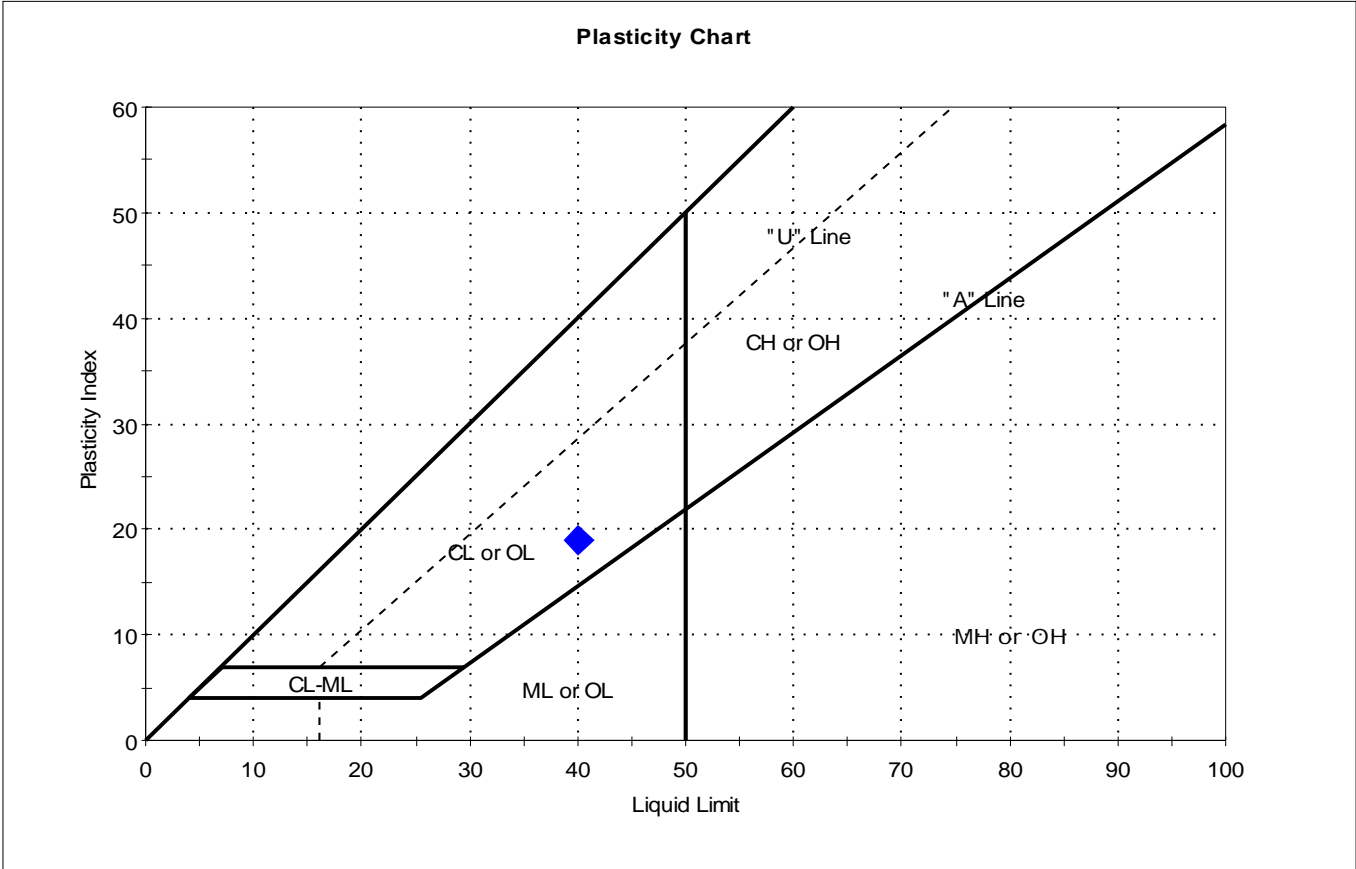
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S1-11	Sample Type:	tube
Sample ID:	UP-3 - Bottom	Test Date:	07/13/16
Depth :	69-71	Test Id:	382101
Test Comment:	---		
Visual Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-3 - Bottom	S1-11	69-71	37	40	21	19	0.8	

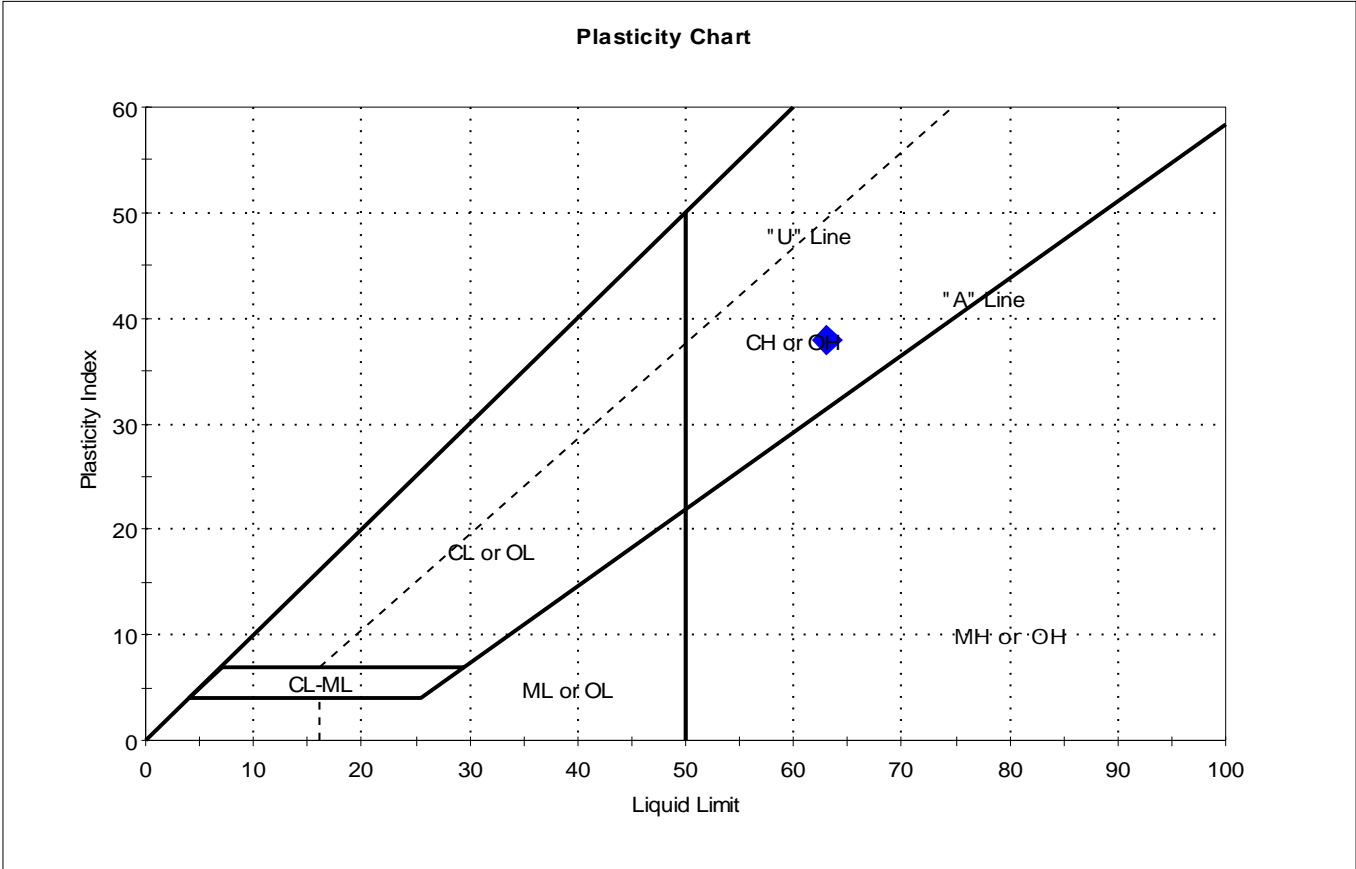
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: NONE
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S2-1	Sample Type:	tube
Sample ID:	Tube 1 - Top middle	Test Date:	06/28/16
Depth :	52-54	Test Id:	382075
Test Comment:	---		
Visual Description:	Moist, dark reddish gray clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 1 - Top middle	S2-1	52-54	53	63	25	38	0.7	

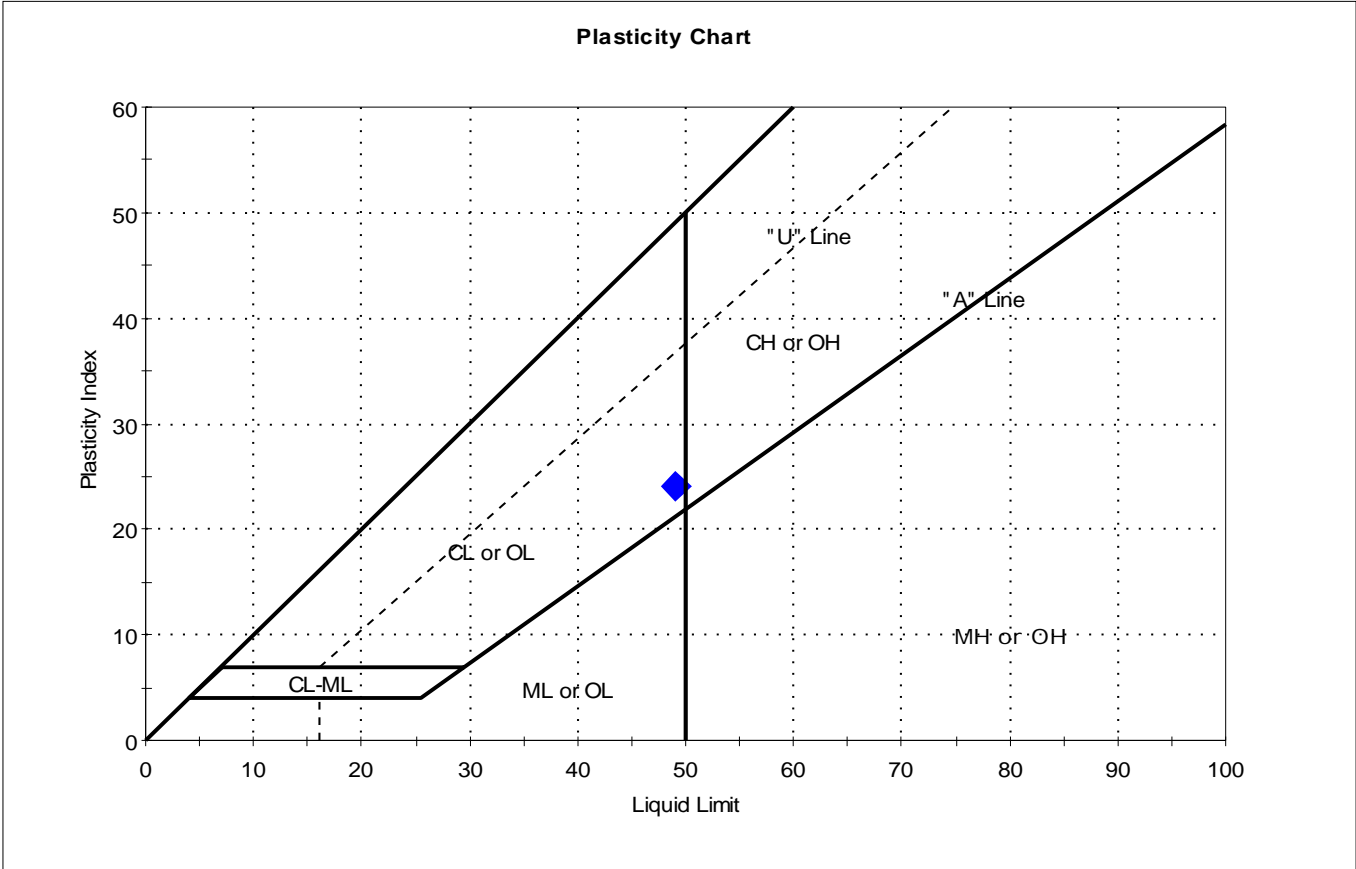
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	cam
Boring ID:	S2-1	Test Date:	06/29/16	Checked By:	emm
Sample ID:	Tube 1 - Bottom	Test Id:	382001		
Depth :	52-54				
Test Comment:	---				
Visual Description:	Moist, dark reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 1 - Bottom	S2-1	52-54	39	49	25	24	0.6	

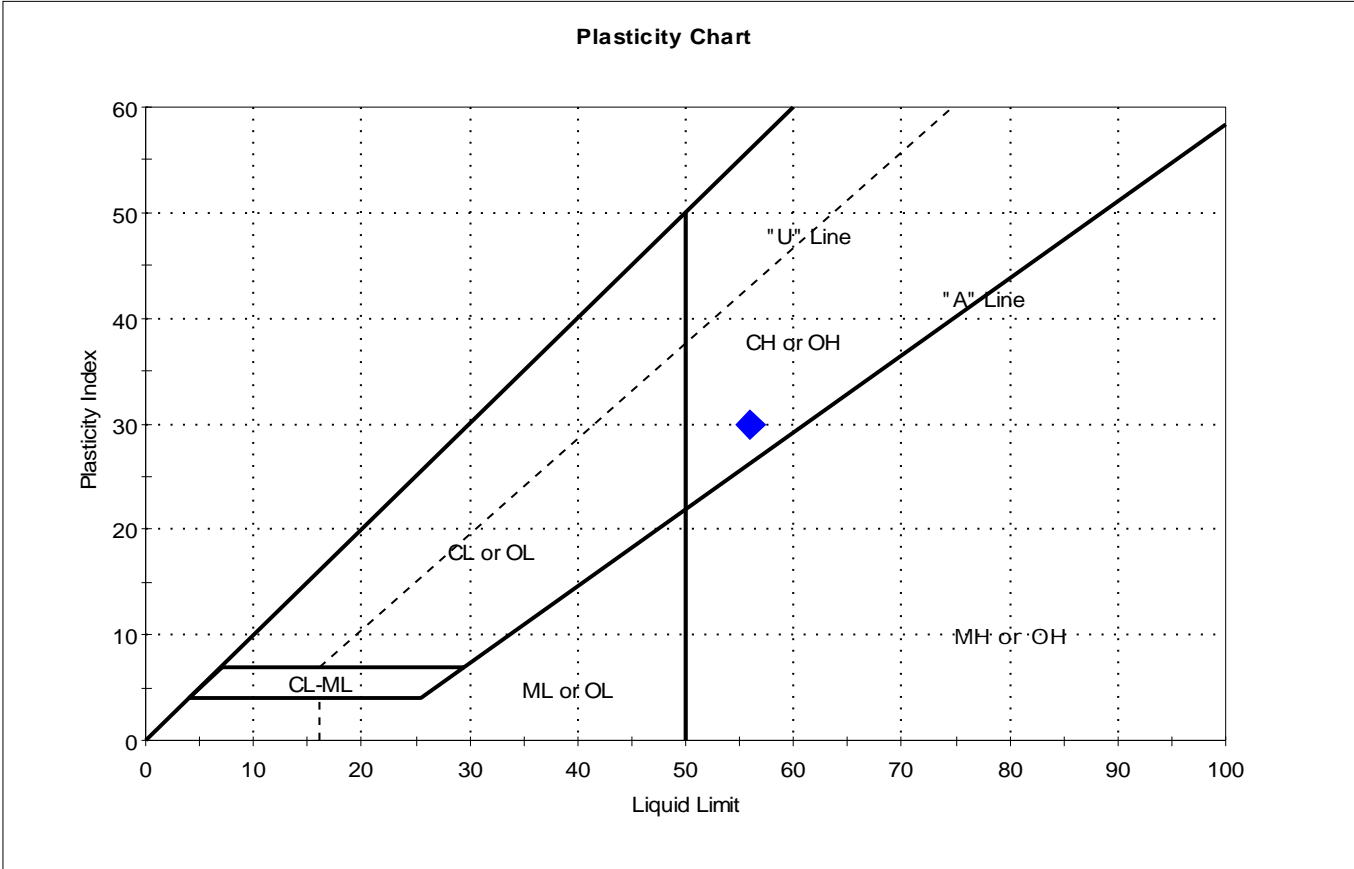
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S2-1	Sample Type:	tube
Sample ID:	Tube 2 - Top middle	Test Date:	06/28/16
Depth :	62-64	Test Id:	382076
Test Comment:	---		
Visual Description:	Moist, dark reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 2 - Top middle	S2-1	62-64	51	56	26	30	0.8	

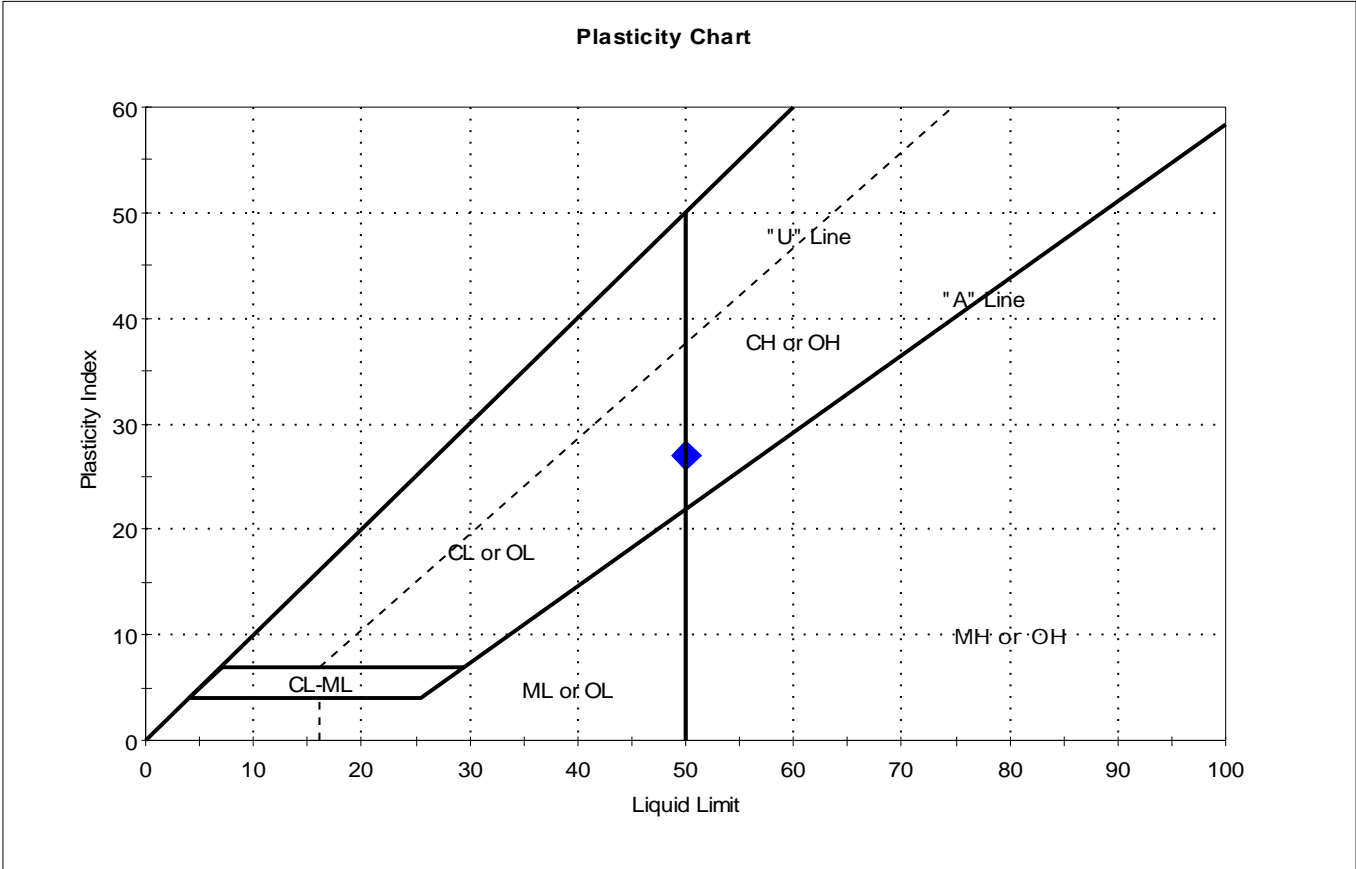
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	cam
Boring ID:	S2-1	Test Date:	06/28/16	Checked By:	emm
Sample ID:	Tube 2 - Bottom	Test Id:	382002		
Depth :	62-64				
Test Comment:	---				
Visual Description:	Moist, dark reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 2 - Bottom	S2-1	62-64	42	50	23	27	0.7	

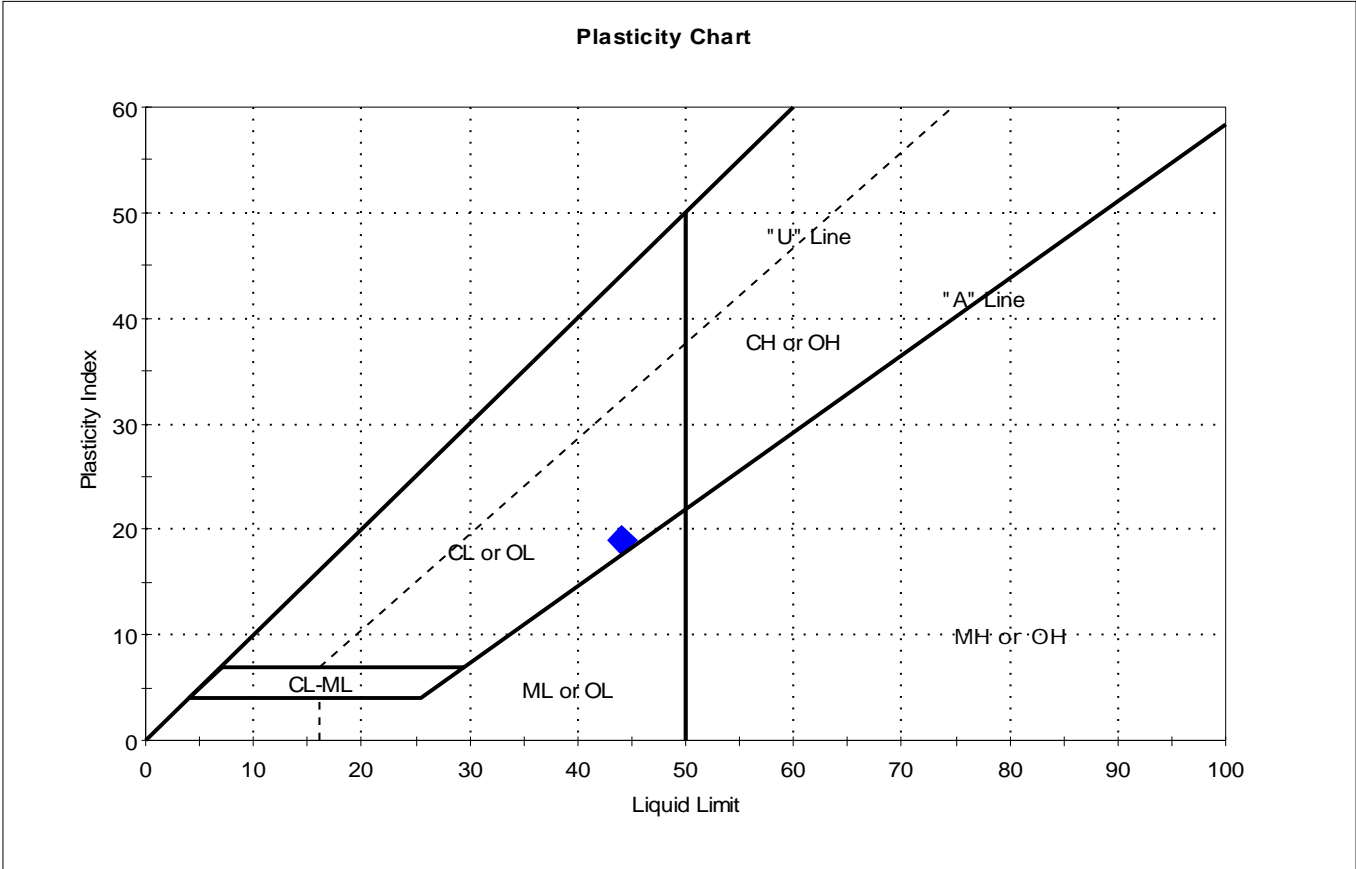
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S2-1	Sample Type:	tube
Sample ID:	Tube 3 - Top middle	Test Date:	06/28/16
Depth :	72-74	Test Id:	382080
Test Comment:	---		
Visual Description:	Moist, dark reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 3 - Top middle	S2-1	72-74	47	44	25	19	1.2	

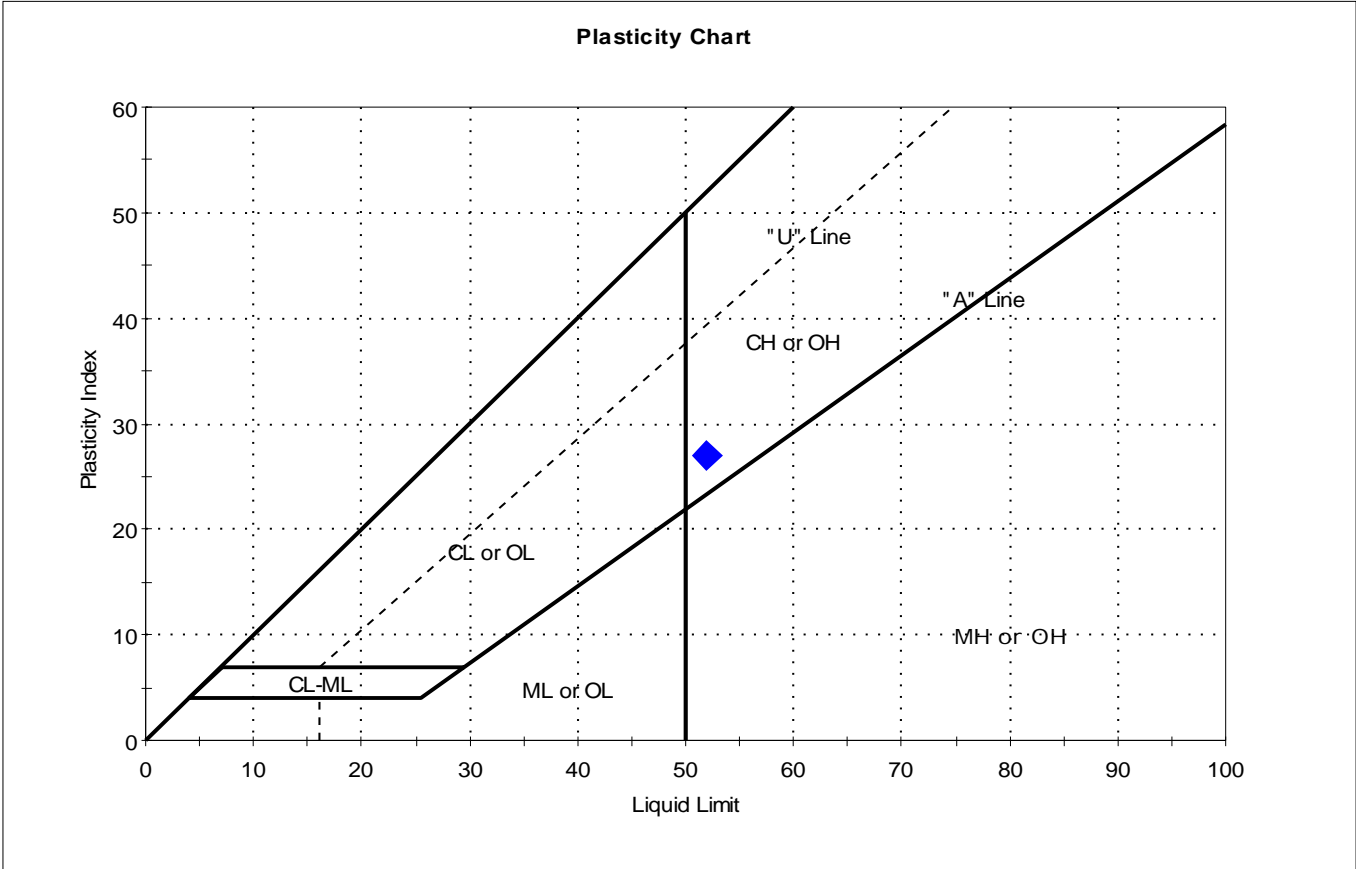
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	cam
Boring ID:	S2-1	Test Date:	06/28/16	Checked By:	emm
Sample ID:	Tube 3 - Bottom	Test Id:	382003		
Depth :	72-74				
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90

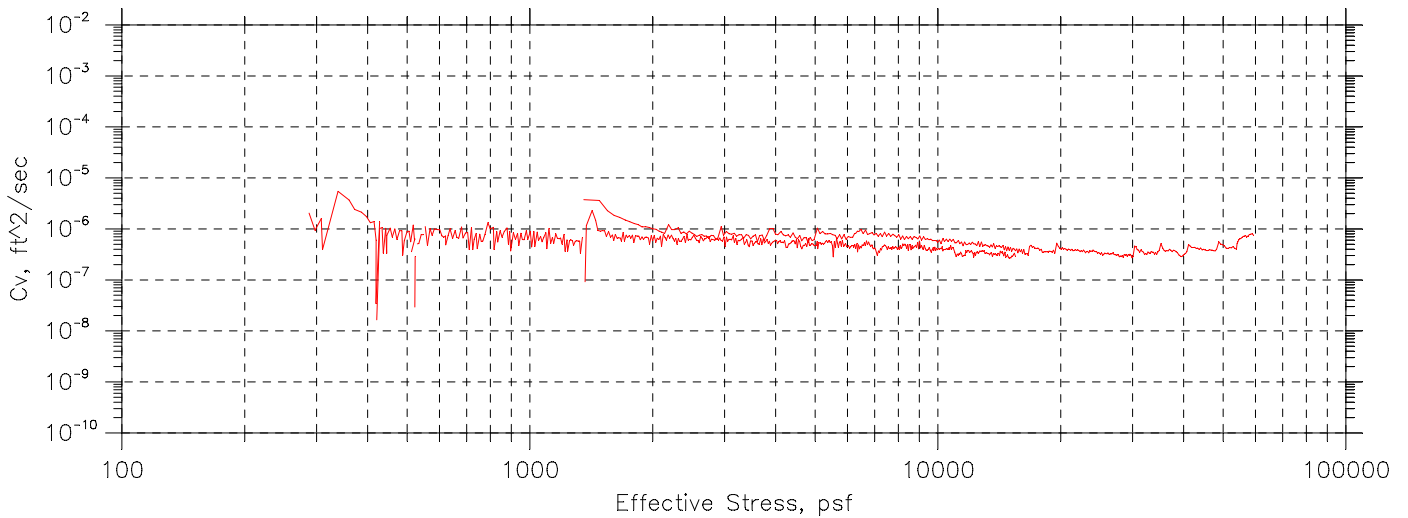
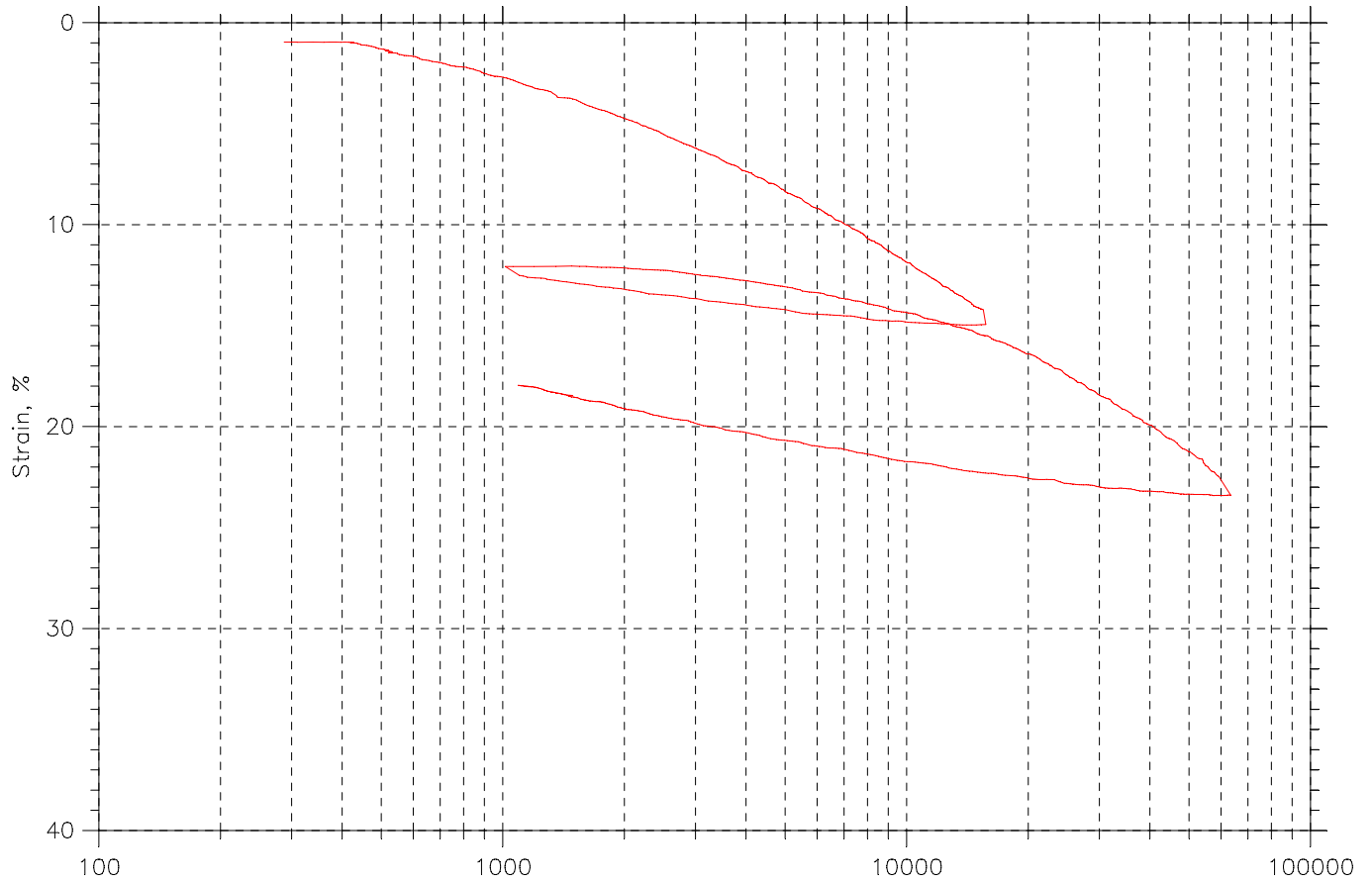


Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 3 - Bottom	S2-1	72-74	45	52	25	27	0.8	

Sample Prepared using the WET method

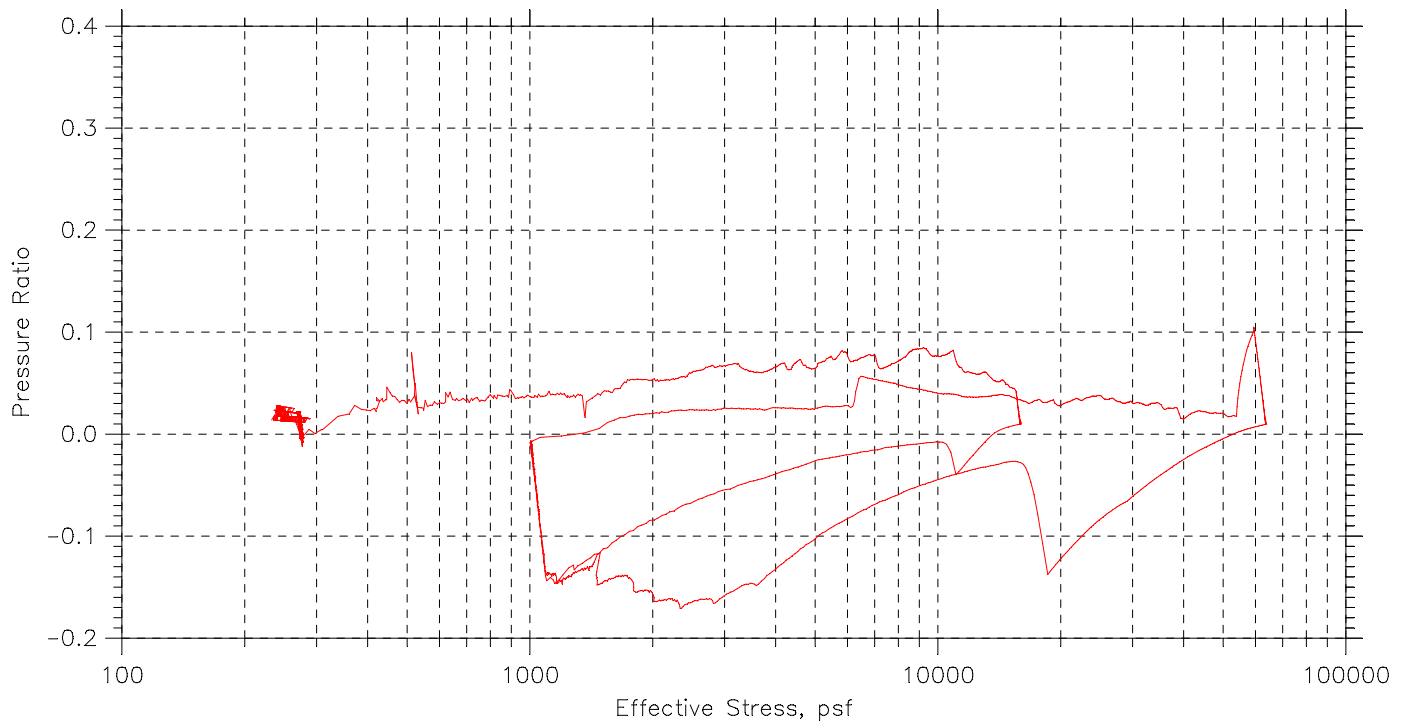
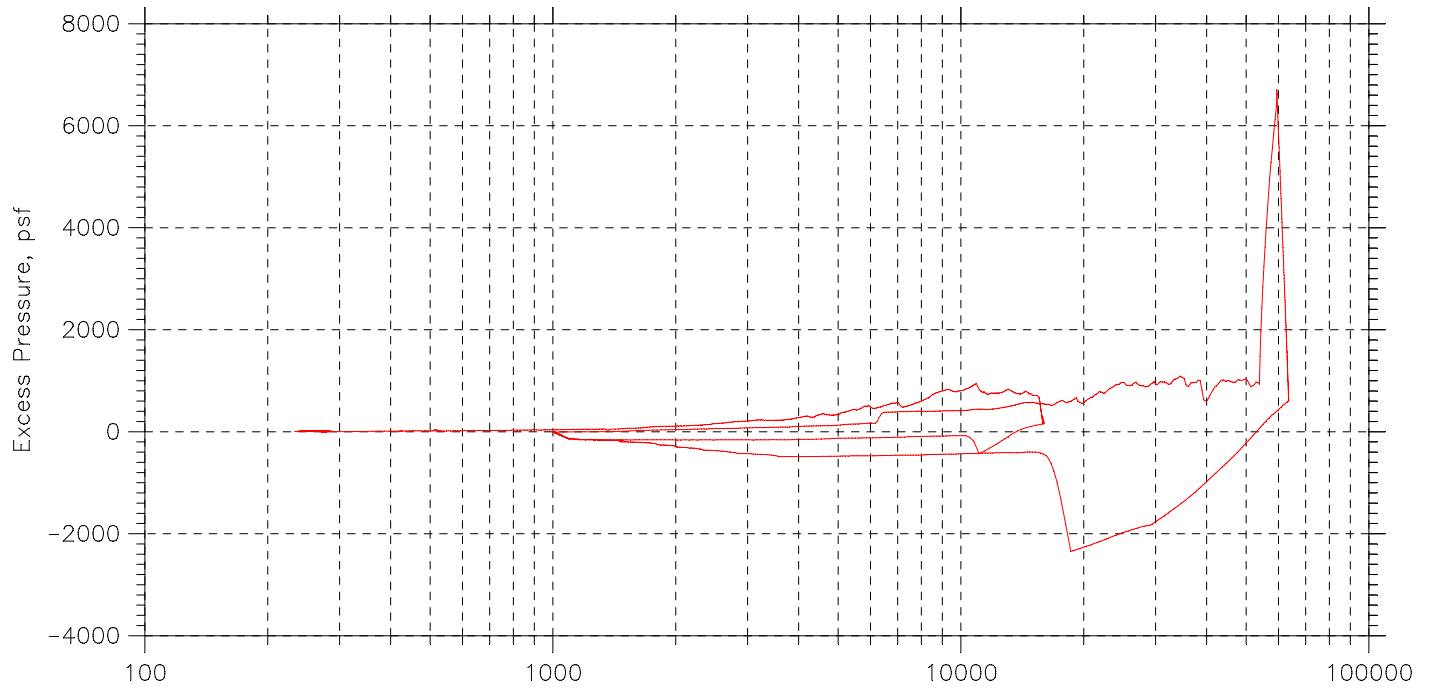
Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-9	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/09/16	Depth: 67-69 ft
Test No.: CRC-9	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System Y		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-9	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/09/16	Depth: 67-69 ft
Test No.: CRC-9	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System Y		
Page 2 of 3		

CRC TEST DATA

EXPRESS

Project: Reconstruction of Exit
 Boring No.: RW-9
 Sample No.: UP-1
 Test No.: CRC-9

Location: Hartford, CT
 Tested By: md
 Test Date: 06/09/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 67-69 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System Y

Estimated Specific Gravity: 2.79
 Initial Void Ratio: 1.30
 Final Void Ratio: 1.02

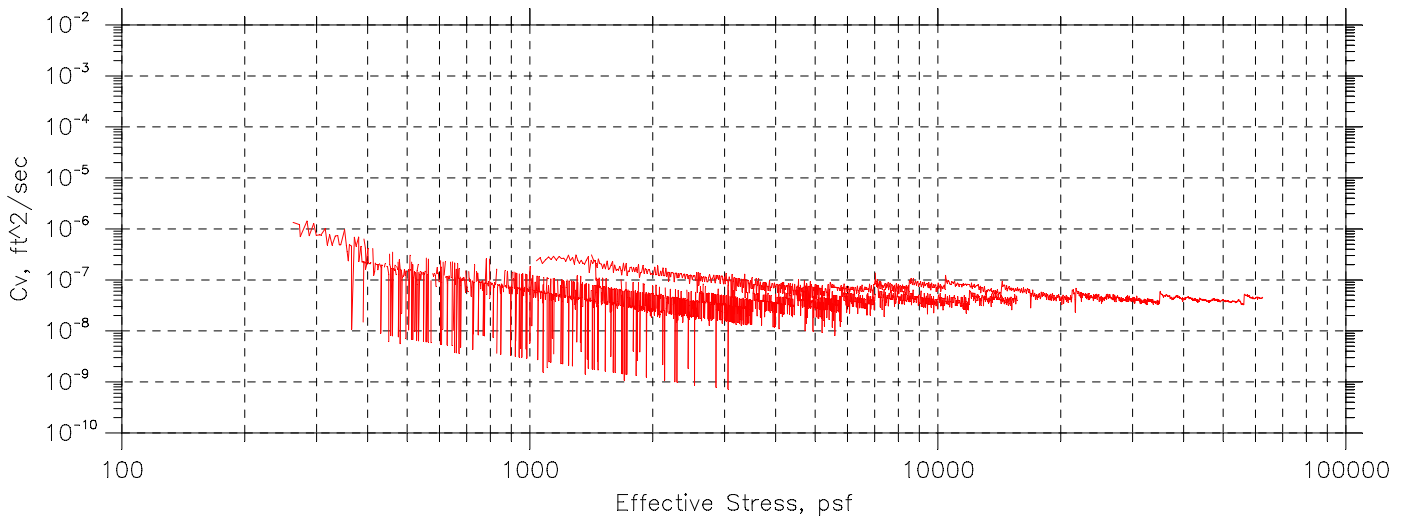
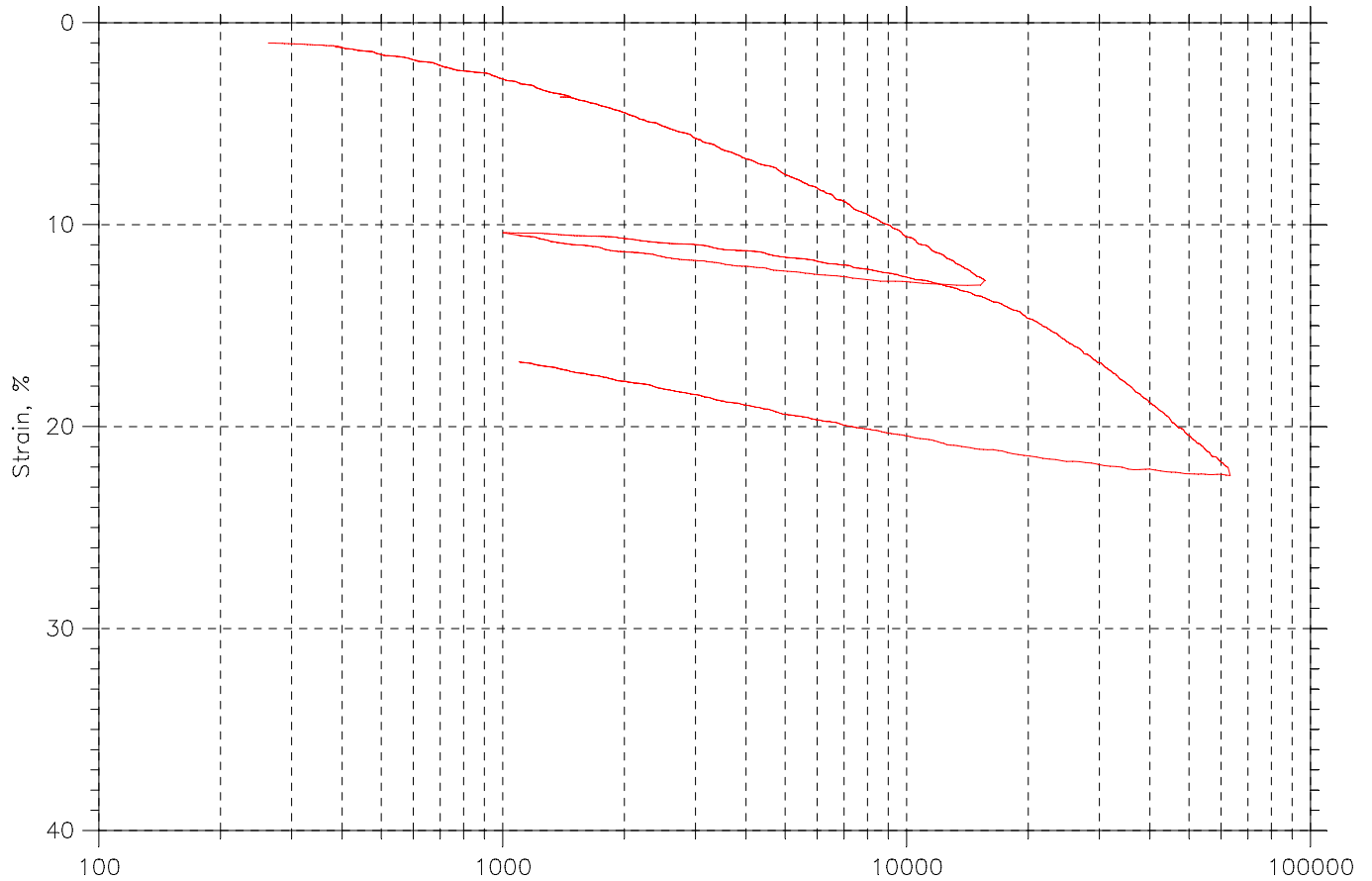
Liquid Limit: 49
 Plastic Limit: 23
 Plasticity Index: 26

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.88 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	A-1052	RING		B346
Wt. Container + Wet Soil, gm	227.92	252.71	243.18	140.32
Wt. Container + Dry Soil, gm	153.97	207.42	207.42	104.95
Wt. Container, gm	8.4300	109.52	109.52	8.1100
Wt. Dry Soil, gm	145.54	97.902	97.902	96.840
Water Content, %	50.81	46.26	36.52	36.52
Void Ratio	---	1.30	1.02	---
Degree of Saturation, %	---	99.73	100.00	---
Dry Unit Weight, pcf	---	75.980	86.341	---

