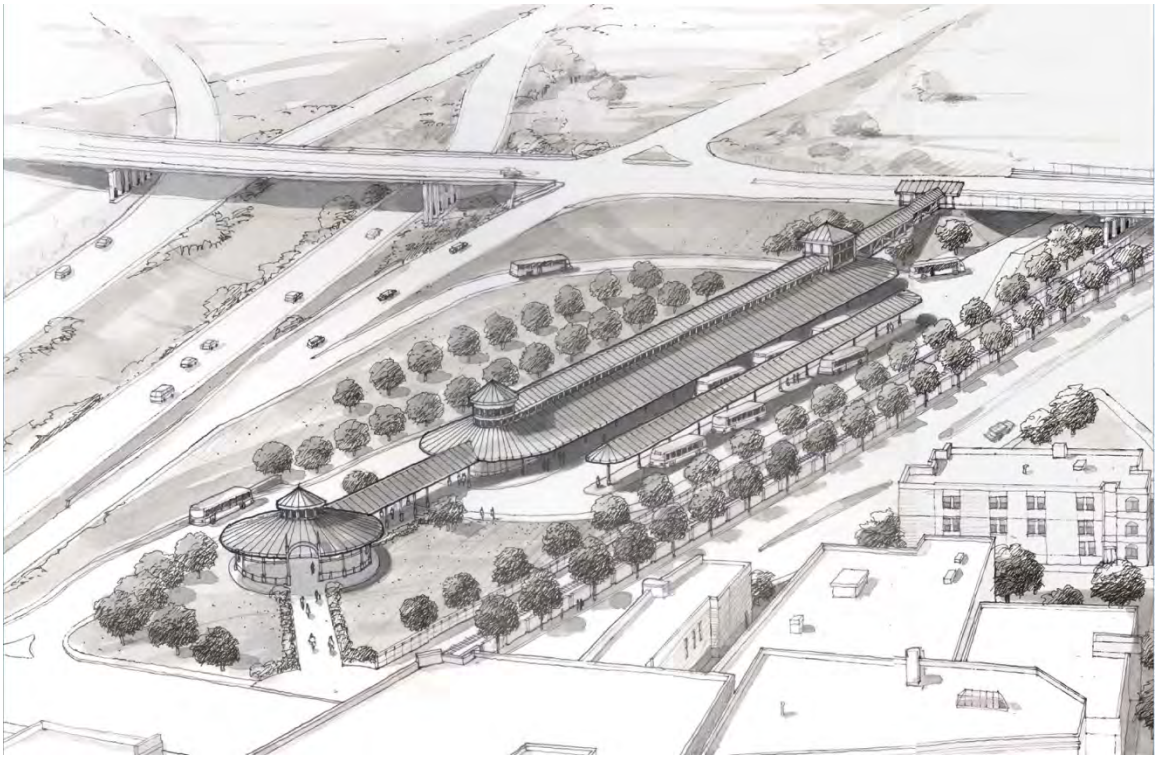
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

NEW BRITAIN – HARTFORD BUSWAY
STATE PROJECT NO. 88-H035

BUSWAY STATION 18+80 TO STATION 118+00

NEW BRITAIN, CONNECTICUT

RETAINING WALL GEOTECHNICAL REPORT



MAY 2011

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Proposed Retaining Walls 101-115

Geotechnical Report

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1.0 INTRODUCTION

1.1 General Information

This is a Structure Soils Report for a series of retaining walls along a section of the New Britain to Hartford Busway. The section of Busway is in New Britain and starts north of the proposed New Britain Bus Terminal at East Street station 18+80 to north of East Street station 118+00. The retaining walls in question are shown on the Boring Location Plans in Appendix 1. Foundation designs are in accordance with the Connecticut Department of Transportation Geotechnical Manual, using AASHTO Load and Resistance Factor Design (LRFD), 2004 with updates, design methodology.

2.0 PROPOSED CONSTRUCTION AND EXISTING CONDITIONS

2.1 General

The Boring Location Plans in Appendix 1 show the approximate locations and lengths of the retaining walls and the boring hole locations. The entire length of the Busway and retaining walls are within the right-of-way of an abandoned railroad line which runs through New Britain.

2.2 Existing Conditions

A pilot subsurface exploration program was undertaken during the preliminary design phase of the Busway project. These preliminary borings established the preliminary design parameters of the structure and roadway design. In order to augment the preliminary boring information and to address specifically the critical locations of retaining walls, twenty (20) supervised test borings were performed at the following locations.

Retaining Wall 101 – Sta 211+14 (B-102), Sta 209+00 (B-141),
Sta 210+00 Sta (B-143)
Retaining Wall 102 – Sta 19+12 (B-104), Sta 20+76 Sta (B-106)
Retaining Wall 104 – Sta 37+52 (B-116), Sta 39+02 Sta (B-117)
Retaining Wall 106 – Sta 72+88 (B-126), Sta 74+92 Sta (B-127)
Retaining Wall 106 and 113 – Sta 78+23 (B-128), Sta 80+27 Sta (B-129)
Retaining Wall 107 and 114 – Sta 85+01 (B-130)
Retaining Wall 109 – Sta 98+79 (B-133)
Retaining Wall 110 – Sta 103+88 (B-134)
Retaining Wall 111 and 112 – Sta 110+37 (B-137), Sta 111+15 (B-138),
Sta 114+58 (B-139), Sta 117+72 Sta (B-140)
Retaining Wall 115 – Sta 49+50 (B-146), Sta. 51+75 (B-147)

The test borings along the abandoned railroad were advanced utilizing truck mounted drilling equipment and extended to depths of 17’ to 53’ feet below the existing surface grades. The borings were performed using 4” outside diameter (3.25” I.D.) hollow stem augers, unless otherwise noted

on the boring logs. In some cases 4" outside diameter solid stem augers and roller bits were used. To obtain the rock cores the drillers rotated a 2" inside diameter diamond encrusted NQ core barrel at the top of suspected bedrock. All field work was performed under the direct technical observation of a representative from VN Engineers, Inc. Our representative located the explorations in the field, maintained a continuous log of the explorations as the work proceeded, and supervised the soil sampling operations so as to develop the required subsurface information.

Select soil samples were subjected to laboratory testing. The laboratory program included moisture content determinations, and grain size including hydrometer analyses. The results of the laboratory tests are attached.

The results of the subsurface exploration program and laboratory analyses have provided the basis for our engineering analysis and design recommendations.