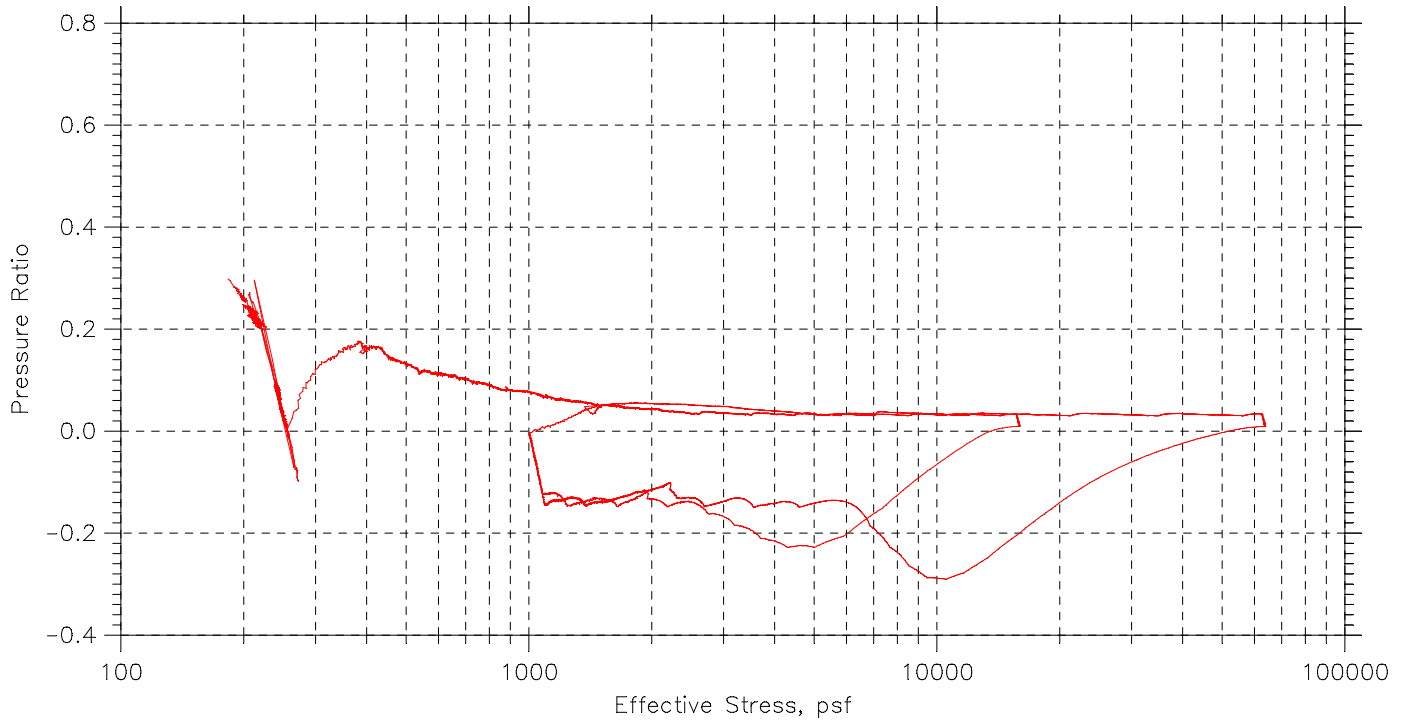
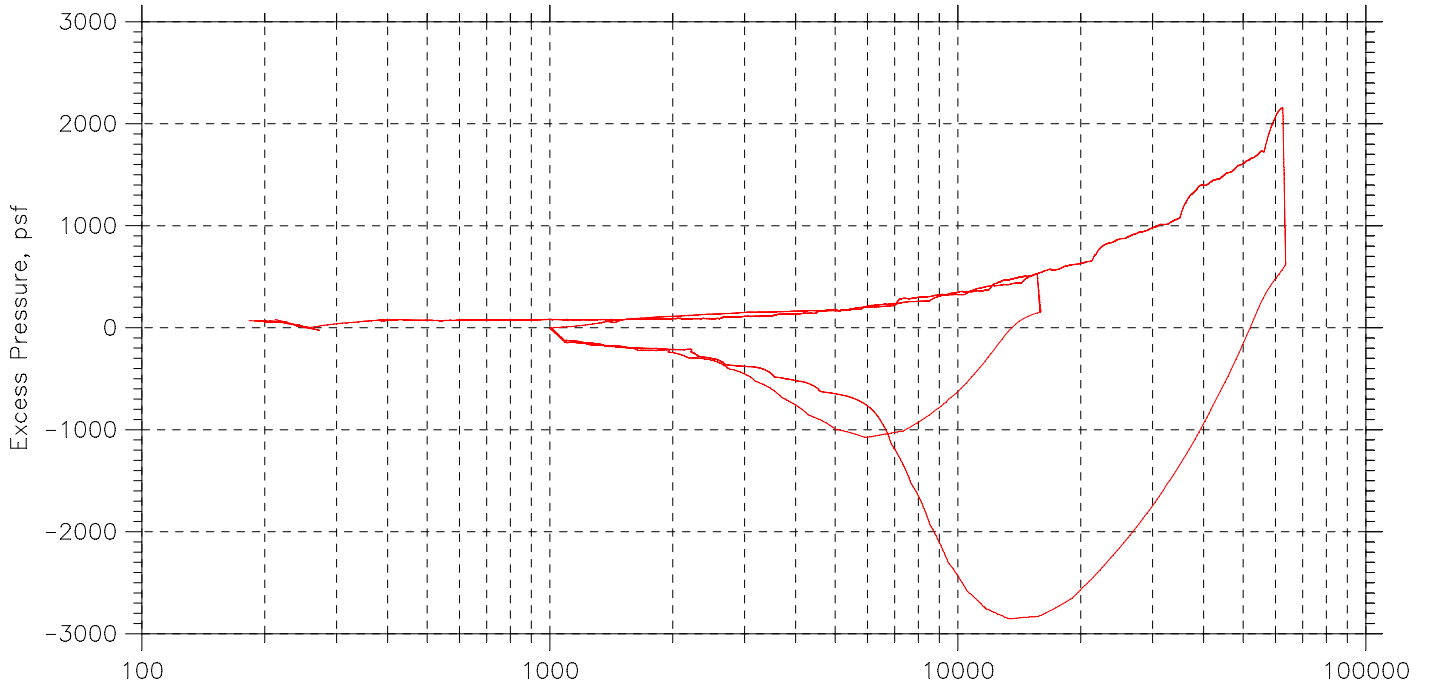
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-9	Tested By: md	Checked By: njh
Sample No.: UP-3	Test Date: 06/06/16	Depth: 76-78 ft
Test No.: CRC-5	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System V		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-9	Tested By: md	Checked By: njh
Sample No.: UP-3	Test Date: 06/06/16	Depth: 76-78 ft
Test No.: CRC-5	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System V		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: RW-9
 Sample No.: UP-3
 Test No.: CRC-5

Location: Hartford, CT
 Tested By: md
 Test Date: 06/06/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 76-78 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System V

Estimated Specific Gravity: 2.82
 Initial Void Ratio: 1.26
 Final Void Ratio: 0.987

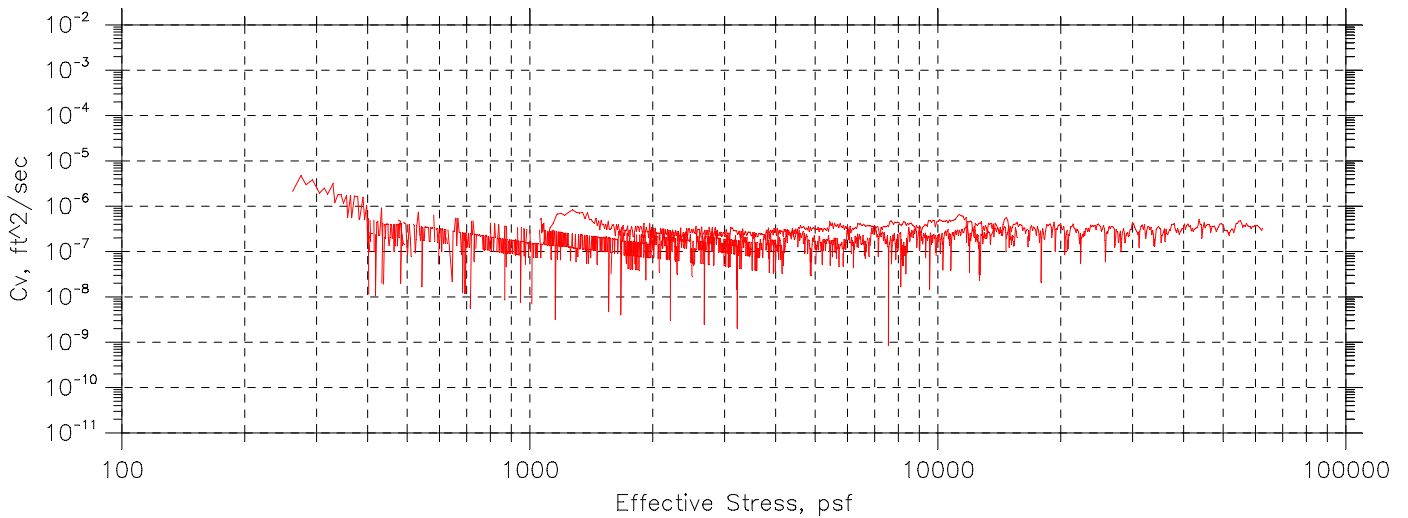
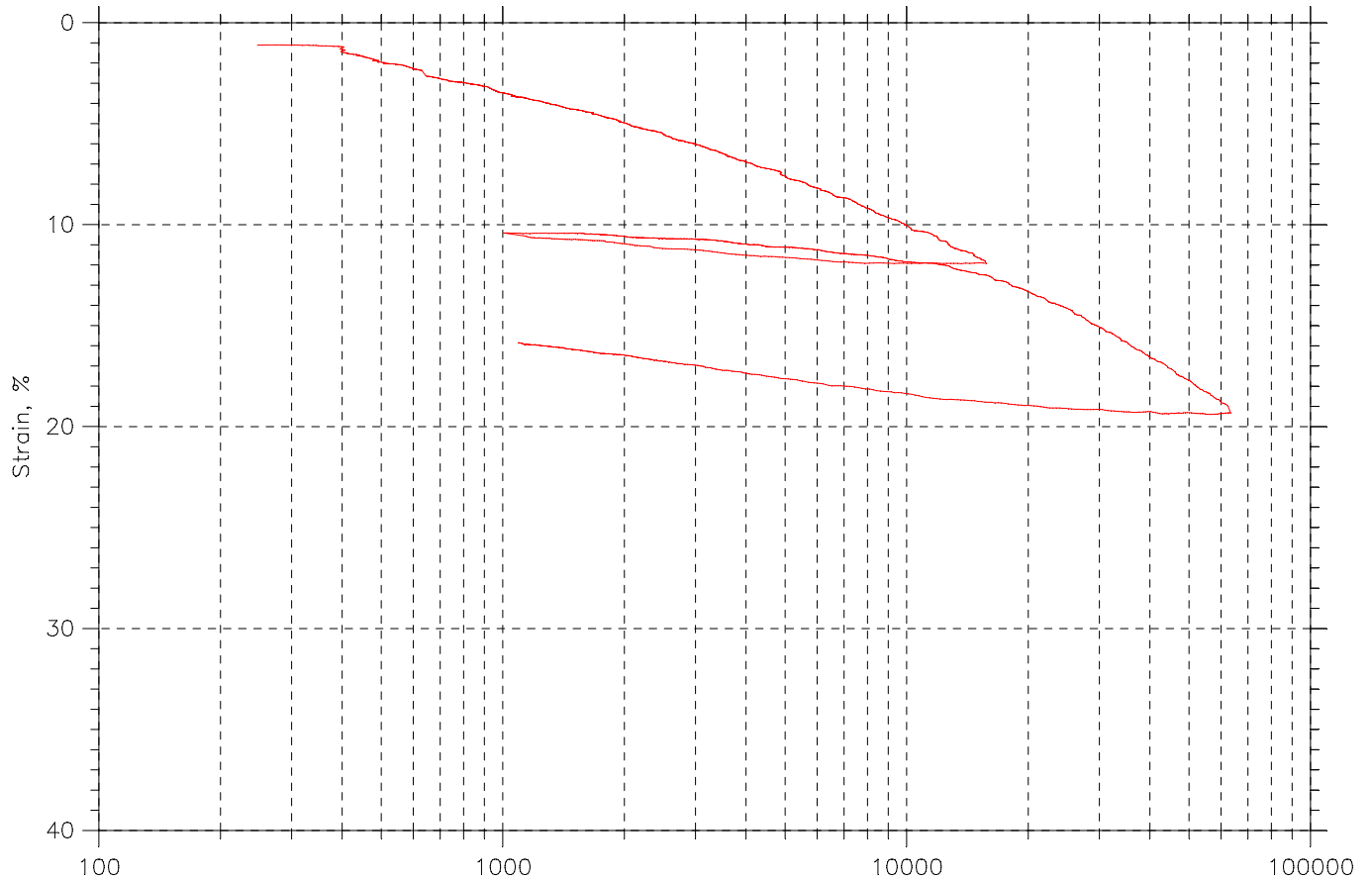
Liquid Limit: 50
 Plastic Limit: 23
 Plasticity Index: 27

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.88 in

Container ID	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
	A-701	RING		a582
Wt. Container + Wet Soil, gm	231.54	252.79	243.41	144.56
Wt. Container + Dry Soil, gm	153.55	208.25	208.25	109.23
Wt. Container, gm	8.5600	107.91	107.91	8.4200
Wt. Dry Soil, gm	144.99	100.34	100.34	100.81
Water Content, %	53.79	44.39	35.05	35.05
Void Ratio	---	1.26	0.987	---
Degree of Saturation, %	---	99.39	100.00	---
Dry Unit Weight, pcf	---	77.869	88.488	---

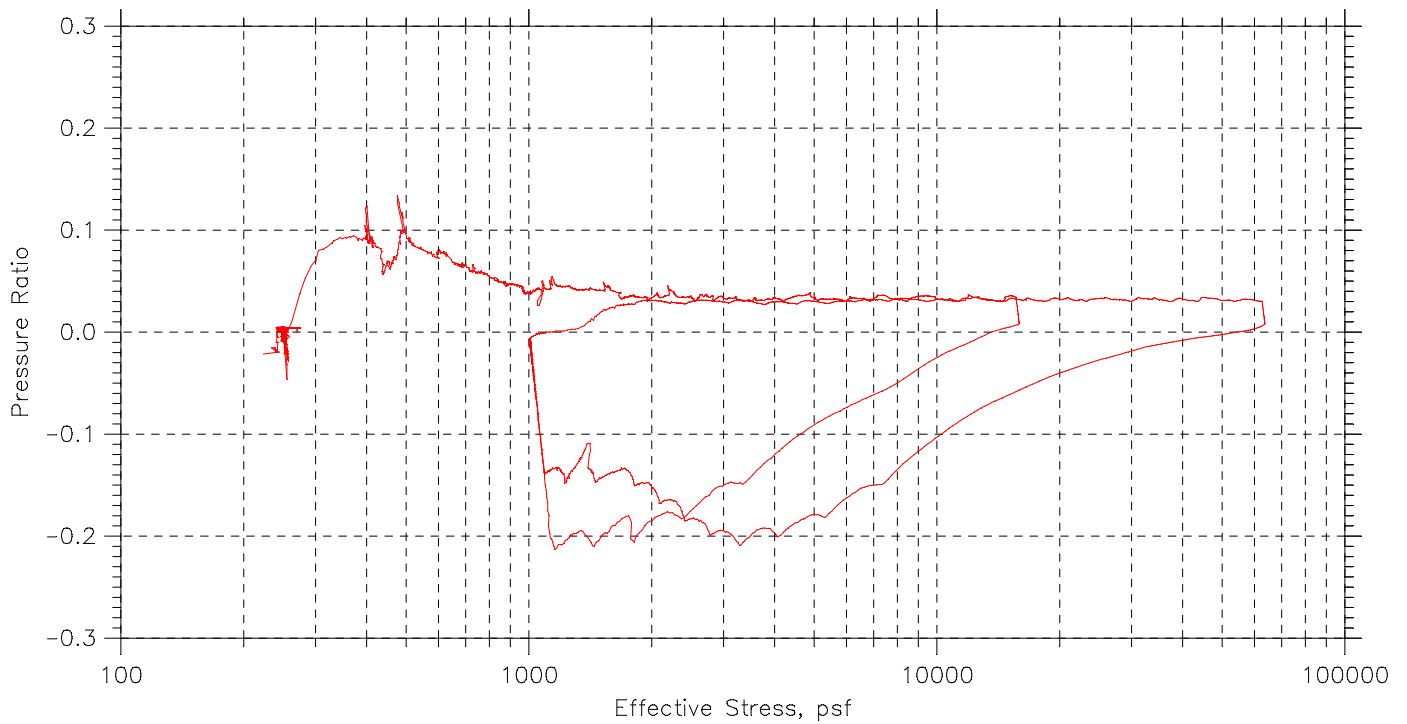
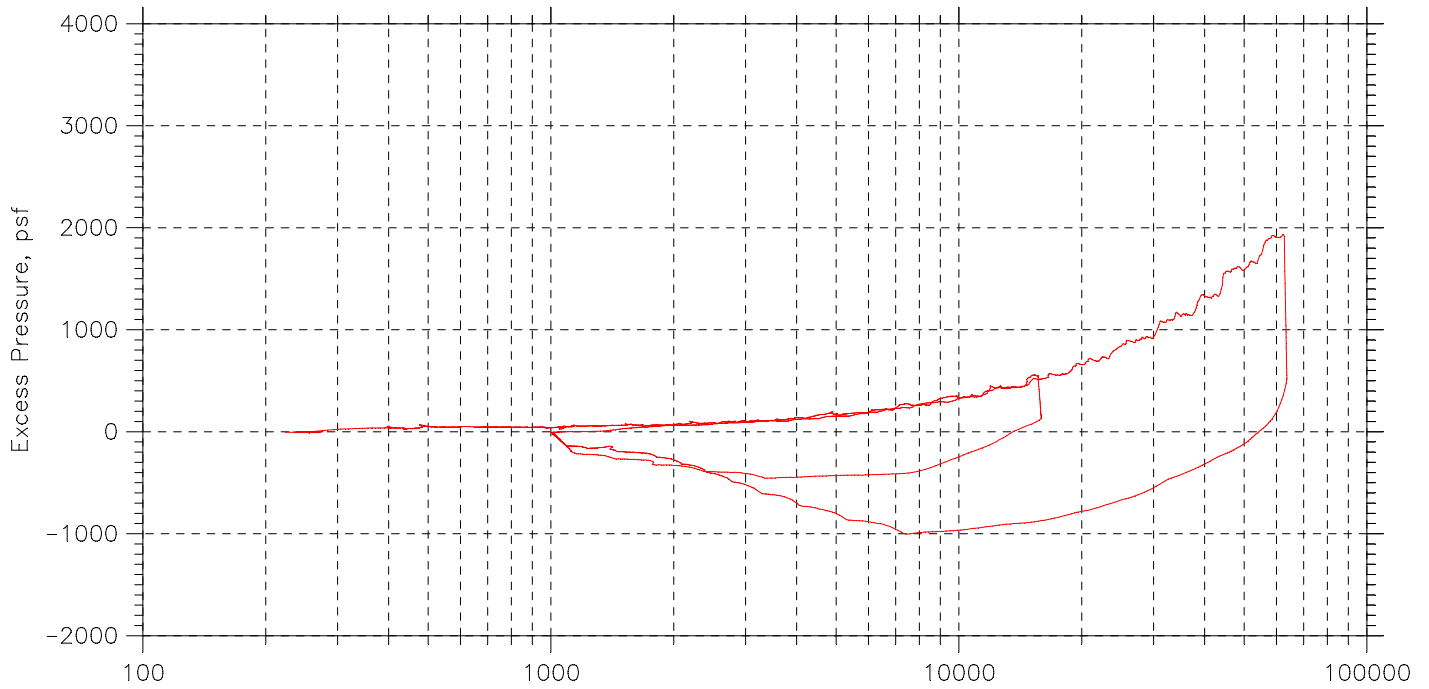
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-1 Bott	Test Date: 06/27/16	Depth: 52-54 ft
Test No.: CRC-14	Sample Type: intact	Elevation: ---
Description: Moist, dark reddish brown clay		
Remarks: System Y		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-1 Bott	Test Date: 06/27/16	Depth: 52-54 ft
Test No.: CRC-14	Sample Type: intact	Elevation: ---
Description: Moist, dark reddish brown clay		
Remarks: System Y		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: S2-1
 Sample No.: Tube-1 Bott
 Test No.: CRC-14

Location: Hartford, CT
 Tested By: md
 Test Date: 06/27/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 52-54 ft
 Elevation: ---

Soil Description: Moist, dark reddish brown clay
 Remarks: System Y

Estimated Specific Gravity: 2.83
 Initial Void Ratio: 1.12
 Final Void Ratio: 0.927

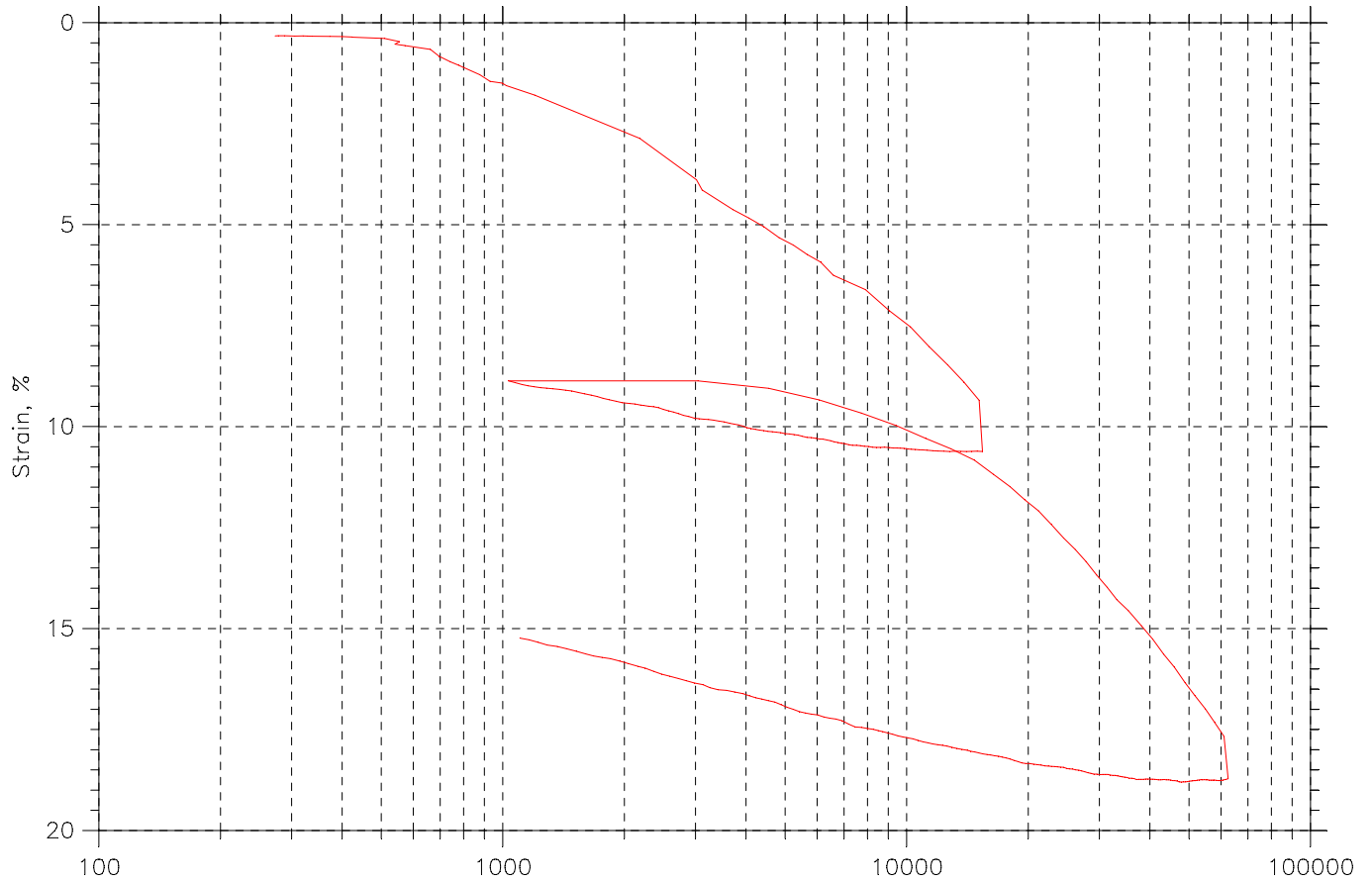
Liquid Limit: 49
 Plastic Limit: 25
 Plasticity Index: 24

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.91 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	16961	RING		c1561
Wt. Container + Wet Soil, gm	117.49	259.01	252.04	149.79
Wt. Container + Dry Soil, gm	86.960	216.82	216.82	114.93
Wt. Container, gm	8.3300	109.18	109.18	8.3800
Wt. Dry Soil, gm	78.630	107.64	107.64	106.55
Water Content, %	38.83	39.19	32.72	32.72
Void Ratio	---	1.12	0.927	---
Degree of Saturation, %	---	99.37	100.00	---
Dry Unit Weight, pcf	---	83.540	91.802	---

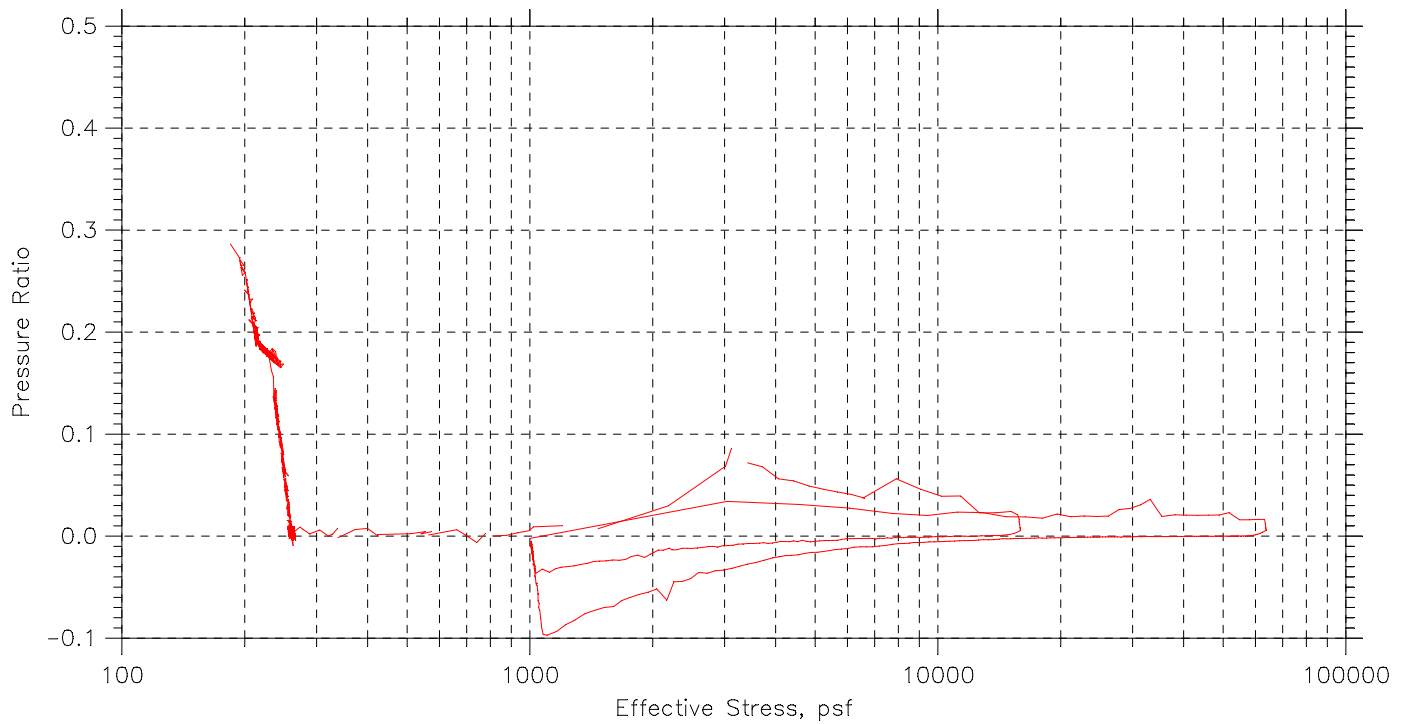
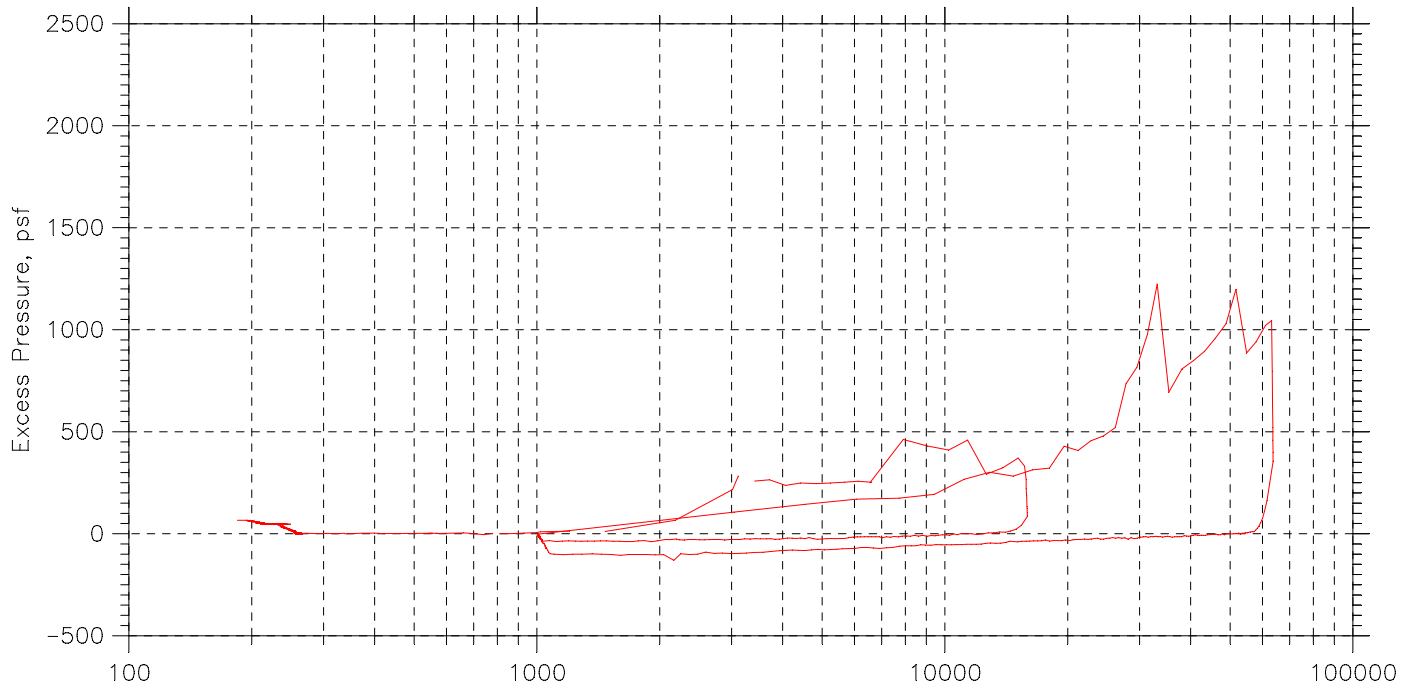
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-2 Bott	Test Date: 06/27/16	Depth: 62-64 ft
Test No.: CRC-16	Sample Type: intact	Elevation: ---
Description: Moist, dark reddish brown clay		
Remarks: System 0		
Page 1 of 3		

Constant Rate of Consolidation
Constant Strain Rate by ASTM D4186
Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-2 Bott	Test Date: 06/27/16	Depth: 62-64 ft
Test No.: CRC-16	Sample Type: intact	Elevation: ---
Description: Moist, dark reddish brown clay		
Remarks: System 0		
Page 2 of 3		

CRC TEST DATA

EXPRESS

Project: Reconstruction of Exit
 Boring No.: S2-1
 Sample No.: Tube-2 Bott
 Test No.: CRC-16

Location: Hartford, CT
 Tested By: md
 Test Date: 06/27/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 62-64 ft
 Elevation: ---

Soil Description: Moist, dark reddish brown clay
 Remarks: System 0

Estimated Specific Gravity: 2.85
 Initial Void Ratio: 1.18
 Final Void Ratio: 0.859

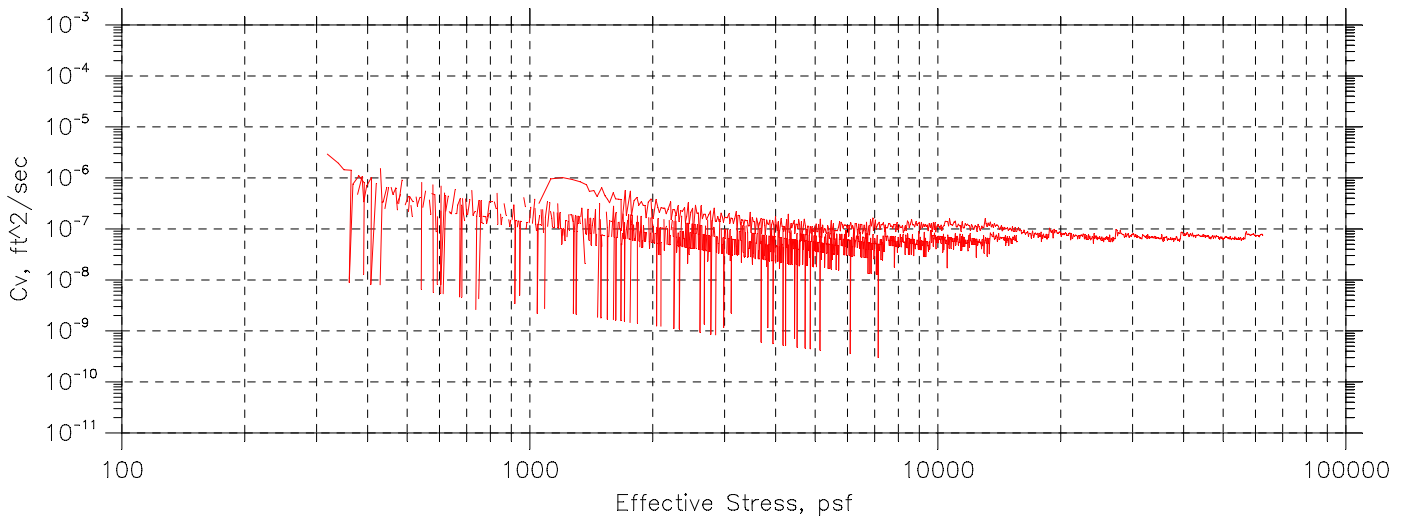
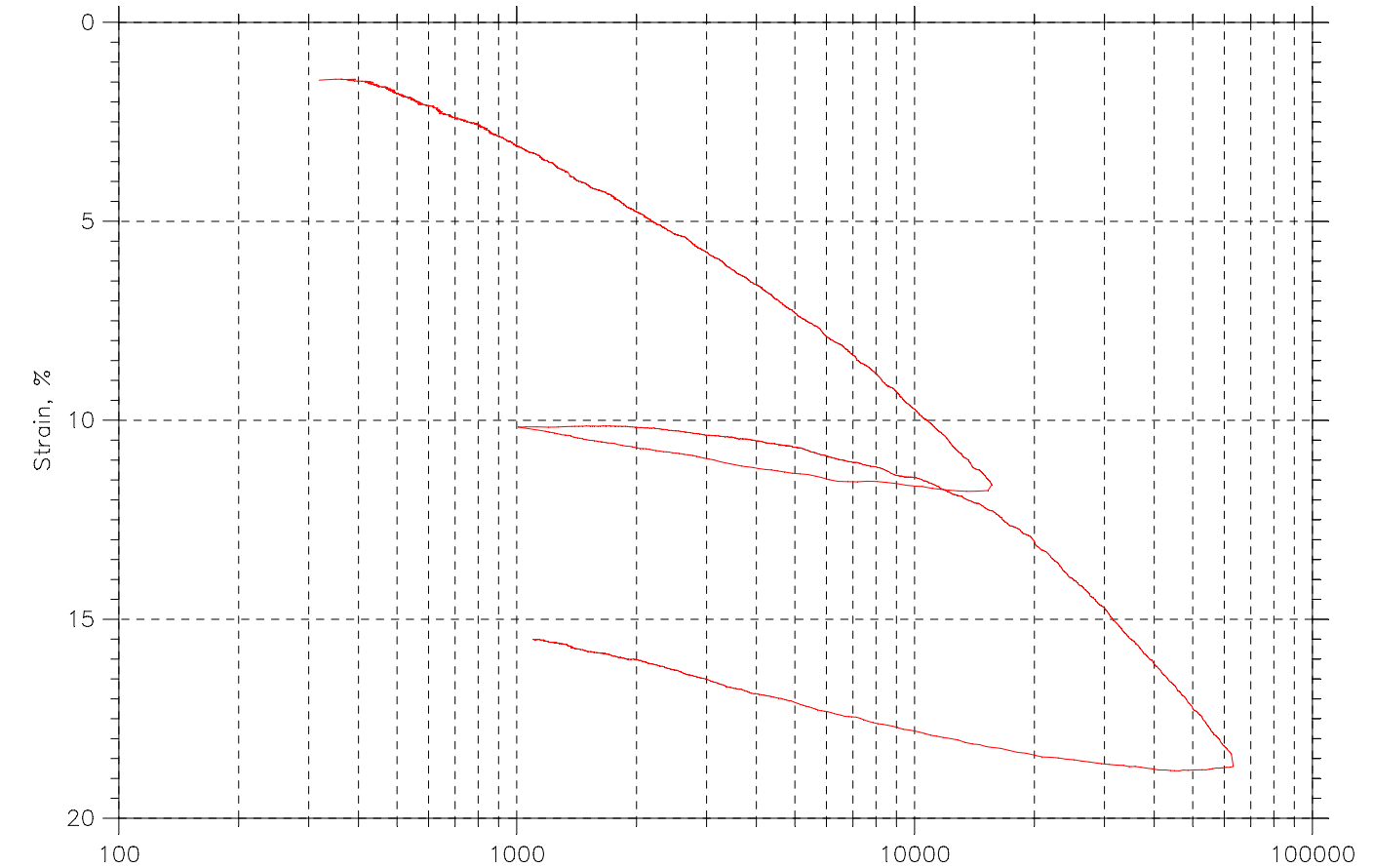
Liquid Limit: 50
 Plastic Limit: 23
 Plasticity Index: 27

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.85 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	A-828	RING		b505
Wt. Container + Wet Soil, gm	130.43	257.90	246.74	145.38
Wt. Container + Dry Soil, gm	94.470	215.01	215.01	113.52
Wt. Container, gm	8.5800	109.85	109.85	7.9300
Wt. Dry Soil, gm	85.890	105.16	105.16	105.59
Water Content, %	41.87	40.79	30.17	30.17
Void Ratio	---	1.18	0.859	---
Degree of Saturation, %	---	98.61	100.00	---
Dry Unit Weight, pcf	---	81.613	95.592	---

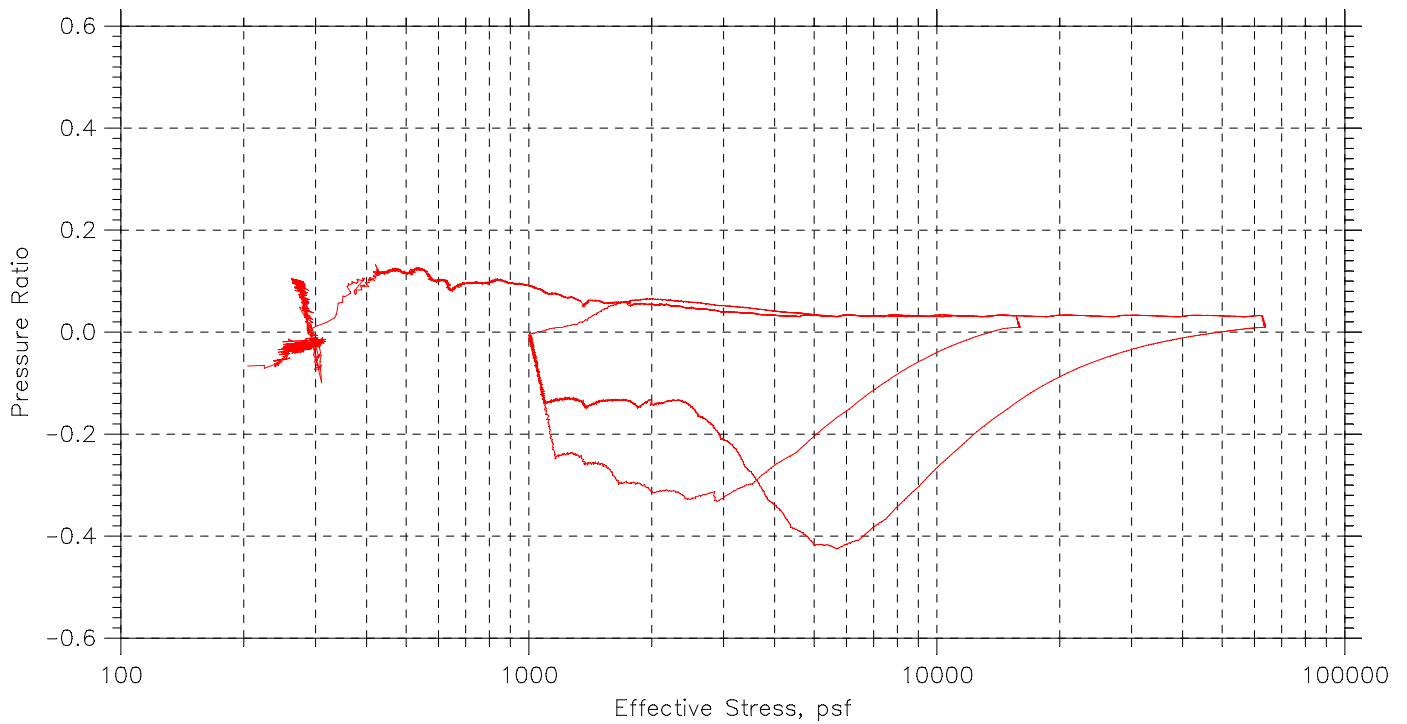
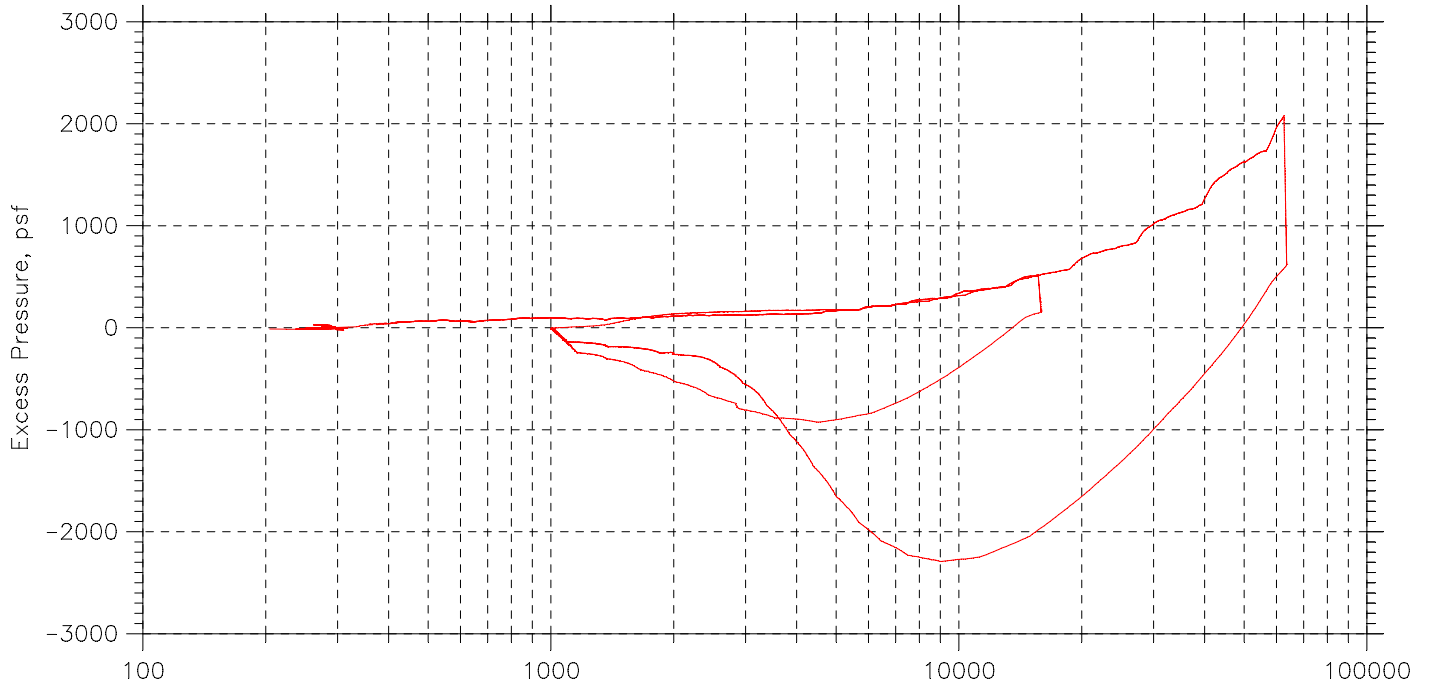
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
Constant Strain Rate by ASTM D4186
Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-3 Bott	Test Date: 06/27/16	Depth: 72-74 ft
Test No.: CRC-15	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System R		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-3 Bott	Test Date: 06/27/16	Depth: 72-74 ft
Test No.: CRC-15	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System R		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: S2-1
 Sample No.: Tube-3 Bott
 Test No.: CRC-15

Location: Hartford, CT
 Tested By: md
 Test Date: 06/27/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 72-74 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System R

Estimated Specific Gravity: 2.81
 Initial Void Ratio: 1.20
 Final Void Ratio: 0.956

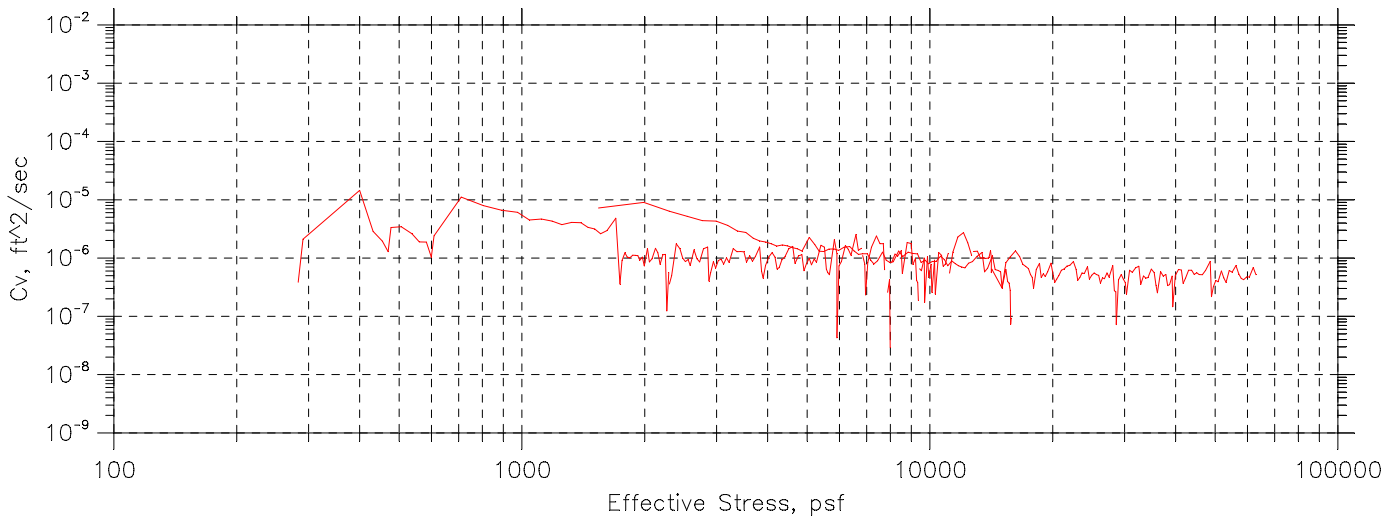
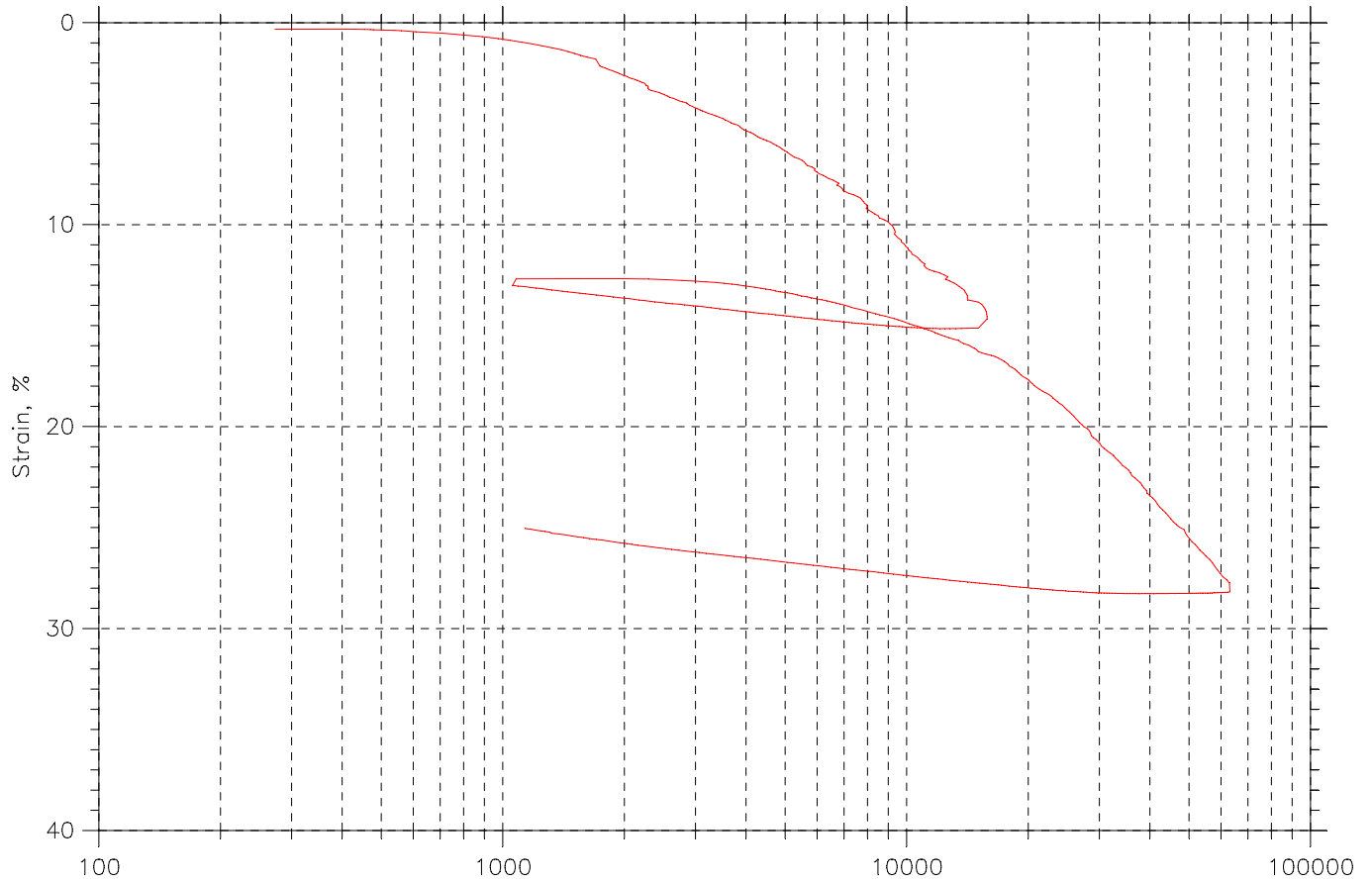
Liquid Limit: 52
 Plastic Limit: 25
 Plasticity Index: 27

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.89 in

Container ID	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
	A-844	RING		B-660
Wt. Container + Wet Soil, gm	205.53	253.92	245.71	148.46
Wt. Container + Dry Soil, gm	144.23	210.71	210.71	112.79
Wt. Container, gm	8.8000	107.92	107.92	8.0300
Wt. Dry Soil, gm	135.43	102.79	102.79	104.76
Water Content, %	45.26	42.04	34.05	34.05
Void Ratio	---	1.20	0.956	---
Degree of Saturation, %	---	98.54	100.00	---
Dry Unit Weight, pcf	---	79.774	89.634	---

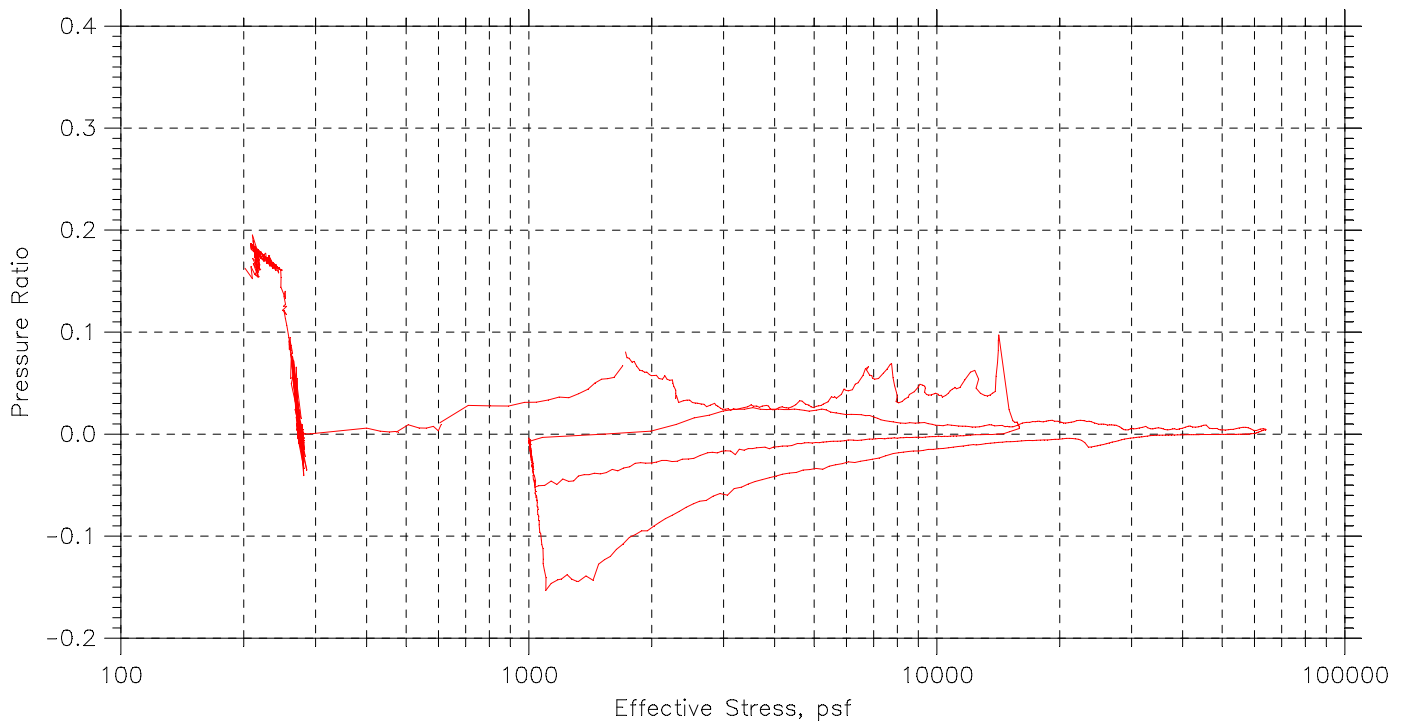
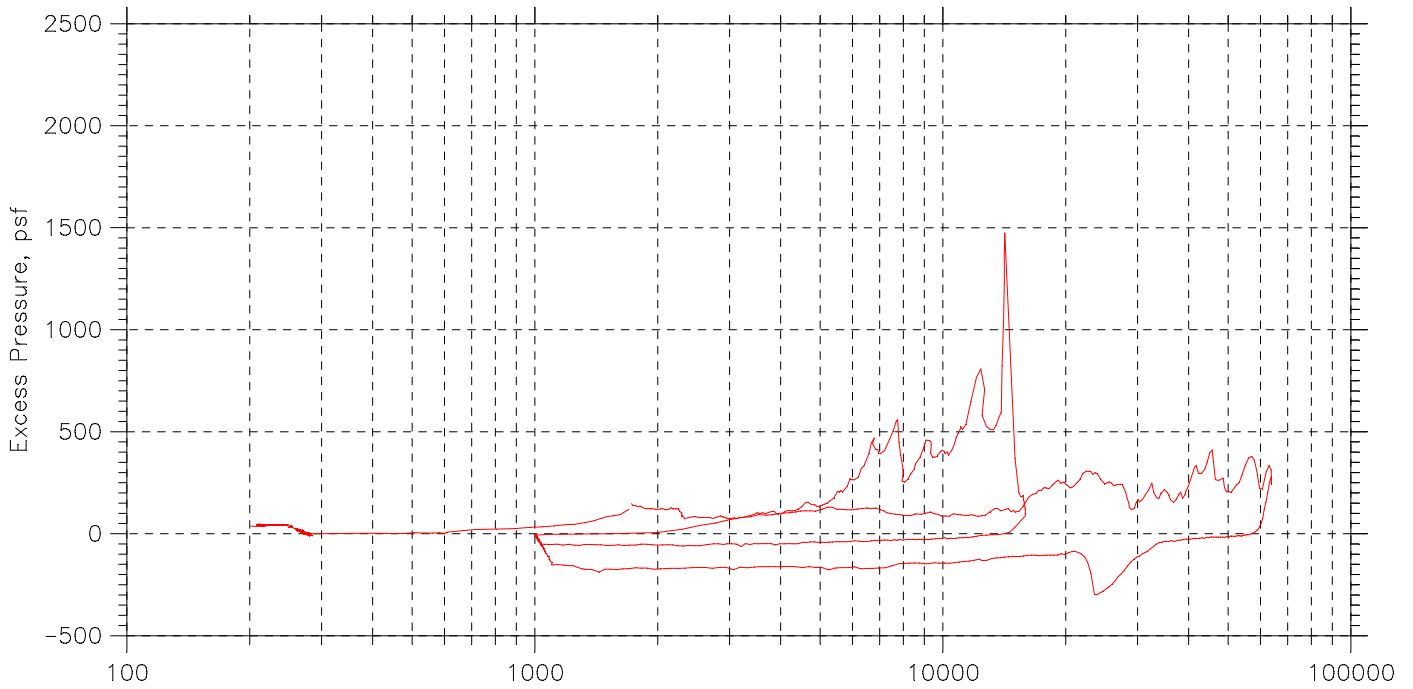
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S1-11	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 07/13/16	Depth: 61-63 ft
Test No.: CRC-12B	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System F		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S1-11	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 07/13/16	Depth: 61-63 ft
Test No.: CRC-12B	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System F		
Page 2 of 3		

CRC TEST DATA

EXPRESS

Project: Reconstruction of Exit
 Boring No.: S1-11
 Sample No.: UP-1
 Test No.: CRC-12B

Location: Hartford, CT
 Tested By: md
 Test Date: 07/13/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 61-63 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System F

Estimated Specific Gravity: 2.78
 Initial Void Ratio: 1.22
 Final Void Ratio: 0.731

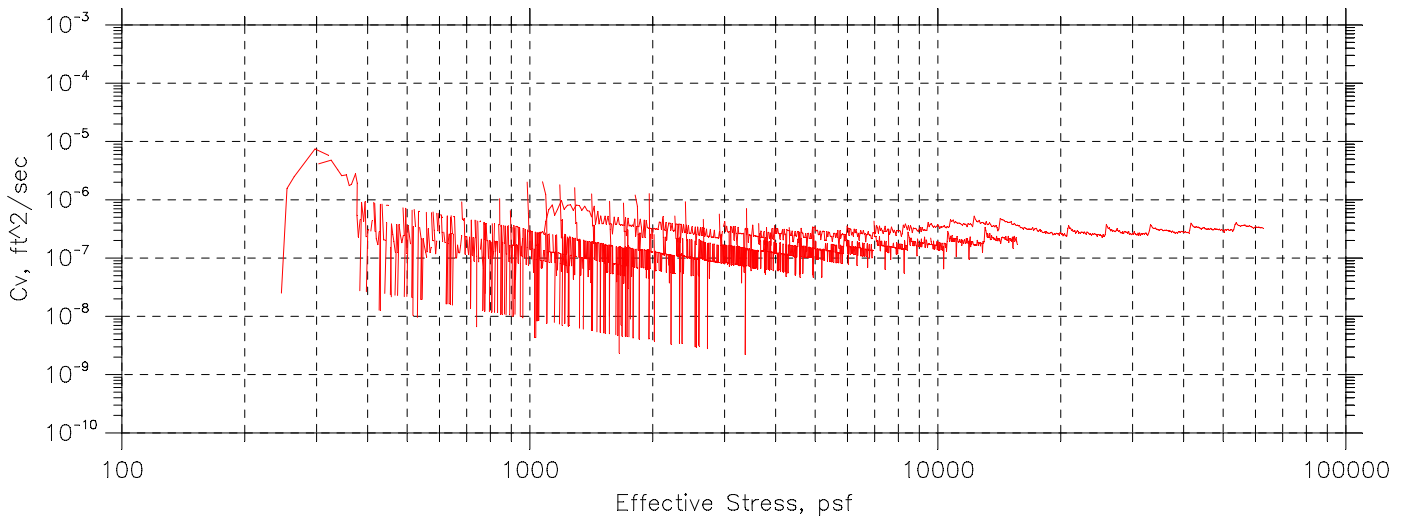
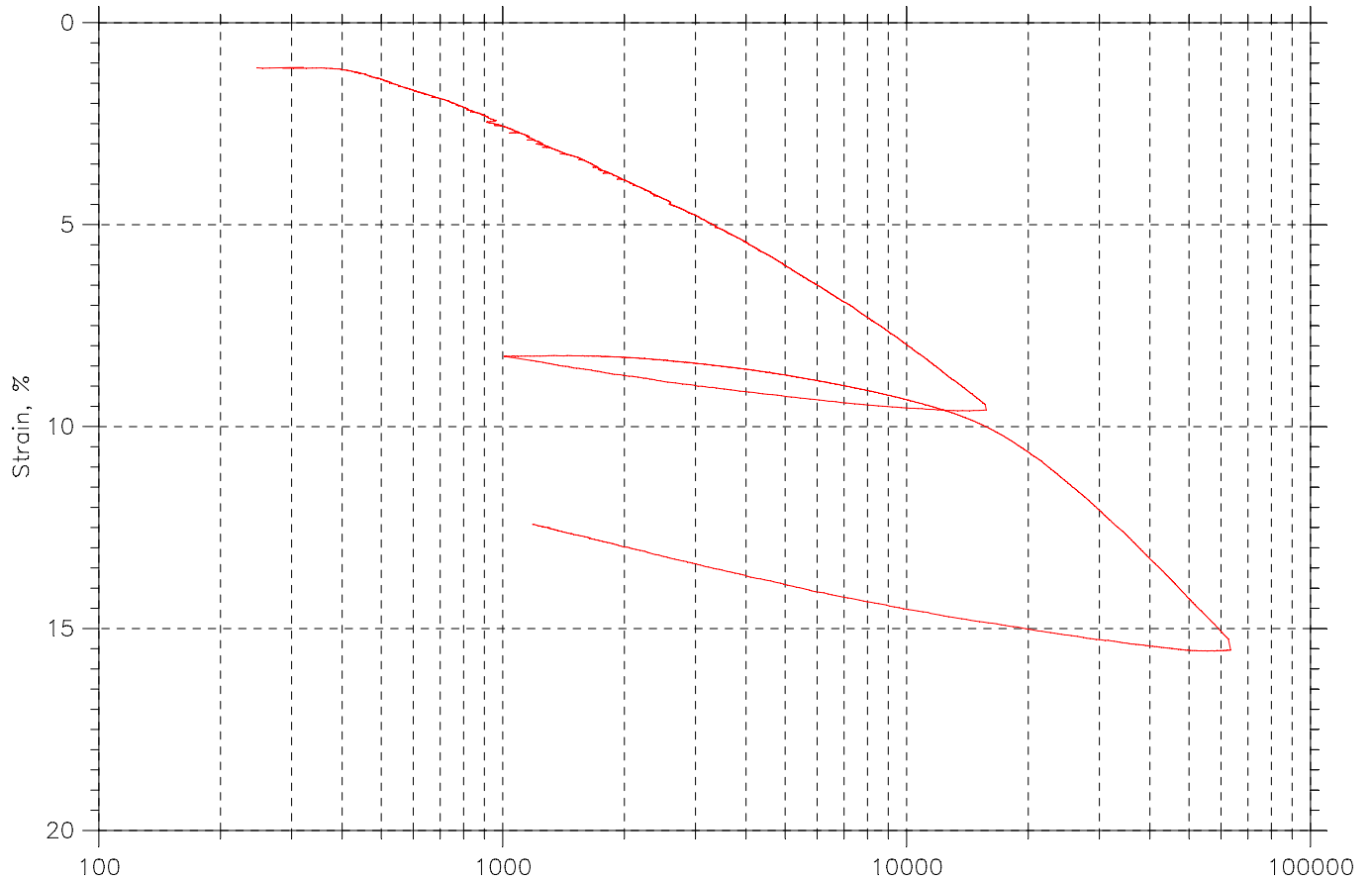
Liquid Limit: 46
 Plastic Limit: 24
 Plasticity Index: 22

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.78 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	C-1289	RING		B-591
Wt. Container + Wet Soil, gm	176.32	254.92	237.24	127.03
Wt. Container + Dry Soil, gm	115.26	210.74	210.74	102.25
Wt. Container, gm	8.3700	109.85	109.85	7.9000
Wt. Dry Soil, gm	106.89	100.89	100.89	94.350
Water Content, %	57.12	43.79	26.26	26.26
Void Ratio	---	1.22	0.731	---
Degree of Saturation, %	---	99.96	100.00	---
Dry Unit Weight, pcf	---	78.300	100.39	---

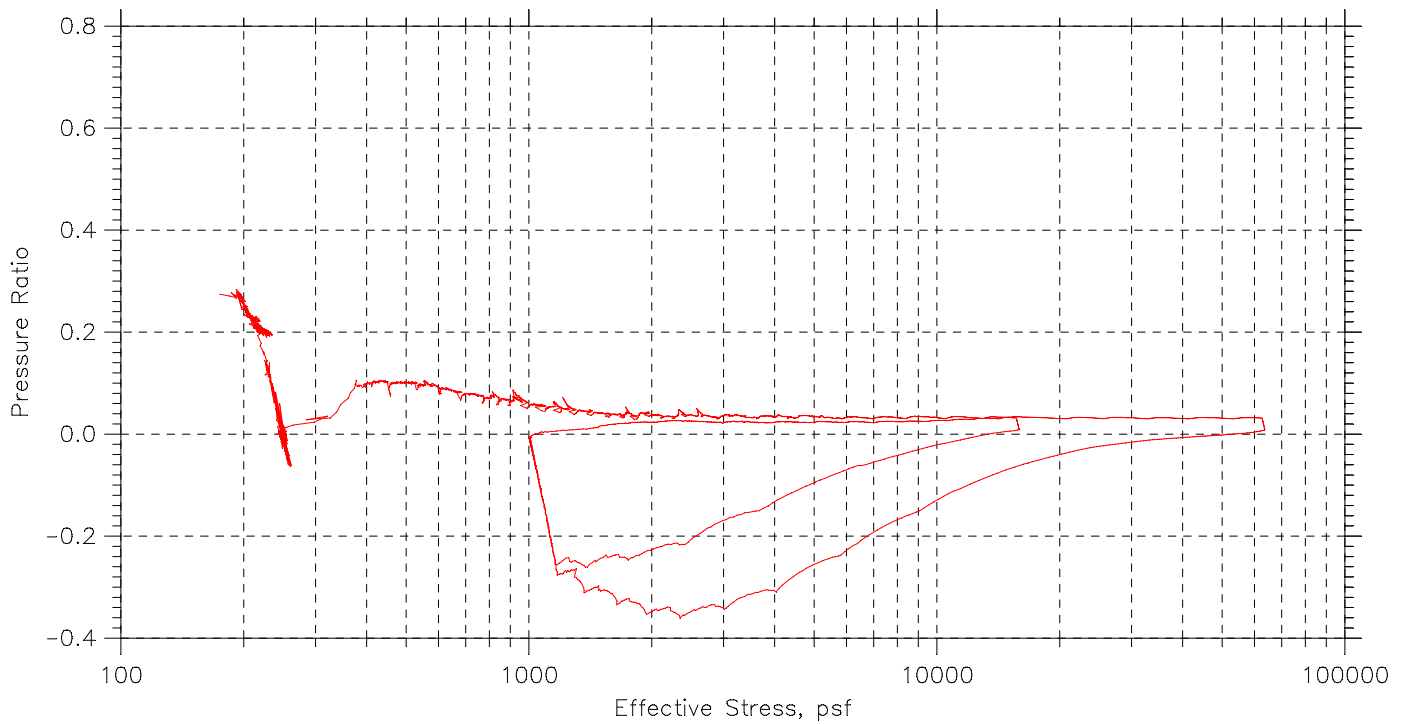
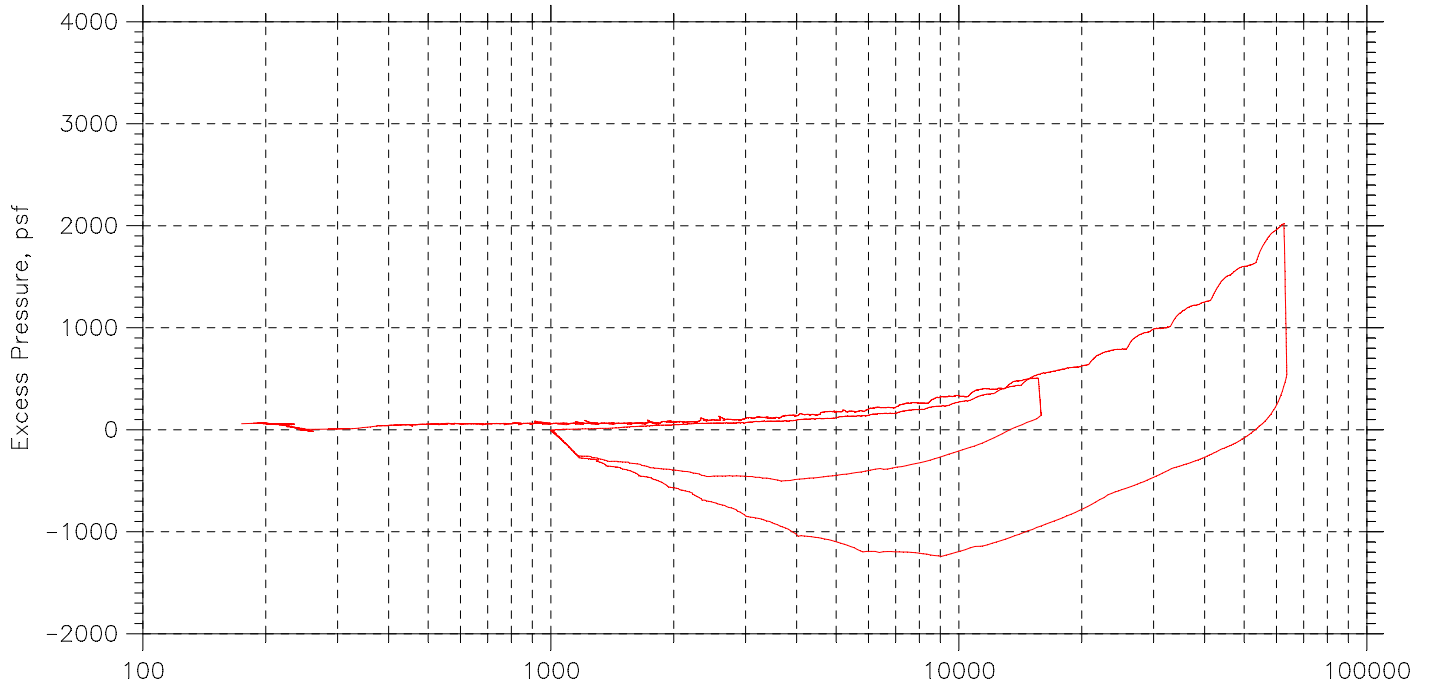
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S1-11	Tested By: md	Checked By: njh
Sample No.: UP-3	Test Date: 06/06/16	Depth: 69-71 ft
Test No.: CRC-3	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System F		
Page 1 of 3		

Constant Rate of Consolidation
Constant Strain Rate by ASTM D4186
Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S1-11	Tested By: md	Checked By: njh
Sample No.: UP-3	Test Date: 06/06/16	Depth: 69-71 ft
Test No.: CRC-3	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System F		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: S1-11
 Sample No.: UP-3
 Test No.: CRC-3

Location: Hartford, CT
 Tested By: md
 Test Date: 06/06/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 69-71 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System F

Estimated Specific Gravity: 2.86
 Initial Void Ratio: 1.02
 Final Void Ratio: 0.834

Liquid Limit: 40
 Plastic Limit: 21
 Plasticity Index: 19

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.91 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	A-583	RING		B572
Wt. Container + Wet Soil, gm	171.15	263.65	256.58	156.03
Wt. Container + Dry Soil, gm	127.59	223.28	223.28	122.78
Wt. Container, gm	8.3600	109.19	109.19	8.8500
Wt. Dry Soil, gm	119.23	114.09	114.09	113.93
Water Content, %	36.53	35.38	29.18	29.18
Void Ratio	---	1.02	0.834	---
Degree of Saturation, %	---	99.58	100.00	---
Dry Unit Weight, pcf	---	88.545	97.302	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	06/27/16
Depth:	---	Tested By:	daa
		Checked By:	jsc
		Test Id:	381989

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
S1-12	C1	112.5-113 ft	165	10981	3	No	1,*
S1466-1	C2	49.5-50 ft	160	8511	3	Yes	---
S2-1	C2	98.5-99 ft	164	7103	3	Yes	---
S480-1	C2	54.5-55 ft	164	8063	3	No	1,*
S6043-1	C2	184-184.5 ft	164	10588	3	No	1,*

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.
 All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.
 The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
 Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure
 (See attached photographs)

- 1: Best effort end preparation. See Tolerance report for details.
- 2: The as-received core did not meet the ASTM side straightness tolerance due to irregularities in the sample as cored.
- 3: Specimen L/D < 2.
- 4: The as-received core did not meet the ASTM minimum diameter tolerance of 1.875 inches.
- 5: Specimen diameter is less than 10 times maximum particle size.
- 6: Specimen diameter is less than 6 times maximum particle size.

*Because the indicated tested specimens did not meet the ASTM D4543 standard tolerances, the results reported here may differ from those for a test specimen within tolerances.

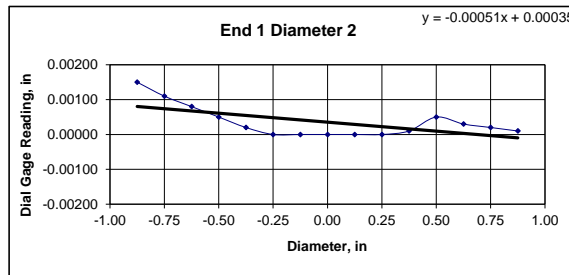
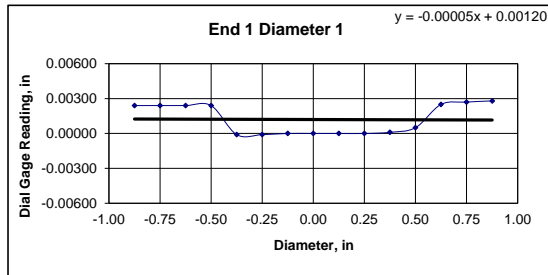


Client:	Freeman Companies, LLC	Test Date:	6/24/2016
Project Name:	Reconstruction of Exit Charter Oak Bridge	Tested By:	rlc
Project Location:	Hartford, CT	Checked By:	jsc
GTX #:	304831		
Boring ID:	S1-12		
Sample ID:	C1		
Depth:	112.5-113 ft		
Visual Description:	See photographs		

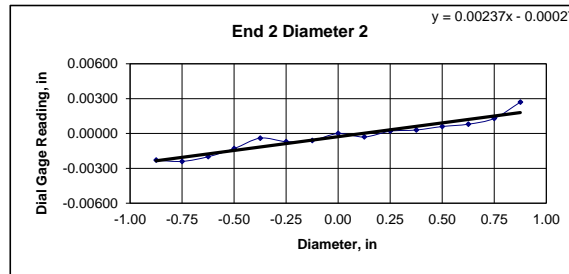
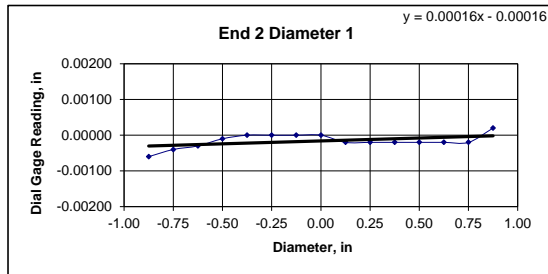
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? YES			
Specimen Length, in:	4.47	4.47	4.47	Maximum difference must be $<$ 0.020 in.			
Specimen Diameter, in:	1.98	1.99	1.99	Straightness Tolerance Met? YES			
Specimen Mass, g:	598.58						
Bulk Density, lb/ft ³ :	165						
Length to Diameter Ratio:	2.3						
		Minimum Diameter Tolerance Met?	YES				
		Length to Diameter Ratio Tolerance Met?	YES				

END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00240	0.00240	0.00240	0.00240	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00050	0.00250	0.00270	0.00280
Diameter 2, in (rotated 90°)	0.00150	0.00110	0.00080	0.00050	0.00020	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00050	0.00030	0.00020	0.00010
											Difference between max and min readings, in: 0° = 0.00290 90° = 0.00150				
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00060	-0.00040	-0.00030	-0.00010	0.00000	0.00000	0.00000	0.00000	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	0.00020
Diameter 2, in (rotated 90°)	-0.00230	-0.00240	-0.00200	-0.00130	-0.00040	-0.00070	-0.00060	0.00000	-0.00030	0.00020	0.00030	0.00060	0.00080	0.00130	0.00270
											Difference between max and min readings, in: 0° = 0.0008 90° = 0.0051 Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00255				
											Flatness Tolerance Met? NO				



DIAMETER 1	
End 1:	Slope of Best Fit Line: 0.00005 Angle of Best Fit Line: 0.00286
End 2:	Slope of Best Fit Line: 0.00051 Angle of Best Fit Line: 0.02922
Maximum Angular Difference:	0.02636
Parallelism Tolerance Met? Spherically Seated	NO



DIAMETER 2	
End 1:	Slope of Best Fit Line: 0.00016 Angle of Best Fit Line: 0.00917
End 2:	Slope of Best Fit Line: 0.00237 Angle of Best Fit Line: 0.13579
Maximum Angular Difference:	0.12662
Parallelism Tolerance Met? Spherically Seated	NO

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						Maximum angle of departure must be \leq 0.25°	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00290	1.985	0.00146	0.084	YES		
Diameter 2, in (rotated 90°)	0.00150	1.985	0.00076	0.043	YES		
						Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00080	1.985	0.00040	0.023	YES		
Diameter 2, in (rotated 90°)	0.00510	1.985	0.00257	0.147	YES		



Client:	Freeman Companies, LLC	Test Date:	6/24/2016
Project Name:	Reconstruction of Exit Charter Oak Bridge	Tested By:	rlc
Project Location:	Hartford, CT	Checked By:	jsc
GTX #:	304831		
Boring ID:	S1-12	Tolerance measurements were performed using a machinist straightedge and feeler gauges to ASTM specifications.	
Sample ID:	C1		
Depth:	112.5-113 ft		
Visual Description:	See photographs		

BEST EFFORT END FLATNESS TOLERANCES OF ROCK CORE SPECIMENS TO ASTM D4543

END FLATNESS			
END 1			
Diameter 1	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
Diameter 2 (rotated 90°)	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
END 2			
Diameter 1	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
Diameter 2 (rotated 90°)	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
End Flatness Tolerance Met? YES			

Client:	Freeman Companies, LLC
Project Name:	Reconstruction of Exit Charter Oak Bridge
Project Location:	Hartford, CT
GTX #:	304831
Test Date:	6/25/2016
Tested By:	daa
Checked By:	jsc
Boring ID:	S1-12
Sample ID:	C1
Depth, ft:	112.5-113



After cutting and grinding



After break

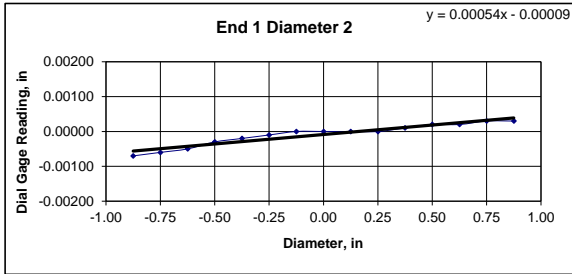
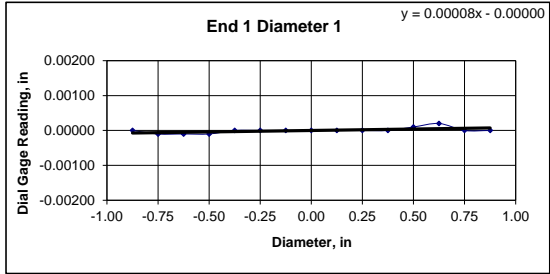


Client: Freeman Companies, LLC	Test Date: 6/24/2016
Project Name: Reconstruction of Exit Charter Oak Bridge	Tested By: rlc
Project Location: Hartford, CT	Checked By: jsc
GTX #: 304831	
Boring ID: S2-1	
Sample ID: C2	
Depth: 98.5-99 ft	
Visual Description: See photographs	

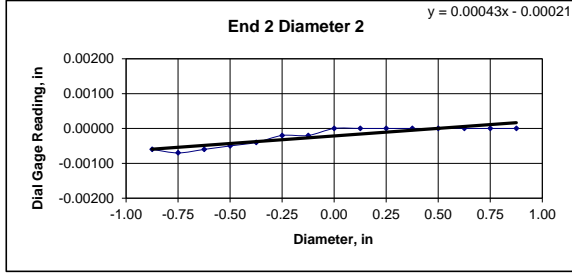
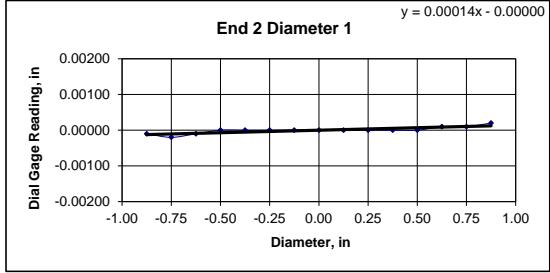
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? YES			
Specimen Length, in:	4.47	4.47	4.47	Maximum difference must be $<$ 0.02 in. Straightness Tolerance Met? YES			
Specimen Diameter, in:	1.98	1.99	1.99				
Specimen Mass, g:	597.27						
Bulk Density, lb/ft ³ :	164						
Length to Diameter Ratio:	2.3						
		Minimum Diameter Tolerance Met?	YES				
		Length to Diameter Ratio Tolerance Met?	YES				

END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00070	-0.00060	-0.00050	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00020	0.00030
	Difference between max and min readings, in:														
	0° = 0.00030												90° = 0.00100		
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00020
Diameter 2, in (rotated 90°)	-0.00060	-0.00070	-0.00060	-0.00050	-0.00040	-0.00020	-0.00020	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Difference between max and min readings, in:														
	0° = 0.0004												90° = 0.0007		
	Maximum difference must be $<$ 0.0020 in.												Difference = \pm 0.00050		
	Flatness Tolerance Met? YES														



DIAMETER 1	
End 1:	Slope of Best Fit Line: 0.00008 Angle of Best Fit Line: 0.00458
End 2:	Slope of Best Fit Line: 0.00014 Angle of Best Fit Line: 0.00802
Maximum Angular Difference:	0.00344
Parallelism Tolerance Met?	YES
Spherically Seated	



DIAMETER 2	
End 1:	Slope of Best Fit Line: 0.00031 Angle of Best Fit Line: 0.01776
End 2:	Slope of Best Fit Line: 0.00031 Angle of Best Fit Line: 0.01776
Maximum Angular Difference:	0.00000
Parallelism Tolerance Met?	YES
Spherically Seated	

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						Maximum angle of departure must be \leq 0.25°	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00030	1.985	0.00015	0.009	YES		
Diameter 2, in (rotated 90°)	0.00100	1.985	0.00050	0.029	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00040	1.985	0.00020	0.012	YES		
Diameter 2, in (rotated 90°)	0.00070	1.985	0.00035	0.020	YES		



Client:	Freeman Companies, LLC
Project Name:	Reconstruction of Exit Charter Oak Bridge
Project Location:	Hartford, CT
GTX #:	304831
Test Date:	6/27/2016
Tested By:	daa
Checked By:	jsc
Boring ID:	S2-1
Sample ID:	C2
Depth, ft:	98.5-99



After cutting and grinding



After break

WALL 105 LAB TESTS

Draft



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/01/16
Depth :	---	Test Id:	382158
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
RW-9	UP- 1 - Top	67-69	Moist, reddish brown clay	52.9
RW-9	UP- 1 - Top middle	67-69	Moist, reddish brown clay	47.4
RW-9	UP- 1 - Bottom middle	67-69	Moist, reddish brown clay	45.9
RW-9	UP- 1 - Bottom	67-69	Moist, reddish brown clay	50.8
S1-11	UP- 1 - Top	61-63	Moist, reddish brown clay	40.4
S1-11	UP- 1 - Top middle	61-63	Moist, reddish brown clay	46.0
S1-11	UP- 1 - Bottom middle	61-63	Moist, reddish brown clay	62.6
S1-11	UP- 1 - Bottom	61-63	Moist, reddish brown clay	57.1

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/01/16
Depth :	---	Test Id:	382102
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
RW-9	UP- 3 - Top	76-78	Moist, reddish brown clay	68.9
RW-9	UP- 3 - Top middle	76-78	Moist, reddish brown clay	46.2
RW-9	UP- 3 - Bottom middle	76-78	Moist, reddish brown clay	46.8
RW-9	UP- 3 - Bottom	76-78	Wet, reddish brown clay	53.8
S1-11	UP- 3 - Top	69-71	Moist, reddish brown clay	44.9
S1-11	UP- 3 - Top middle	69-71	Moist, red clay	45.8
S1-11	UP- 3 - Bottom middle	69-71	Moist, reddish brown clay	36.6
S1-11	UP- 3 - Bottom	69-71	Moist, reddish brown clay	36.5

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	06/24/16
Depth :	---	Test Id:	382021
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
RW-5	UP- 3 - Top	45-47	Moist, reddish brown clay	55.2
RW-5	UP- 3 - Top middle	45-47	Moist, reddish brown clay	40.9
RW-5	UP- 3 - Bottom middle	45-47	Moist, reddish brown silt	36.1
RW-5	UP- 3 - Bottom	45-47	Wet, reddish brown silt	40.4
S2-1	Tube 1 - Top	52-54	Moist, dark reddish gray clay	44.4
S2-1	Tube 1 - Top middle	52-54	Moist, dark reddish gray clay	52.7
S2-1	Tube 1 - Bottom middle	52-54	Moist, dark reddish brown clay	39.2
S2-1	Tube 1 - Bottom	52-54	Moist, dark reddish brown clay	38.8

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	06/24/16
Depth :	---	Test Id:	382023
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
S2-1	Tube 2 - Top	62-64	Moist, dark reddish brown clay	43.8
S2-1	Tube 2 - Top middle	62-64	Moist, dark reddish brown clay	51.0
S2-1	Tube 2 - Bottom middle	62-64	Moist, dark reddish brown clay	44.0
S2-1	Tube 2 - Bottom	62-64	Moist, dark reddish brown clay	41.9
S2-1	Tube 3 - Top	72-74	Moist, dark reddish brown clay	38.5
S2-1	Tube 3 - Top middle	72-74	Moist, dark reddish brown clay	47.4
S2-1	Tube 3 - Bottom middle	72-74	Moist, reddish brown clay	39.4
S2-1	Tube 3 - Bottom	72-74	Moist, reddish brown clay	45.3

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	---	Tested By:	jbr
Boring ID:	---	Test Date:	07/26/16	Checked By:	emm
Sample ID:	---	Test Id:	384878		
Depth :	---				

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
S1-2	S-2	4-6 ft	Moist, red sand with gravel	7.1	6.5
S1-5	S-3	10-12 ft	Moist, reddish brown silt with gravel	7.4	6.2
S1-S12	S-2	5-7 ft	Moist, reddish brown silt with gravel	8.1	7.2
S2-1	S-4	15-17 ft	Moist, reddish brown silt with gravel	6.8	6.6
S2-3	S-2	5-7 ft	Moist, reddish brown clay	7.5	7.3
S-0480-1	S-5	14-16 ft	Moist, olive brown silt	4.5	4.3
S-0480-2	S-3	9-11 ft	Moist, olive brown silt	6.3	6.0
S-06043-1	S-2	5-7 ft	Moist, brown sand	7.5	6.8

Notes: Sample Preparation: screened through #10 sieve
 Method A, pH meter used



Client:	Freeman Companies, LLC
Project:	Reconstruction of Exit Charter Oak Bridge
Location:	Hartford, CT
GTX#:	304831
Test Date:	07/26/16
Tested By:	jbr
Checked By:	emm

**Laboratory Measurement of Soil Resistivity Using
 the Wenner Four-Electrode Method by ASTM G57
 (Laboratory Measurement)**

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, (ohm-cm) ⁻¹
S1-2	S-2	4-6	Moist, red sand with gravel	4,442	2.25E-04
S1-5	S-3	10-12	Moist, reddish brown silt with gravel	3,099	3.23E-04
S1-S12	S-2	5-7	Moist, reddish brown silt with gravel	1,963	5.09E-04
S2-1	S-4	15-17	Moist, reddish brown silt with gravel	1,343	7.45E-04
S2-3	S-2	5-7	Moist, reddish brown clay	486	2.06E-03
S-0480-1	S-5	14-16	Moist, olive brown silt	3,099	3.23E-04
S-0480-2	S-3	9-11	Moist, olive brown silt	1,892	5.28E-04
S-06043-1	S-2	5-7	Moist, brown sand	15,496	6.45E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
 Water added to sample to create a thick slurry prior to testing (saturated condition).
 Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
 Test conducted in standard laboratory atmosphere: 68-73 F



6100 HILLCROFT
PHONE (713) 369-5400

HOUSTON, TEXAS 77081
FAX (713) 369-5518

RESULTS OF TESTS

PROJECT: RECONSTRUCTOION OF EXIT CHARTER OAK BRIDGE
(GTX 304831)

REPORT DATE: 08-01-16

FOR: GEOTESTING EXPRESS, INC.
125 NAGOG PARK ACTION, MA 01720

CLIENT NUMBER:
JOB NUMBER: 04.1115-0003

REPORTED TO: ETHAN MARRO

REPORT NUMBER:
DATE SAMPLED:
TIME SAMPLED:
SAMPLED BY: CLIENT
DATE RECEIVED:
TIME RECEIVED:
RECEIVED BY:

SOLUBLE SULFATE AASHTO T-290

SAMPLE ID	RESULTS	UNITS	LAB No.	TIME/DATE	ANALYST
S1-S, S-2, 4 – 6'	< 30 *	mg/kg	0726052	1100/08-01-16	SD
S1-5, S-3, 10 – 12'	57 *	mg/kg	0726053	1100/08-01-16	SD
S1-12, S-2, 5 – 7'	< 50 *	mg/kg	0726054	1100/08-01-16	SD
S2-1, S-4, 15 – 17'	< 50 *	mg/kg	0726055	1100/08-01-16	SD
S2-3, S-2, 5 – 7'	297 *	mg/kg	0726056	1100/08-01-16	SD
S-0480-1, S-5, 14 – 16'	543 *	mg/kg	0726057	1100/08-01-16	SD
S-0480-2, S-3, 9 – 11'	355 *	mg/kg	0726058	1100/08-01-16	SD
S-06043-41, S-2, 5 – 7'	< 30*	mg/kg	0726059	1100/08-01-16	SD

SO4CL 069-16

Respectfully submitted,

* Dry weight basis

Steve DeGregorio
Chemist

SD

** WATER EXTRACTION PERFORMED BY USING A 1:10 RATIO OF SAMPLE AND REAGENT WATER FOLLOWED BY CENTRIFUGE AND VACUUME FILTRATION. THE WATER EXTRACT IS THEN ANALYZED USING THE ASTM D-512 AND D-516 METHODS.

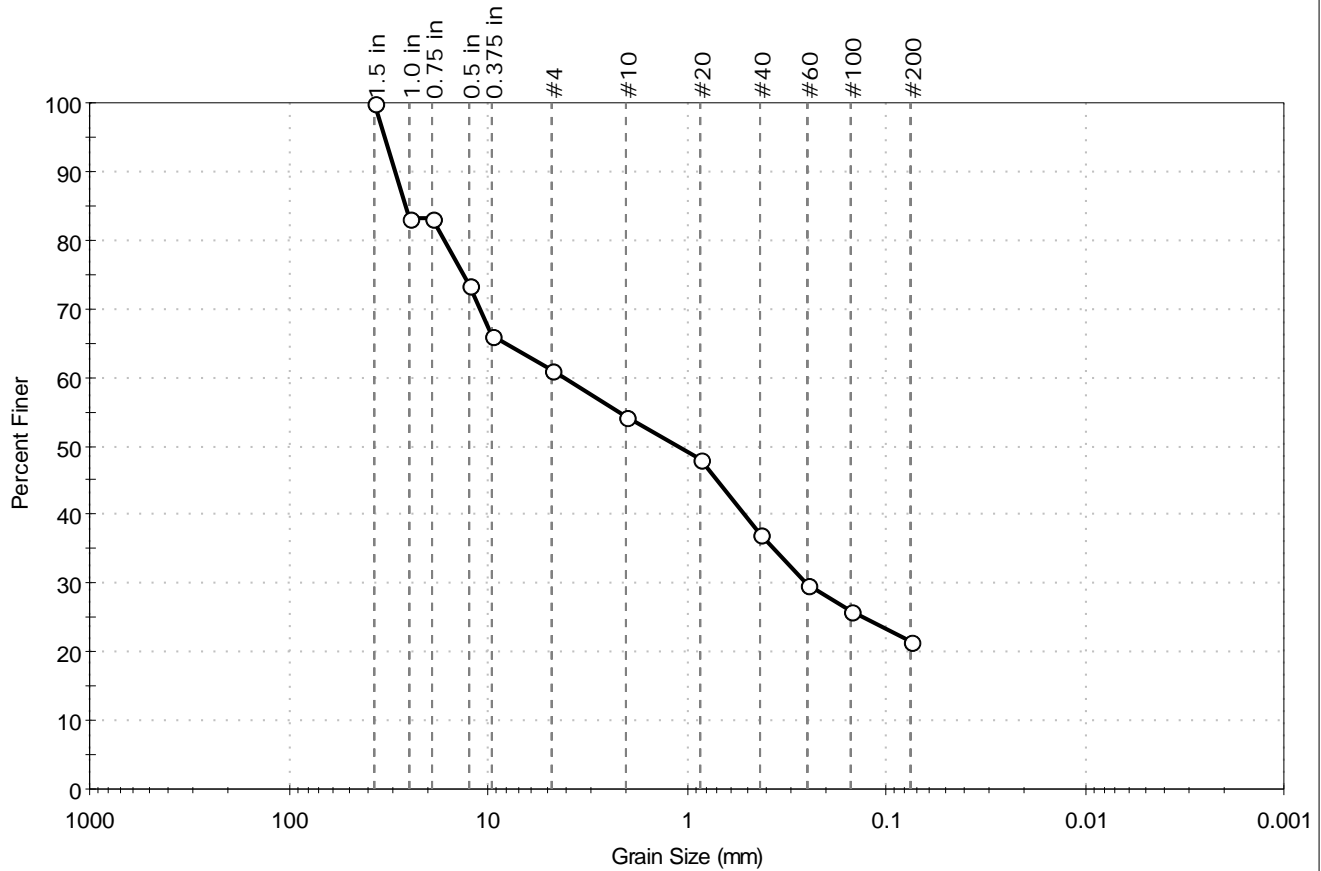
THE RESULTS RELATE AS TO THE LOCATION TESTED AND NO OTHER REFERENCE SHALL BE MADE.
THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF THE LABORATORY.