2.3 Wall 101 – Along Route 72 Exit Ramp, Sta. 209+10.0 to Sta. 211+30.70 –

Length = 220.7 ft, maximum height = 25 ft. Since the differential settlement of a spread type foundation was estimated to be excessive, this wall will have a pile supported concrete footing. It will have a standard barrier curb on top and will also have a metal beam rail attached to it on one end.

2.3.1 Subsurface Data

Borings B-102, B-141 and B-143 represent the type of soil under wall 101. The complete logs are included in Appendix 2. This wall is to be built along the north side of the relocated route 72 exit ramp.

The soils encountered at B-102 indicate loose fill to about 5' and medium dense fill to about 15'. From 15' to 20' a layer of loose sand soil was encountered. B-141 shows a layer of medium dense fill to about 3' below grade that is underlain by a medium dense sand layer observed to a depth of 19 feet below grade. B-143 indicates medium dense fill to about 3', loose silty sand from 3' to 8' and medium dense silt/sand from 8' to 19'. From about 20' to the top of bed rock B-102 and B-143 indicate medium dense to dense silt and gravel. In boring B-141 layer loose to medium dense sand and soft silt was identified between 19 and 28 feet below grade and was underlain by a layer of medium-dense to very-dense gravel and sand which extends to the top of bedrock. Bedrock was encountered at 35', 40.5, and 40' below grade at B-102, B-141 and B-143, respectively.

Groundwater was observed between 16 and 17 feet below grade.

Complete logs of the borings performed in the vicinity of proposed retaining wall 101 are presented in Appendix 2 of this report and are summarized above. As stated previously, loose or previously disturbed soils were encountered within boring B-141 between 20 and 25 feet below surface grade and were also encountered within boring B-102 at 20 and 25 feet below grade level. Since the depth to suitable bearing soils varies, we recommend that the foundation of Wall 101 consist of pile supported poured concrete footings.

We have estimated the allowable geotechnical pile capacities in accordance with the LRFD method of design. Since the borings indicate variable subsurface conditions, we do not anticipate that a driven H-pile will reach competent bedrock, therefore we recommend anticipating a depth of penetration into the glacial till/ gravel layer of 10 to 15 feet, at best. The contractor should use these estimated penetrations to determine the pile length for the preconstruction test pile program, in accordance with section 10.7.3.3, and use the actual lengths to determine the production pile lengths. In our experience these capacities should be achieved with less penetration using a lighter hammer. It should also be noted that a higher capacity hammer may result in a damaged pile. The actual depth of penetration into the till layer must be determined in the field via a Pile Driving Analyzer (PDA). Piles which either encounter refusal at shallower depths than anticipated or do not achieve penetration into the till layer must be targeted for PDA testing.

Allowable Geotechnical Capacity

Pile Size	Tip Resistance	Skin Friction		Downdrag	Total Geotechnical Capacity
		Sand	Till		
HP 10 x 57	98 kips	35	56	- 26	191 kips
HP 12 x 74	125 kips	42	68	- 32	237 kips
HP 14 x 89	152kips	50	80	- 38	283 kips
HP 14 x 117	198 kips	51	81	-38	332 kips

In the event that it is decided to penetrate the very dense gravel layer and provide end bearing piles into bedrock, the end bearing capacity will increase therefore VN Engineers should be contacted for revised allowable capacities.

Based upon the boring logs we occasionally encountered high blow counts above the till layer, therefore severe driving should be

anticipated. The contractor may consider predrilling or spudding where obstructions are encountered. Additionally, the group effect of the pile cap must be considered in accordance with 10.7.3.9.

It should be noted that the pile spacing should be limited to no less than 30", or 2.5 pile diameters, whichever is greater. Additionally, we recommend performing laboratory analyses upon the different soil layers encountered at the site to determine if the soil is corrosive to steel. Corrosion protection should be applied as required by the soil conditions.

2.4 Wall 102 – Along Busway Under Route 71 Bridge, Sta. 19+27.6 to Sta. 20+86.27 – Length = 158.67 ft, maximum height = 14 ft. Due to the closeness of this wall to the stub abutment in back of it, this wall will be of cast-in-place construction and will require an earth retaining system left in place so as not to undermine the abutment. It will also have to be constructed in limited headroom conditions and require ground anchors to provide resistance to sliding.

2.4.1 Subsurface Data

Borings B-104 and B-106 represent the type of soil under wall 102. The complete log is included in Appendix 2 of this report. This wall is to be built beneath the existing Truman Street overpass (Route 175).

The soils encountered at B-104 and B-106 indicate loose fill to 12' and B-106 indicates soft silt from 15' to 30'. From 30 to 37 feet medium dense to dense red brown silt was encountered. The boring was ended at 37 feet with a standard penetration resistance of 47 blows per foot. Therefore, in the present condition the soils at the proposed bottom of the retaining wall will not provide sufficient bearing capacity to limit settlement. Consequently, the subgrade soils in this vicinity must be prepared in accordance with the Section 4.3 Bearing Conditions and Stability and Section 4.7 Subgrade Preparation. The angle of internal friction of the backfill soil only is based upon the assumption that the backfill soils and sub grade will be prepared in accordance with the site preparation procedures outlined in section 4.7 of this report, and is considered to be 32 degrees. The angle of internal friction for the underlying loose sand, and/or soft silt can be assumed to be 28 degrees. The depth of the footings is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the order of 0.07. Therefore, considering the loose soil conditions which are too deep to be removed entirely, the upper loose soils should be removed and replaced as described in section 4.3. For tension anchor design the minimum unbounded length should be the greater of either

H/5, or 3.5 feet beyond the critical failure plane. Additionally, the Ultimate Unit Resistance (Qa) of the anchors in the loose silt/sand soil should be 70 kPa, and the resistance factor (φ) shall be 0.7 for anchors which are load tested. Finally, the Resistance Factor for sliding should be 0.80 for the cast-in-place wall.

It is our understanding that proposed retaining wall 102 will be constructed with a minimum foundation embedment of 4 feet. It should be noted however that section 10 of the LRFD Reference Manual indicates that, "Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state." The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils are suitable for foundation support and have not been disturbed during construction. Where the soils at the bottom of the proposed wall foundation are considered to be loose and/or unsuitable the recommendations of section 4.7 Site Preparation must be adhered to in order to properly prepare the foundation subgrade.

Groundwater was observed at 20 feet in hole B-104 and at 16 feet in hole B-106.

2.5 Wall 104 – Along Busway East of Stanley Street, Sta. 37+65.0 to Sta. 39+40.0

Length = 175 ft, maximum height = 10 ft. This wall will be of cast-in-place construction and require temporary sheeting to construct, as it is adjacent to an existing building.

2.5.1 Subsurface Data

Borings B-116 and B-117 are representative of the subsurface conditions at this wall. Complete logs are included in Appendix 2. The soil in these holes are characterized by four (4) to seven (7) feet of Black or Brown sand with the underlying layers to about 15 feet consisting of a Red brown silt. Below 15 feet, the Red brown sand appears again to the end of the holes at 22 feet. The blow counts in these holes ran from about 7 to over 100 blows per foot. The angle of internal friction is based upon the standard penetration tests (SPT) shown on the boring logs and is considered to range from 28 to 32 degrees at the proposed footing sub grade elevation. The depth of the footings is assumed to be 4 feet and

the width to length ratio for the footing is assumed to be on the order of 0.03. Therefore, considering the loose sand and/or medium stiff silt soil encountered at the proposed bearing depth, the Presumptive Bearing Resistance is 3000 pounds per square foot. For Strength Limit States the ultimate soil bearing capacity (q ult) is 8 tons per square foot. In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.80 for the cast-in-place wall.

It is our understanding that proposed retaining wall 104 will be constructed with a minimum foundation embedment of 4 feet. It should be noted however that section 10 of the LRFD Reference Manual indicates that, "Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state." The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils are suitable for foundation support and have not been disturbed during construction. It should also be noted that the silt soils at a depth of 4 feet are sensitive to disturbance due to heavy construction equipment and/or exposure to adverse weather.

Groundwater was observed at 12 feet below grade level.

2.6 Wall 106 – Along Busway through Cemetery, Sta. 70+96.5 to Sta. 81+26.5

– Length = 1030 ft, maximum height = 17.25 ft. This wall will be of cast-in-place construction and have a visual screen attached to the top.

2.6.1 Subsurface Data

Borings B-126, B-127, B-128, and B-129 are representative of the subsurface materials at the wall and the full logs of these holes are in Appendix 2. The soils in this area consist of either medium dense Red Brown sand, and gravel for the upper 2 to 14 feet or stiff Brown silt. The angle of internal friction is based upon the standard penetration tests (SPT) shown on the boring logs and is considered to be 32 degrees. The depth of the footings is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the order of 0.006. Considering the medium dense sand and/or stiff silt soil encountered at the proposed bearing depth, the Presumptive Bearing Resistance is 3000 pounds per square foot.

For Strength Limit States the ultimate soil bearing capacity (q ult) is 13 tons per square foot. In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.80 for the cast-in-place wall.

It is our understanding that proposed retaining wall 106 will be constructed with a minimum foundation embedment of 4 feet, therefore the basic nominal bearing resistance will be 26 kips per square foot. It should be noted however that section 10 of the LRFD Reference Manual indicates that, "Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state." The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils are suitable for foundation support and have not been disturbed during construction. It should also be noted that the silt soils encountered in borings B-128 and B-129 at a depth of 2 feet are sensitive to disturbance due to heavy construction equipment and/or exposure to adverse weather. Where the soils at the bottom of the proposed wall foundation are considered to be loose and/or unsuitable the recommendations of section 4.7 Site Preparation must be adhered to in order to properly prepare the foundation subgrade.

Groundwater was observed at the 15 feet level in hole B-126. No groundwater was encountered in holes B-127, B-128 and B-129.

2.7 Wall 107 – Along Busway through Cemetery, Sta. 81+82.5 to Sta. 85+12.5

– Length = 330 ft, maximum height = 18.5 ft. This wall will be of cast-in-place construction with a visual screen attached to the top of it.

2.7.1 Subsurface Data

Boring B-130 represents conditions under the wall at this location. Complete log is in Appendix 2. The soil is generally medium dense Brown sand for the upper 5 feet, underlain by very stiff Red Brown silt to 20' below existing surface. The hole was terminated at 27 feet. The angle of internal friction is based upon the standard penetration tests (SPT) shown on the boring logs and is considered to be 32 degrees. The depth of the footings is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the

order of 0.02. Considering the very stiff silt soil encountered at the proposed bearing depth, the Presumptive Bearing Resistance is 3000 pounds per square foot. For Strength Limit States the ultimate soil bearing capacity (q ult) is 13 tons per square foot. In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.80 for the cast-in-place wall.

It is our understanding that proposed retaining wall 107 will be constructed with a minimum foundation embedment of 4 feet, therefore the basic nominal bearing resistance will be 26 kips per square foot. It should be noted however that section 10 of the LRFD Reference Manual indicates that, "Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state." The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils are suitable for foundation support and have not been disturbed during construction. It should also be noted that the silt soils at a depth of 5 feet are sensitive to disturbance due to heavy construction equipment and/or exposure to adverse weather.

No groundwater was observed in hole B-130.

2.8 Wall 108 – Along Busway at Piper Brook, Sta. 93+20 to Sta. 94+05 –

Length = 85 ft, maximum height = 11.5 ft. This wall will be of cast-in-place construction and will be partially built over the Piper Brook culvert. It will also have a metal beam rail attached to each end of it.

2.8.1 Subsurface Data

The wall at this location is represented by the pilot boring program hole SB-21. The complete log of the boring can be found in Appendix 2. The soils consisted of gravel to a depth of 5 feet, followed by medium dense sand to 8 feet and stiff to hard silt to 27.5 feet. Since the retaining wall will cross over the culvert and transition from the natural soils to the culvert backfill and back, the sub grade for the wall should be prepared as recommended in the Subgrade Preparation section of this report. However, the inspector should be careful to create a uniform support condition beneath the entire wall. The depth of the footings is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the

order of 0.07. The angle of internal friction is based upon the assumption that the backfill soils and subgrade will be prepared in accordance with the site preparation procedures outlined in section 4.7 of this report, and is considered to be 32 degrees. Therefore, considering the varying soil conditions, the ultimate bearing soil bearing capacity (q ult) is 8 tons per square foot.
In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.80 for the cast-in-place wall.

It should be noted however that section 10 of the LRFD Reference Manual indicates that, "Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state." The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils have been prepared to provide a relatively uniform bearing surface, are suitable for foundation support and have not been disturbed during construction. Where the soils at the bottom of the proposed wall foundation are considered to be loose and/or unsuitable the recommendations of section 4.7 Site Preparation must be adhered to in order to properly prepare the foundation subgrade.

Groundwater was encountered at 14.3 feet below grade elevation.