END OF REPORT



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S2-1	Sample Type:	jar
Sample ID:	S-3	Test Date:	08/02/16
Depth :	10-12 ft	Test Id:	384940
Test Comment:	---		
Visual Description:	Moist, dark reddish brown clayey sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	38.8	39.6	21.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1.0 in	25.00	83		
0.75 in	19.00	83		
0.5 in	12.50	73		
0.375 in	9.50	66		
#4	4.75	61		
#10	2.00	54		
#20	0.85	48		
#40	0.42	37		
#60	0.25	30		
#100	0.15	26		
#200	0.075	22		

<u>Coefficients</u>	
D ₈₅ = 26.1716 mm	D ₃₀ = 0.2527 mm
D ₆₀ = 4.1015 mm	D ₁₅ = N/A
D ₅₀ = 1.0976 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

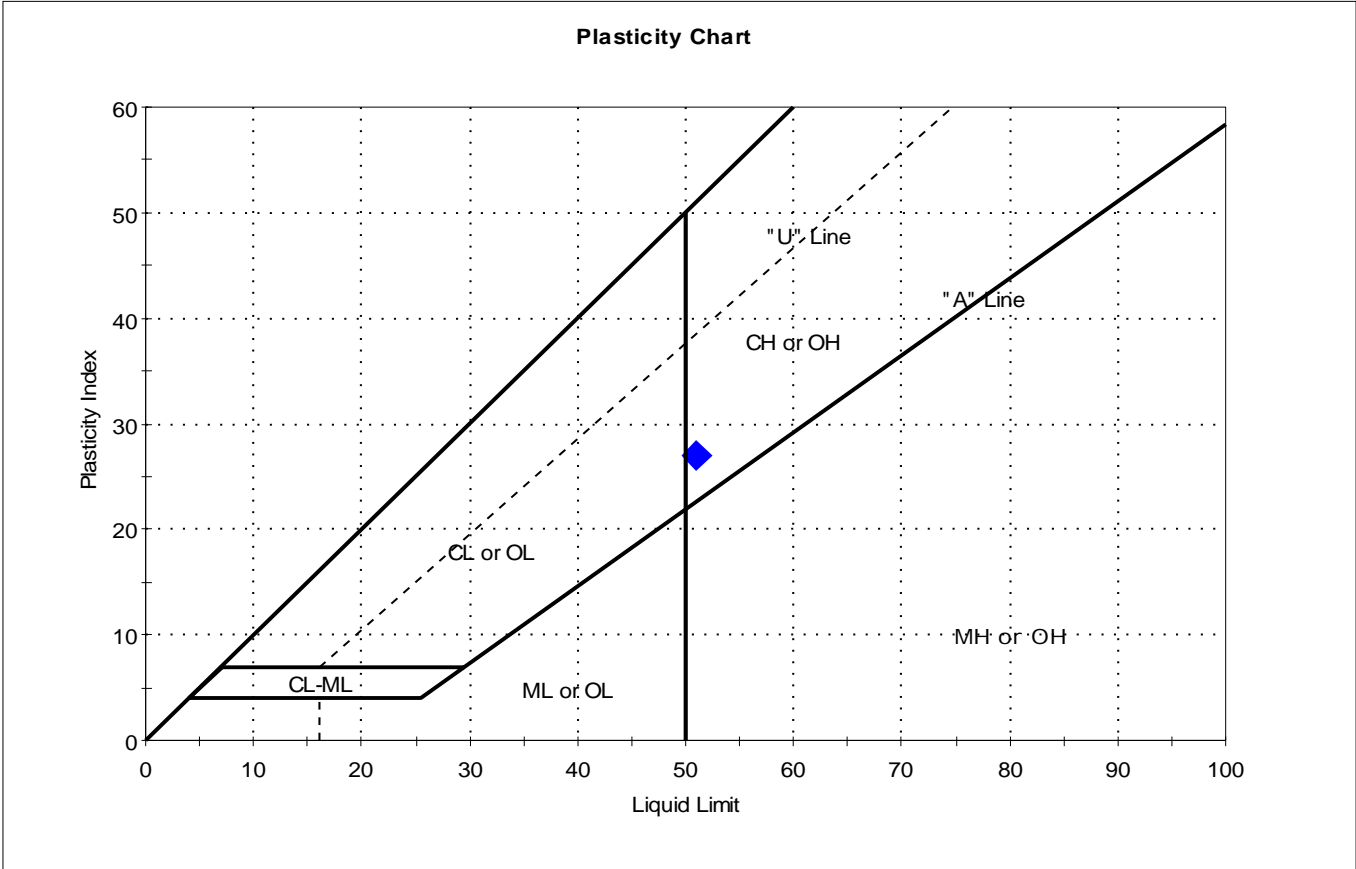
<u>Classification</u>	
<u>ASTM</u>	N/A
<u>AASHTO</u>	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-9	Sample Type:	tube
Sample ID:	UP-1 - Top middle	Test Date:	07/12/16
Depth :	67-69	Test Id:	382165
Test Comment:	---		
Visual Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Top middle	RW-9	67-69	47	51	24	27	0.9	

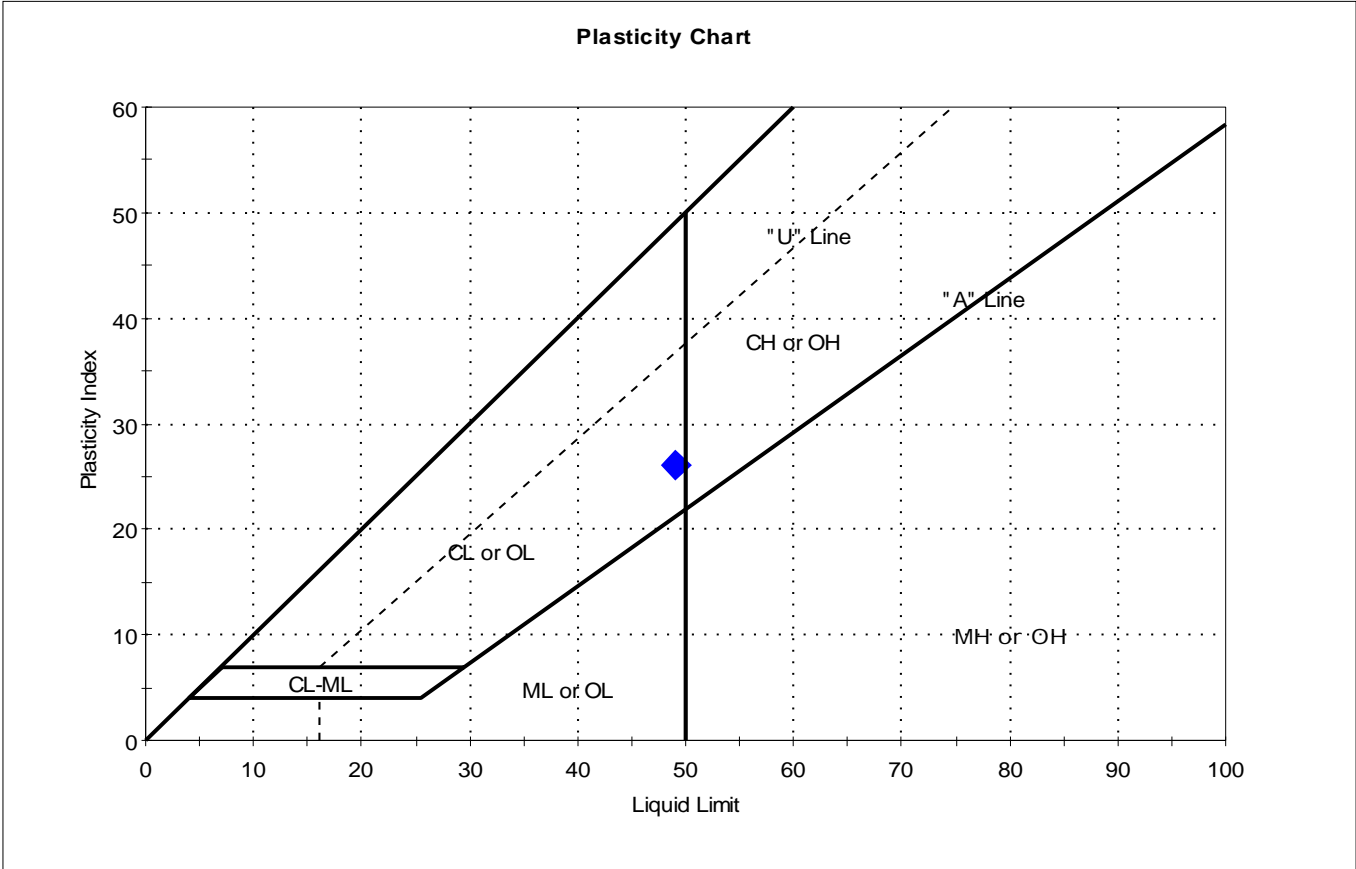
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	cam
Boring ID:	RW-9	Test Date:	07/08/16	Checked By:	emm
Sample ID:	UP-1 - Bottom	Test Id:	382163		
Depth :	67-69				
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Bottom	RW-9	67-69	51	49	23	26	1.1	

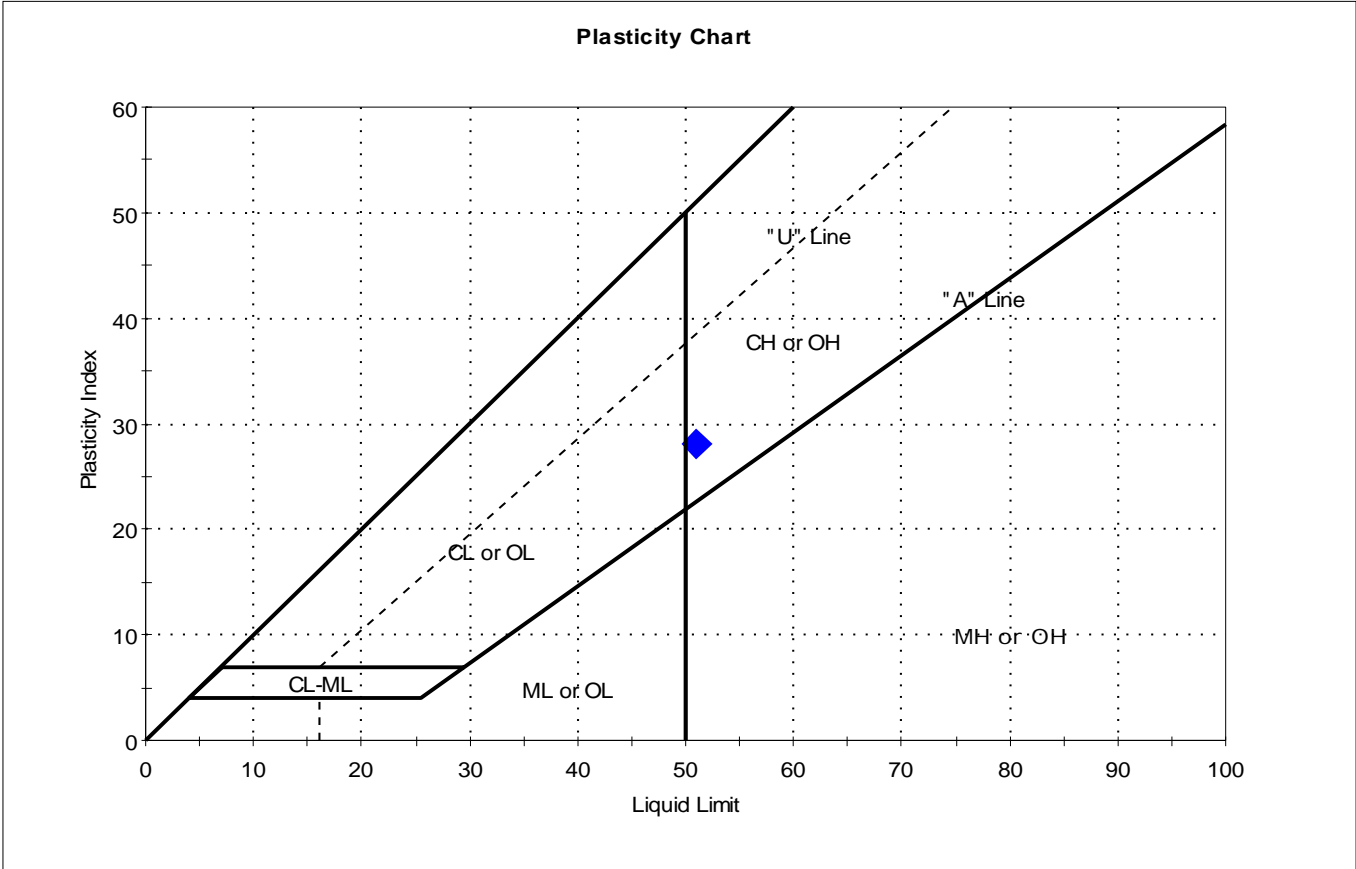
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	RW-9	Sample Type:	tube
Sample ID:	UP-3 - Top middle	Test Date:	07/13/16
Depth :	76-78	Test Id:	382111
Test Comment:	---		
Visual Description:	Moist, reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-3 - Top middle	RW-9	76-78	46	51	23	28	0.8	

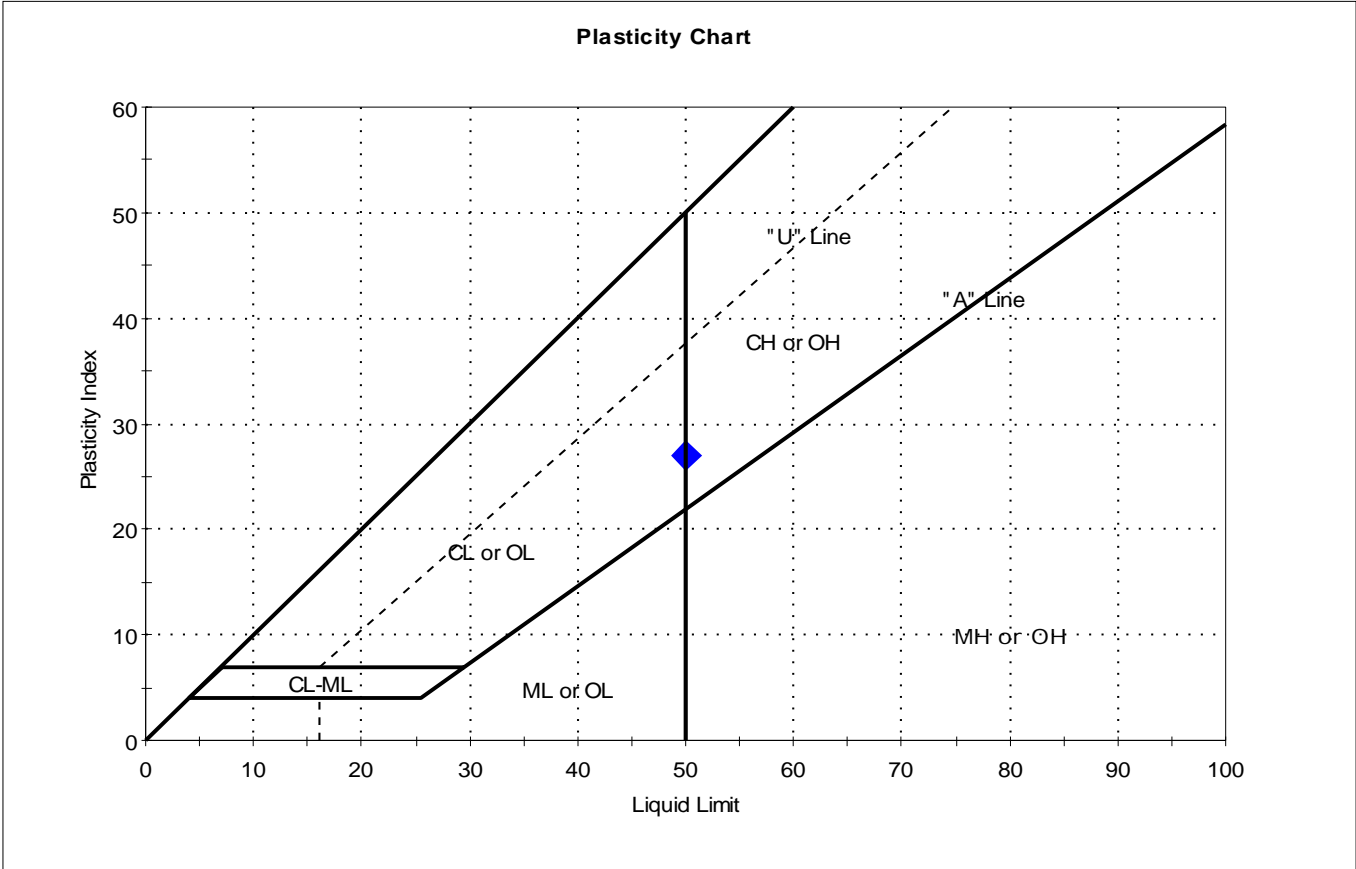
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	GA
Boring ID:	RW-9	Test Date:	07/13/16	Checked By:	emm
Sample ID:	UP-3 - Bottom	Test Id:	382107		
Depth :	76-78				
Test Comment:	---				
Visual Description:	Wet, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-3 - Bottom	RW-9	76-78	54	50	23	27	1.1	

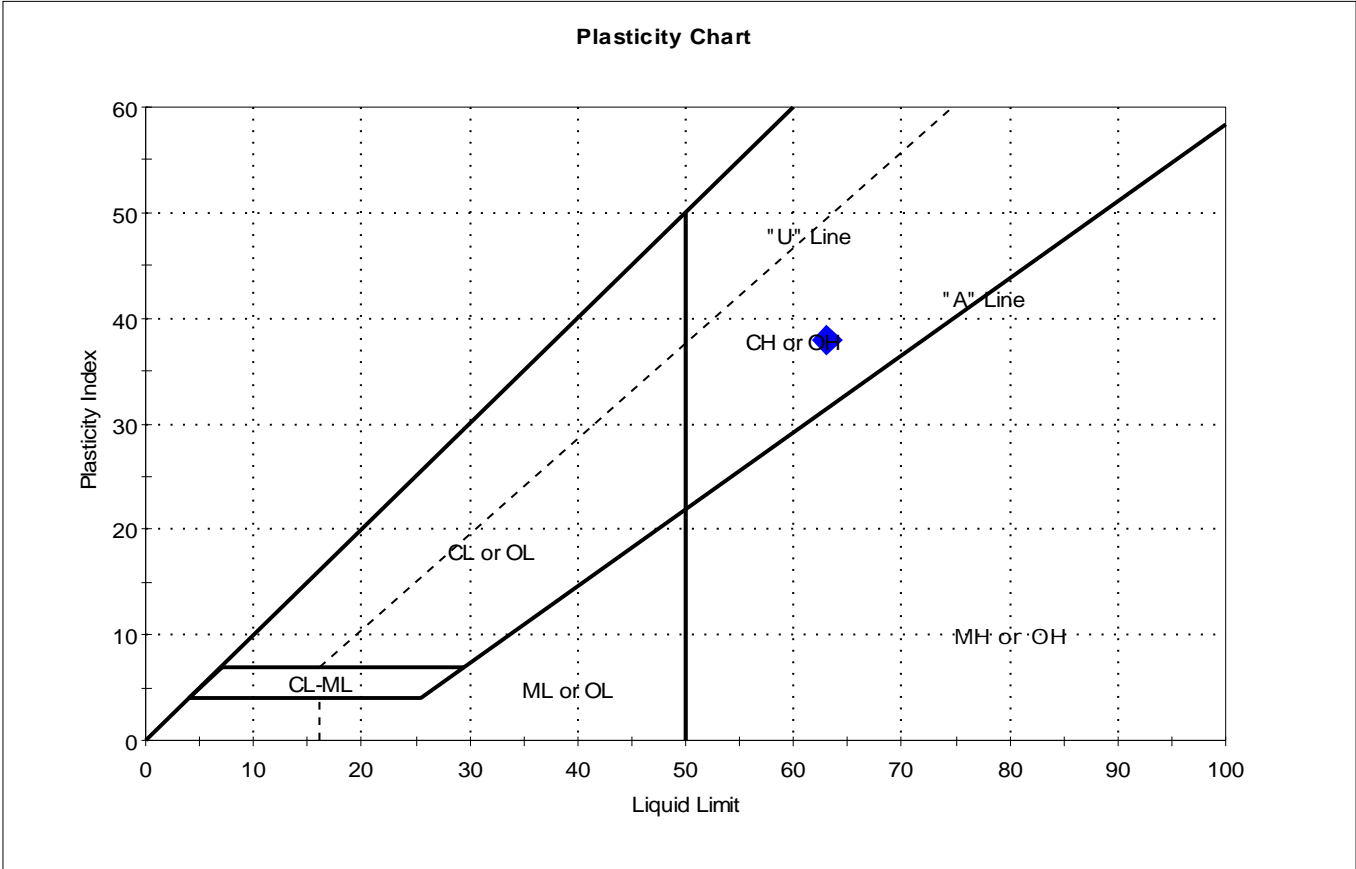
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: NONE
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S2-1	Sample Type:	tube
Sample ID:	Tube 1 - Top middle	Test Date:	06/28/16
Depth :	52-54	Test Id:	382075
Test Comment:	---		
Visual Description:	Moist, dark reddish gray clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 1 - Top middle	S2-1	52-54	53	63	25	38	0.7	

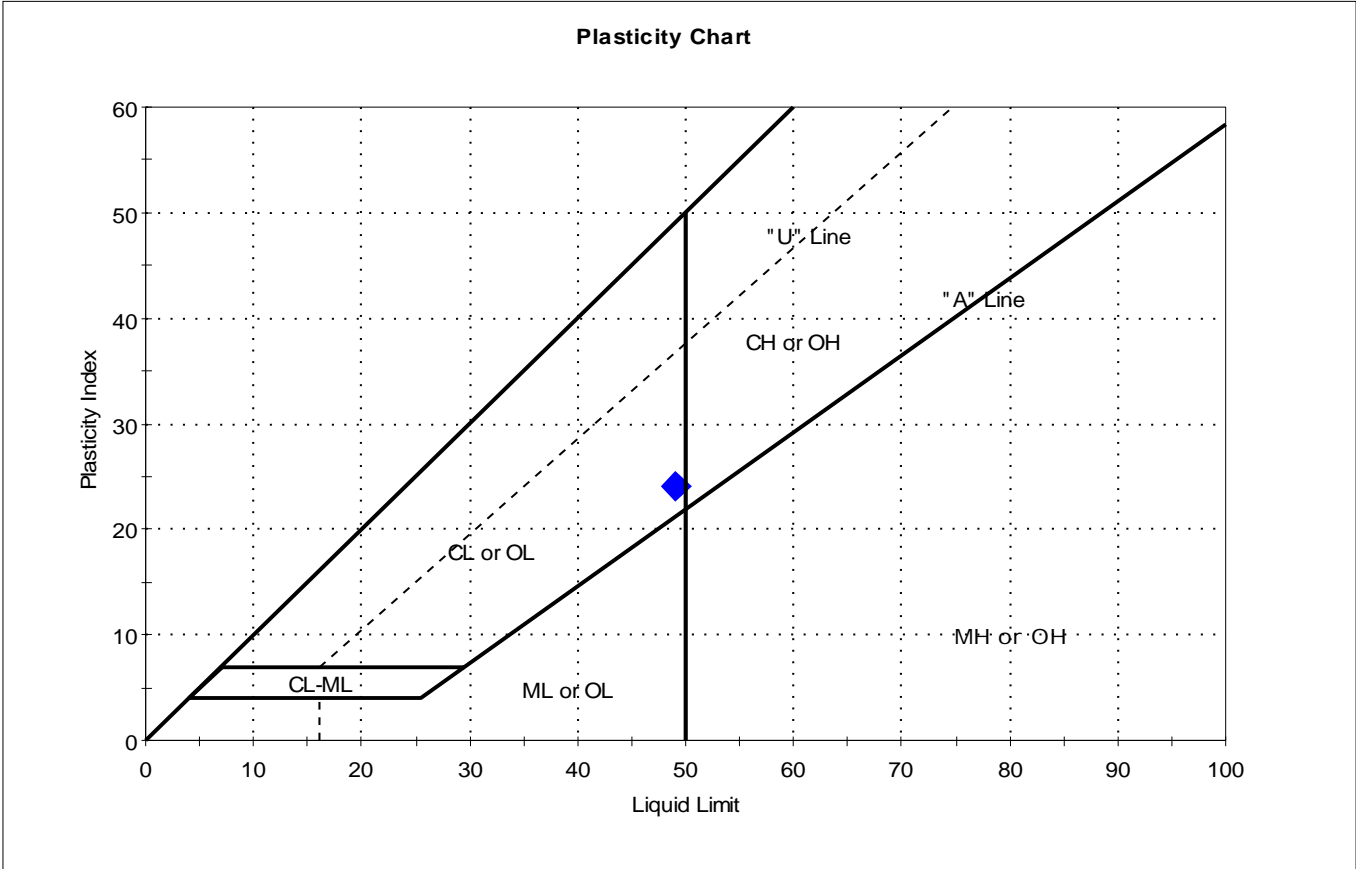
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S2-1	Sample Type:	tube
Sample ID:	Tube 1 - Bottom	Test Date:	06/29/16
Depth :	52-54	Test Id:	382001
Test Comment:	---		
Visual Description:	Moist, dark reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 1 - Bottom	S2-1	52-54	39	49	25	24	0.6	

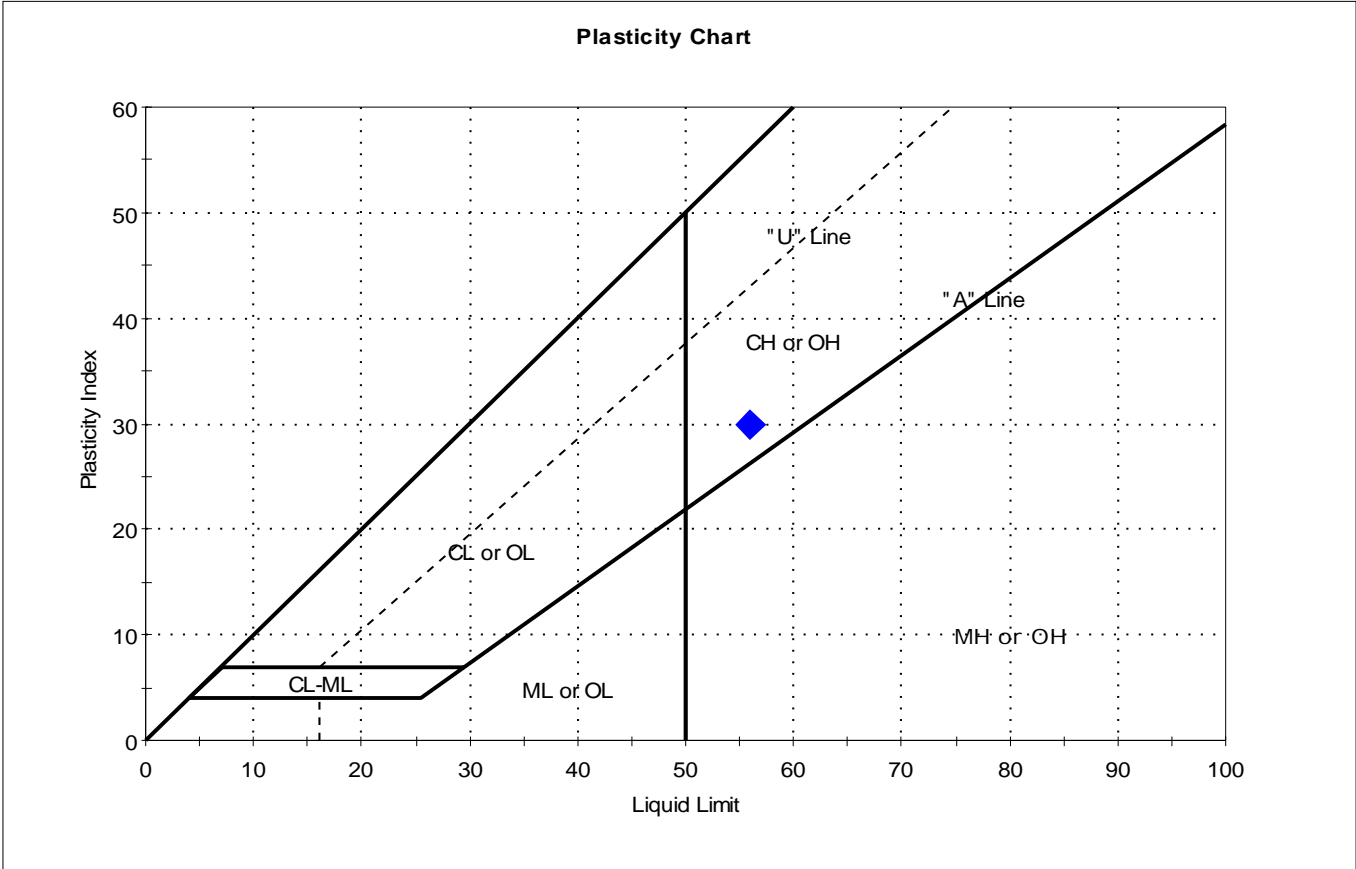
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S2-1	Sample Type:	tube
Sample ID:	Tube 2 - Top middle	Test Date:	06/28/16
Depth :	62-64	Test Id:	382076
Test Comment:	---		
Visual Description:	Moist, dark reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 2 - Top middle	S2-1	62-64	51	56	26	30	0.8	

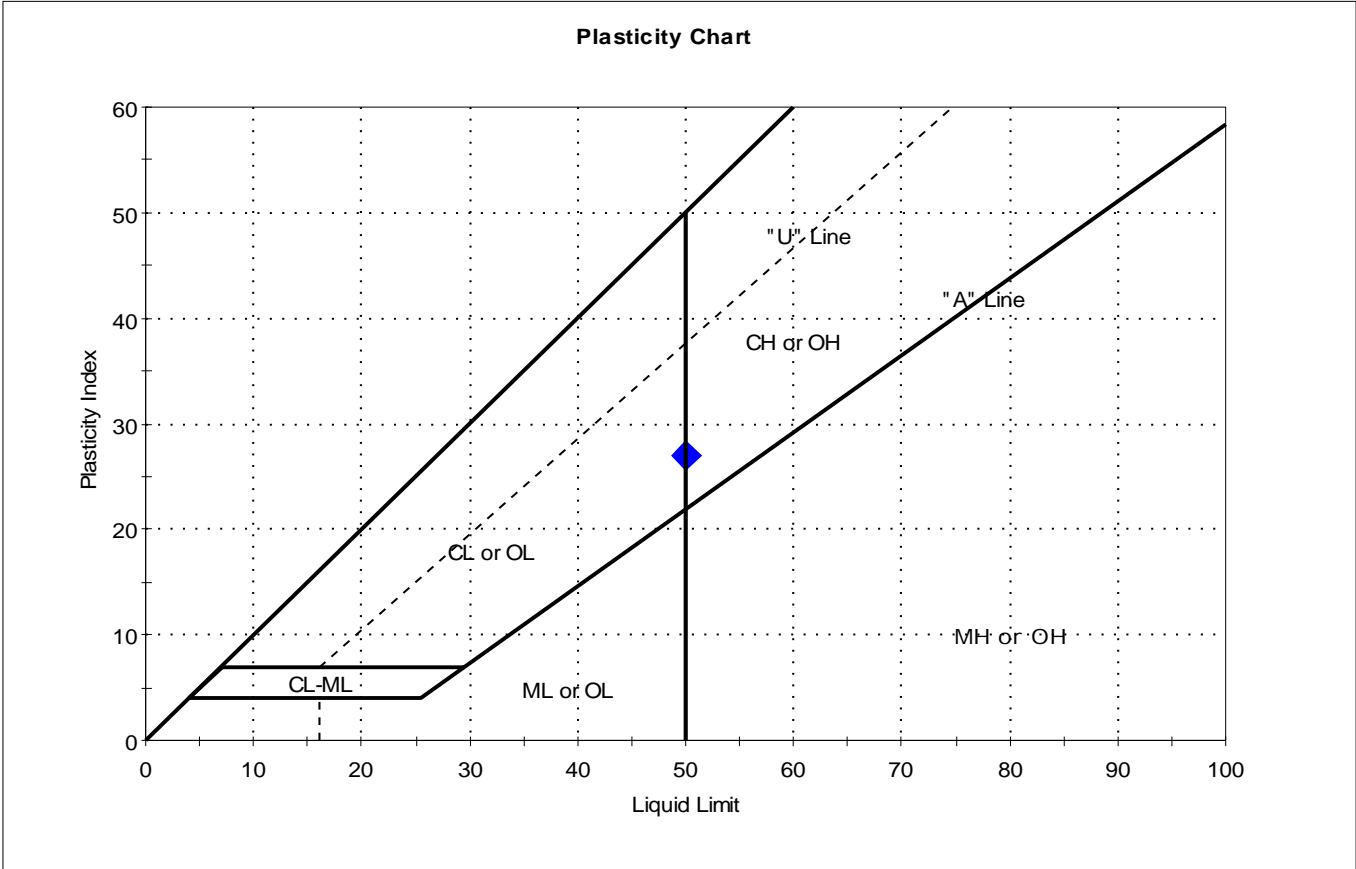
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S2-1	Sample Type:	tube
Sample ID:	Tube 2 - Bottom	Test Date:	06/28/16
Depth :	62-64	Test Id:	382002
Test Comment:	---		
Visual Description:	Moist, dark reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 2 - Bottom	S2-1	62-64	42	50	23	27	0.7	

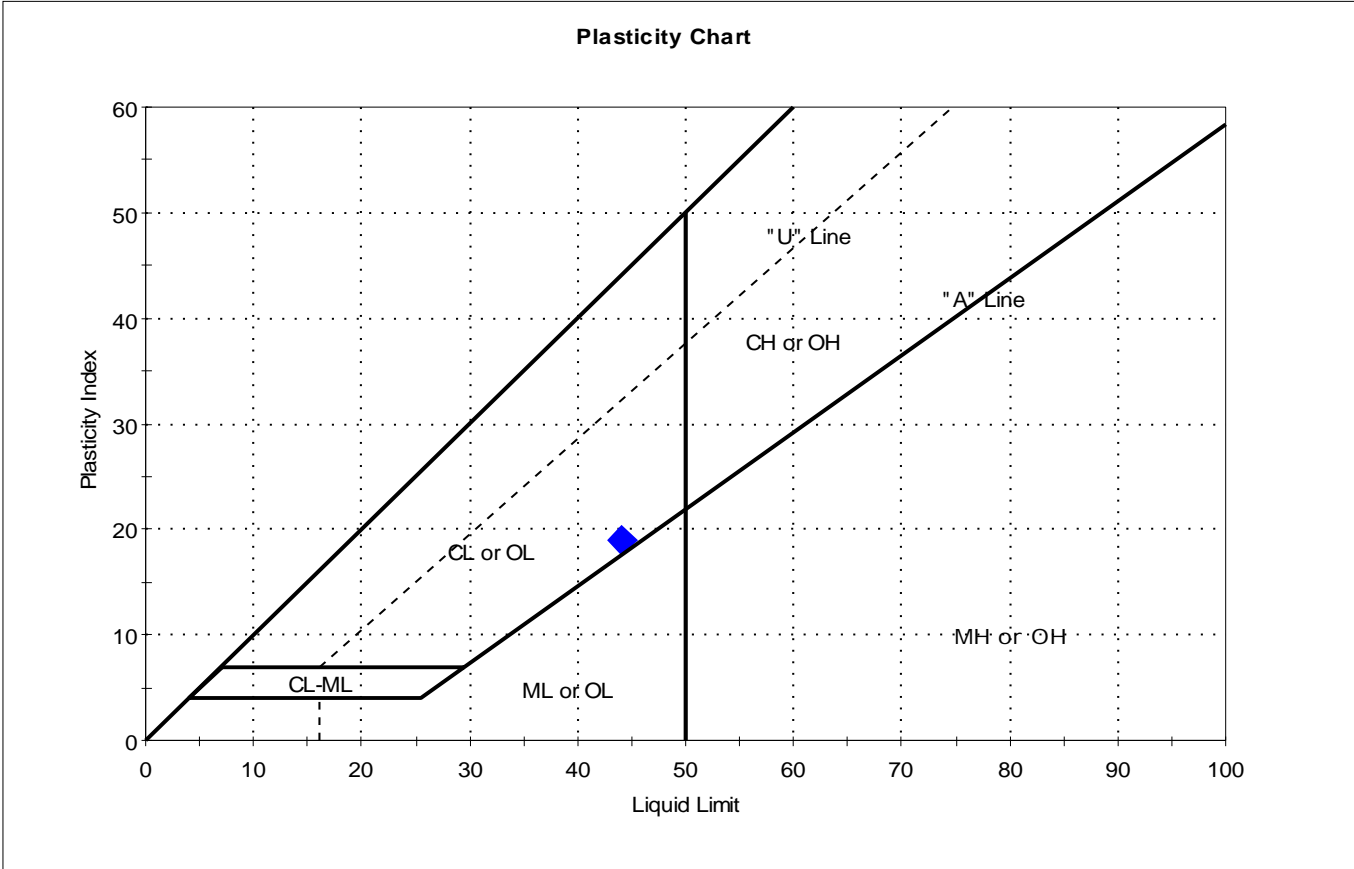
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S2-1	Sample Type:	tube
Sample ID:	Tube 3 - Top middle	Test Date:	06/28/16
Depth :	72-74	Test Id:	382080
Test Comment:	---		
Visual Description:	Moist, dark reddish brown clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 3 - Top middle	S2-1	72-74	47	44	25	19	1.2	

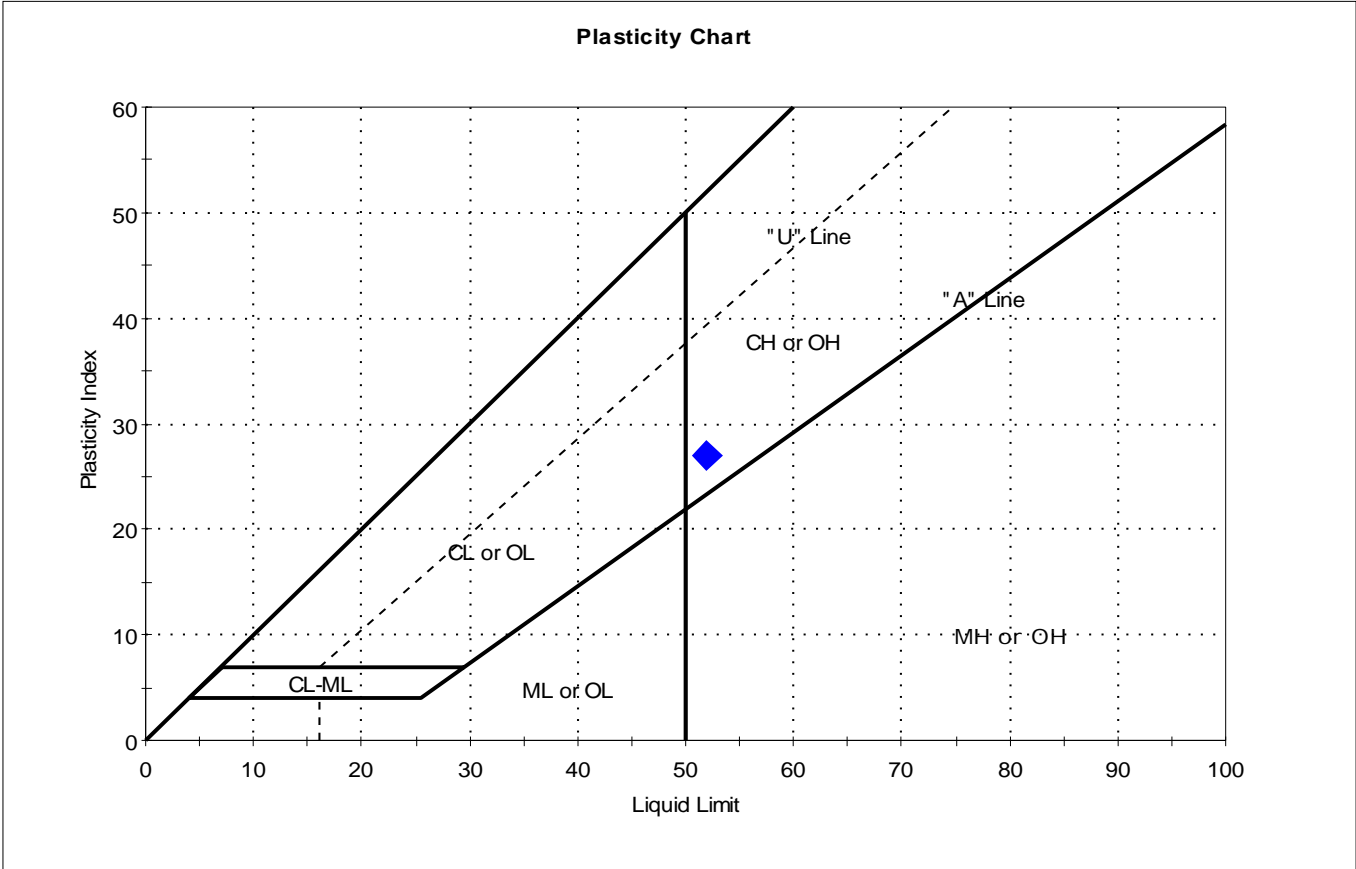
Sample Prepared using the WET method

Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	cam
Boring ID:	S2-1	Test Date:	06/28/16	Checked By:	emm
Sample ID:	Tube 3 - Bottom	Test Id:	382003		
Depth :	72-74				
Test Comment:	---				
Visual Description:	Moist, reddish brown clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90

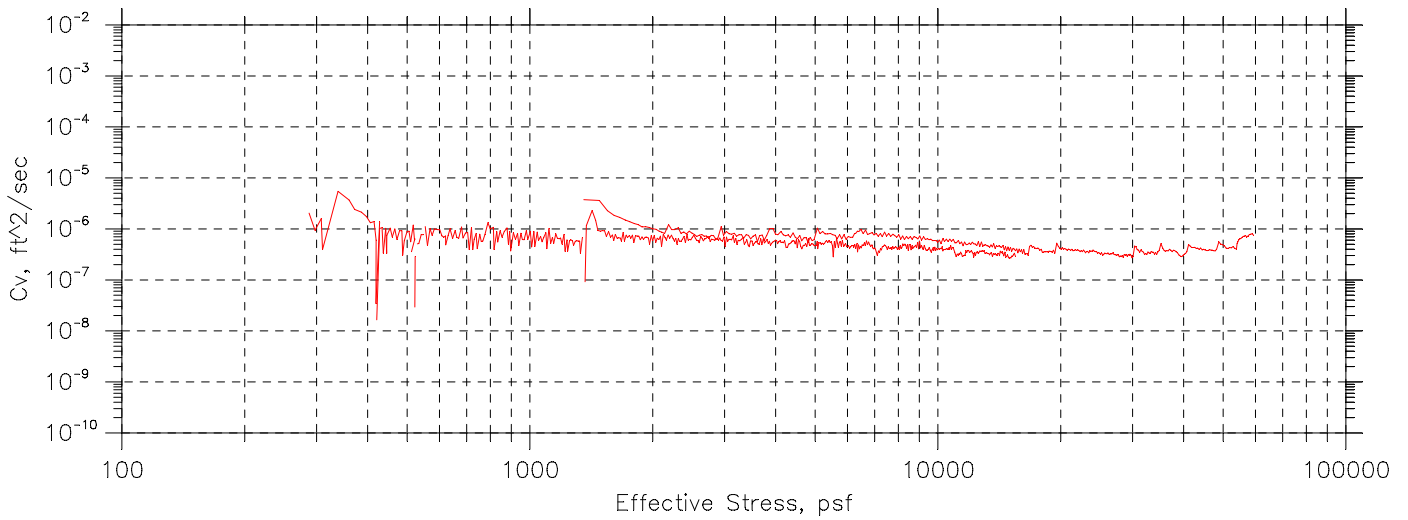
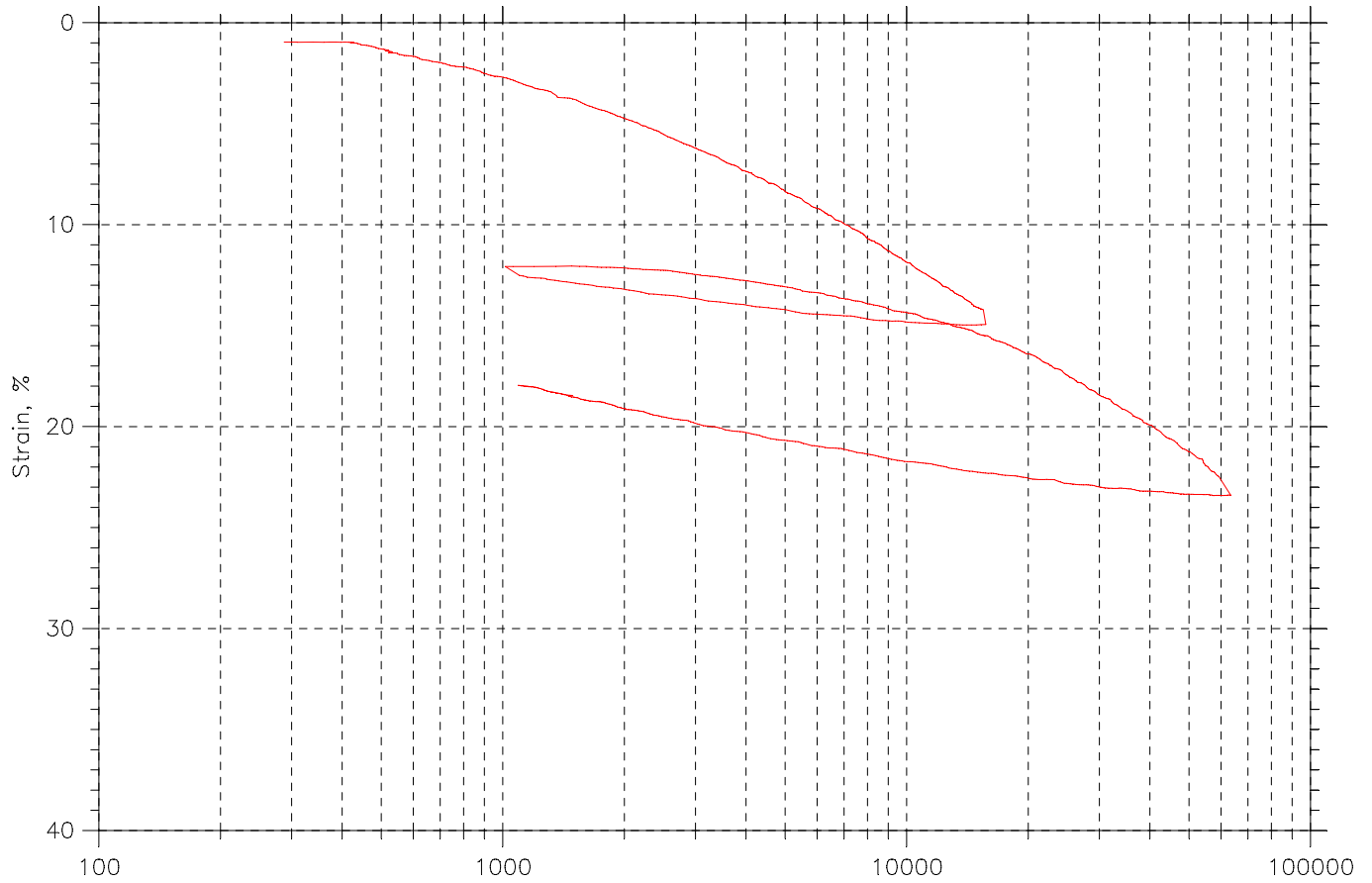


Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	Tube 3 - Bottom	S2-1	72-74	45	52	25	27	0.8	

Sample Prepared using the WET method

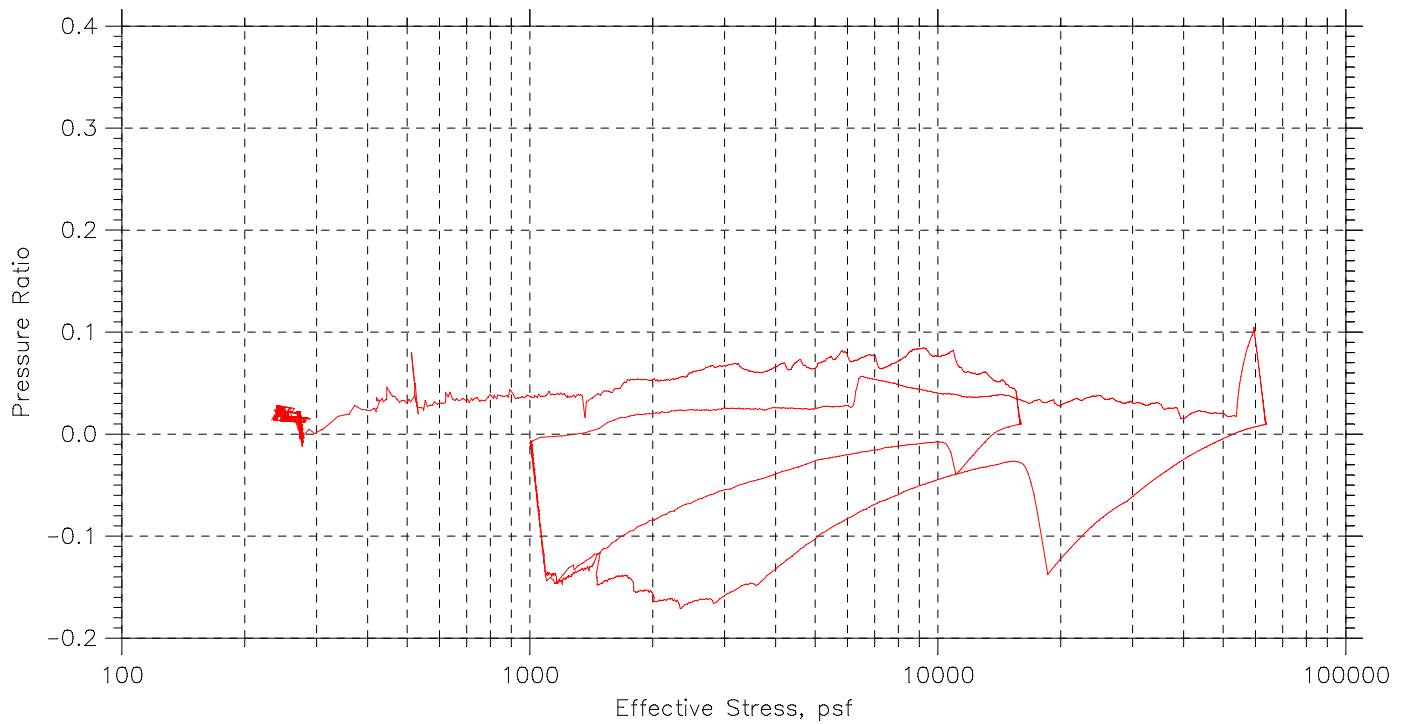
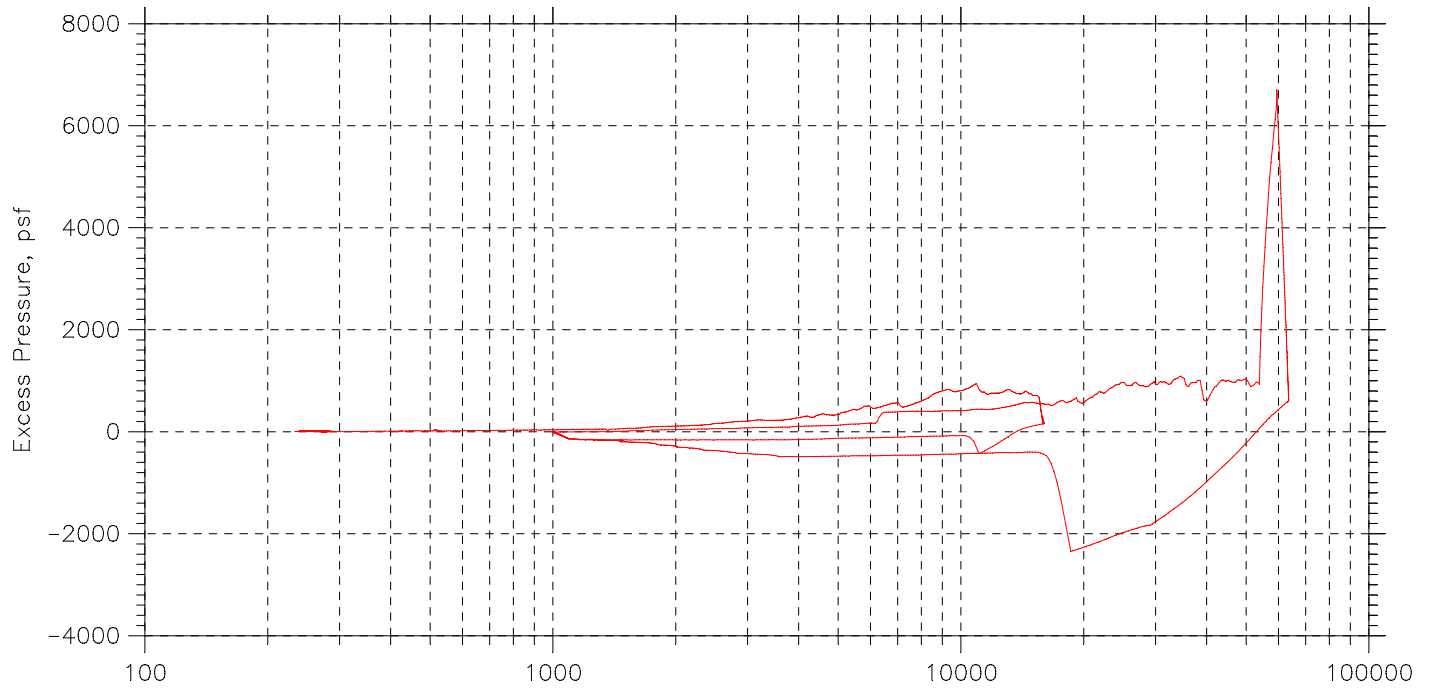
Dry Strength: VERY HIGH
 Dilatancy: SLOW
 Toughness: LOW

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-9	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/09/16	Depth: 67-69 ft
Test No.: CRC-9	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System Y		
Page 1 of 3		

Constant Rate of Consolidation
Constant Strain Rate by ASTM D4186
Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-9	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/09/16	Depth: 67-69 ft
Test No.: CRC-9	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System Y		
Page 2 of 3		

CRC TEST DATA

EXPRESS

Project: Reconstruction of Exit
 Boring No.: RW-9
 Sample No.: UP-1
 Test No.: CRC-9

Location: Hartford, CT
 Tested By: md
 Test Date: 06/09/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 67-69 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System Y

Estimated Specific Gravity: 2.79
 Initial Void Ratio: 1.30
 Final Void Ratio: 1.02

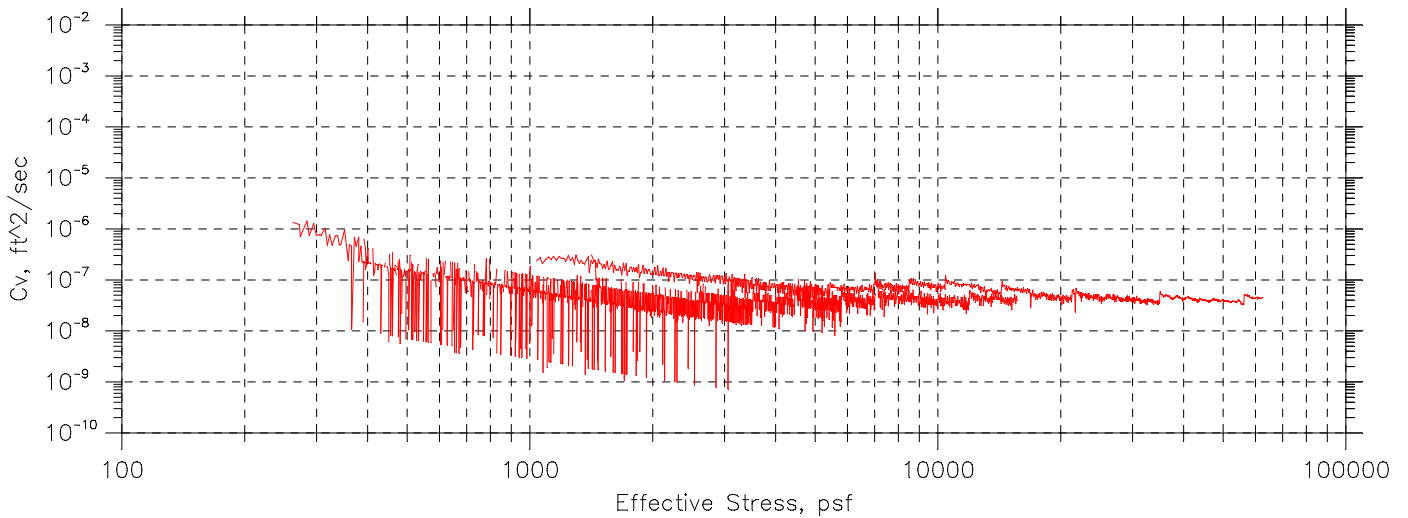
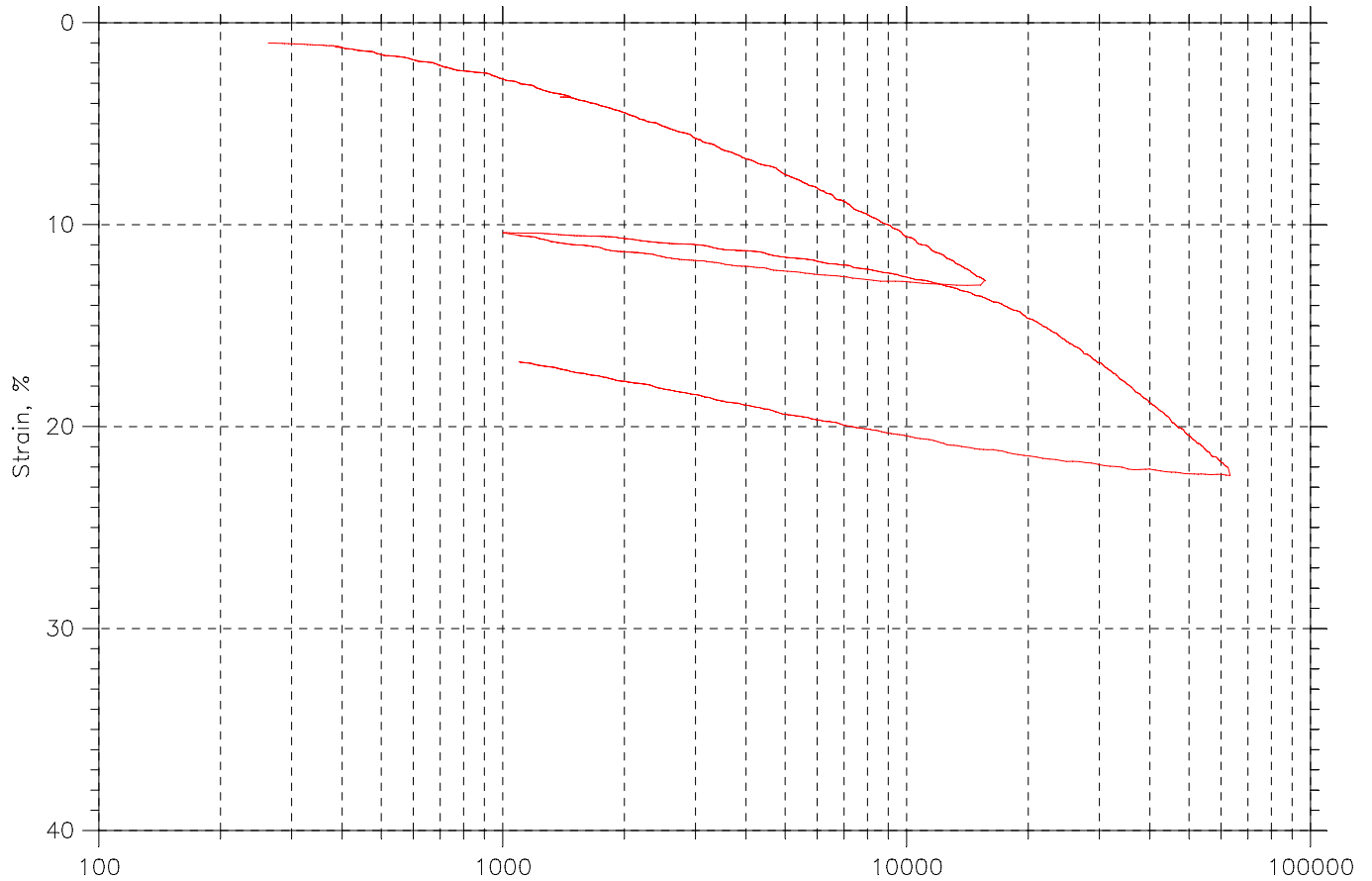
Liquid Limit: 49
 Plastic Limit: 23
 Plasticity Index: 26

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.88 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	A-1052	RING		B346
Wt. Container + Wet Soil, gm	227.92	252.71	243.18	140.32
Wt. Container + Dry Soil, gm	153.97	207.42	207.42	104.95
Wt. Container, gm	8.4300	109.52	109.52	8.1100
Wt. Dry Soil, gm	145.54	97.902	97.902	96.840
Water Content, %	50.81	46.26	36.52	36.52
Void Ratio	---	1.30	1.02	---
Degree of Saturation, %	---	99.73	100.00	---
Dry Unit Weight, pcf	---	75.980	86.341	---

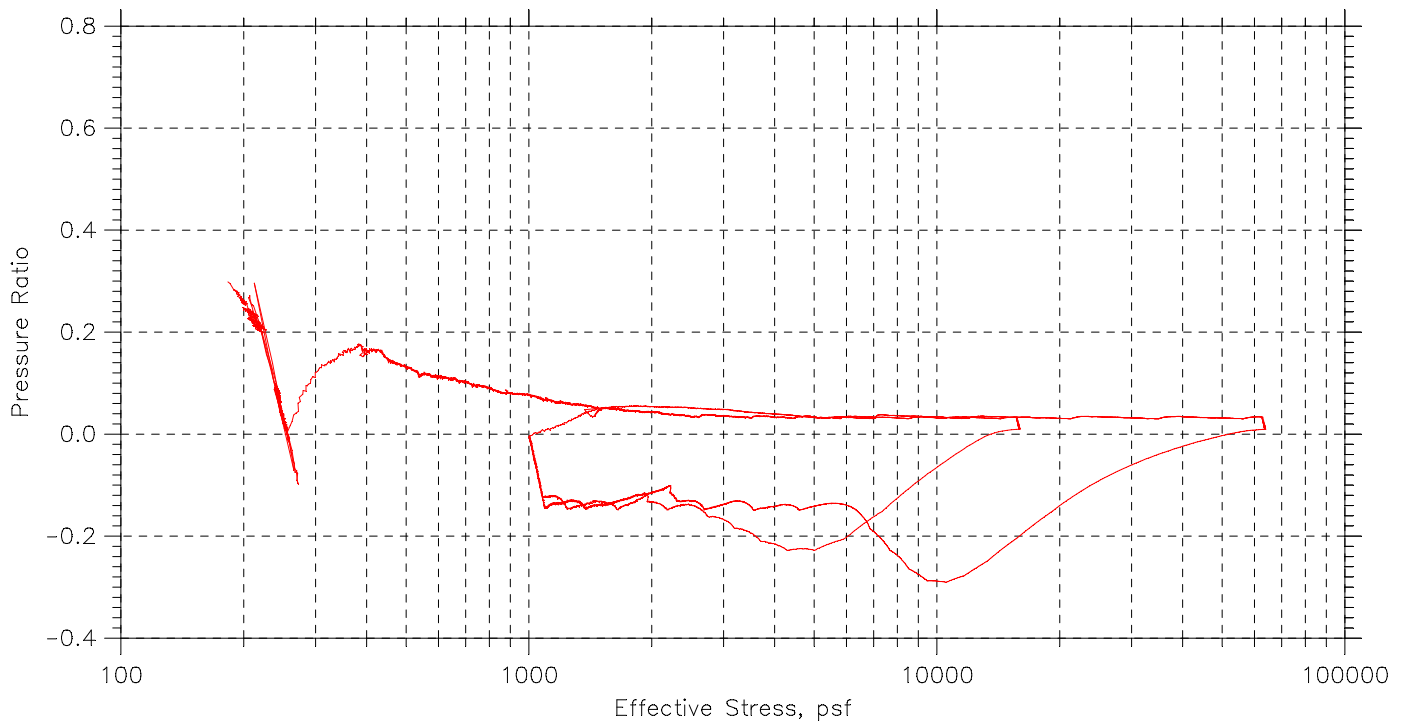
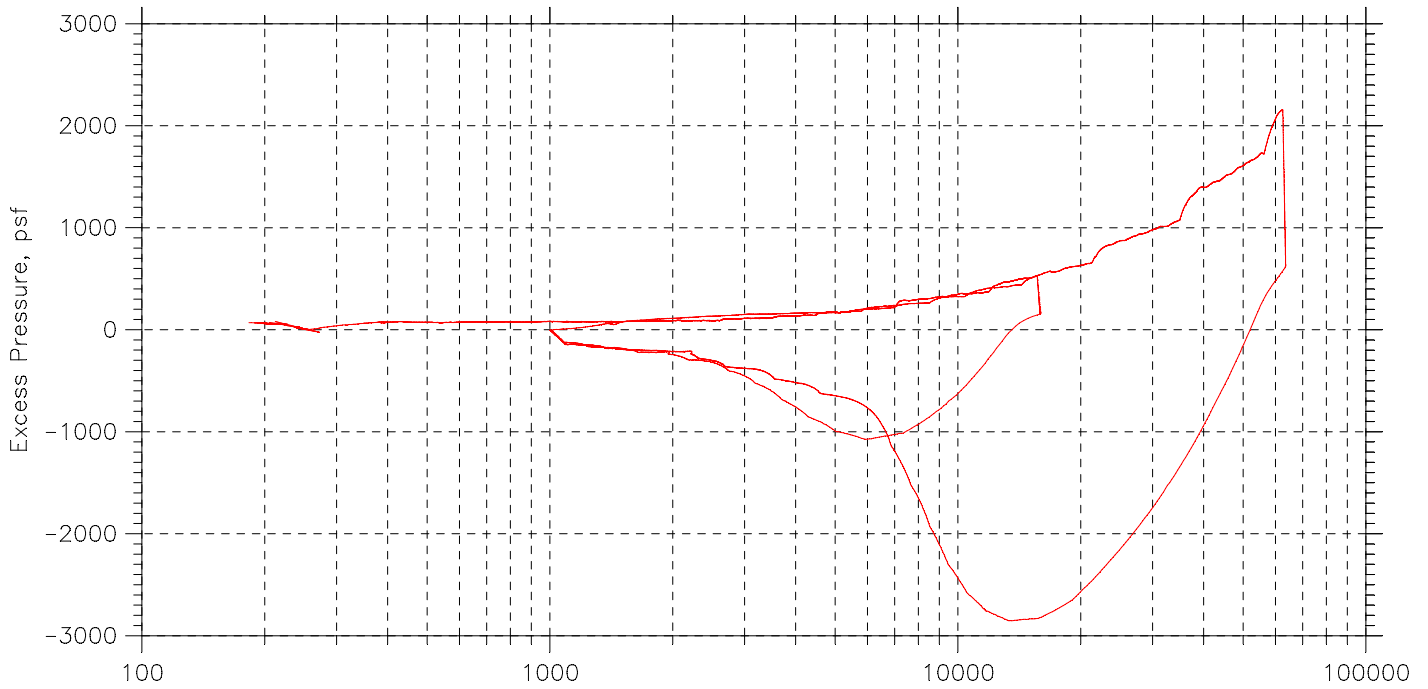
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-9	Tested By: md	Checked By: njh
Sample No.: UP-3	Test Date: 06/06/16	Depth: 76-78 ft
Test No.: CRC-5	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System V		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: RW-9	Tested By: md	Checked By: njh
Sample No.: UP-3	Test Date: 06/06/16	Depth: 76-78 ft
Test No.: CRC-5	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System V		
Page 2 of 3		

CRC TEST DATA

EXPRESS

Project: Reconstruction of Exit
 Boring No.: RW-9
 Sample No.: UP-3
 Test No.: CRC-5

Location: Hartford, CT
 Tested By: md
 Test Date: 06/06/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 76-78 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System V

Estimated Specific Gravity: 2.82
 Initial Void Ratio: 1.26
 Final Void Ratio: 0.987

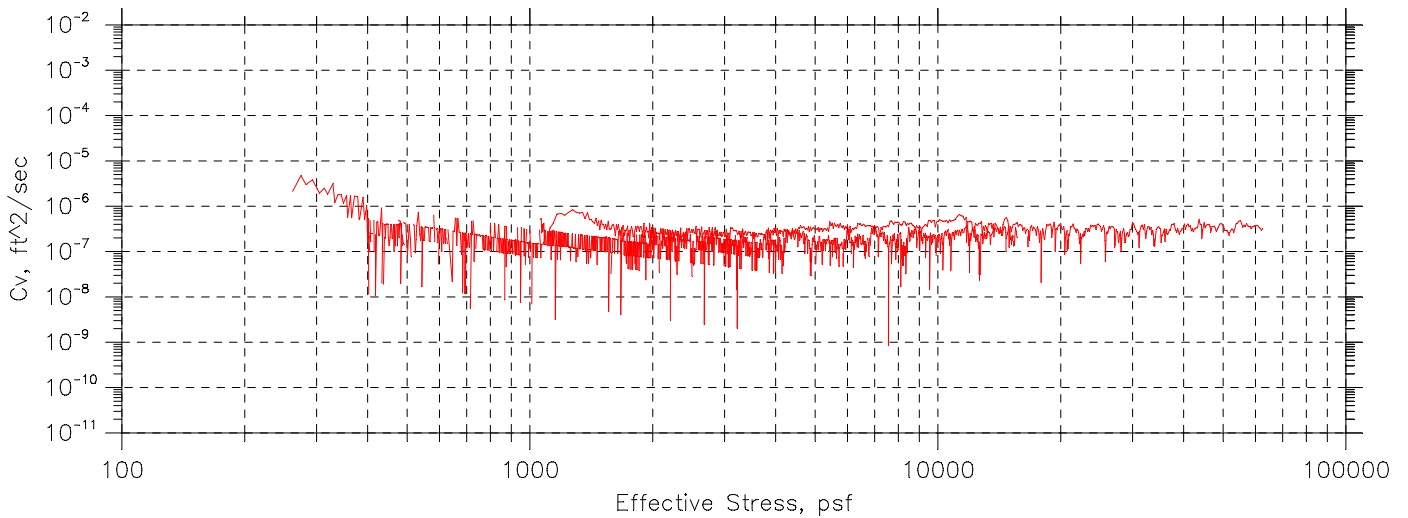
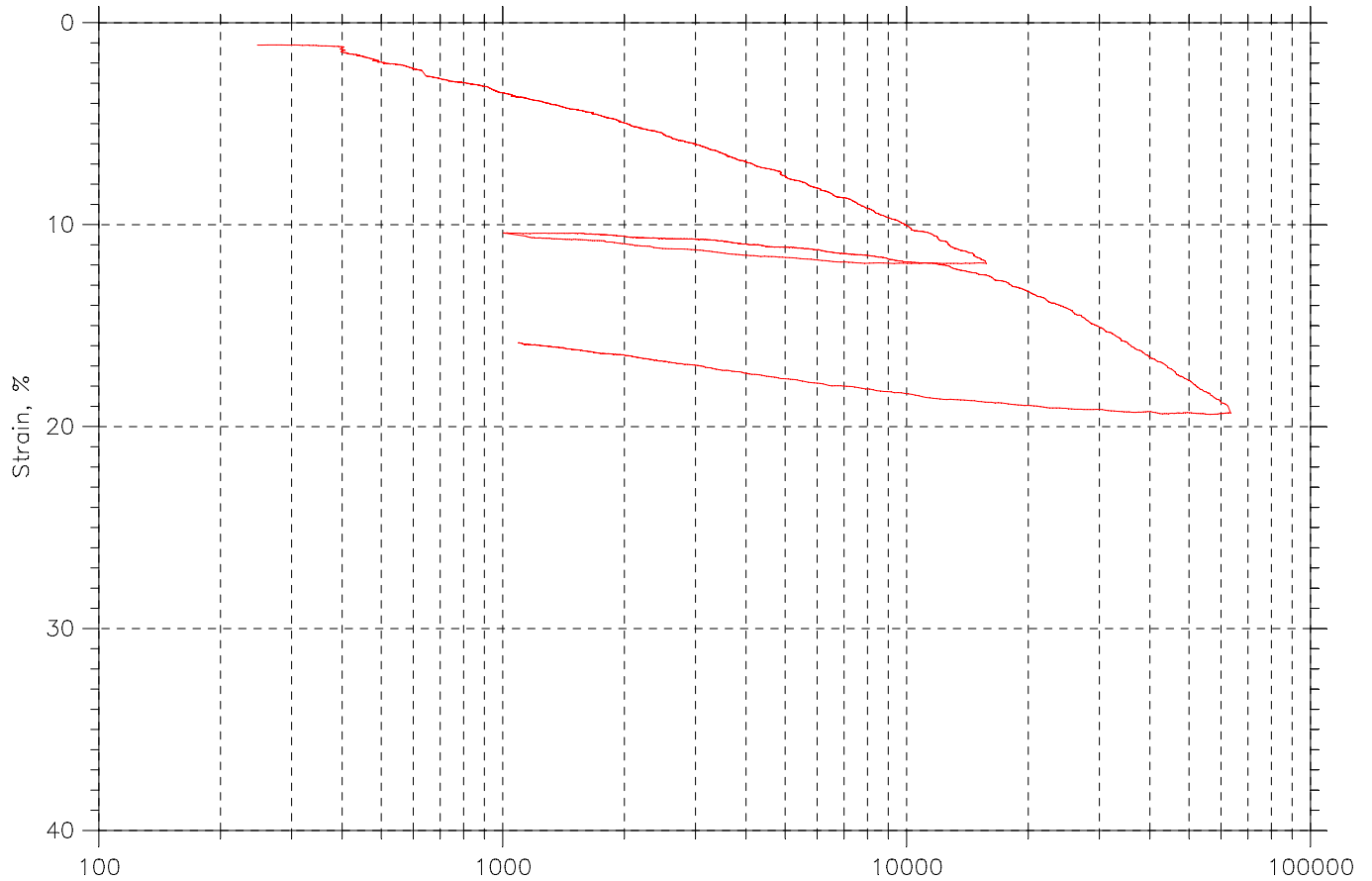
Liquid Limit: 50
 Plastic Limit: 23
 Plasticity Index: 27

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.88 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	A-701	RING		a582
Wt. Container + Wet Soil, gm	231.54	252.79	243.41	144.56
Wt. Container + Dry Soil, gm	153.55	208.25	208.25	109.23
Wt. Container, gm	8.5600	107.91	107.91	8.4200
Wt. Dry Soil, gm	144.99	100.34	100.34	100.81
Water Content, %	53.79	44.39	35.05	35.05
Void Ratio	---	1.26	0.987	---
Degree of Saturation, %	---	99.39	100.00	---
Dry Unit Weight, pcf	---	77.869	88.488	---

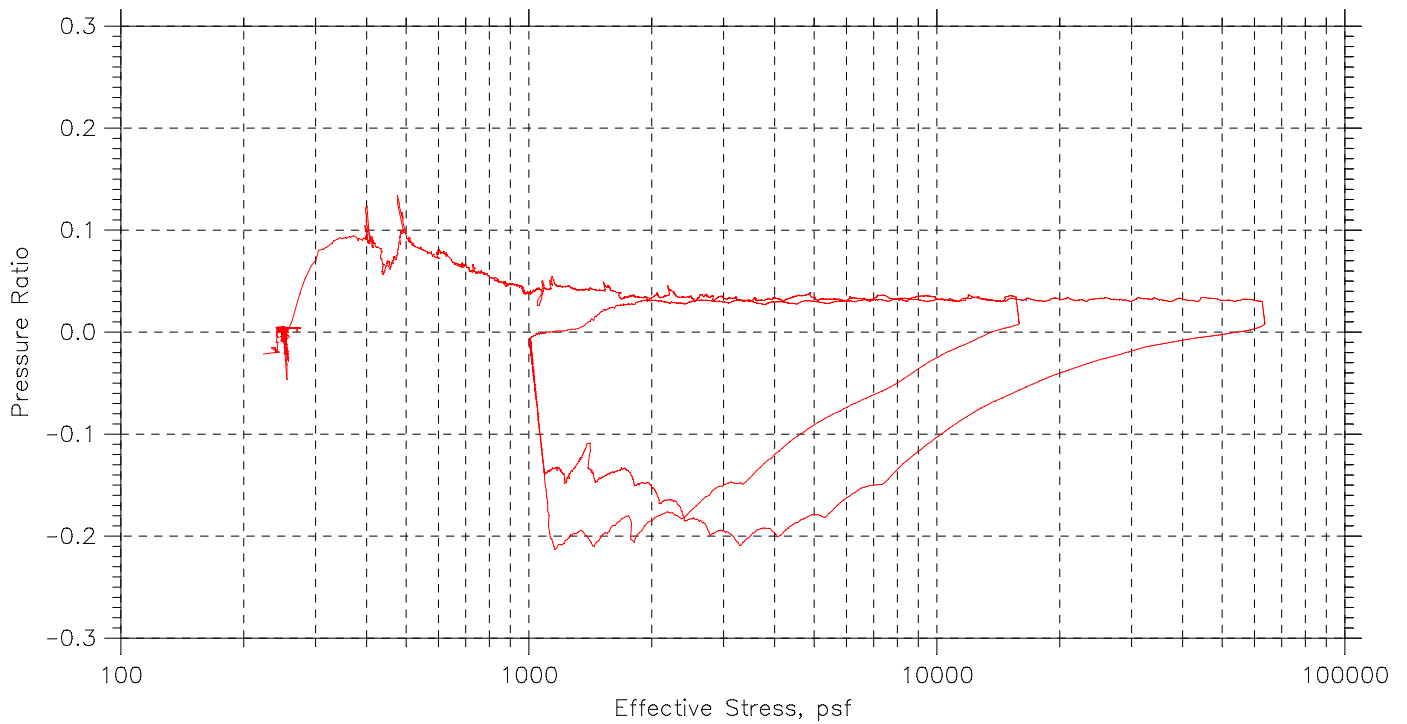
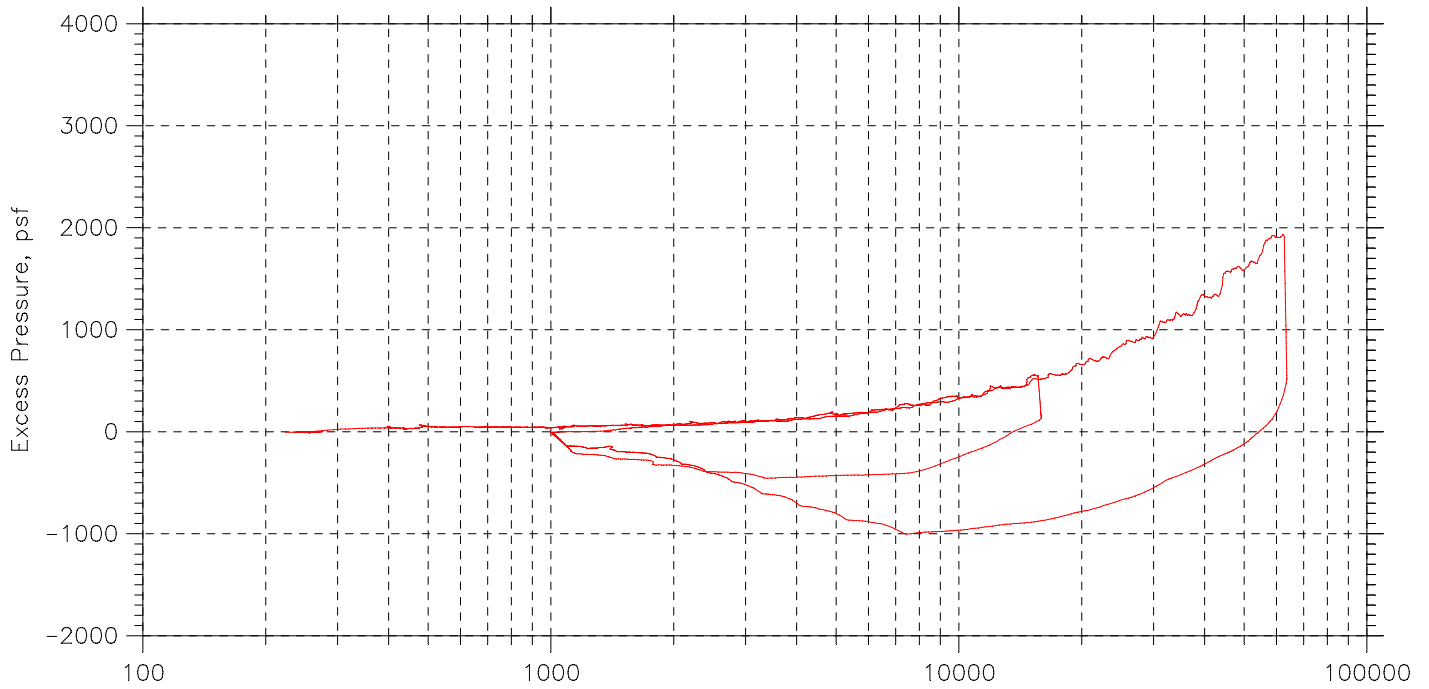
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-1 Bott	Test Date: 06/27/16	Depth: 52-54 ft
Test No.: CRC-14	Sample Type: intact	Elevation: ---
Description: Moist, dark reddish brown clay		
Remarks: System Y		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-1 Bott	Test Date: 06/27/16	Depth: 52-54 ft
Test No.: CRC-14	Sample Type: intact	Elevation: ---
Description: Moist, dark reddish brown clay		
Remarks: System Y		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: S2-1
 Sample No.: Tube-1 Bott
 Test No.: CRC-14

Location: Hartford, CT
 Tested By: md
 Test Date: 06/27/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 52-54 ft
 Elevation: ---

Soil Description: Moist, dark reddish brown clay
 Remarks: System Y

Estimated Specific Gravity: 2.83
 Initial Void Ratio: 1.12
 Final Void Ratio: 0.927

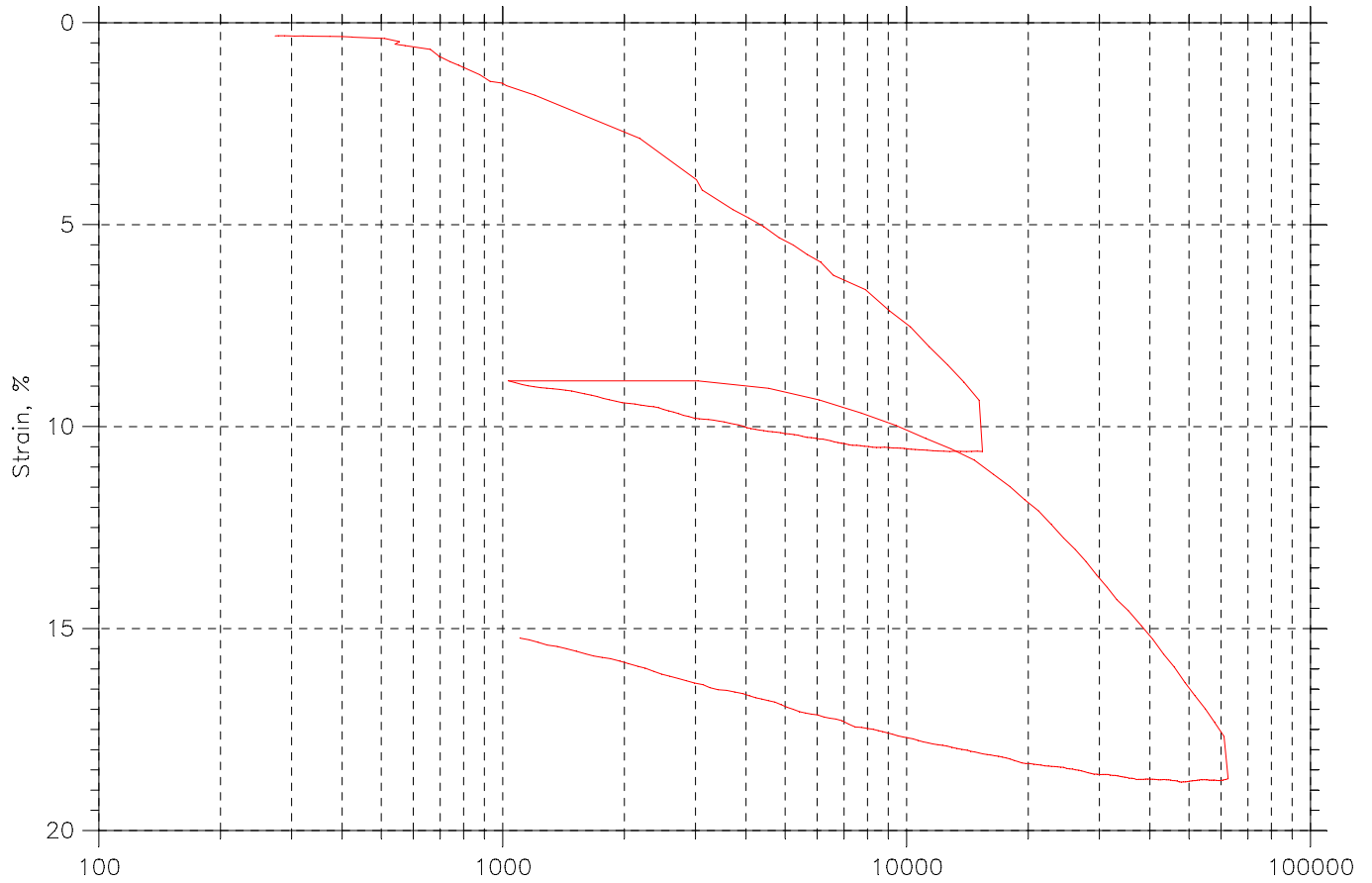
Liquid Limit: 49
 Plastic Limit: 25
 Plasticity Index: 24

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.91 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	16961	RING		c1561
Wt. Container + Wet Soil, gm	117.49	259.01	252.04	149.79
Wt. Container + Dry Soil, gm	86.960	216.82	216.82	114.93
Wt. Container, gm	8.3300	109.18	109.18	8.3800
Wt. Dry Soil, gm	78.630	107.64	107.64	106.55
Water Content, %	38.83	39.19	32.72	32.72
Void Ratio	---	1.12	0.927	---
Degree of Saturation, %	---	99.37	100.00	---
Dry Unit Weight, pcf	---	83.540	91.802	---

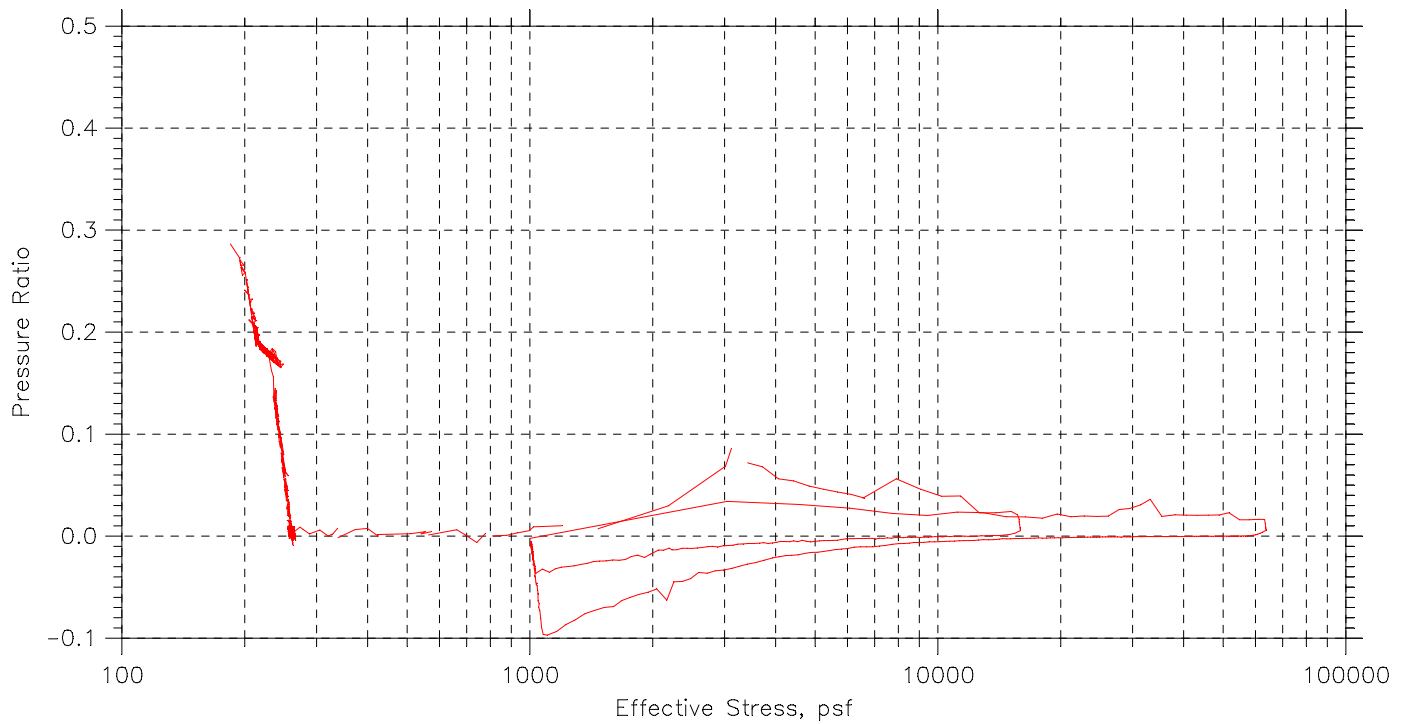
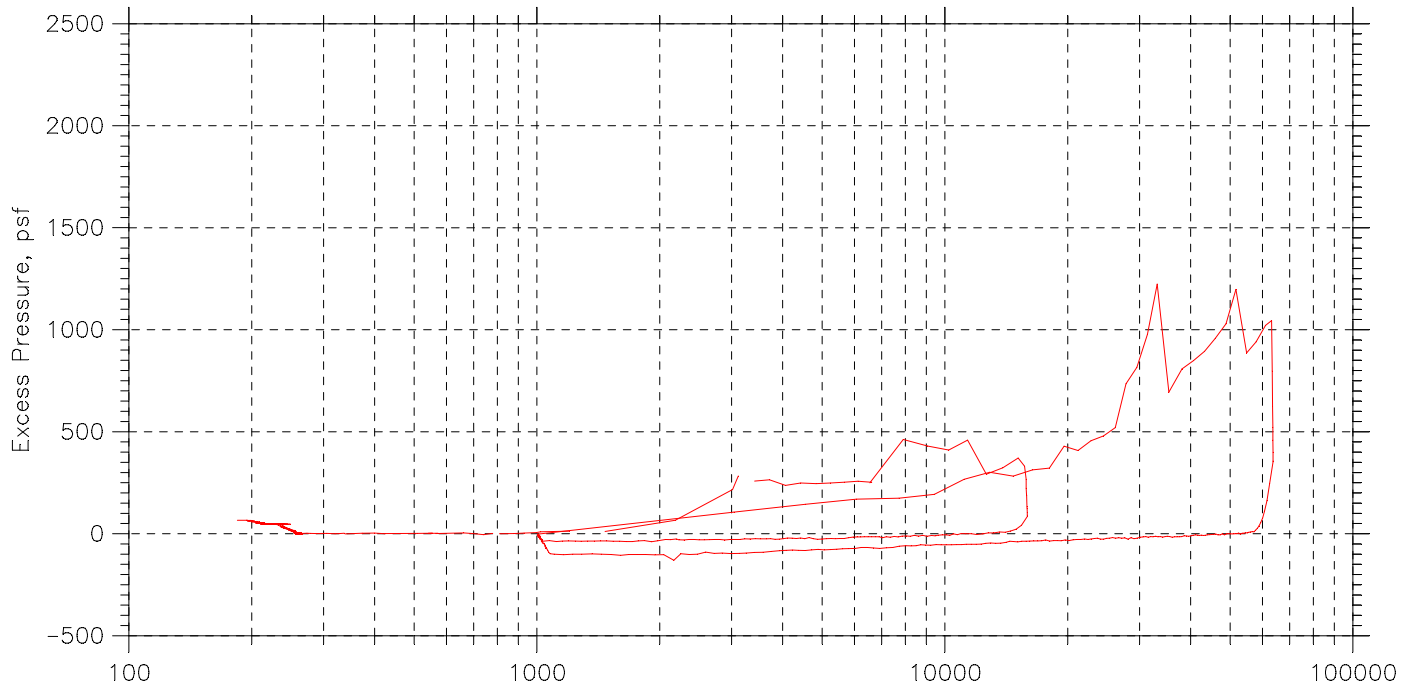
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-2 Bott	Test Date: 06/27/16	Depth: 62-64 ft
Test No.: CRC-16	Sample Type: intact	Elevation: ---
Description: Moist, dark reddish brown clay		
Remarks: System 0		
Page 1 of 3		

Constant Rate of Consolidation
Constant Strain Rate by ASTM D4186
Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-2 Bott	Test Date: 06/27/16	Depth: 62-64 ft
Test No.: CRC-16	Sample Type: intact	Elevation: ---
Description: Moist, dark reddish brown clay		
Remarks: System 0		
Page 2 of 3		

CRC TEST DATA

EXPRESS

Project: Reconstruction of Exit
 Boring No.: S2-1
 Sample No.: Tube-2 Bott
 Test No.: CRC-16

Location: Hartford, CT
 Tested By: md
 Test Date: 06/27/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 62-64 ft
 Elevation: ---

Soil Description: Moist, dark reddish brown clay
 Remarks: System 0

Estimated Specific Gravity: 2.85
 Initial Void Ratio: 1.18
 Final Void Ratio: 0.859