2.9 Wall 109 – Along Busway at Allen Street, Sta. 98+25 to Sta. 103+70

– Length = 545 ft, maximum height = 24.75 ft. This wall will be a proprietary wall of either modular or MSE construction based on geotechnical considerations. It will have a standard parapet section on top and a metal beam rail will be attached to it at one end.

2.9.1 Subsurface Data

Boring B-133 and pilot program hole SB-22, 23 and 24 represent the subsurface data at the wall. The boring log information is included in Appendix 2. General description of the soil is poorly graded medium dense to dense sand and gravel fill to a depth of 7.5 to 10.5 feet below the ground surface. The gravel fill was underlain by dense to very dense natural sand/silt soils to a depth of 10.5 to 15 feet below grade. Rock was encountered at depths ranging from 15 to 43 feet below grade.

Since the retaining wall may be underlain by several feet of gravelly fill at the north end of the wall, the subgrade for the wall should be prepared as recommended in the Subgrade Preparation section of this report. This way require over excavation of fill soil and/or replacement with suitable compacted backfill. The inspector should be careful to create a uniform support condition beneath the entire wall. The depth of the footings is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the order of 0.01. The angle of internal friction is based upon the assumption that the backfill soils and sub grade will be prepared in accordance with the site preparation procedures outlined in section 4.7 of this report, and is considered to be 32 degrees. Therefore, considering the poorly graded sand soil encountered at the proposed bearing depth, the Presumptive Bearing Resistance is 6000 pounds per square foot. For Strength Limit States the ultimate soil bearing capacity (q ult) is 13 tons per square foot. In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.90 for the modular block or MSE wall.

It is our understanding that proposed retaining wall 109 will be constructed with a minimum foundation embedment of 4 feet. It should be noted however that section 10 of the LRFD Reference Manual indicates that, "Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state." The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils provide a uniform bearing layer, are suitable for foundation support and have not been disturbed during construction.

Groundwater was observed in boring B-133 at 16 feet and was also encountered at depths ranging from 8.3 to 11.9 feet below grade in the borings performed for the pilot program.

2.10 Wall 110 – Along Busway at Allen Street, Sta. 100+00 to Sta. 103+70

– Length = 370 ft, maximum height = 25.5 ft. This will be a proprietary type wall of either modular or MSE construction. It will have a standard parapet section on top and an impact attenuator will be attached to one end of the wall.

2.10.1 Subsurface Data

Boring hole B-134 at station 103+88 represents the sub-surface soils for this wall as well as the subsurface data for the southwest wingwall of the Allen Street Bridge. The boring log for this hole is included in Appendix 2. The soil consists of medium dense Red Brown Sand down to about 15 feet, which is underlain by very dense Red Brown Gravel till down to 30 feet, where bedrock was encountered and a 10 feet long core was obtained.

Since the pilot borings on the easterly side of the Busway revealed that the retaining wall may be underlain by several feet of gravelly fill, the subgrade for the wall should be prepared as recommended in the Subgrade Preparation section of this report. However, the inspector should be careful to create a uniform support condition beneath the entire wall. Where the natural medium dense red brown sand is encountered the angle of internal friction is based upon the standard penetration tests (SPT) shown on the boring logs and is considered to be 34 degrees. Where the gravel fill is encountered the angle of internal friction is based upon the assumption that the backfill soils and subgrade will be prepared in accordance with the site preparation procedures outlined in section 4.7 of this report, and is considered to be 32 degrees. The depth of the footings is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the order of 0.02. Therefore, considering the medium dense sand soil and/or gravelly fill encountered at the proposed bearing depth, the Presumptive Bearing Resistance is 5000 pounds per square foot. For Strength Limit States the ultimate soil bearing capacity (q ult) is 13 tons per square foot. In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.90 for the modular block or MSE wall.

It is our understanding that proposed retaining wall 110 will be constructed with a minimum foundation embedment of 4 feet. It should be noted however that section 10 of the LRFD Reference Manual indicates that, “Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state.” The designer should also be aware that load inclination, punching shear and proximity to slopes will

also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils provide a uniform bearing layer, are suitable for foundation support and have not been disturbed during construction.

Groundwater was observed at 13 feet below grade in hole B-134.

2.11 Wall 111 – Along Busway at East Main Street (SR 175) Bridge, Sta. 110+40 to Sta. 118+40 – Length = 800 ft, maximum height = 36.25 ft. This will be a proprietary type wall of either modular or MSE construction. It will have a standard barrier curb on top and require temporary sheeting to construct.

2.11.1 Subsurface Data

Subsurface investigation holes representative of the conditions under this wall are B-138, B-139, and B-140. There are also pilot boring holes SB-27, SB-28, and RB-8**.** The soil in the vicinity of borings B-138, 139 and 140 consist of loose to medium dense Brown Sand to 3 to 4.5 feet and medium stiff to hard Red Brown silt down to 32 feet, at which depth borings B-139 and B-140 were terminated. Alternately, medium dense to very dense sandy fill soil was encountered in borings SB-27, 28 and RB-8 to a depth of 4.5 feet. SB-27 shows medium stiff silt beneath the fill to 16.5 feet, very dense sand with gravel to 25.5 feet, very dense gravelly silt to 52' and then siltstone bedrock.SB-28 shows loose to medium stiff silt beneath the fill to 12 feet, then medium stiff to stiff lean clay to 26 feet. RB-8 shows stiff to very stiff clayey silt/ silt 30 feet. The complete logs are included in Appendix 2.

Since the borings performed for this study, as well as the previously performed pilot borings revealed that the site soils consist of 4.5 feet of sand/gravel fill, the subgrade for the wall should be prepared as recommended in the Subgrade Preparation section of this report. However, the inspector should be careful to create a uniform support condition beneath the entire wall. Where the wall is to founded upon the natural medium dense to dense sand soil, the angle of internal friction is based upon the standard penetration tests (SPT) shown on the boring logs and is considered to be 34 degrees, however where fill is required to reach the foundation sub grade elevation we recommend a friction angle of 32 degrees, provided it is properly placed and compacted in accordance with our recommendations. The depth of the footings

is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the order of 0.008. Therefore, considering the medium stiff silt soil encountered in SB-28at the proposed bearing depth, the Presumptive Bearing Resistance is 3000 pounds per square foot. For Strength Limit States the ultimate soil bearing capacity (q ult) is 8 tons per square foot. In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.90 for the modular block or MSE wall.