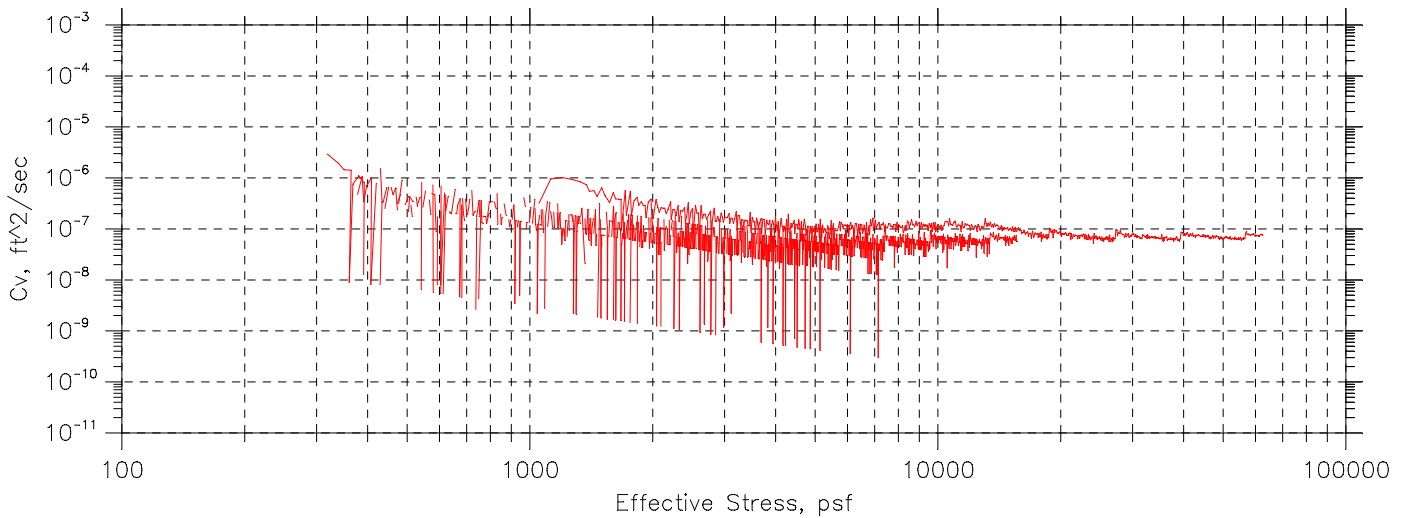
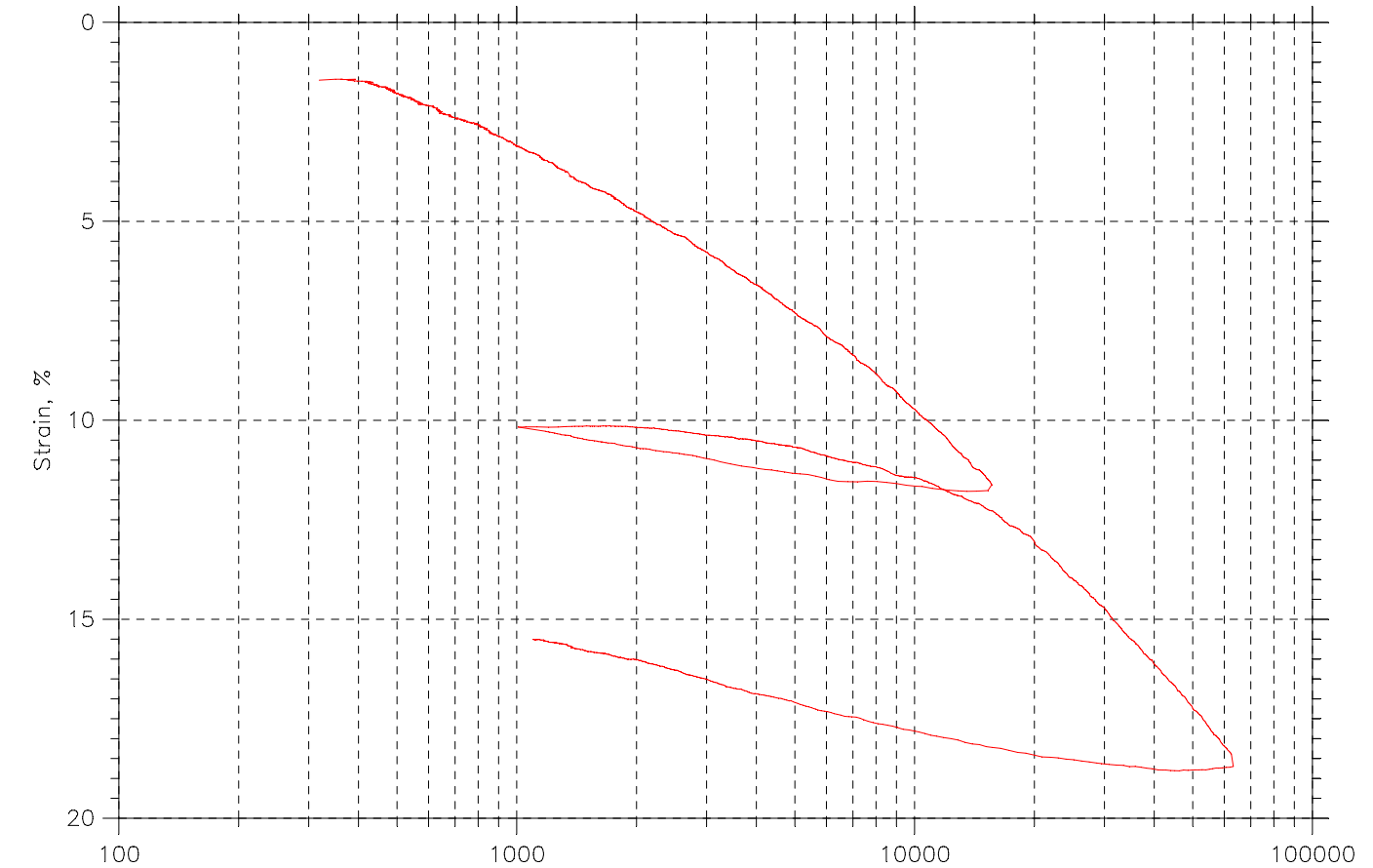
Liquid Limit: 50
 Plastic Limit: 23
 Plasticity Index: 27

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.85 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	A-828	RING		b505
Wt. Container + Wet Soil, gm	130.43	257.90	246.74	145.38
Wt. Container + Dry Soil, gm	94.470	215.01	215.01	113.52
Wt. Container, gm	8.5800	109.85	109.85	7.9300
Wt. Dry Soil, gm	85.890	105.16	105.16	105.59
Water Content, %	41.87	40.79	30.17	30.17
Void Ratio	---	1.18	0.859	---
Degree of Saturation, %	---	98.61	100.00	---
Dry Unit Weight, pcf	---	81.613	95.592	---

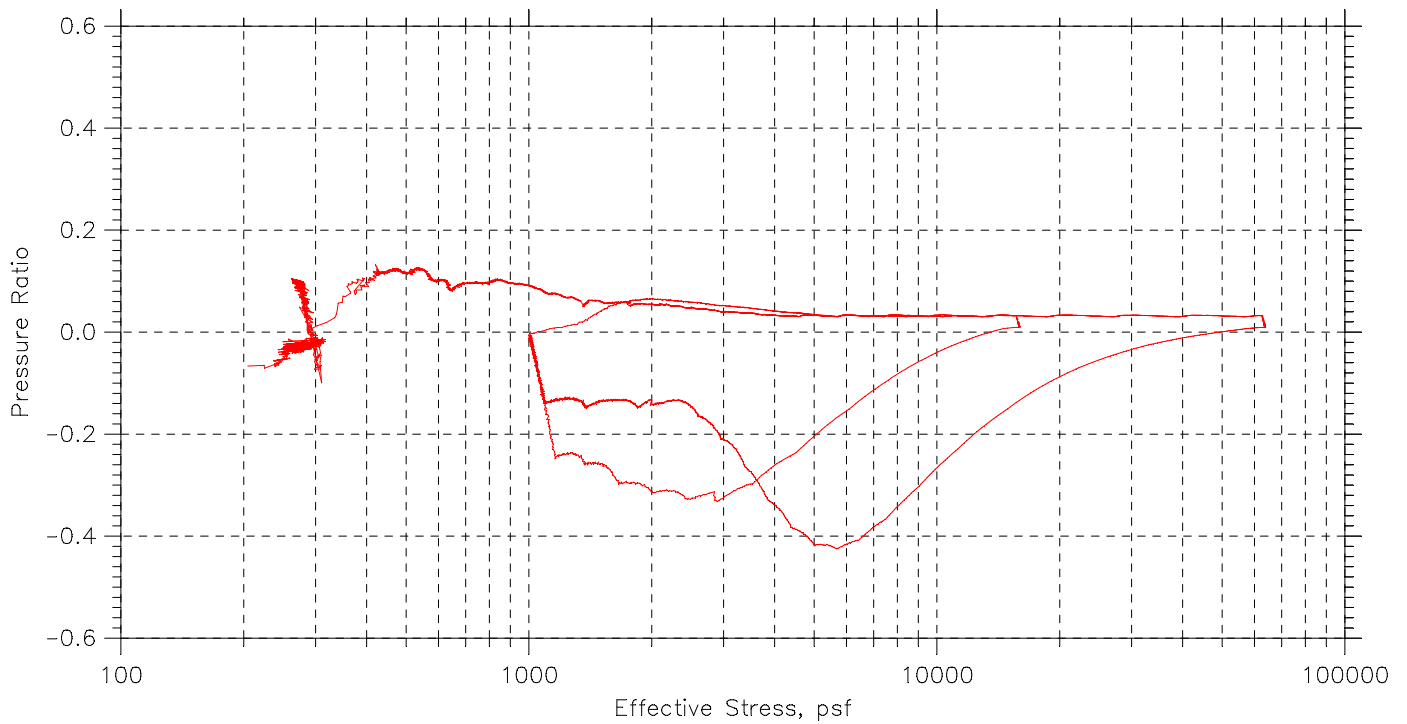
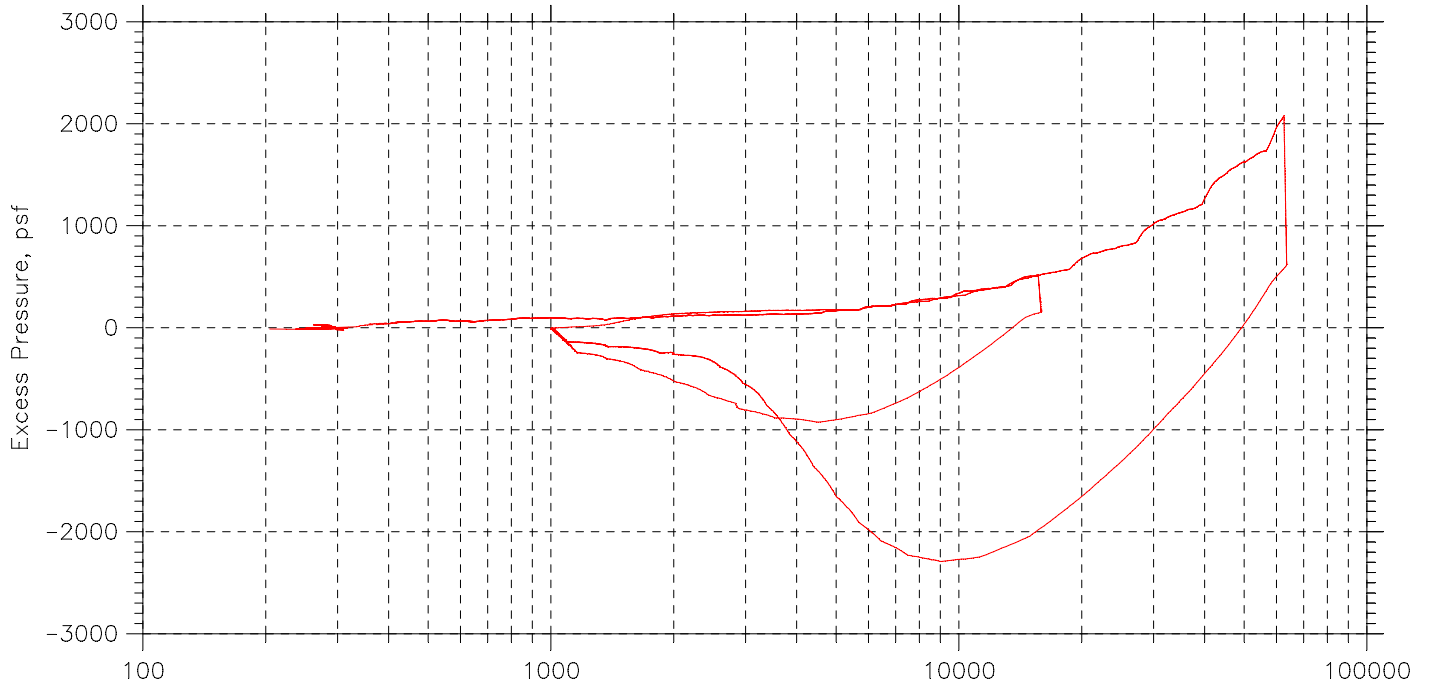
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
Constant Strain Rate by ASTM D4186
Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-3 Bott	Test Date: 06/27/16	Depth: 72-74 ft
Test No.: CRC-15	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System R		
Page 1 of 3		

Constant Rate of Consolidation
Constant Strain Rate by ASTM D4186
Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S2-1	Tested By: md	Checked By: njh
Sample No.: Tube-3 Bott	Test Date: 06/27/16	Depth: 72-74 ft
Test No.: CRC-15	Sample Type: intact	Elevation: ---
Description: Moist, reddish brown clay		
Remarks: System R		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: S2-1
 Sample No.: Tube-3 Bott
 Test No.: CRC-15

Location: Hartford, CT
 Tested By: md
 Test Date: 06/27/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 72-74 ft
 Elevation: ---

Soil Description: Moist, reddish brown clay
 Remarks: System R

Estimated Specific Gravity: 2.81
 Initial Void Ratio: 1.20
 Final Void Ratio: 0.956

Liquid Limit: 52
 Plastic Limit: 25
 Plasticity Index: 27

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.89 in

Container ID	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
	A-844	RING		B-660
Wt. Container + Wet Soil, gm	205.53	253.92	245.71	148.46
Wt. Container + Dry Soil, gm	144.23	210.71	210.71	112.79
Wt. Container, gm	8.8000	107.92	107.92	8.0300
Wt. Dry Soil, gm	135.43	102.79	102.79	104.76
Water Content, %	45.26	42.04	34.05	34.05
Void Ratio	---	1.20	0.956	---
Degree of Saturation, %	---	98.54	100.00	---
Dry Unit Weight, pcf	---	79.774	89.634	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	06/27/16
Depth :	---	Tested By:	daa
		Checked By:	jsc
		Test Id:	381989

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
S1-12	C1	112.5-113 ft	165	10981	3	No	1,*
S1466-1	C2	49.5-50 ft	160	8511	3	Yes	---
S2-1	C2	98.5-99 ft	164	7103	3	Yes	---
S480-1	C2	54.5-55 ft	164	8063	3	No	1,*
S6043-1	C2	184-184.5 ft	164	10588	3	No	1,*

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.
 All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.
 The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
 Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure
 (See attached photographs)

- 1: Best effort end preparation. See Tolerance report for details.
- 2: The as-received core did not meet the ASTM side straightness tolerance due to irregularities in the sample as cored.
- 3: Specimen L/D < 2.
- 4: The as-received core did not meet the ASTM minimum diameter tolerance of 1.875 inches.
- 5: Specimen diameter is less than 10 times maximum particle size.
- 6: Specimen diameter is less than 6 times maximum particle size.

*Because the indicated tested specimens did not meet the ASTM D4543 standard tolerances, the results reported here may differ from those for a test specimen within tolerances.

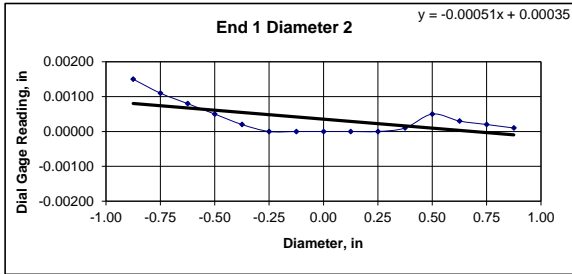
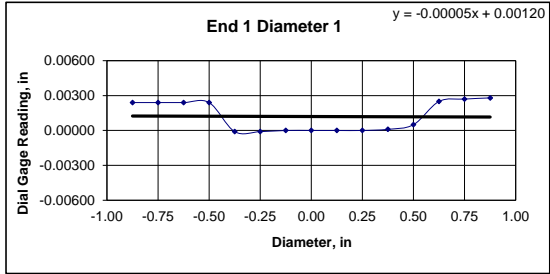


Client:	Freeman Companies, LLC	Test Date:	6/24/2016
Project Name:	Reconstruction of Exit Charter Oak Bridge	Tested By:	rlc
Project Location:	Hartford, CT	Checked By:	jsc
GTX #:	304831		
Boring ID:	S1-12		
Sample ID:	C1		
Depth:	112.5-113 ft		
Visual Description:	See photographs		

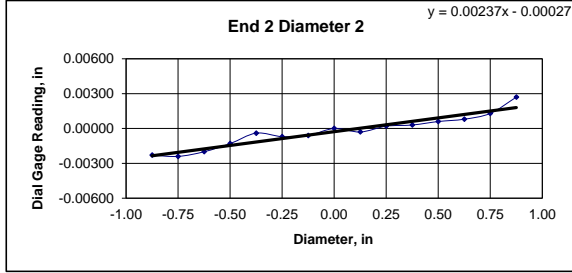
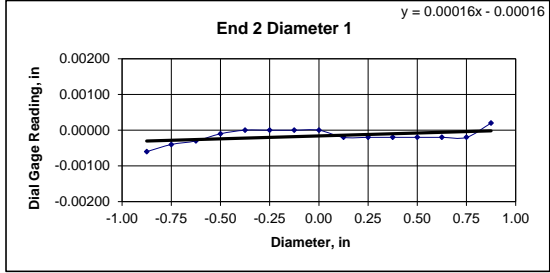
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? YES			
Specimen Length, in:	4.47	4.47	4.47	Maximum difference must be $<$ 0.020 in.			
Specimen Diameter, in:	1.98	1.99	1.99	Straightness Tolerance Met? YES			
Specimen Mass, g:	598.58						
Bulk Density, lb/ft ³ :	165						
Length to Diameter Ratio:	2.3						
		Minimum Diameter Tolerance Met?	YES				
		Length to Diameter Ratio Tolerance Met?	YES				

END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00240	0.00240	0.00240	0.00240	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00010	0.00050	0.00250	0.00270	0.00280
Diameter 2, in (rotated 90°)	0.00150	0.00110	0.00080	0.00050	0.00020	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00050	0.00030	0.00020	0.00010
											Difference between max and min readings, in:				
											0° = 0.00290		90° = 0.00150		
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00060	-0.00040	-0.00030	-0.00010	0.00000	0.00000	0.00000	0.00000	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	-0.00020	0.00020
Diameter 2, in (rotated 90°)	-0.00230	-0.00240	-0.00200	-0.00130	-0.00040	-0.00070	-0.00060	0.00000	-0.00030	0.00020	0.00030	0.00060	0.00080	0.00130	0.00270
											Difference between max and min readings, in:				
											0° = 0.0008		90° = 0.0051		
											Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00255				
											Flatness Tolerance Met? NO				



DIAMETER 1	
End 1:	Slope of Best Fit Line: 0.00005 Angle of Best Fit Line: 0.00286
End 2:	Slope of Best Fit Line: 0.00051 Angle of Best Fit Line: 0.02922
Maximum Angular Difference:	0.02636
Parallelism Tolerance Met?	NO
Spherically Seated	



DIAMETER 2	
End 1:	Slope of Best Fit Line: 0.00016 Angle of Best Fit Line: 0.00917
End 2:	Slope of Best Fit Line: 0.00237 Angle of Best Fit Line: 0.13579
Maximum Angular Difference:	0.12662
Parallelism Tolerance Met?	NO
Spherically Seated	

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?	Maximum angle of departure must be \leq 0.25°
Diameter 1, in	0.00290	1.985	0.00146	0.084	YES	
Diameter 2, in (rotated 90°)	0.00150	1.985	0.00076	0.043	YES	Perpendicularity Tolerance Met? YES
END 2						
Diameter 1, in	0.00080	1.985	0.00040	0.023	YES	
Diameter 2, in (rotated 90°)	0.00510	1.985	0.00257	0.147	YES	



Client:	Freeman Companies, LLC	Test Date:	6/24/2016
Project Name:	Reconstruction of Exit Charter Oak Bridge	Tested By:	rlc
Project Location:	Hartford, CT	Checked By:	jsc
GTX #:	304831		
Boring ID:	S1-12	Tolerance measurements were performed using a machinist straightedge and feeler gauges to ASTM specifications.	
Sample ID:	C1		
Depth:	112.5-113 ft		
Visual Description:	See photographs		

BEST EFFORT END FLATNESS TOLERANCES OF ROCK CORE SPECIMENS TO ASTM D4543

END FLATNESS			
END 1			
Diameter 1	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
Diameter 2 (rotated 90°)	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
END 2			
Diameter 1	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
Diameter 2 (rotated 90°)	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
End Flatness Tolerance Met? YES			

Client:	Freeman Companies, LLC
Project Name:	Reconstruction of Exit Charter Oak Bridge
Project Location:	Hartford, CT
GTX #:	304831
Test Date:	6/25/2016
Tested By:	daa
Checked By:	jsc
Boring ID:	S1-12
Sample ID:	C1
Depth, ft:	112.5-113



After cutting and grinding



After break



Client:	Freeman Companies, LLC	Test Date:	6/24/2016
Project Name:	Reconstruction of Exit Charter Oak Bridge	Tested By:	rlc
Project Location:	Hartford, CT	Checked By:	jsc
GTX #:	304831		
Boring ID:	S2-1		
Sample ID:	C2		
Depth:	98.5-99 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? YES			
Specimen Length, in:	4.47	4.47	4.47	Maximum difference must be $<$ 0.020 in. Straightness Tolerance Met? YES			
Specimen Diameter, in:	1.98	1.99	1.99				
Specimen Mass, g:	597.27						
Bulk Density, lb/ft ³ :	164						
Length to Diameter Ratio:	2.3						
		Minimum Diameter Tolerance Met?	YES				
		Length to Diameter Ratio Tolerance Met?	YES				

END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	-0.00010	-0.00010	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00070	-0.00060	-0.00050	-0.00030	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00020	0.00020	0.00030
	Difference between max and min readings, in:														
	$0^\circ = 0.00030$						$90^\circ = 0.00100$								
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00010	0.00010	0.00020
Diameter 2, in (rotated 90°)	-0.00060	-0.00070	-0.00060	-0.00050	-0.00040	-0.00020	-0.00020	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Difference between max and min readings, in:														
	$0^\circ = 0.0004$						$90^\circ = 0.0007$								
	Maximum difference must be $<$ 0.0020 in.												Difference = \pm 0.00050		
	Flatness Tolerance Met? YES														

		<p>DIAMETER 1</p> <p>End 1: Slope of Best Fit Line: 0.00008 Angle of Best Fit Line: 0.00458</p> <p>End 2: Slope of Best Fit Line: 0.00014 Angle of Best Fit Line: 0.00802</p> <p>Maximum Angular Difference: 0.00344</p> <p>Parallelism Tolerance Met? YES Spherically Seated</p>

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						<i>Maximum angle of departure must be \leq 0.25°</i>	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00030	1.985	0.00015	0.009	YES		
Diameter 2, in (rotated 90°)	0.00100	1.985	0.00050	0.029	YES	Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00040	1.985	0.00020	0.012	YES		
Diameter 2, in (rotated 90°)	0.00070	1.985	0.00035	0.020	YES		



Client:	Freeman Companies, LLC
Project Name:	Reconstruction of Exit Charter Oak Bridge
Project Location:	Hartford, CT
GTX #:	304831
Test Date:	6/27/2016
Tested By:	daa
Checked By:	jsc
Boring ID:	S2-1
Sample ID:	C2
Depth, ft:	98.5-99



After cutting and grinding



After break

WALL 106 LAB TESTS

Draft



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/01/16
Depth :	---	Test Id:	382134
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
S6043-1	UP- 1 - Top	43-45	Moist, gray clay	50.1
S6043-1	UP- 1 - Top middle	43-45	Moist, gray clay	49.3
S6043-1	UP- 1 - Bottom middle	43-45	Moist, dark gray clay	51.1
S6043-1	UP- 1 - Bottom	43-45	Moist, dark gray clay	47.7
RW-5	UP- 1 - Top	37-39	Moist, reddish brown clay	44.1
RW-5	UP- 1 - Top middle	37-39	Moist, reddish brown clay	48.2
RW-5	UP- 1 - Bottom middle	37-39	Moist, reddish brown clay	52.0
RW-5	UP- 1 - Bottom	37-39	Moist, reddish brown clay	50.2

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/01/16
Depth :	---	Test Id:	382122
		Tested By:	GA
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
S5796-1	UP- 1 - Top	67-69	Moist, gray clay	45.6
S5796-1	UP- 1 - Top middle	67-69	Wet, gray clay	40.1
S5796-1	UP- 1 - Bottom middle	67-69	Moist, greenish gray clay	43.3
S5796-1	UP- 1 - Bottom	67-69	Wet, greenish gray clay	43.4
S6043-1	UP- 2 - Top	53-55	Moist, gray clay	58.9
S6043-1	UP- 2 - Top middle	53-55	Moist, gray clay	51.3
S6043-1	UP- 2 - Bottom middle	53-55	Moist, greenish gray clay	52.2
S6043-1	UP- 2 - Bottom	53-55	Moist, greenish gray clay	53.3

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/26/16
Depth :	---	Test Id:	384878
		Tested By:	jbr
		Checked By:	emm

pH of Soil by ASTM D4972

Boring ID	Sample ID	Depth	Visual Description	pH of Soil in Distilled Water	pH of Soil in Calcium Chloride
S1-2	S-2	4-6 ft	Moist, red sand with gravel	7.1	6.5
S1-5	S-3	10-12 ft	Moist, reddish brown silt with gravel	7.4	6.2
S1-S12	S-2	5-7 ft	Moist, reddish brown silt with gravel	8.1	7.2
S2-1	S-4	15-17 ft	Moist, reddish brown silt with gravel	6.8	6.6
S2-3	S-2	5-7 ft	Moist, reddish brown clay	7.5	7.3
S-0480-1	S-5	14-16 ft	Moist, olive brown silt	4.5	4.3
S-0480-2	S-3	9-11 ft	Moist, olive brown silt	6.3	6.0
S-06043-1	S-2	5-7 ft	Moist, brown sand	7.5	6.8

Notes: Sample Preparation: screened through #10 sieve
 Method A, pH meter used



Client:	Freeman Companies, LLC
Project:	Reconstruction of Exit Charter Oak Bridge
Location:	Hartford, CT
GTX#:	304831
Test Date:	07/26/16
Tested By:	jbr
Checked By:	emm

**Laboratory Measurement of Soil Resistivity Using
 the Wenner Four-Electrode Method by ASTM G57
 (Laboratory Measurement)**

Boring ID	Sample ID	Depth, ft.	Sample Description	Electrical Resistivity, ohm-cm	Electrical Conductivity, (ohm-cm) ⁻¹
S1-2	S-2	4-6	Moist, red sand with gravel	4,442	2.25E-04
S1-5	S-3	10-12	Moist, reddish brown silt with gravel	3,099	3.23E-04
S1-S12	S-2	5-7	Moist, reddish brown silt with gravel	1,963	5.09E-04
S2-1	S-4	15-17	Moist, reddish brown silt with gravel	1,343	7.45E-04
S2-3	S-2	5-7	Moist, reddish brown clay	486	2.06E-03
S-0480-1	S-5	14-16	Moist, olive brown silt	3,099	3.23E-04
S-0480-2	S-3	9-11	Moist, olive brown silt	1,892	5.28E-04
S-06043-1	S-2	5-7	Moist, brown sand	15,496	6.45E-05

Notes: Test Equipment: Nilsson Model 400 Soil Resistance Meter, MC Miller Soil Box
 Water added to sample to create a thick slurry prior to testing (saturated condition).
 Electrical Conductivity is calculated as inverse of Electrical Resistivity (per ASTM G57)
 Test conducted in standard laboratory atmosphere: 68-73 F



6100 HILLCROFT
PHONE (713) 369-5400

HOUSTON, TEXAS 77081
FAX (713) 369-5518

RESULTS OF TESTS

PROJECT: RECONSTRUCTOION OF EXIT CHARTER OAK BRIDGE
(GTX 304831)

REPORT DATE: 08-01-16

FOR: GEOTESTING EXPRESS, INC.
125 NAGOG PARK ACTION, MA 01720

CLIENT NUMBER:
JOB NUMBER: 04.1115-0003

REPORTED TO: ETHAN MARRO

REPORT NUMBER:
DATE SAMPLED:
TIME SAMPLED:
SAMPLED BY: CLIENT

SOLUBLE SULFATE AASHTO T-290

DATE RECEIVED:
TIME RECEIVED:
RECEIVED BY:

SAMPLE ID	RESULTS	UNITS	LAB No.	TIME/DATE	ANALYST
S1-S, S-2, 4 – 6'	< 30 *	mg/kg	0726052	1100/08-01-16	SD
S1-5, S-3, 10 – 12'	57 *	mg/kg	0726053	1100/08-01-16	SD
S1-12, S-2, 5 – 7'	< 50 *	mg/kg	0726054	1100/08-01-16	SD
S2-1, S-4, 15 – 17'	< 50 *	mg/kg	0726055	1100/08-01-16	SD
S2-3, S-2, 5 – 7'	297 *	mg/kg	0726056	1100/08-01-16	SD
S-0480-1, S-5, 14 – 16'	543 *	mg/kg	0726057	1100/08-01-16	SD
S-0480-2, S-3, 9 – 11'	355 *	mg/kg	0726058	1100/08-01-16	SD
S-06043-41, S-2, 5 – 7'	< 30*	mg/kg	0726059	1100/08-01-16	SD

SO4CL 069-16

Respectfully submitted,

* Dry weight basis

Steve DeGregorio
Chemist

SD

** WATER EXTRACTION PERFORMED BY USING A 1:10 RATIO OF SAMPLE AND REAGENT WATER FOLLOWED BY CENTRIFUGE AND VACUUME FILTRATION. THE WATER EXTRACT IS THEN ANALYZED USING THE ASTM D-512 AND D-516 METHODS.

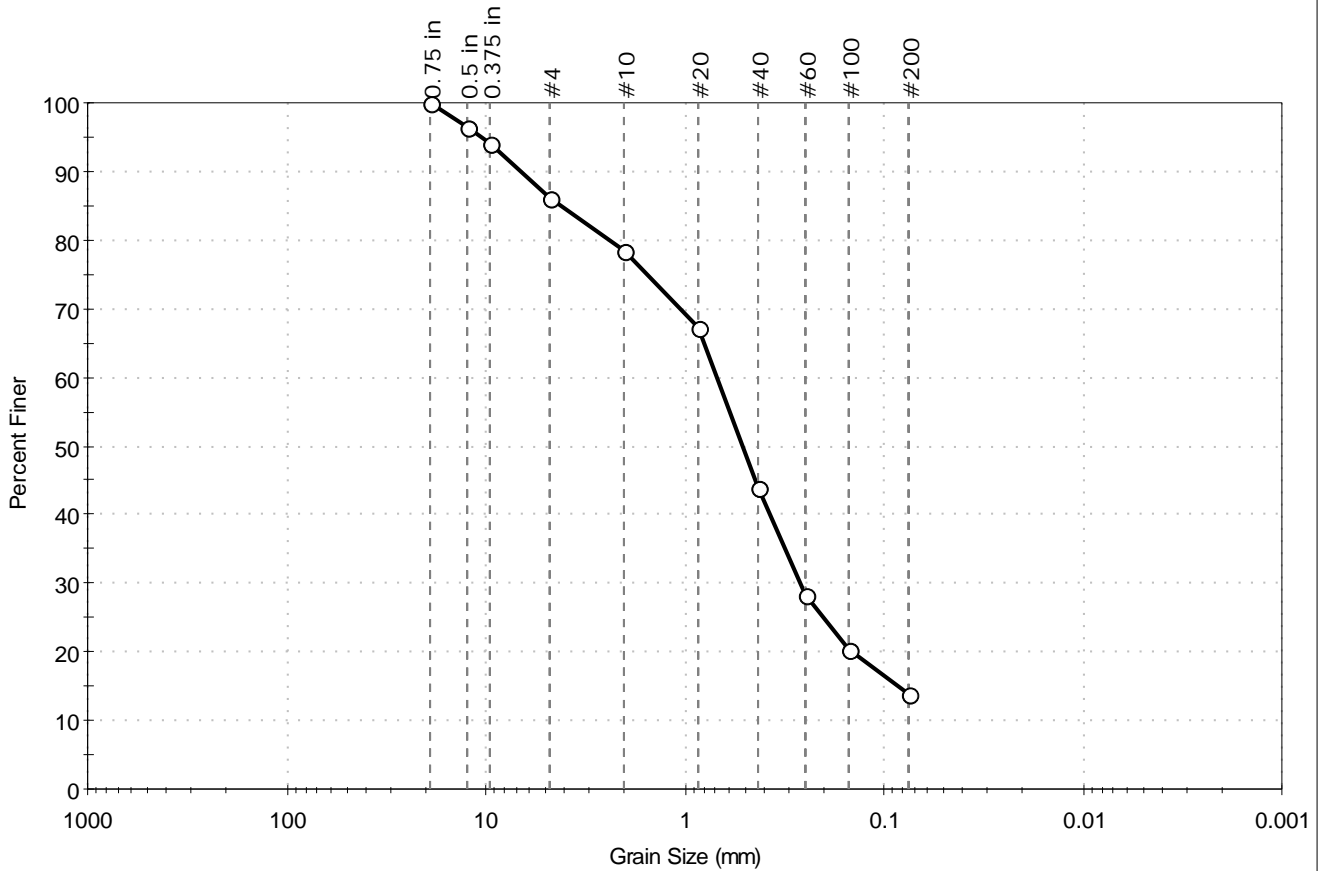
THE RESULTS RELATE AS TO THE LOCATION TESTED AND NO OTHER REFERENCE SHALL BE MADE.
THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF THE LABORATORY.

END OF REPORT



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	R-16	Sample Type:	jar
Sample ID:	S-2	Test Date:	08/02/16
Depth :	5-7 ft	Test Id:	384932
Test Comment:	---		
Visual Description:	Moist, reddish brown silty sand		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	13.8	72.4	13.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	97		
0.375 in	9.50	94		
#4	4.75	86		
#10	2.00	78		
#20	0.85	67		
#40	0.425	44		
#60	0.25	28		
#100	0.15	20		
#200	0.075	14		

<u>Coefficients</u>	
D ₈₅ = 4.1273 mm	D ₃₀ = 0.2646 mm
D ₆₀ = 0.6837 mm	D ₁₅ = 0.0850 mm
D ₅₀ = 0.5093 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

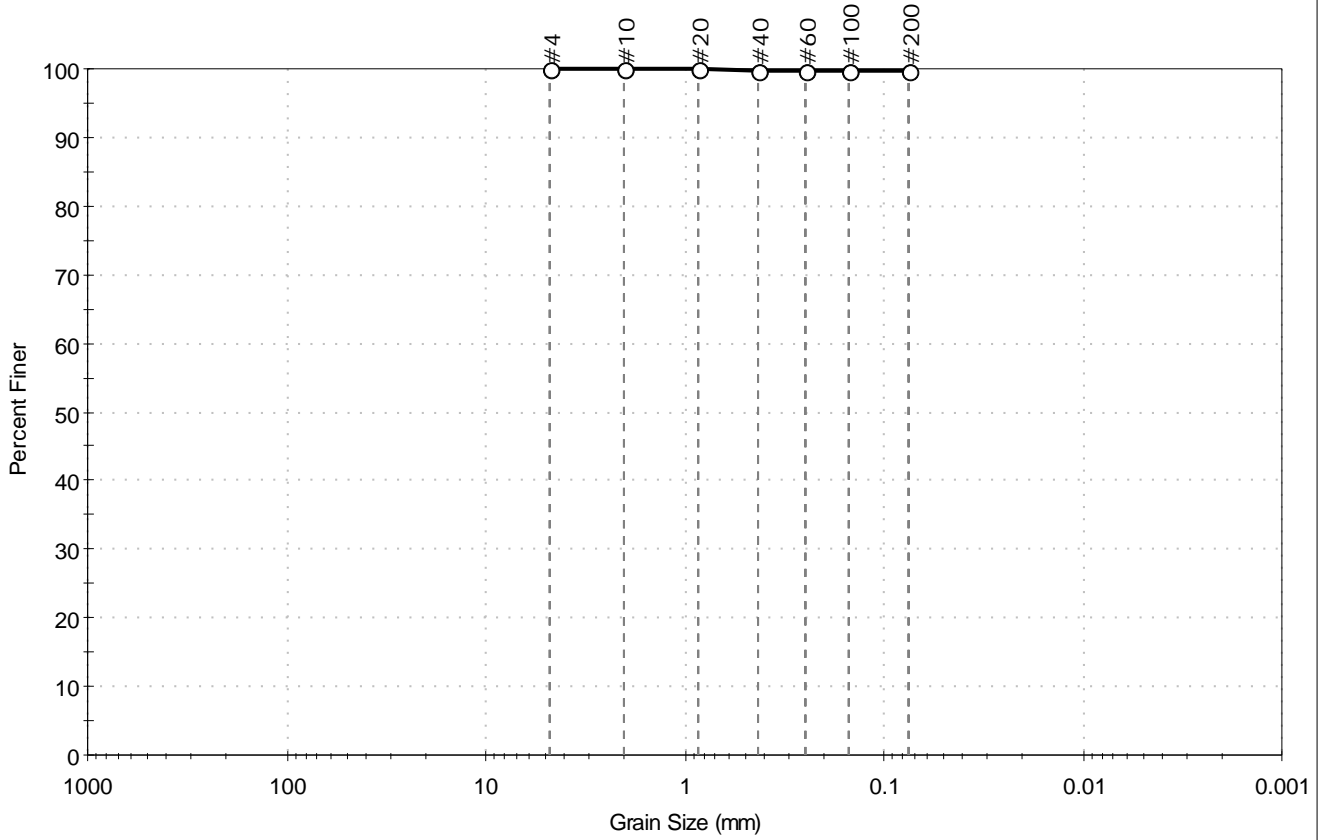
<u>Classification</u>	
<u>ASTM</u>	N/A
<u>AASHTO</u>	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S-6043-1	Sample Type:	jar
Sample ID:	S-5	Test Date:	08/03/16
Depth:	20-21 ft	Test Id:	384959
Test Comment:	---		
Visual Description:	Moist, olive gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	0.4	99.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	100		

<u>Coefficients</u>	
D ₈₅ = N/A	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

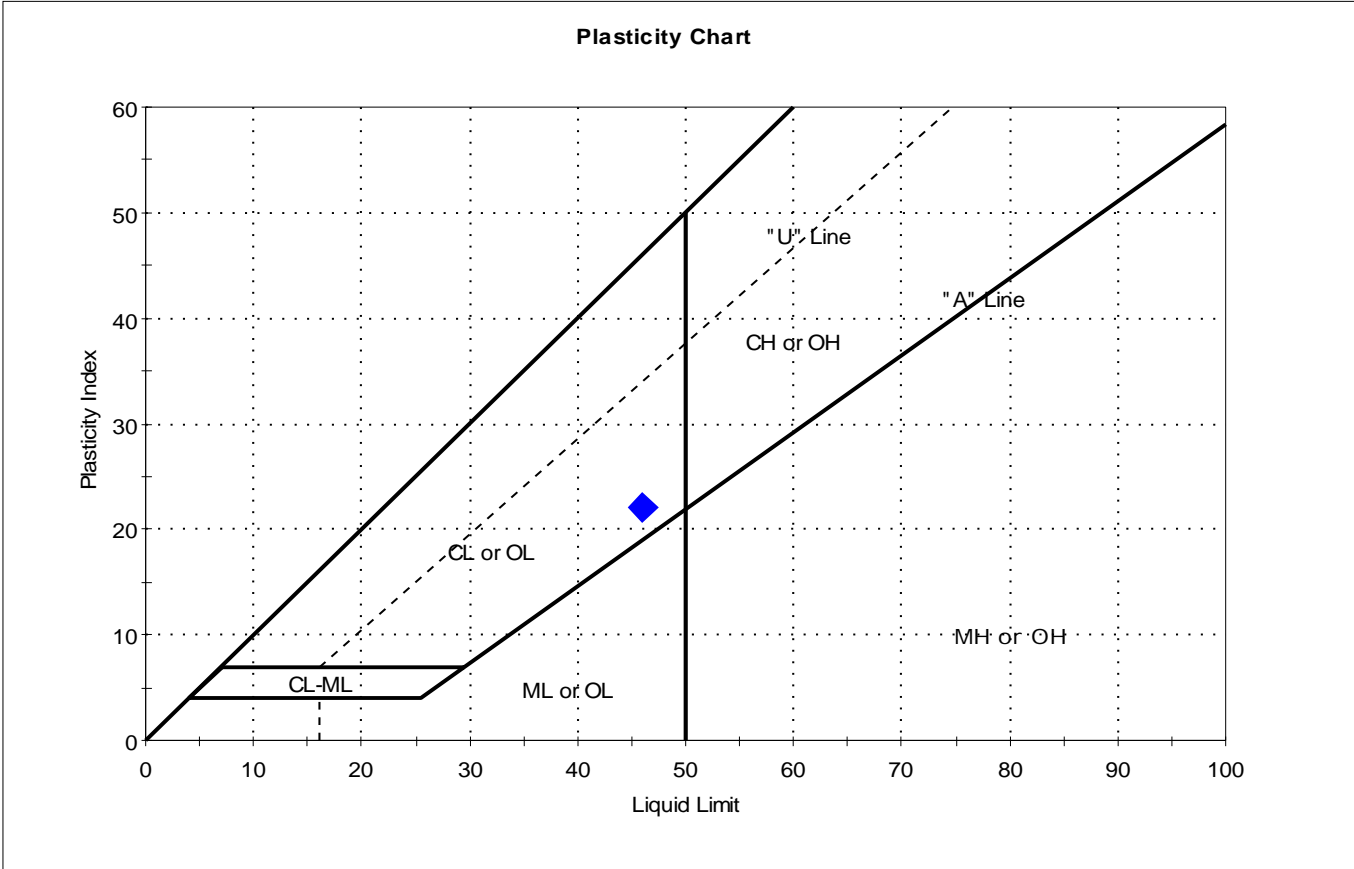
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S6043-1	Sample Type:	tube
Sample ID:	UP-1 - Top middle	Test Date:	07/12/16
Depth :	43-45	Test Id:	382141
Test Comment:	---		
Visual Description:	Moist, gray clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Top middle	S6043-1	43-45	49	46	24	22	1.2	

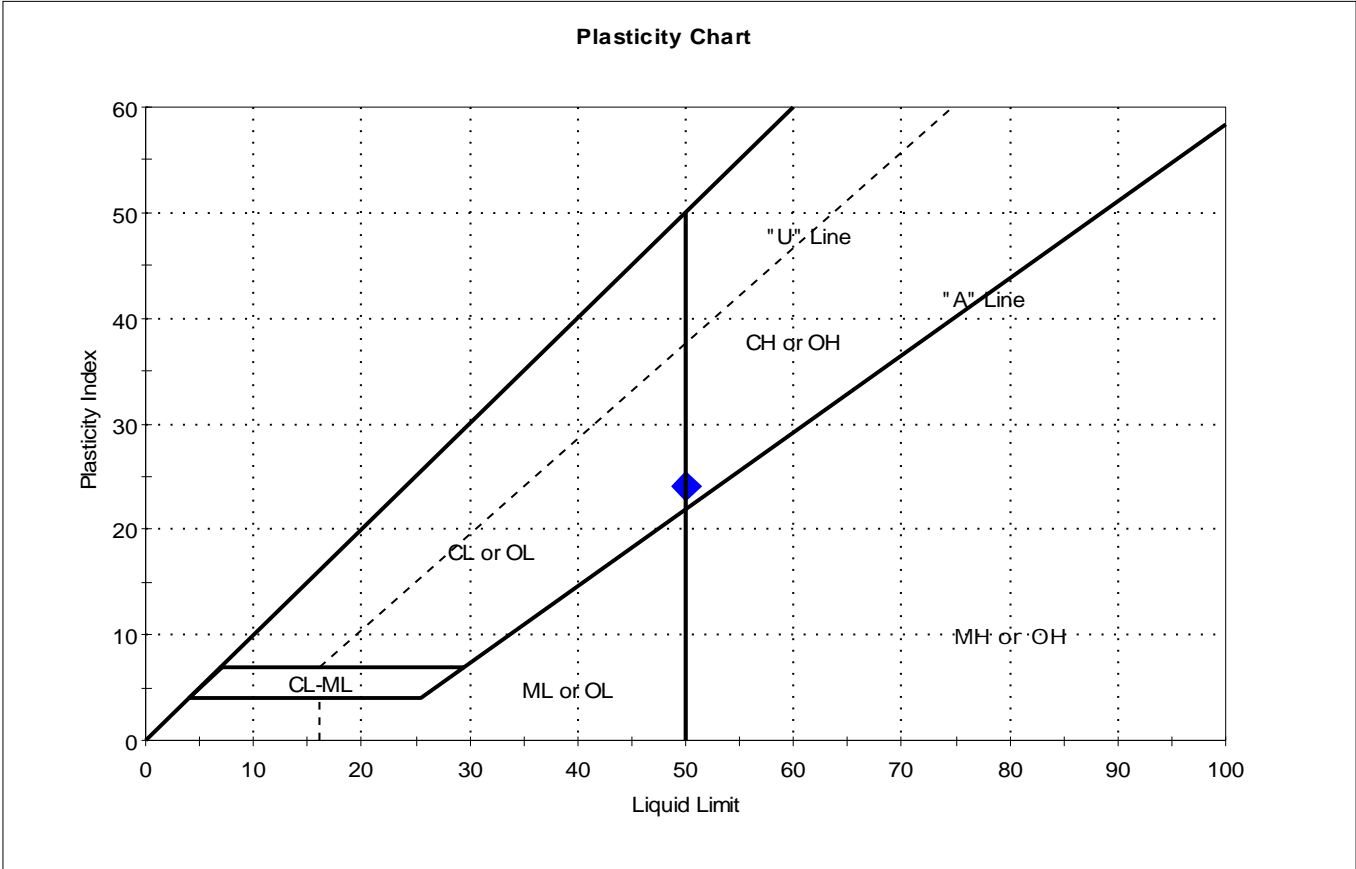
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	GA
Boring ID:	S6043-1	Test Date:	07/12/16	Checked By:	emm
Sample ID:	UP-1 - Bottom	Test Id:	382139		
Depth :	43-45				
Test Comment:	---				
Visual Description:	Moist, dark gray clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Bottom	S6043-1	43-45	48	50	26	24	0.9	

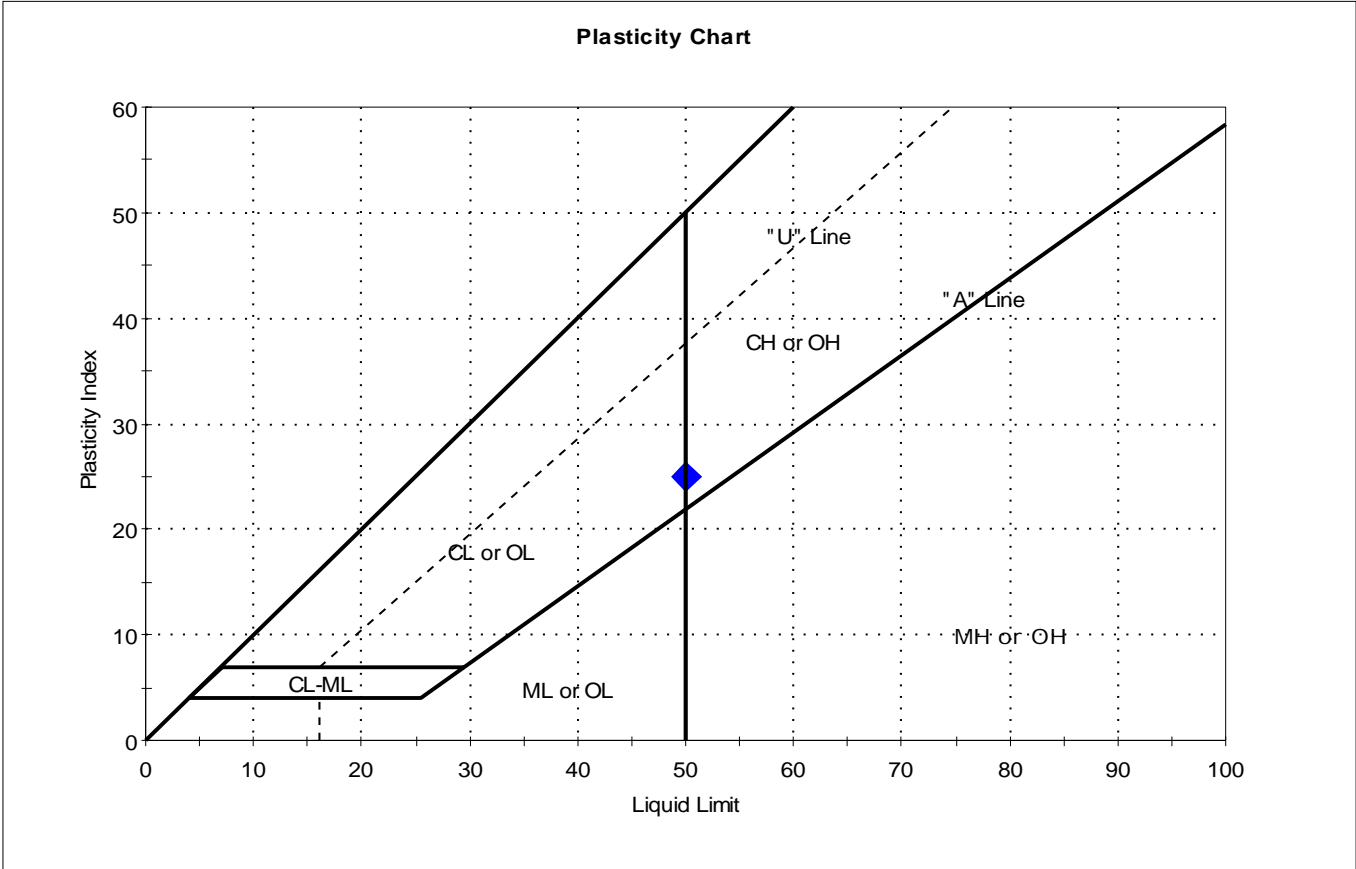
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S6043-1	Sample Type:	tube
Sample ID:	UP-2 - Top middle	Test Date:	07/11/16
Depth :	53-55	Test Id:	382123
Test Comment:	---		
Visual Description:	Moist, gray clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-2 - Top middle	S6043-1	53-55	51	50	25	25	1.1	

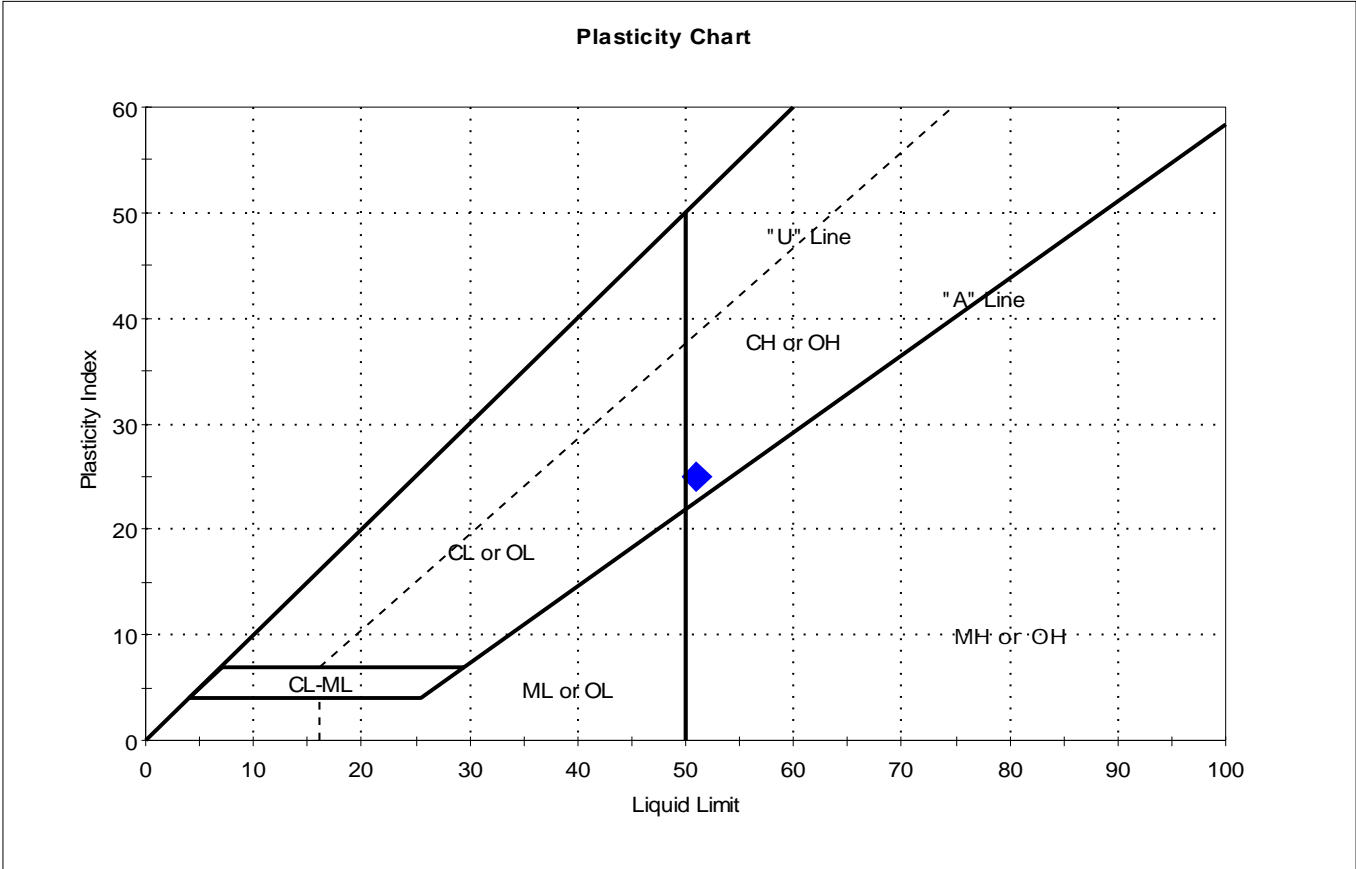
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	GA
Boring ID:	S6043-1	Test Date:	07/12/16	Checked By:	emm
Sample ID:	UP-2 - Bottom	Test Id:	382121		
Depth :	53-55				
Test Comment:	---				
Visual Description:	Moist, greenish gray clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90

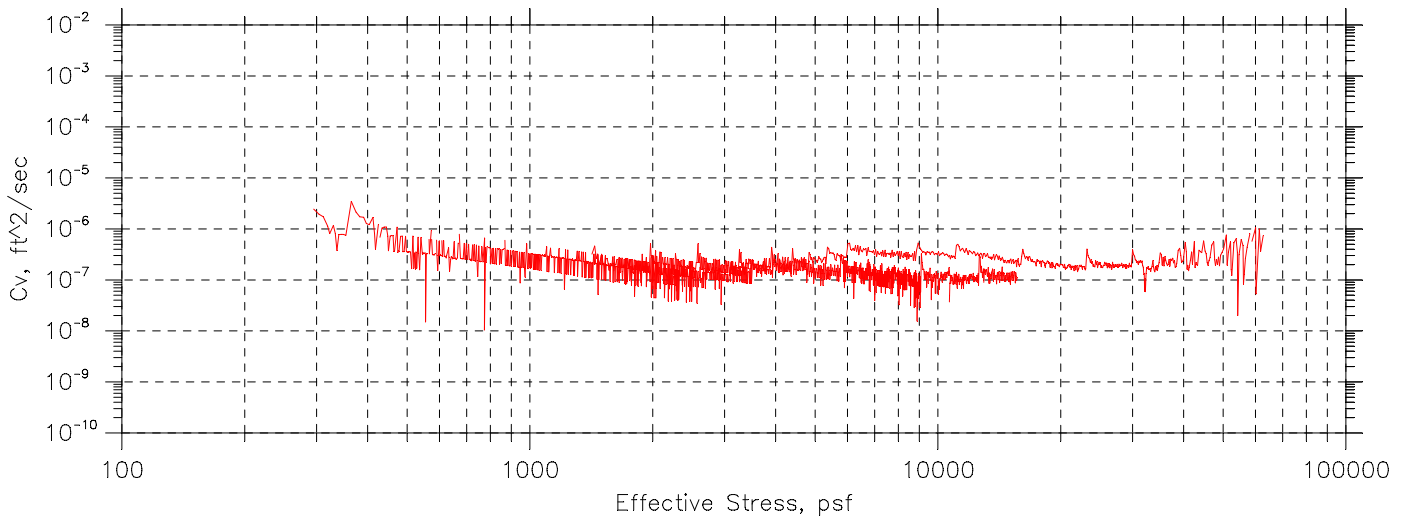
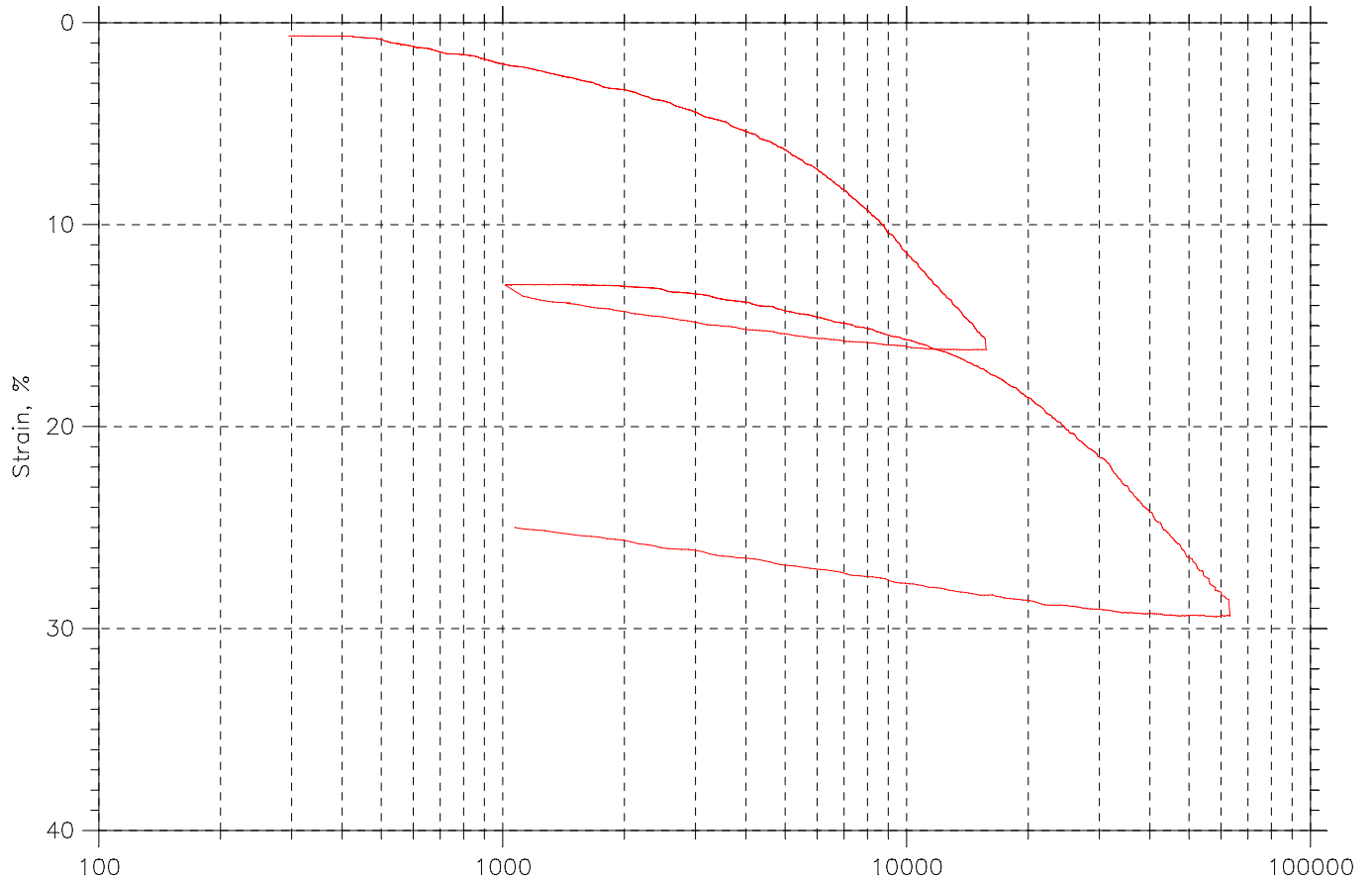


Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-2 - Bottom	S6043-1	53-55	53	51	26	25	1.1	

Sample Prepared using the WET method

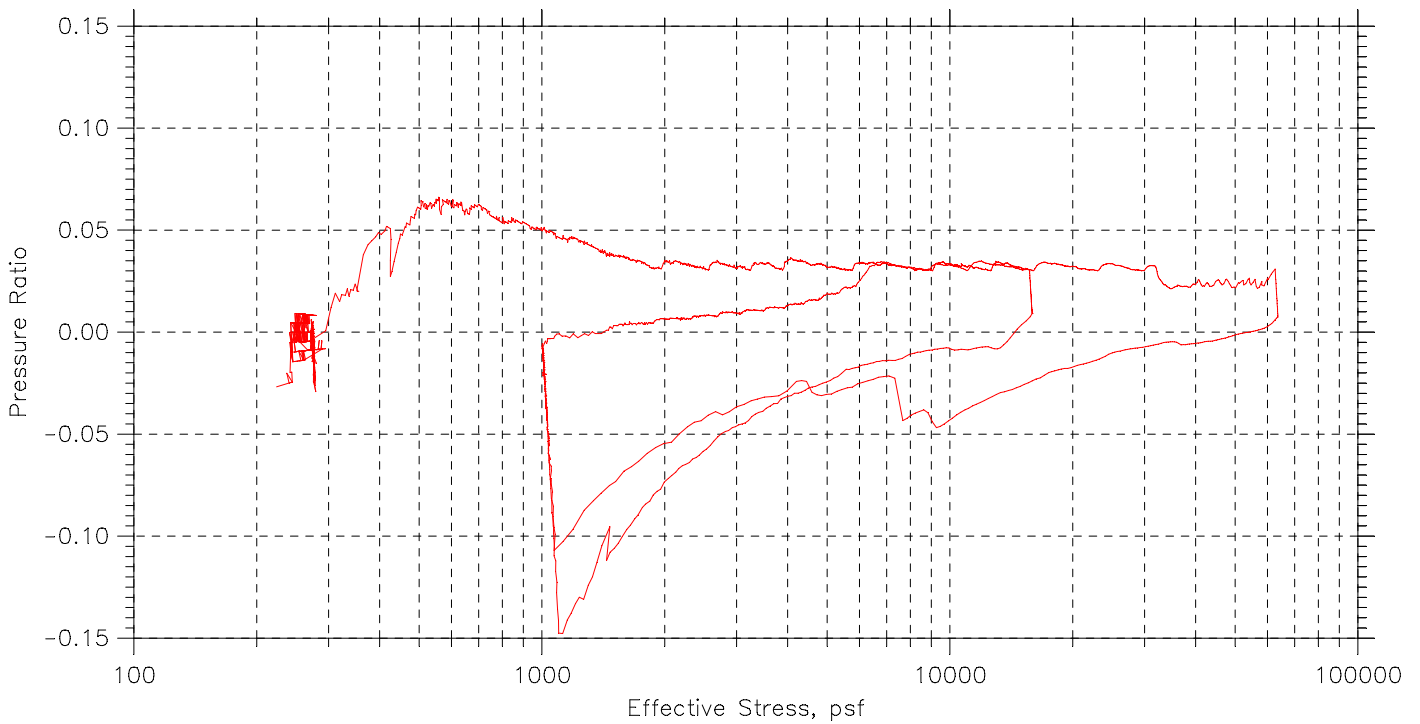
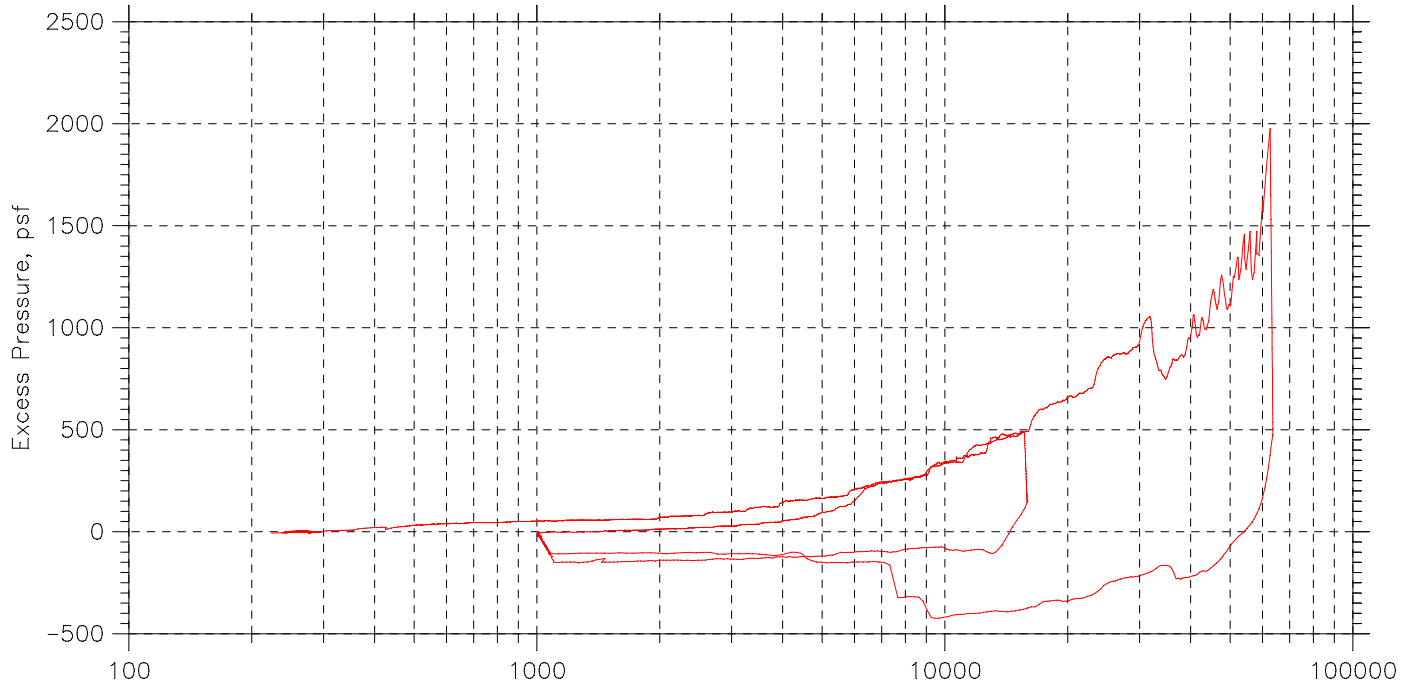
Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S6043-1	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/07/16	Depth: 43-45 ft
Test No.: CRC-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System Y		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S6043-1	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/07/16	Depth: 43-45 ft
Test No.: CRC-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System Y		
Page 2 of 3		

CRC TEST DATA

EXPRESS

Project: Reconstruction of Exit
 Boring No.: S6043-1
 Sample No.: UP-1
 Test No.: CRC-7

Location: Hartford, CT
 Tested By: md
 Test Date: 06/07/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 43-45 ft
 Elevation: ---

Soil Description: Moist, dark gray clay
 Remarks: System Y

Estimated Specific Gravity: 2.76
 Initial Void Ratio: 1.50
 Final Void Ratio: 0.976

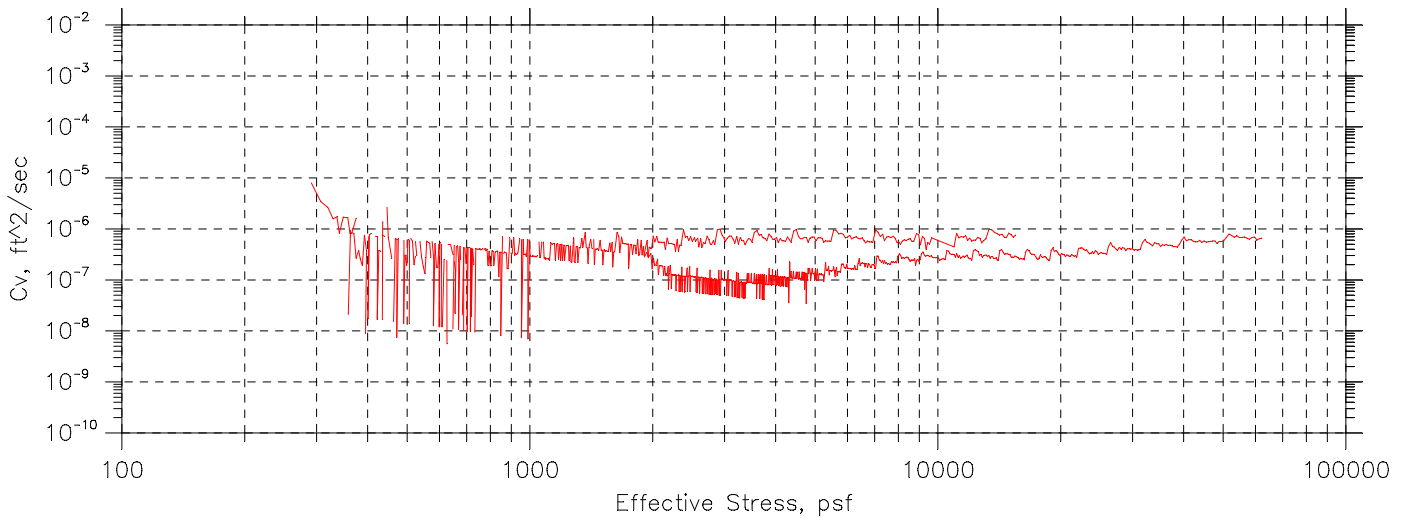
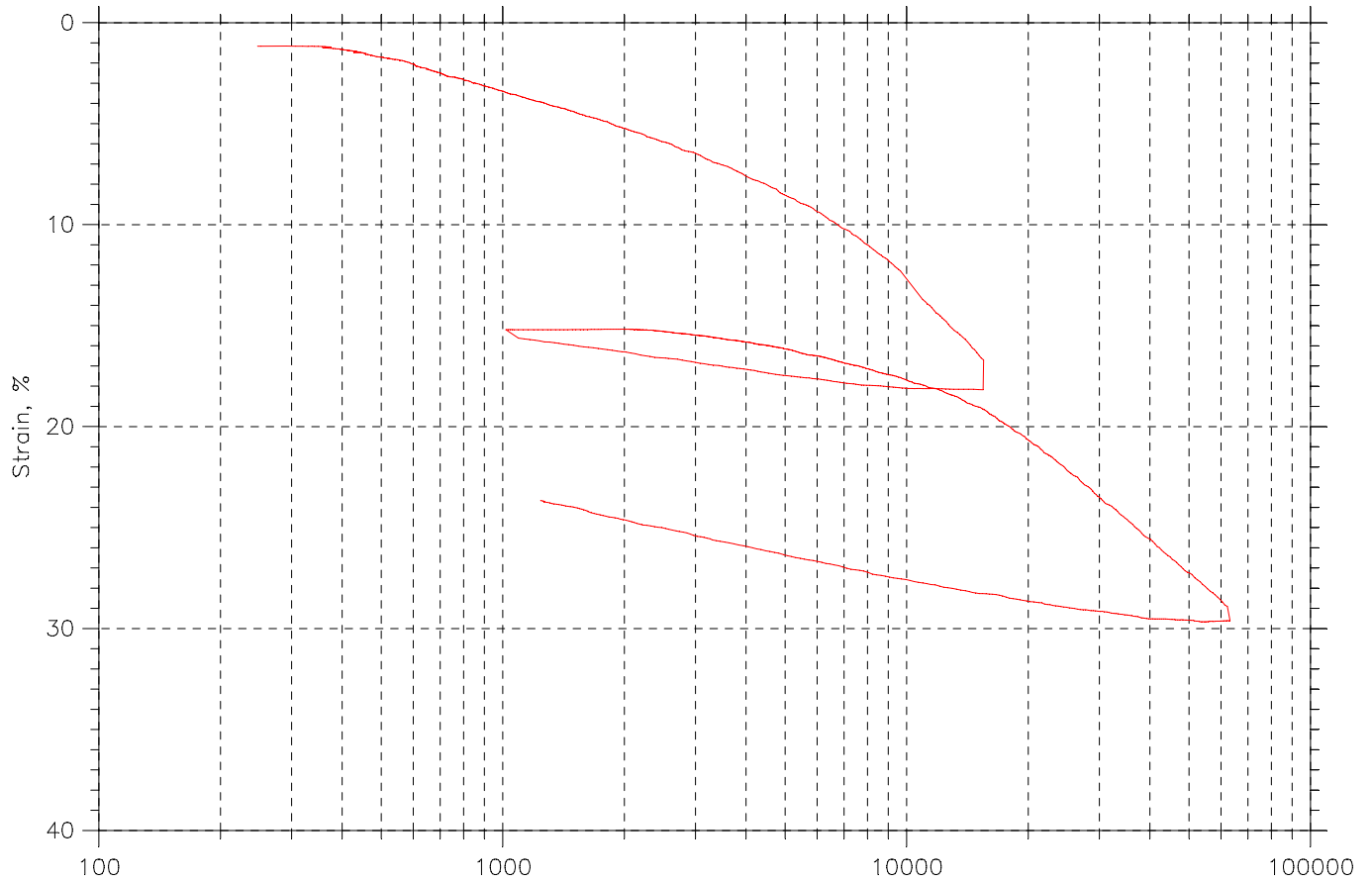
Liquid Limit: 50
 Plastic Limit: 26
 Plasticity Index: 24

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.79 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	16196	RING		a1070
Wt. Container + Wet Soil, gm	186.99	246.76	229.91	126.58
Wt. Container + Dry Soil, gm	129.28	198.52	198.52	95.870
Wt. Container, gm	8.3800	109.80	109.80	9.0900
Wt. Dry Soil, gm	120.90	88.715	88.715	86.780
Water Content, %	47.73	54.38	35.39	35.39
Void Ratio	---	1.50	0.976	---
Degree of Saturation, %	---	99.91	100.00	---
Dry Unit Weight, pcf	---	68.850	87.152	---

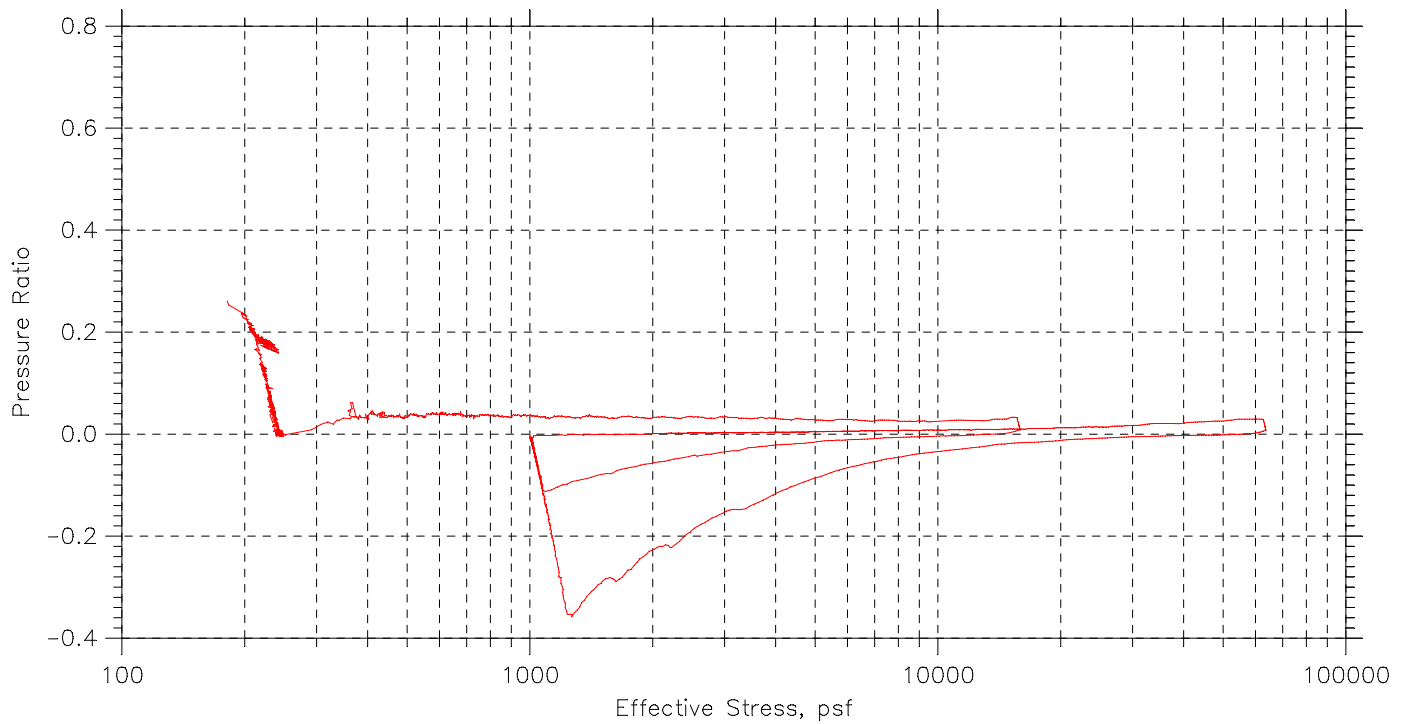
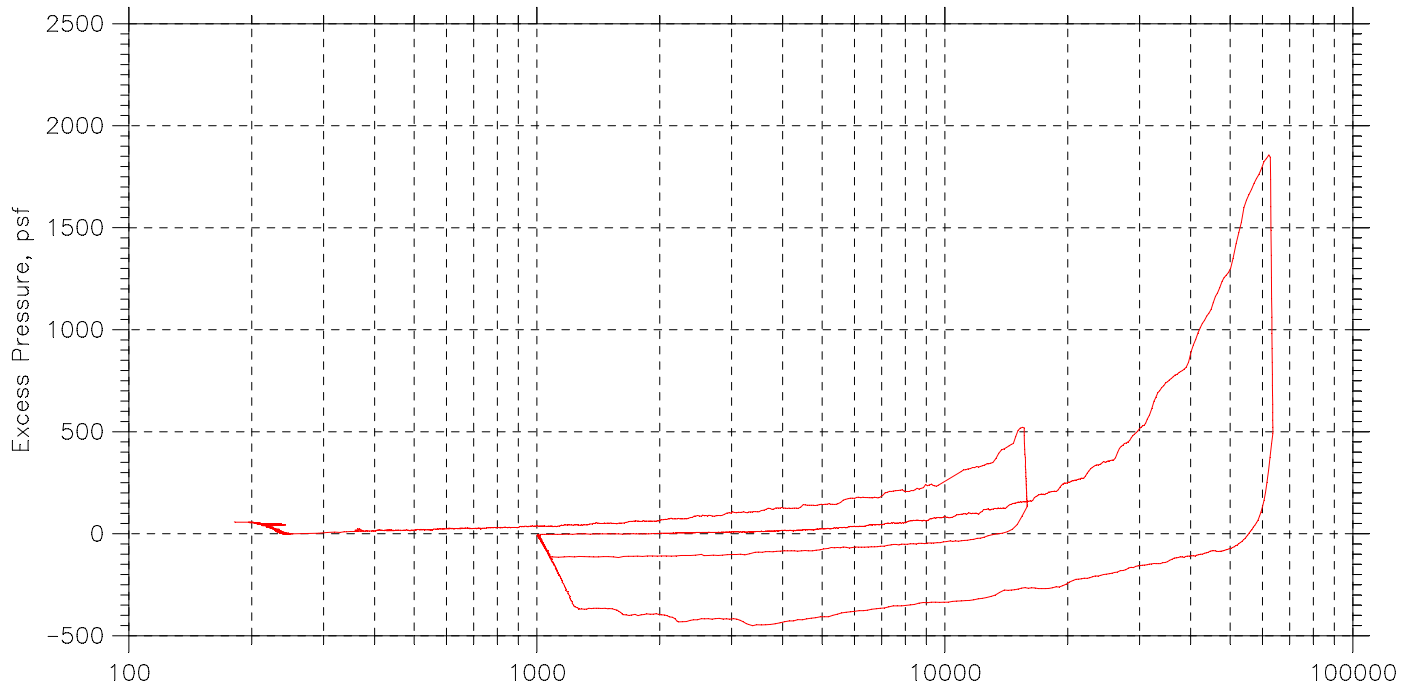
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S6043-1	Tested By: md	Checked By: njh
Sample No.: UP-2	Test Date: 06/06/16	Depth: 53-55 ft
Test No.: CRC-2	Sample Type: intact	Elevation: ---
Description: Moist, greenish gray clay		
Remarks: System 0		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S6043-1	Tested By: md	Checked By: njh
Sample No.: UP-2	Test Date: 06/06/16	Depth: 53-55 ft
Test No.: CRC-2	Sample Type: intact	Elevation: ---
Description: Moist, greenish gray clay		
Remarks: System 0		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: S6043-1
 Sample No.: UP-2
 Test No.: CRC-2

Location: Hartford, CT
 Tested By: md
 Test Date: 06/06/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 53-55 ft
 Elevation: ---

Soil Description: Moist, greenish gray clay
 Remarks: System 0

Estimated Specific Gravity: 2.84
 Initial Void Ratio: 1.63
 Final Void Ratio: 1.10

Liquid Limit: 51
 Plastic Limit: 26
 Plasticity Index: 25

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.80 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	B-613	RING		16776
Wt. Container + Wet Soil, gm	381.11	246.12	230.24	130.15
Wt. Container + Dry Soil, gm	251.42	196.53	196.53	96.240
Wt. Container, gm	7.9400	109.52	109.52	8.7100
Wt. Dry Soil, gm	243.48	87.011	87.011	87.530
Water Content, %	53.27	56.99	38.74	38.74
Void Ratio	---	1.63	1.10	---
Degree of Saturation, %	---	99.58	100.00	---
Dry Unit Weight, pcf	---	67.528	84.410	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	06/27/16
Depth:	---	Tested By:	daa
		Checked By:	jsc
		Test Id:	381989

Bulk Density and Compressive Strength of Rock Core Specimens by ASTM D7012 Method C

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
S1-12	C1	112.5-113 ft	165	10981	3	No	1,*
S1466-1	C2	49.5-50 ft	160	8511	3	Yes	---
S2-1	C2	98.5-99 ft	164	7103	3	Yes	---
S480-1	C2	54.5-55 ft	164	8063	3	No	1,*
S6043-1	C2	184-184.5 ft	164	10588	3	No	1,*

Notes: Density determined on core samples by measuring dimensions and weight and then calculating.
 All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.
 The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
 Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure
 (See attached photographs)

- 1: Best effort end preparation. See Tolerance report for details.
- 2: The as-received core did not meet the ASTM side straightness tolerance due to irregularities in the sample as cored.
- 3: Specimen L/D < 2.
- 4: The as-received core did not meet the ASTM minimum diameter tolerance of 1.875 inches.
- 5: Specimen diameter is less than 10 times maximum particle size.
- 6: Specimen diameter is less than 6 times maximum particle size.

*Because the indicated tested specimens did not meet the ASTM D4543 standard tolerances, the results reported here may differ from those for a test specimen within tolerances.

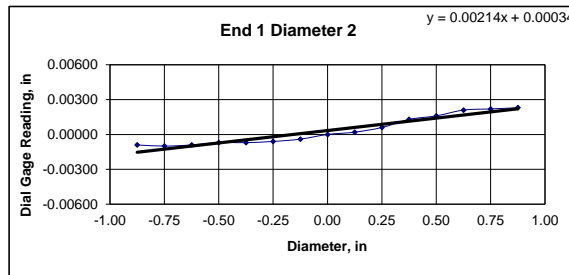
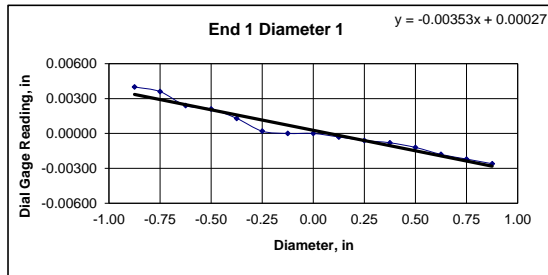


Client:	Freeman Companies, LLC	Test Date:	6/24/2016
Project Name:	Reconstruction of Exit Charter Oak Bridge	Tested By:	rlc
Project Location:	Hartford, CT	Checked By:	jsc
GTX #:	304831		
Boring ID:	S6043-1		
Sample ID:	C2		
Depth:	184-184.5 ft		
Visual Description:	See photographs		

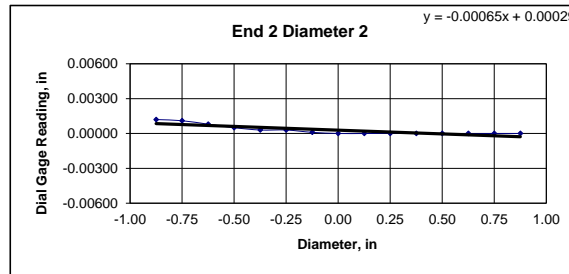
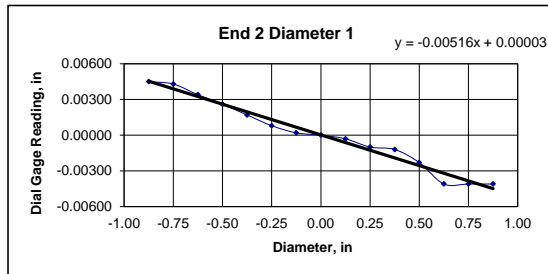
UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? YES			
Specimen Length, in:	4.24	4.25	4.25	Maximum difference must be $<$ 0.020 in. Straightness Tolerance Met? YES			
Specimen Diameter, in:	1.99	1.99	1.99				
Specimen Mass, g:	569.78						
Bulk Density, lb/ft ³ :	164						
Length to Diameter Ratio:	2.1						
		Minimum Diameter Tolerance Met?	YES				
		Length to Diameter Ratio Tolerance Met?	YES				

END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00400	0.00360	0.00240	0.00210	0.00130	0.00020	0.00000	0.00000	-0.00030	-0.00060	-0.00080	-0.00120	-0.00180	-0.00220	-0.00260
Diameter 2, in (rotated 90°)	-0.00090	-0.00100	-0.00090	-0.00070	-0.00070	-0.00060	-0.00040	0.00000	0.00020	0.00060	0.00130	0.00160	0.00210	0.00220	0.00230
	Difference between max and min readings, in: 0° = 0.00660 90° = 0.00330														
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00450	0.00430	0.00340	0.00260	0.00170	0.00080	0.00020	0.00000	-0.00030	-0.00100	-0.00120	-0.00230	-0.00410	-0.00410	-0.00410
Diameter 2, in (rotated 90°)	0.00120	0.00110	0.00080	0.00050	0.00030	0.00030	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Difference between max and min readings, in: 0° = 0.0086 90° = 0.0012 Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00430 Flatness Tolerance Met? NO														



DIAMETER 1	
End 1:	Slope of Best Fit Line: 0.00353 Angle of Best Fit Line: 0.20225
End 2:	Slope of Best Fit Line: 0.00516 Angle of Best Fit Line: 0.29564
Maximum Angular Difference:	0.09339
Parallelism Tolerance Met?	NO
Spherically Seated	



DIAMETER 2	
End 1:	Slope of Best Fit Line: 0.00214 Angle of Best Fit Line: 0.12261
End 2:	Slope of Best Fit Line: 0.00065 Angle of Best Fit Line: 0.03724
Maximum Angular Difference:	0.08537
Parallelism Tolerance Met?	NO
Spherically Seated	

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?	Maximum angle of departure must be \leq 0.25°
Diameter 1, in	0.00660	1.990	0.00332	0.190	YES	
Diameter 2, in (rotated 90°)	0.00330	1.990	0.00166	0.095	YES	Perpendicularity Tolerance Met? YES
END 2						
Diameter 1, in	0.00860	1.990	0.00432	0.248	YES	
Diameter 2, in (rotated 90°)	0.00120	1.990	0.00060	0.035	YES	



Client:	Freeman Companies, LLC	Test Date:	06/24/16
Project Name:	Reconstruction of Exit Charter Oak Bridge	Tested By:	rlc
Project Location:	Hartford, CT	Checked By:	jsc
GTX #:	304831		
Boring ID:	S6043-1	Tolerance measurements were performed using a machinist straightedge and feeler gauges to ASTM specifications.	
Sample ID:	C2		
Depth:	184-184.5		
Visual Description:	See photographs		

BEST EFFORT END FLATNESS TOLERANCES OF ROCK CORE SPECIMENS TO ASTM D4543

END FLATNESS			
END 1			
Diameter 1	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
Diameter 2 (rotated 90°)	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
END 2			
Diameter 1	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
Diameter 2 (rotated 90°)	Is the maximum gap $\leq \pm 0.001$ in.?	YES	
End Flatness Tolerance Met? YES			



Client:	Freeman Companies, LLC
Project Name:	Reconstruction of Exit Charter Oak Bridge
Project Location:	Hartford, CT
GTX #:	304831
Test Date:	6/27/2016
Tested By:	daa
Checked By:	jsc
Boring ID:	S6043-1
Sample ID:	C2
Depth, ft:	184-184.5



After cutting and grinding



After break

WALL 107 LAB TESTS

Draft



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	07/01/16
Depth :	---	Test Id:	382122
		Tested By:	GA
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

Boring ID	Sample ID	Depth	Description	Moisture Content, %
S5796-1	UP- 1 - Top	67-69	Moist, gray clay	45.6
S5796-1	UP- 1 - Top middle	67-69	Wet, gray clay	40.1
S5796-1	UP- 1 - Bottom middle	67-69	Moist, greenish gray clay	43.3
S5796-1	UP- 1 - Bottom	67-69	Wet, greenish gray clay	43.4
S6043-1	UP- 2 - Top	53-55	Moist, gray clay	58.9
S6043-1	UP- 2 - Top middle	53-55	Moist, gray clay	51.3
S6043-1	UP- 2 - Bottom middle	53-55	Moist, greenish gray clay	52.2
S6043-1	UP- 2 - Bottom	53-55	Moist, greenish gray clay	53.3

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	06/24/16
Depth :	---	Test Id:	382024
		Tested By:	md
		Checked By:	emm

Moisture Content of Soil and Rock - AASHTO T 265

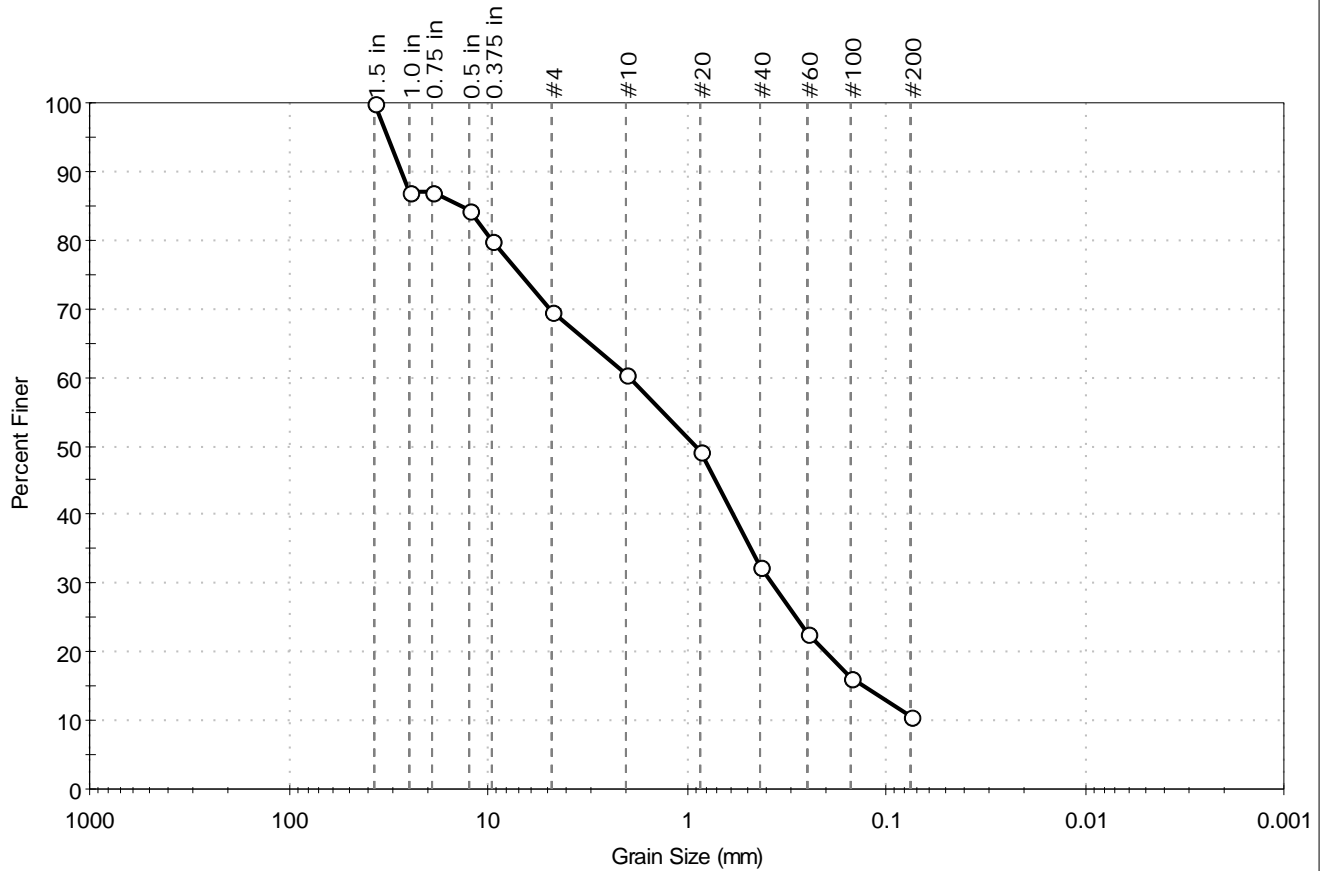
Boring ID	Sample ID	Depth	Description	Moisture Content, %
S5796-1	UP- 3 - Top	85-87	Moist, greenish gray clay	51.3
S5796-1	UP- 3 - Top middle	85-87	Moist, greenish gray clay	51.8
S5796-1	UP- 3 - Bottom middle	85-87	Moist, gray clay	42.9
S5796-1	UP- 3 - Bottom	85-87	Moist, gray clay	53.4
S-8132	Tube 1 - Top	35-37	Moist, reddish brown clay	36.9
S-8132	Tube 1 - Top middle	35-37	Wet, reddish brown clay	43.5
S-8132	Tube 1 - Bottom middle	35-37	Moist, dark reddish brown silt	31.9
S-8132	Tube 1 - Bottom	35-37	Wet, dark reddish brown silt	44.6

Notes: Temperature of Drying : 110° Celsius



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S-5796-1	Sample Type:	jar
Sample ID:	S-3	Test Date:	08/02/16
Depth :	10-12 ft	Test Id:	384944
Test Comment:	---		
Visual Description:	Moist, red sand with silt and gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	30.5	58.9	10.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1.0 in	25.00	87		
0.75 in	19.00	87		
0.5 in	12.50	84		
0.375 in	9.50	80		
#4	4.75	70		
#10	2.00	60		
#20	0.85	49		
#40	0.42	32		
#60	0.25	23		
#100	0.15	16		
#200	0.075	11		

<u>Coefficients</u>	
D ₈₅ = 13.9597 mm	D ₃₀ = 0.3715 mm
D ₆₀ = 1.9405 mm	D ₁₅ = 0.1303 mm
D ₅₀ = 0.9090 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