It is our understanding that proposed retaining wall 111 will be constructed with a minimum foundation embedment of 4 feet. It should be noted however that section 10 of the LRFD Reference Manual indicates that, "Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state." The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils are suitable for foundation support and have not been disturbed during construction. It should also be noted that where silt soils are encountered they are to be considered sensitive to disturbance due to heavy construction equipment and/or exposure to adverse weather.

Groundwater was encountered at 27 feet below grade in hole B-139 and 24 feet below grade in holes B-138 and B-140. Groundwater was also observed at 4.6 to 11.5 feet in borings SB-27 and SB-28, therefore the contractor should consider working above the observed ground water elevation, where possible.

2.12 Wall 112 – Along Busway at East Main Street (SR 175) Bridge, Sta. 110+40 to Sta. 117+75.2 – Length = 735.2 ft, maximum height = 33 ft.

This will be a proprietary type wall of either modular or MSE construction. It will have a noise wall attached to it on top, which will require special design and detailing.

2.12.1 Subsurface Data

Subsurface boring holes for this wall are covered by B-137, B-138, B-139 and B-140. Complete logs for these holes are included in Appendix 2. The soil consists of medium dense Red Brown Sand, some gravel to depths ranging from 3 to 6.5 feet, followed by stiff

to very stiff Red Brown Silt with some clay to depths ranging from 15 to 32 feet. Refusal blow counts in very dense till soil was encountered in boring 137 at a depth of 30 feet below grade.

Since the borings performed for this study revealed that the site soils consist of 3 to 6.5 feet of loose to medium dense sand, the subgrade for the wall should be prepared as recommended in the Subgrade Preparation section of this report. However, the inspector should be careful to create a uniform support condition beneath the entire wall. Where the wall is to be founded upon the natural medium dense sand or stiff silt soil, the angle of internal friction is based upon the standard penetration tests (SPT) shown on the boring logs and is considered to be 32 degrees. The depth of the footings is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the order of 0.008. Therefore, considering the medium stiff silt soil encountered in SB-28 at the proposed bearing depth, the Presumptive Bearing Resistance is 3000 pounds per square foot. For Strength Limit States the ultimate soil bearing capacity (q ult) is 8 tons per square foot. In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.90 for the modular block or MSE wall.

It is our understanding that proposed retaining wall 112 will be constructed with a minimum foundation embedment of 4 feet. It should be noted however that section 10 of the LRFD Reference Manual indicates that, “Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state.” The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils are suitable for foundation support and have not been disturbed during construction. It should also be noted that where silt soils are encountered they are to be considered sensitive to disturbance due to heavy construction equipment and/or exposure to adverse weather.

Groundwater was observed at the 14 feet level in B-137, 27 feet in B-139, and 24 feet in B-138 and B-140.

2.13 Wall 113 – Along Busway through Cemetery, Sta. 76+16.5 to Sta. 81+26.5

– Length = 510 ft, maximum height = 12.5 ft. This wall will be of cast-in-place construction. It will also have drainage pipe penetrations at a number of locations and have a metal beam rail attached to it.

2.13.1 Subsurface Data

Borings B-128, and B-129 are representative of the subsurface materials at the wall and the full logs of these holes are in Appendix 2. The soils in this area consist of medium dense Black Brown sand, and gravel for the upper 2 to 5 feet and stiff Red Brown silt below that to the end of the holes at 17 feet. Where the wall is established upon either the natural medium dense black brown sand or stiff red brown silt, the angle of internal friction is based upon the standard penetration tests (SPT) shown on the boring logs and is considered to be 32 degrees. The depth of the footings is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the order of 0.01. Therefore, considering the medium dense sand soil encountered at the proposed bearing depth, the Presumptive Bearing Resistance is 3000 pounds per square foot. For Strength Limit States the ultimate soil bearing capacity (q ult) is 13 tons per square foot. In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.80 for the cast-in-place wall.

It is our understanding that proposed retaining wall 113 will be constructed with a minimum foundation embedment of 4 feet, therefore the basic nominal bearing resistance will be 26 kips per square foot. It should be noted however that section 10 of the LRFD Reference Manual indicates that, “Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state.” The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils are suitable for foundation support and have not been disturbed during construction. It should also be noted that where silt soils are encountered they are to be considered sensitive to disturbance due to heavy construction equipment and/or exposure to adverse weather.

No groundwater was encountered in holes B-128 and B-129.

2.14 Wall 114 – Along Busway through Cemetery, Sta. 81+82.5 to Sta. 83+58.5

– Length = 176 ft, maximum height = 12 ft. This wall will be of cast-in-place construction and will also have a metal beam rail attached to it on one end.

2.14.1 Subsurface Data

Boring B-130 represents conditions under the wall at this location. Complete log is in Appendix 2. The soil is generally medium dense Brown sand for the upper 5 feet, underlain by very stiff Red Brown silt to 20' below existing surface. The hole was terminated at 27 feet. The angle of internal friction is based upon the standard penetration tests (SPT) shown on the boring logs and is considered to be 32 degrees. The depth of the footings is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the order of 0.02. Therefore, considering the very stiff silt soil encountered at the proposed bearing depth, the Presumptive Bearing Resistance is 3000 pounds per square foot. For Strength Limit States the ultimate soil bearing capacity (q ult) is 13 tons per square foot. In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.80 for the cast-in-place wall.

It is our understanding that proposed retaining wall 114 will be constructed with a minimum foundation embedment of 4 feet, therefore the basic nominal bearing resistance will be 26 kips per square foot. It should be noted however that section 10 of the LRFD Reference Manual indicates that, "Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state." The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

It should be noted that the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the soils are suitable for foundation support and have not been disturbed during construction. It should also be noted that where silt soils are encountered they are to be considered sensitive to disturbance due to heavy construction equipment and/or exposure to adverse weather.

No groundwater was observed in boring hole B-130.

2.15 Wall 115 – Along Busway at Yale Street, Sta. 48+75 to Sta. 51+85 –

Length = 310 ft, maximum height = 6 ft. This wall will be of cast-in-place construction and require temporary sheeting to construct, as it is adjacent to an existing building. It will also have a railing attached to the top.

2.15.1 Subsurface Data

Borings B-146 and B-147 represent conditions under the wall at this location. Complete boring logs are in Appendix 2. The upper 3 to 7 feet of soil is generally loose to medium dense Black fill with debris, including partially decomposed timber railroad ties. The fill is underlain by a medium dense Red Brown silty sand layer which extended to 14' in B-146. A layer of very stiff Tan silt was observed between 7' and 14' feet below grade in B-147. The boring logs indicate a medium dense gravel and sand layer from 14 to 20 feet in B-146 and 14 to 24 feet in B-147. A basaltic boulder was encountered at 20 feet in B-146 and was underlain by very dense glacial till. Glacial till was also observed in B-147 from 24 feet to the end of the boring. Both borings were terminated at about 30 feet below surface grade with over 100 blows per foot. The angle of internal friction is based upon standard penetration tests (SPT) shown on the boring logs and is considered to be 32 degrees. The depth of the footings is assumed to be 4 feet and the width to length ratio for the footing is assumed to be on the order of 0.02. Therefore, considering the medium dense sand and very stiff silt soils encountered at the proposed bearing depth, the Presumptive Bearing Resistance is 5000 pounds per square foot. For Strength Limit States the ultimate soil bearing capacity (q ult) is 13 tons per square foot. In accordance with LRFD design procedures, the Resistance Factor for bearing capacity should be 0.45 and the resistance factor for sliding should be 0.80 for the cast-in-place wall.

It is our understanding that proposed retaining wall 115 will be constructed with a minimum foundation embedment of 4 feet. It should be noted however that section 10 of the LRFD Reference Manual indicates that, "Because the effective dimensions will vary for each limit state under consideration, strict adherence to this provision will require re-computation of the nominal bearing resistance at each limit state." The designer should also be aware that load inclination, punching shear and proximity to slopes will also affect the nominal bearing capacity and must be considered during design of the wall.

Since the depth of fill varied from 3 to 7 feet in boring B-146 and B-147, the foundation sub grade must be inspected and approved in the field at the time of construction in order to verify that the

soils are suitable for foundation support and have not been disturbed during construction. Based upon the boring logs and proposed bottom of wall footing elevation, we anticipate that over-excavation of loose fill and/or unsuitable soil may be required along the wall length. It should also be noted that where silt soils are encountered they are to be considered sensitive to disturbance due to heavy construction equipment and/or exposure to adverse weather.

Groundwater was observed at 10 feet below grade level in hole B-146 and 8 feet below grade in hole B-147.

3.0 SUBSURFACE CONDITIONS AND SUBSURFACE DATA

3.1 Geology

Published geologic data and the subsurface explorations supervised by VN Engineers, Inc. shows the proposed retaining walls will be founded on artificial fill (af), ground-moraine deposits (Qgm), Valley-Train deposits (Qvt), fine-grained noncyclic sediment (Qfs), and Kame-delta deposits (Qkd).

The soils under proposed retaining walls 101 and 102 are a mixture of artificial fill deposits and ground moraine. The Artificial Fills consist of railroad construction fills. The fill generally consists of sand, silt, and gravel obtained from deltaic, ground moraine, or flood plain deposits. Most of the fills were probably obtained from adjacent areas and share similar characteristics. The ground-moraine is made up of reddish-brown silty sand and gravel, composed of clay size particles to large boulders.

In the vicinity of walls 104 and 115, soil characteristics are consistent with Valley-Train and ground-moraine deposits. The ground-moraine is inter-bedded with micaceous, medium grained sand and gravel typical of Valley-Train deposits. These soils are overlain by artificial fill which can be up to 4 feet thick.

Retaining wall 106 through 109 including walls 113 and 114 will be founded on soil described as Fine-grained noncyclic sediment. Fine-grained noncyclic sediment consists of reddish-brown clayey silt that is characterized by convolute bedding. The deformed unit is distinguished by its silt content and thin bedding. This layer was found to extend about 15 feet below grade and is underlain by very dense glacial till.

The proposed retaining walls 110, 111, and 112 will be constructed within fine-grained noncyclic sediment and Kame-delta deposits. The Kame-delta Deposit is composed of stratified drift which consists of reddish-

brown, well sorted, well stratified sands with moderate amounts of silt, clay, and gravel.

Existing subsurface conditions from published sources of information are included in Appendix 4 of this report. The subsurface data described in previous sections under each foundation wall came from final design boring logs which are shown in Appendix 2, and also from pilot boring logs which were used during the preliminary design phase of the Busway project which was done by others.

3.2 Soil and Rock Profile

Refer to Appendix 1 for soil and rock profiles along the proposed retaining walls. The location plans of the borings are also shown in Appendix 1.

Based upon the subsurface data, the following is a generalized subsurface profile in order of increasing depth:

- **Topsoil –** only encountered at boring B-134
- **Asphalt-** encountered 3" of asphalt at B-104 and 10" at B-121 & 122
- **Fill –** generally encountered 2' of sandy fill soil, however ranged from 0 to 15' thick
- **Sand –** Medium dense sand was encountered at various depths ranging from 4' to 40'
- **Silt –** medium stiff to hard silt was encountered at various depths ranging from 4' to 32'
- **Dense Glacial Till –** very dense glacial till was encountered at 6 of the borings performed for the retaining walls at depths ranging from 12' to 27'
- **Bedrock –** Bedrock was encountered at 4 of the borings performed for the retaining walls at depths ranging from 15' to 40'

Topsoil and/or asphalt were typically not encountered within the borings and are therefore considered to be localized.

The fill soil encountered varied significantly with regards to consistency as well as thickness. Typically the fill depth was no greater than 3 feet below the surface elevations, therefore, the wall footings will generally be below the fill. However, at borings B-116, 122, 130 and 133 the depth to the bottom of fill was encountered at 4 to 5 feet below the surface grades, therefore, over excavation may be required. Additionally, at borings B-102 and 104 the depth to the bottom of fill was encountered at 12 to 15 feet below the surface grades, therefore some degree of sub grade preparation will be required.

In general, medium dense sand or stiff silt was encountered at the depth of the proposed retaining foundations. Either the medium dense sand or stiff silt will be suitable for support of the retaining walls, however the silt soil will be sensitive to exposure to adverse weather and/or direct contact of heavy construction equipment. Therefore, the degree of site preparation will vary depending upon the material encountered at the foundation subgrade.

Dense glacial till was encountered within 7 of the borings performed for the retaining walls, at depths ranging from 12 to 27 feet. Therefore, it is anticipated that the glacial till will not be encountered during the excavation for the retaining wall foundations.