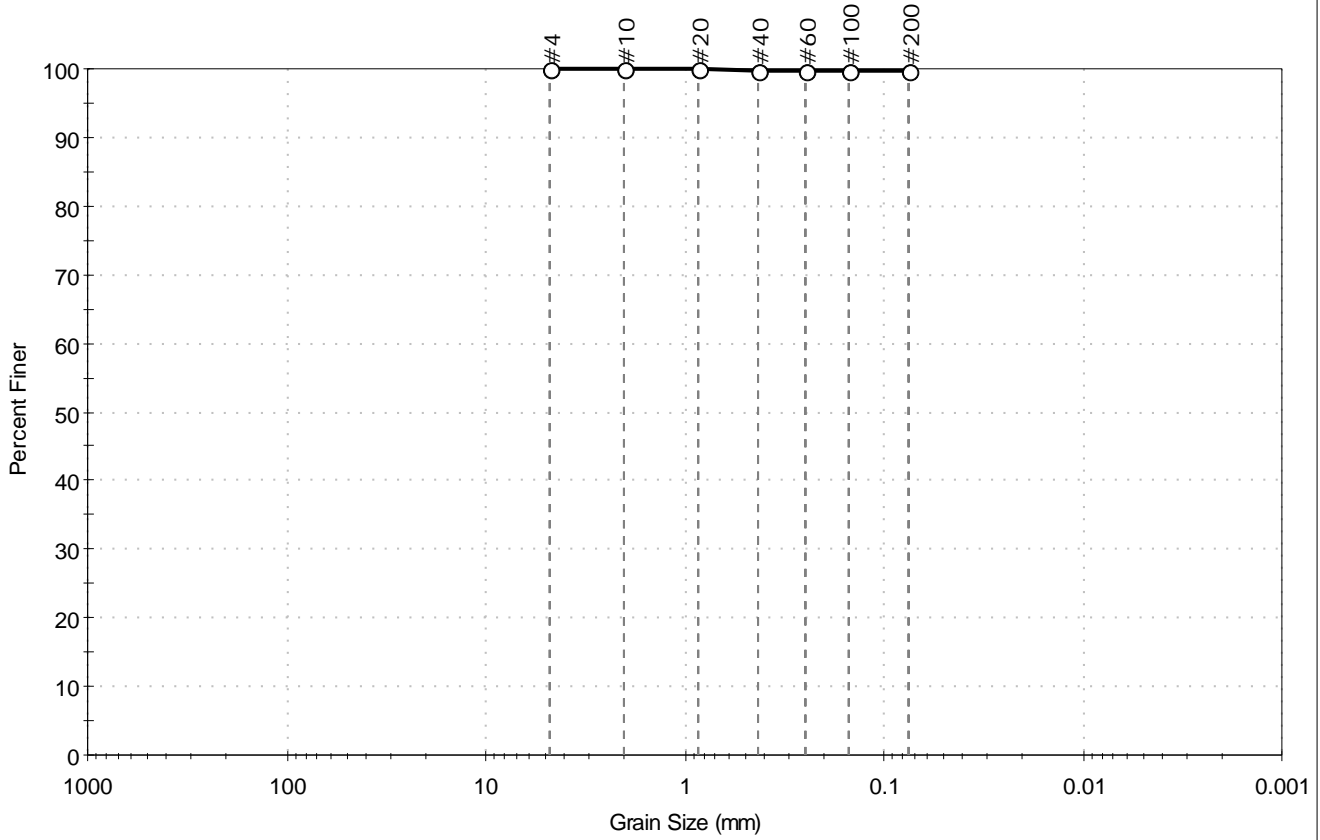
<u>Classification</u>	
<u>ASTM</u>	N/A
<u>AASHTO</u>	Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S-6043-1	Sample Type:	jar
Sample ID:	S-5	Test Date:	08/03/16
Depth:	20-21 ft	Test Id:	384959
Test Comment:	---		
Visual Description:	Moist, olive gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	0.4	99.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	100		

<u>Coefficients</u>	
D ₈₅ = N/A	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

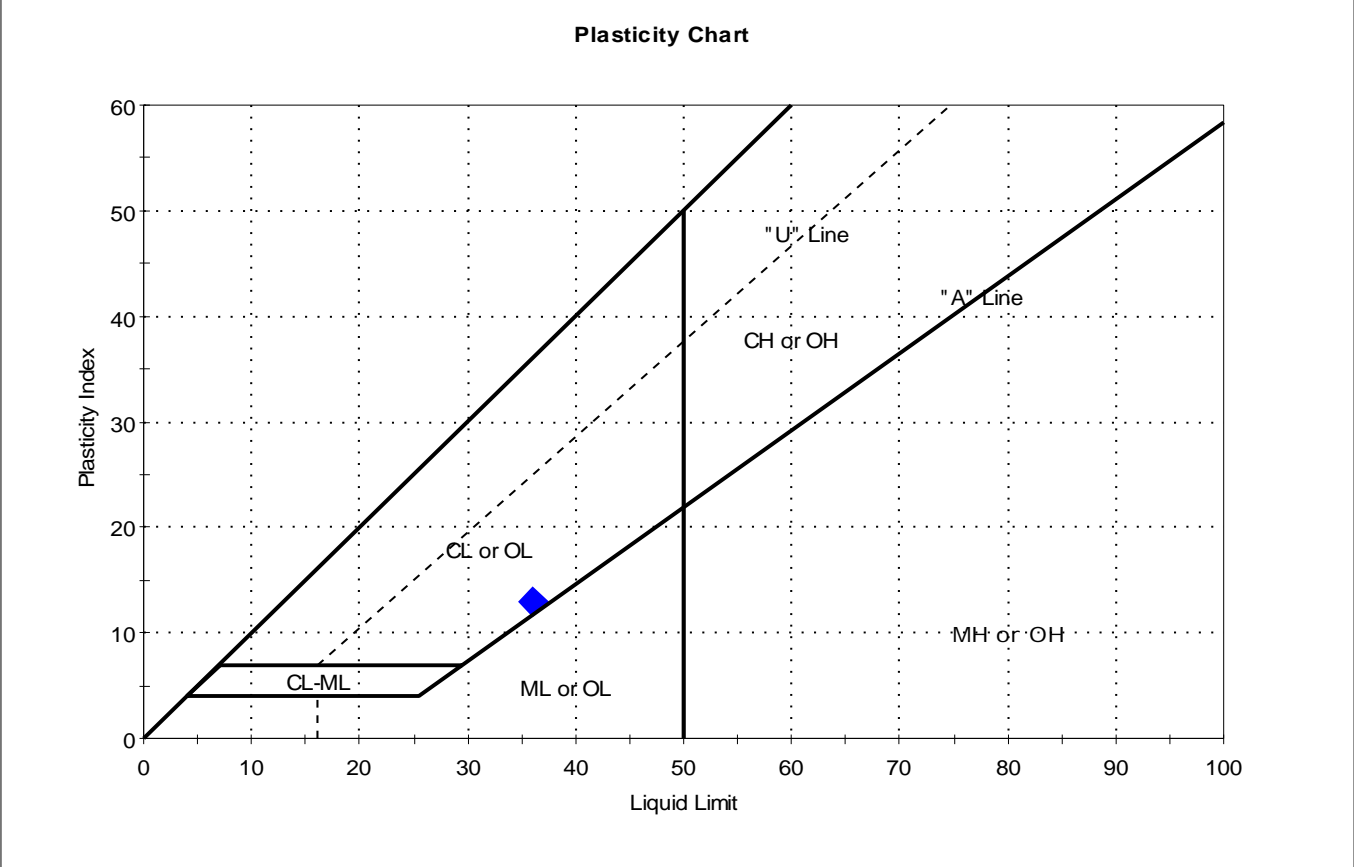
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S5796-1	Sample Type:	tube
Sample ID:	UP-1 - Top middle	Test Date:	07/13/16
Depth :	67-69	Test Id:	382132
Test Comment:	---		
Visual Description:	Wet, gray clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Top middle	S5796-1	67-69	40	36	23	13	1.3	

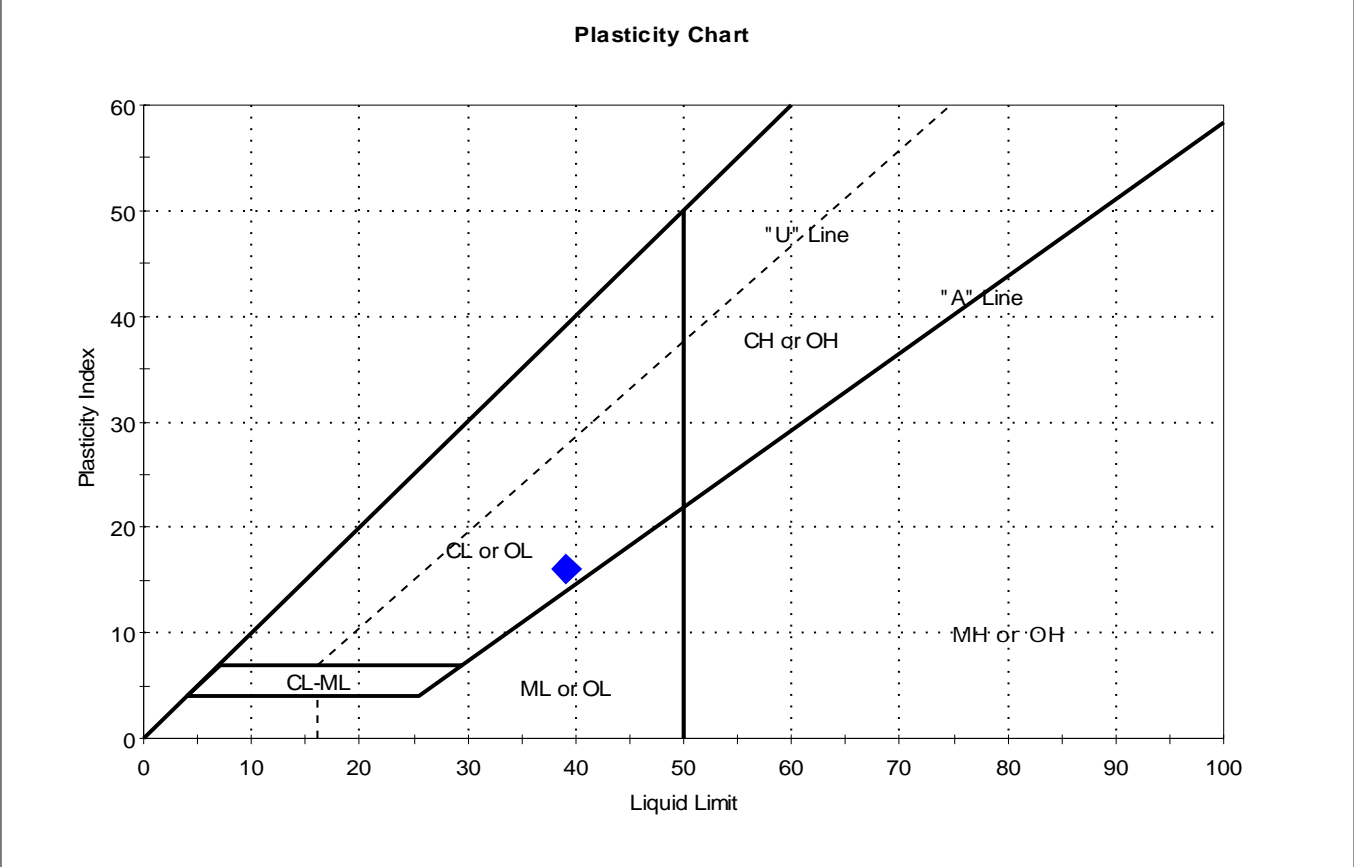
Sample Prepared using the WET method

Dry Strength: MEDIUM
 Dilatancy: RAPID
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S5796-1	Sample Type:	tube
Sample ID:	UP-1 - Bottom	Test Date:	07/13/16
Depth :	67-69	Test Id:	382127
Test Comment:	---		
Visual Description:	Wet, greenish gray clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-1 - Bottom	S5796-1	67-69	43	39	23	16	1.3	

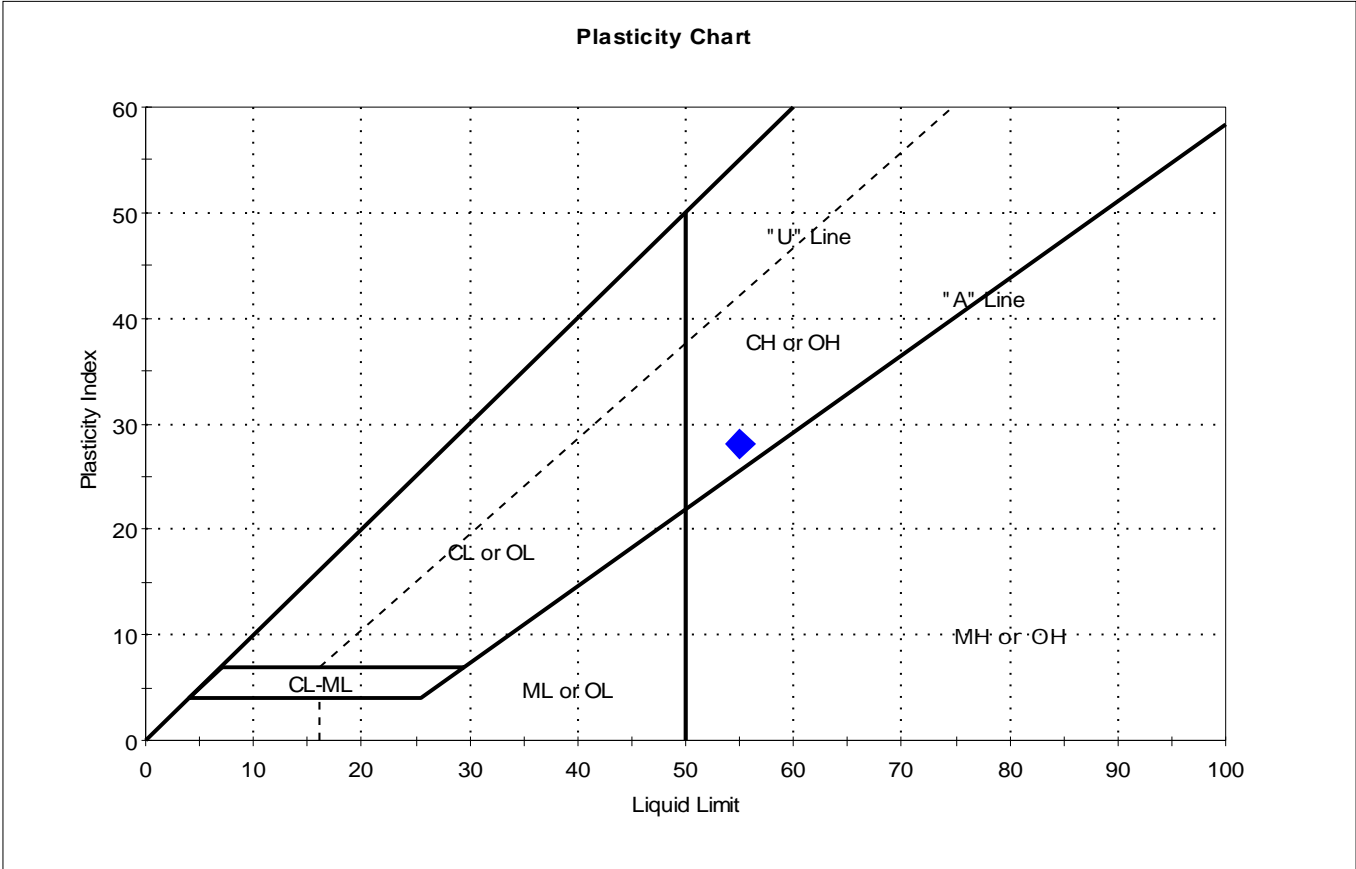
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: NONE
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		
Project:	Reconstruction of Exit Charter Oak Bridge		
Location:	Hartford, CT	Project No:	GTX-304831
Boring ID:	S5796-1	Sample Type:	tube
Sample ID:	UP-3 - Top middle	Test Date:	07/14/16
Depth :	85-87	Test Id:	382094
Test Comment:	---		
Visual Description:	Moist, greenish gray clay		
Sample Comment:	---		

Atterberg Limits - AASHTO T 89 and T 90



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-3 - Top middle	S5796-1	85-87	52	55	27	28	0.9	

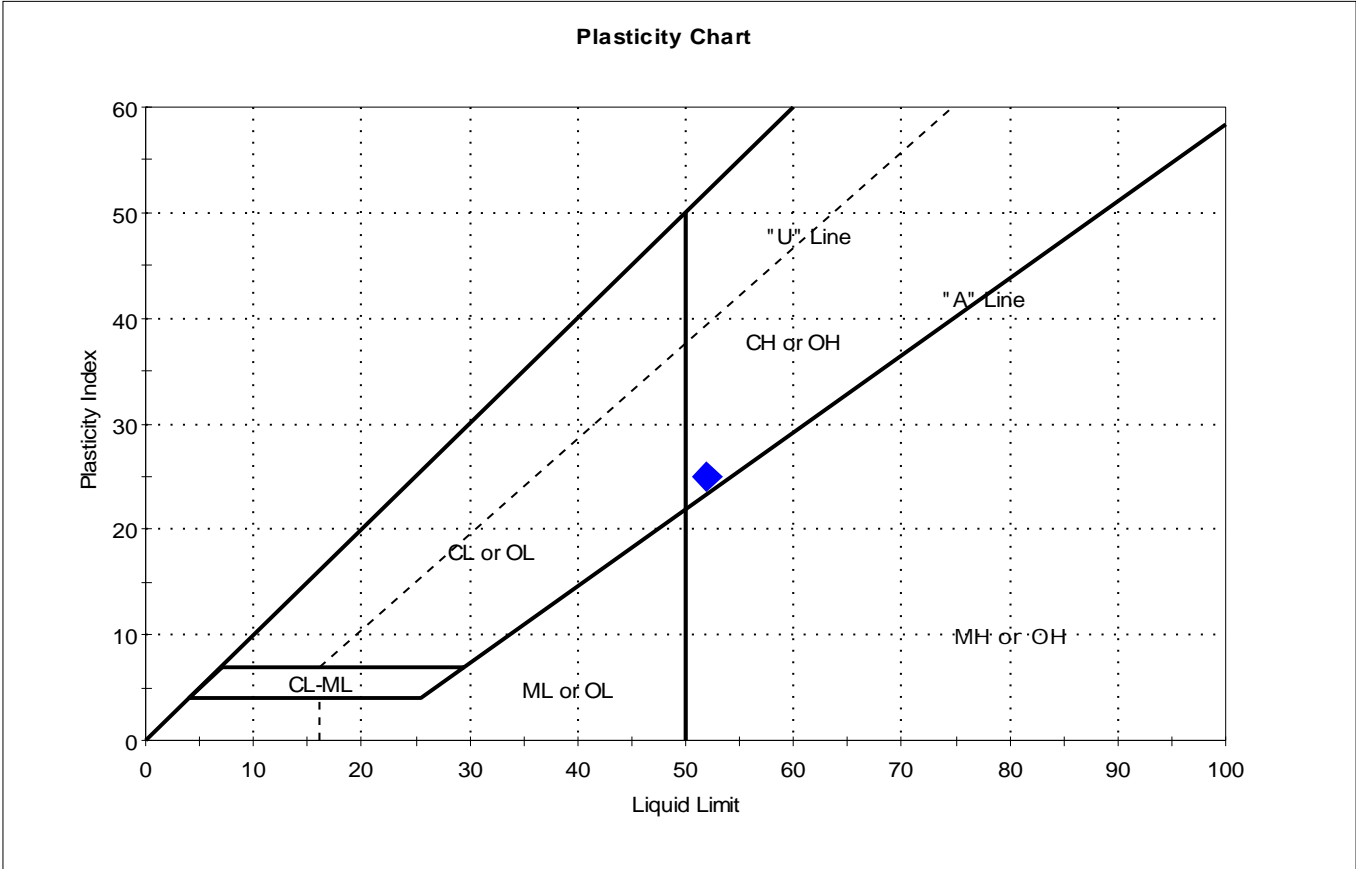
Sample Prepared using the WET method

Dry Strength: HIGH
 Dilatancy: SLOW
 Toughness: MEDIUM



Client:	Freeman Companies, LLC		Project No:	GTX-304831	
Project:	Reconstruction of Exit Charter Oak Bridge				
Location:	Hartford, CT	Sample Type:	tube	Tested By:	GA
Boring ID:	S5796-1	Test Date:	07/13/16	Checked By:	emm
Sample ID:	UP-3 - Bottom	Test Id:	382089		
Depth :	85-87				
Test Comment:	---				
Visual Description:	Moist, gray clay				
Sample Comment:	---				

Atterberg Limits - AASHTO T 89 and T 90

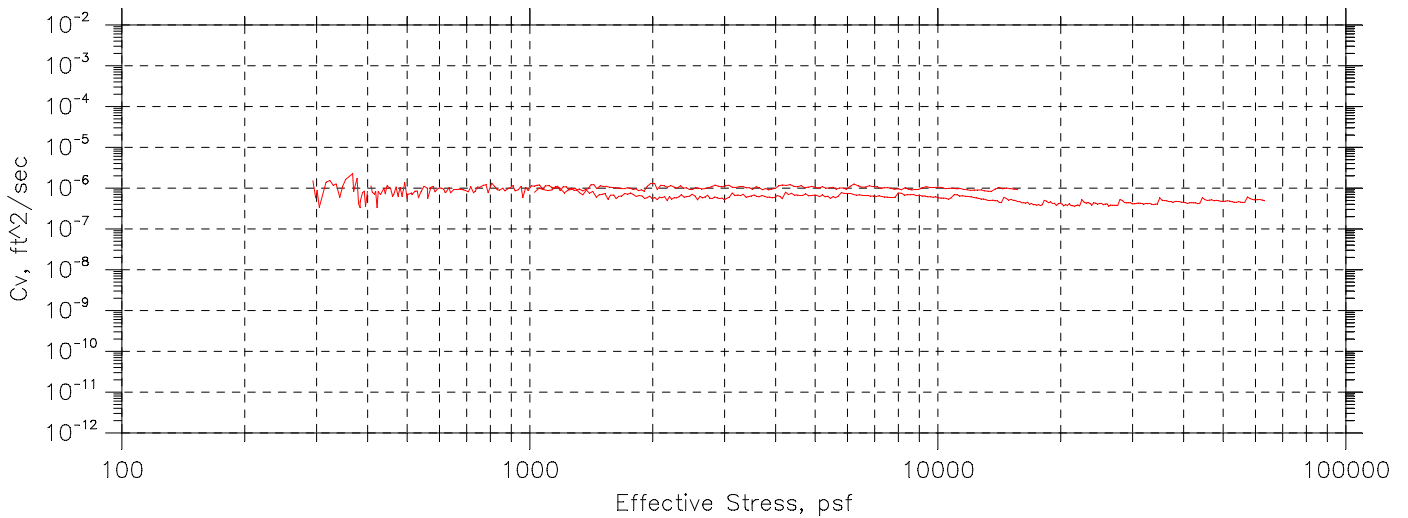
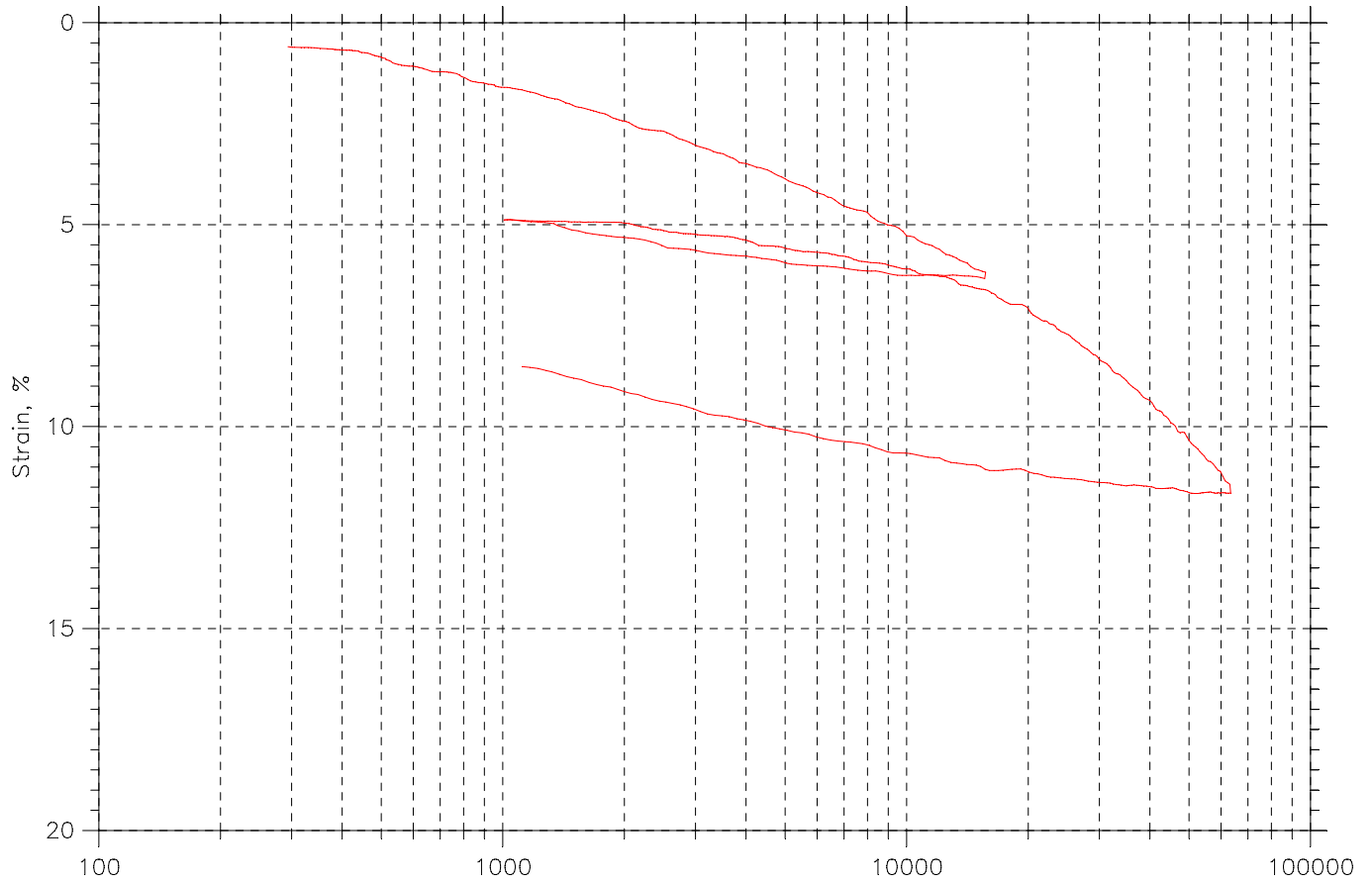


Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	UP-3 - Bottom	S5796-1	85-87	53	52	27	25	1.1	

Sample Prepared using the WET method

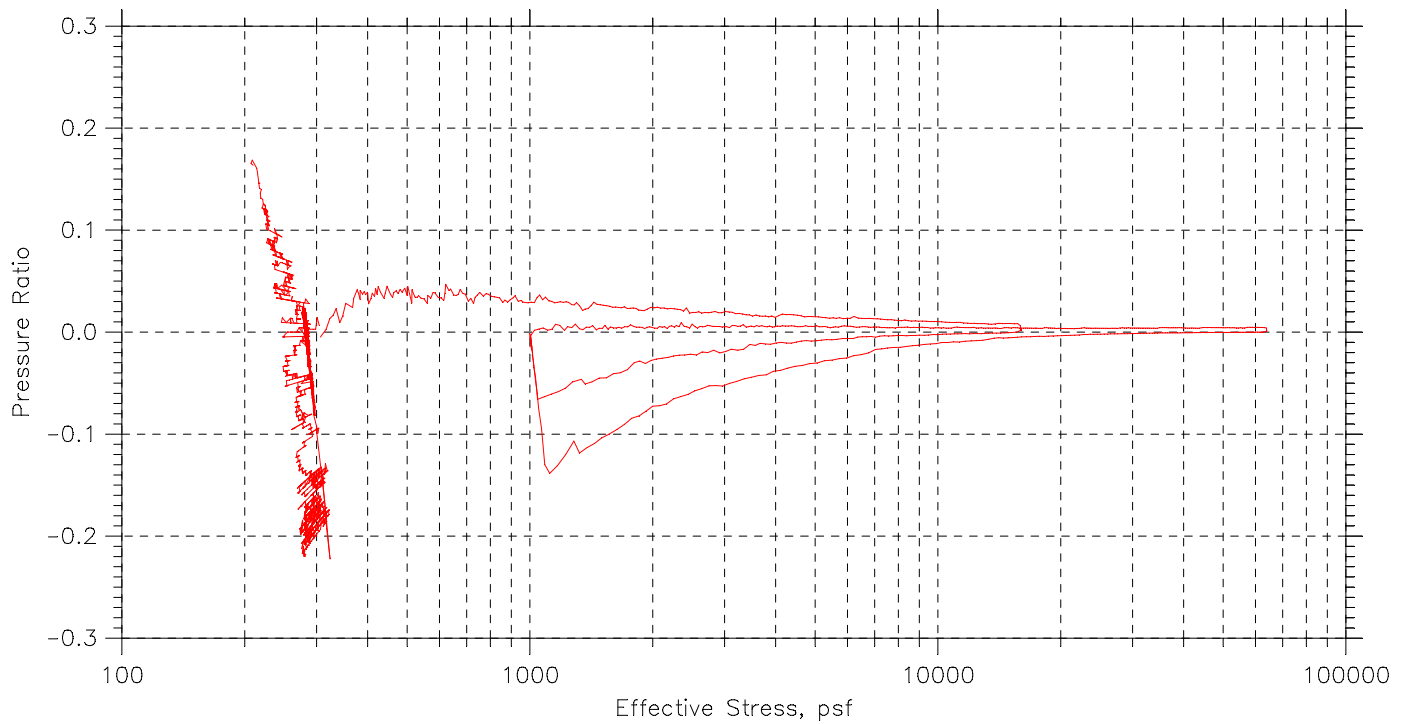
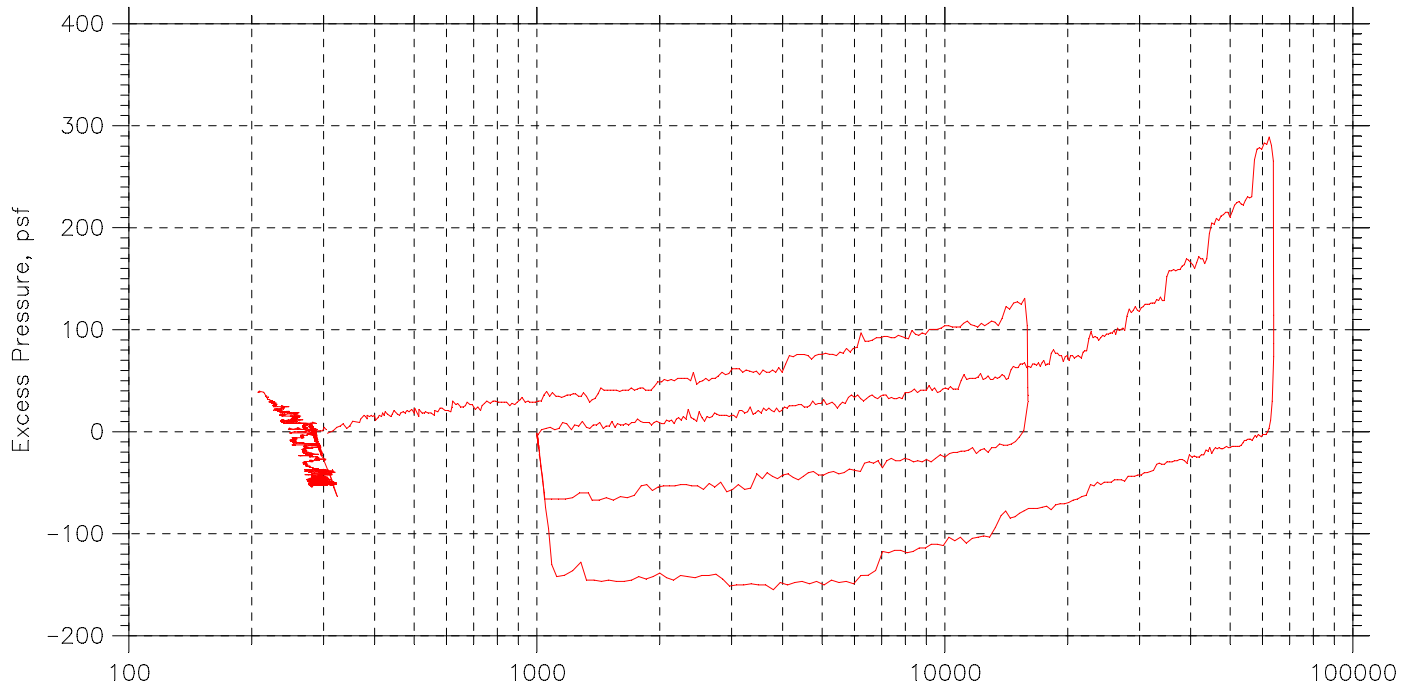
Dry Strength: MEDIUM
 Dilatancy: NONE
 Toughness: MEDIUM

Constant Rate of Consolidation
Constant Strain Rate by ASTM D4186
Summary Report



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S5796-1	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/09/16	Depth: 67-69 ft
Test No.: CRC-11	Sample Type: intact	Elevation: ---
Description: Moist, greenish gray clay		
Remarks: System v		
Page 1 of 3		

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Pressure Curves



Project: Reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S5796-1	Tested By: md	Checked By: njh
Sample No.: UP-1	Test Date: 06/09/16	Depth: 67-69 ft
Test No.: CRC-11	Sample Type: intact	Elevation: ---
Description: Moist, greenish gray clay		
Remarks: System v		
Page 2 of 3		

CRC TEST DATA

Project: Reconstruction of Exit
 Boring No.: S5796-1
 Sample No.: UP-1
 Test No.: CRC-11

Location: Hartford, CT
 Tested By: md
 Test Date: 06/09/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 67-69 ft
 Elevation: ---

Soil Description: Moist, greenish gray clay
 Remarks: System v

Estimated Specific Gravity: 2.82
 Initial Void Ratio: 1.03
 Final Void Ratio: 0.847

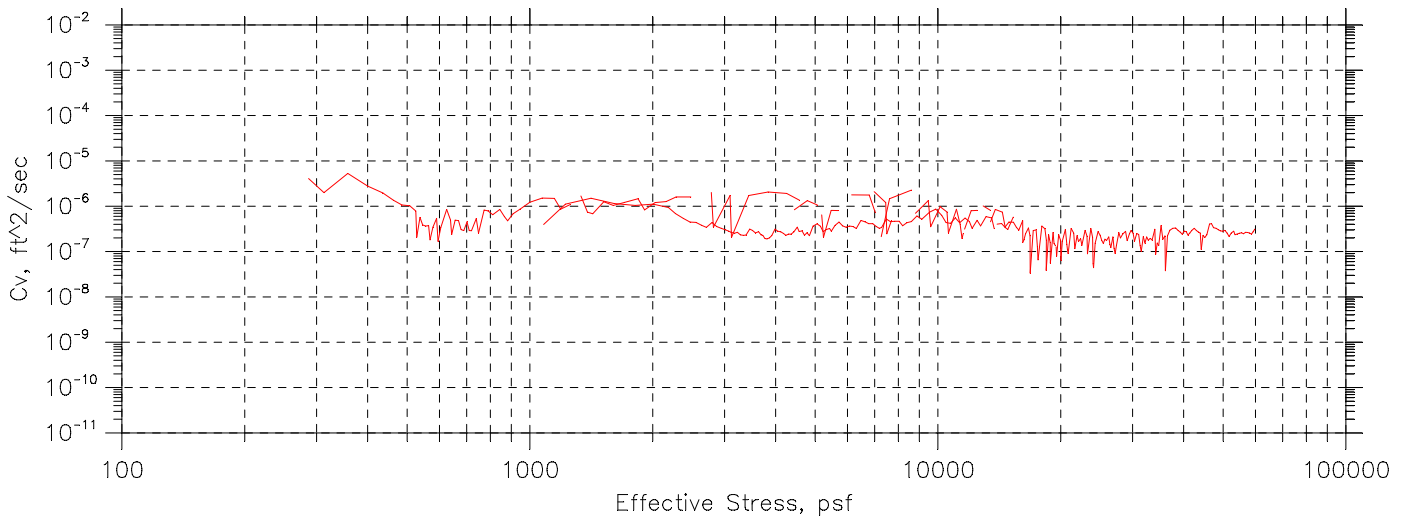
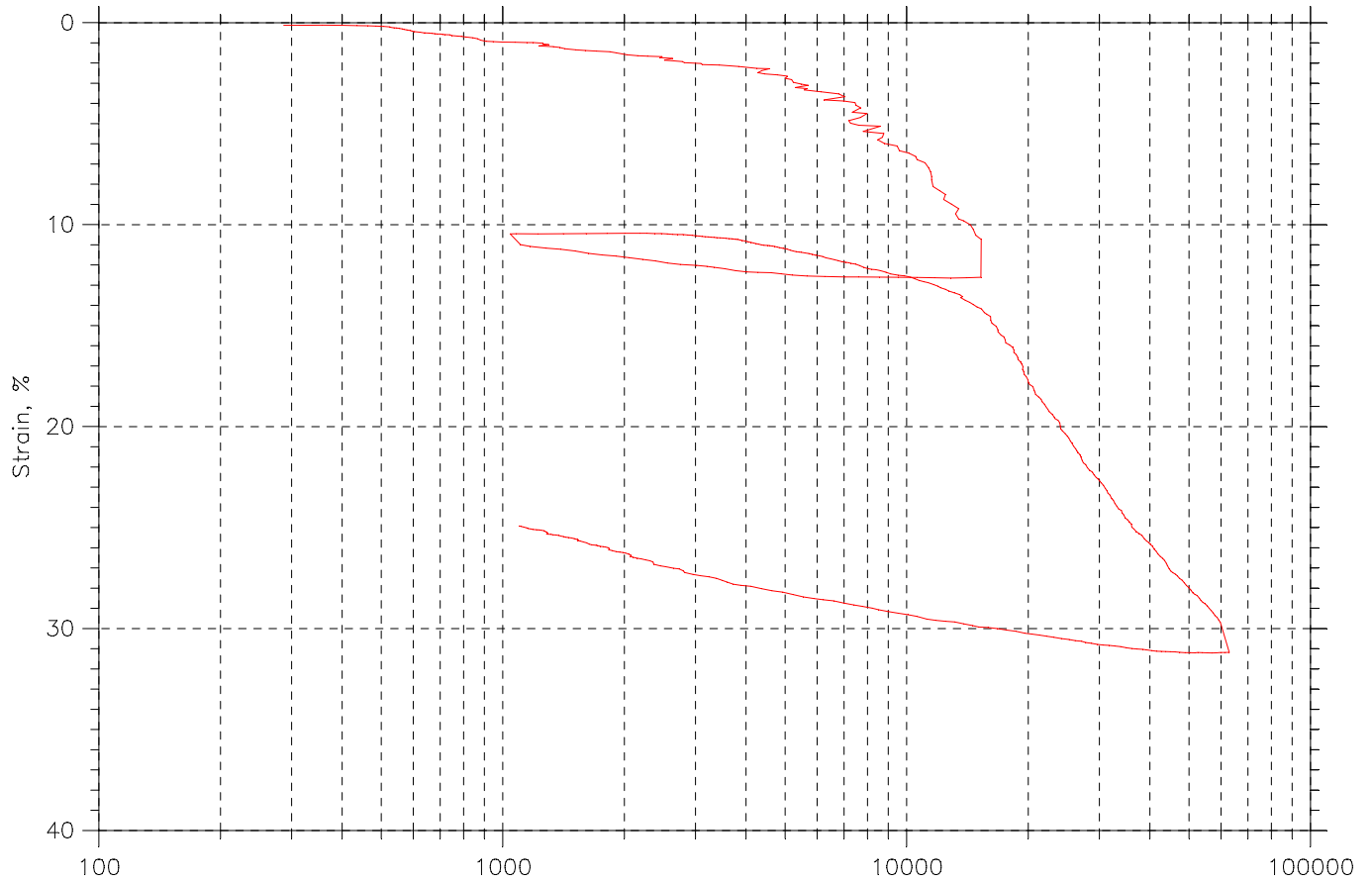
Liquid Limit: 39
 Plastic Limit: 23
 Plasticity Index: 16

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.91 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	C-1254	RING		16941
Wt. Container + Wet Soil, gm	215.83	261.53	254.34	156.75
Wt. Container + Dry Soil, gm	152.99	220.78	220.78	122.57
Wt. Container, gm	8.3600	109.11	109.11	8.8300
Wt. Dry Soil, gm	144.63	111.67	111.67	113.74
Water Content, %	43.45	36.49	30.05	30.05
Void Ratio	---	1.03	0.847	---
Degree of Saturation, %	---	99.88	100.00	---
Dry Unit Weight, pcf	---	86.666	95.238	---

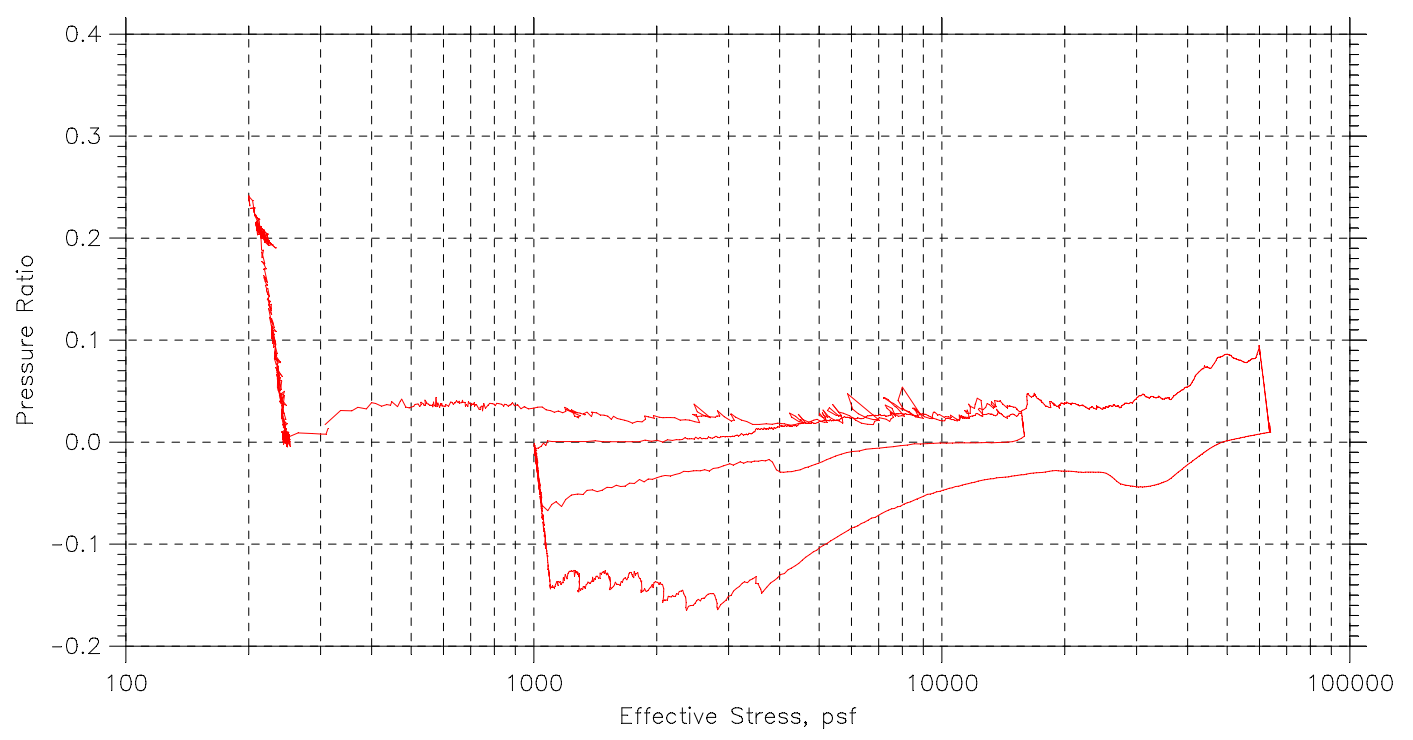
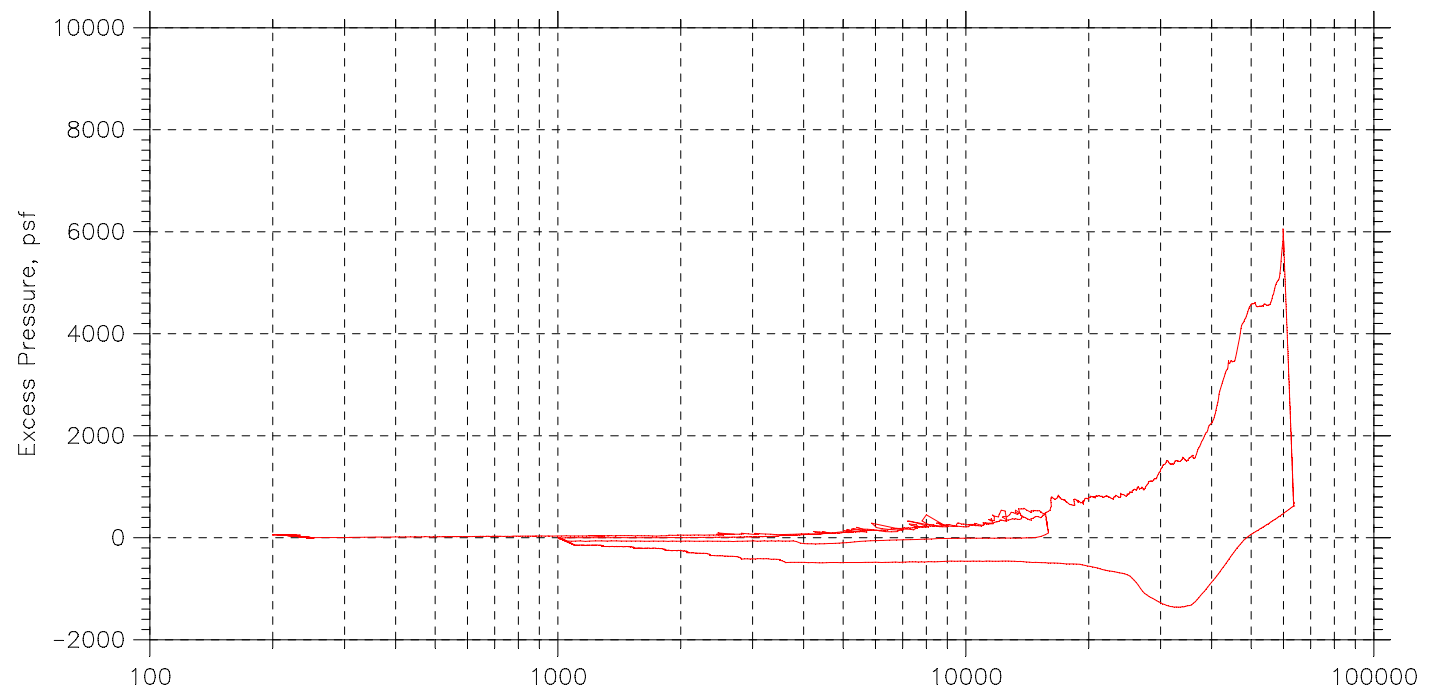
Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

Constant Rate of Consolidation
 Constant Strain Rate by ASTM D4186
 Summary Report



Project: reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S5796-1	Tested By: md	Checked By: njh
Sample No.: UP-3	Test Date: 06/28/16	Depth: 85-87 ft
Test No.: CRC-4A	Sample Type: intact	Elevation: ---
Description: Moist, gray clay		
Remarks: System 0		
Page 1 of 3Page 1 of 3		

Constant Rate of Consolidation Constant Strain Rate by ASTM D4186 Pressure Curves



Project: reconstruction of Exit	Location: Hartford, CT	Project No.: GTX-304831
Boring No.: S5796-1	Tested By: md	Checked By: njh
Sample No.: UP-3	Test Date: 06/28/16	Depth: 85-87 ft
Test No.: CRC-4A	Sample Type: intact	Elevation: ---
Description: Moist, gray clay		
Remarks: System 0		
Page 2 of 3Page 2 of 3		

CRC TEST DATA

Project: reconstruction of Exit
 Boring No.: S5796-1
 Sample No.: UP-3
 Test No.: CRC-4A

Location: Hartford, CT
 Tested By: md
 Test Date: 06/28/16
 Sample Type: intact

Project No.: GTX-304831
 Checked By: njh
 Depth: 85-87 ft
 Elevation: ---

Soil Description: Moist, gray clay
 Remarks: System 0

Estimated Specific Gravity: 2.75
 Initial Void Ratio: 1.44
 Final Void Ratio: 0.882

Liquid Limit: 52
 Plastic Limit: 27
 Plasticity Index: 25

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.77 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	C-1428	RING		B-453
Wt. Container + Wet Soil, gm	111.98	247.53	229.51	126.48
Wt. Container + Dry Soil, gm	75.790	200.49	200.49	97.840
Wt. Container, gm	8.0300	109.81	109.81	8.3600
Wt. Dry Soil, gm	67.760	90.677	90.677	89.480
Water Content, %	53.41	51.88	32.01	32.01
Void Ratio	---	1.44	0.882	---
Degree of Saturation, %	---	98.99	100.00	---
Dry Unit Weight, pcf	---	70.373	91.393	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.