Bedrock was encountered in 4 of the borings performed for the retaining walls, at depths ranging from 15 to 40 feet below the surface grades. Therefore, it is anticipated that bedrock will not be encountered during the excavation for the retaining wall foundations. The depth to bedrock as well as recovery and Rock Quality Designation (RQD) are presented in the table below:

BORING No.	Rock Depth	CORE No.	REC. %	RQD %
B-102	Rock at 35’	Core 1	97%	72%
B-110	Rock at 40’	Core 1	90%	37%
		Core 2	100 %	52%
B-115	Rock at 35	Core 1	95%	27%
		Core 2	95%	20%
B-133	Rock at 15’	Core 1	75%	35%

3.3 Laboratory Test Results

3.3.1 Soil Gradation Analyses

VN Engineers performed laboratory tests on select soil samples to verify the field classifications at critical locations and depths. The results of the laboratory analyses are presented in Appendix 3.

3.3.2 Rock Testing

Since the proposed retaining wall foundations will not bear at the depth of the bedrock, rock testing was not deemed necessary for the foundation design.

3.4 Groundwater Observations

Typically, groundwater was encountered at depths ranging from 8 to 30 feet below the surface grades in the borings performed for the retaining walls. Therefore, the excavations for the proposed retaining wall foundations will not extend below the water elevation. However, at

boring B-115, groundwater was encountered at a depth of 2.5 feet below the surface elevation. Consequently, some degree of dewatering may be required to establish the foundations below the depth of frost penetration. Alternately, the state could consider installing the foundations above the groundwater and raising the grades to provide sufficient depth of cover at this location.

4.0 RECOMMENDATIONS

4.1 Geotechnical Issues

The following geotechnical issues are discussed in detail in separate sections included in this report:

- Retaining Wall Types
- Bearing Conditions and Stability
- Subsurface Drainage
- Settlement
- Existing Fill
- Subgrade Preparation
- Re-use of On-site Materials

4.2 Retaining Wall Types

The types of retaining walls designed for this project include poured concrete, reinforced earth and modular interlocking concrete retaining walls. Currently, poured concrete walls are proposed for walls 101, 102, 104, 106, 107, 108, 113, 114, and 115 while either reinforced earth or modular being utilized for the remainder of the walls.

For flexible walls, the active equivalent fluid pressure of the backfill soil should be considered to be 40 psf. This assumes that the backfill soil is properly compacted to no less that 95% of the maximum dry density of the soil.

4.3 Bearing Conditions and Stability

Based upon the borings performed for this study, the proposed retaining walls will generally bear upon either medium dense natural sand soil or stiff natural silt soil. Following the site preparation recommendations included in this report, these soils will provide adequate bearing support for the proposed retaining walls. Allowable bearing capacity at each wall location is provided in section 2.

However, it should be noted that 12 to 15 feet of fill was encountered at boring B-104, while 4 to 5 feet of fill was encountered at borings B-116, 122, 130 and 133. These borings are in the vicinity of walls 102, 104, 107, 109, and 114. Where the depth of fill is on the order of 4 to 5 feet below grade, over excavation may be required. However, where the

bottom of fill was encountered at 12 to 15 feet below the surface grades, it will be impractical to remove and replace the fill for support of the walls. Therefore, the sub grade preparation may include either over excavating (to two feet below the proposed footing elevation and compacting the subgrade, followed by replacement with controlled compacted fill), or pre-grouting of the loose fill soils beneath the foundations.

The global stability analyses of the proposed retaining walls have been performed utilizing the Janbu Circular Failure Method. Global stability of a poured type wall is a function of the dimensions of the heel and the toe, and the global stability of a reinforced wall depends upon the design length of the reinforced grid. Likewise, global stability of a modular block wall depends upon the final dimensions and loading conditions. The analysis determined the minimum recommended factor of safety for each retaining wall and those results are summarized in the table below.

WALL No.	FOS
RW-101	1.45
RW-102	2.60
RW-104	5.69
RW-106	12.28
RW-107	3.93
RW-108	3.58
RW-109	2.36

WALL No.	FOS
RW-110	2.36
RW-111	2.74
RW-112	2.74
RW-113	6.89
RW-114	7.13
RW-115	5.20

4.4 Subsurface Drainage

The preliminary design of the proposed retaining walls indicates that all walls will include a drainage system. In accordance with the ConnDOT Bridge Design Manual the underdrains should consist of 6" drains which are connected to the roadway drainage.

4.5 Settlement

As previously stated, the majority of the soils beneath the retaining wall locations will consist of either medium dense natural sands or stiff natural silt soils. If the foundations sub grades are prepared in accordance with our recommendations, we anticipate that the settlement will be limited to less than 1 inch. However, at boring locations B-102 (Wall 101) and B-104 (Wall 102) the loose sandy fill was encountered to depths of 12 to 15 feet below the surface grades, therefore it may be impractical to remove and replace the loose soil beneath the proposed footing. In these areas we recommend either over excavating to approximately 2 to 4 feet below the footing subgrade and prepare a widened pad area to spread the load of the wall, or pile supporting the wall.

4.6 Existing Fill

Fill soils encountered during the subsurface excavation program generally did not extend to depths greater than the bottom of the proposed retaining wall foundations. However, at a few locations the fill was reported to extend below the depth of the proposed wall foundation, as shown below.

Wall 101 – B-102 indicates loose fill to 5' and medium dense to dense fill from 5' to 15'. Loose fill was also encountered between 5 and 10 feet in B-143 and as deep as 20 to 25 feet in B-141.

Wall 102 – B-104 and B-106 indicate loose fill to 12', and B-106 indicates soft silt from 15' to 27'.

Wall 106 – Although the borings performed for this study indicate suitable bearing soils for the proposed retaining walls, boring SB-15 and SB-16 performed for the pilot program indicate fill to a depth of 7.5 feet below the surface grades. However, all borings performed in the vicinity of wall 106 indicate either medium dense sand or stiff silt at depths greater than 3 feet below grade.

Wall 108 – The borings performed for the pilot program indicate that the fill soil in the vicinity of wall 108 extend to 4.5 to 9 feet below the surface grades. As the wall is to cross over a portion of the Piper Brook Culvert, all the soil above the culvert is assumed to be fill, therefore the subgrade soils along retaining wall 108 will require preparation in order to provide a uniform bed of support.

4.7 Subgrade Preparation

As previously stated, the majority of the natural soils encountered at the depth of the proposed retaining wall subgrade elevations consisted of either medium dense natural sand soils or stiff natural silt soils which are suitable for support of the proposed walls.

Although the majority of the soils are suitable for support, there will be some degree of site preparation required in order to protect the subgrade from disturbance due to heavy construction equipment as well as adverse weather conditions. In addition, the locations listed in the previous section may require additional attention in order to prepare the subgrade sufficiently for uniform support and minimal settlement.

Site preparation will naturally commence with relocation of any existing utility poles, stripping of the existing pavement and preparation of the subgrade soils. Prior to commencement of earthwork construction operations, any subsurface utilities and/or abandoned subsurface structures

should be located within five feet of the proposed construction area. Required tree removal should follow the location of utilities and structures. Following excavation to the proposed subgrade elevation we recommend proof rolling the exposed subgrade in accordance with the procedures outlined in subsequent paragraphs, and removing all nonsuitable subgrade soils prior to preparing the existing suitable soils for the retaining wall foundations. Generally the subgrade soils consisted of medium dense to dense sand, however due to elevated levels of silt and moisture found along portions of the proposed Busway, care should be taken not to disturb the soil during excavation. Therefore, where silts and/or silty sands are encountered at the subgrade elevation we recommend that the contractor should; 1) not work during adverse weather, 2) maintain positive drainage during construction, and 3) not leave the subbase soil exposed for extended periods. Additionally, if the existing soils below the subgrade elevations are determined to be either organic or over saturated, we recommend over excavating to a more suitable layer.

Existing soils below the proposed subgrade elevation determined to be suitable sand soils which are simply loose, due to insufficient compaction during initial placement, should be proof rolled with a 10 to 20 ton vibratory roller under the direction of a qualified geotechnical engineer, prior to determining the suitability of same for the proposed wall support. Where the soils are not determined to be firm and unyielding beneath the load of the roller, removal and recompaction of the soil may be required. The extent of the removal and replacement must be made in the field at the time of construction.

It should be noted that actual field conditions may vary from those encountered in the boring logs. Therefore the borings logs can be utilized to target areas of unsuitable subgrade soils; however actual depth of excavation required should be determined in the field at the time of construction. Additionally, similar unsuitable conditions may be encountered between boring locations. Therefore, we recommend that following excavation to the suitable bearing layers the exposed soil subbase along the entire length of all walls should be proof rolled under the direction of a qualified geotechnical engineer in accordance with the procedures outlined later in this section.

Portions of the soil to be removed may consist of sandy soil which is suitable for reuse as granular fill, therefore the state may consider separating these soils from the unsuitable materials and stockpiling them for future reuse, if at all practical. Any materials which are too silty, wet or compressible will not be suitable for reuse as controlled compacted fill or backfill, and should be disposed of in a suitable manner, or stockpiled on-site for future use as general fill within any landscaped areas.

All fill material on-site or imported should be placed in layers on the order of 10 to 12 inches in loose thickness and be uniformly compacted with a 10 ton vibratory roller, or greater, to at least 95 percent of its maximum dry density as determined by ASTM D-1557 Test Procedures. Backfill within confined areas should be placed in layers on the order of 6 inches utilizing portable vibratory plate compaction equipment.

4.8 Re-use of On-site Materials

The soils encountered along the portions of the proposed Busway which require excavation generally consist of either silty sand or clayey silt, neither of which will be reusable for select, free draining fill. There are however, portions of the site which consist of sand soils with 17 percent fines or less. These soils must be identified in the field and stock piled for future use.

Reuse of the site soils may also be limited by environmental considerations, which is beyond the scope of this report.

4.9 Sheeting, Bracing and Retaining

Based upon the proposed Busway alignment, a portion of the proposed retaining walls may require sheeting and/or bracing adjacent to existing features. Since space limitations along portions of the alignment may preclude performance of open trenching operations, it may be necessary to perform the required excavations via extraordinary earth support provisions.

It should be noted that any type of driven type sheeting has the potential of densifying the soils, resulting in settlement of adjacent structures and/or utilities. Therefore, it will be critical to properly design the earth support systems in order to preclude undermining of adjacent structures and/or roadways, utilities, etc.

Although the contractor should be able to utilize the method of his choice, we recommend having a specialty contractor provide detailed design recommendations and submit the method of construction for review and approval by a qualified geotechnical engineer.

It should be noted that any sloughing of the trench walls adjacent to the excavations could undermine adjacent pavement, curbs, sidewalks, or utility lines. Consequently, costly repairs to existing improvements could result. It should be explicitly stated in the contract document that the contractor is responsible for maintaining the integrity of the existing above-grade and below-grade structures and/or dewatering operations. All construction excavations should be performed in conformance with applicable local, state and federal OSHA safety regulations.

The estimated geotechnical parameters which may be used for the design of sheeting, bracing and/or retaining walls are provided in section 2 for each individual location.

The Owner and the Contractor should be aware of and become familiar with applicable local, state, and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the Contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing this information solely as a service to our client. Under no circumstances should the information provided below be interpreted to mean that VN Engineers, Inc. is assuming responsibility for construction site safety or the Contractor's activities; such responsibility is not being implied and should not be inferred. The Contractor should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, state, or federal safety regulations, e.g. OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations. Such regulations are strictly enforced and, if they are not followed, the Owner, Contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties.

As a safety measure, it is recommended that all vehicles and soil piles be kept a minimum lateral distance from the crest of the slope equal to no less than 1/3 the slope height. The exposed slope face should be protected against the elements.

We recommend that an engineer be retained to monitor the soils exposed in all excavations and/or slopes and provide engineering services for such slopes. This will provide an opportunity to monitor the soil types encountered and to modify the excavation slope as necessary. It also offers an opportunity to verify the stability of the excavation slopes during construction.

5.0 CONSTRUCTIBILITY

5.1 Interference with Existing Structures

Site preparation will naturally commence with relocation of the existing utility poles, stripping of the existing pavement and preparation of the subgrade soils. Prior to commencement of earthwork construction operations, any subsurface utilities and/or abandoned subsurface structures should be located within five feet of the proposed construction area. Required tree removal should follow the location of utilities and structures.

5.2 Retaining Wall Construction

The current plans indicate that the anticipated types of retaining walls for the project include poured concrete, modular and reinforced earth. However, the design details such as dimensions and specifications have not as yet been finalized; therefore we recommend that all retaining walls be designed by a licensed professional engineer in the state of Connecticut.

It should be noted however, that proper care during construction of the walls will be critical for the longevity of the walls. For example, the type of soil backfill, drainage and compaction is critical during the construction of all walls. Subgrade preparation is of utmost importance for the poured concrete and modular interlocking concrete retaining wall, while the reinforced earth wall depends upon the straps being tight and soil being free of corrosive contaminants and properly compacted.

5.3 Environmental Concerns

Although environmental considerations are beyond the scope of this report, it is important to note that environmentally impacted soils and/or ground water may require special procedures for disposal which may significantly impact the project costs and schedule.

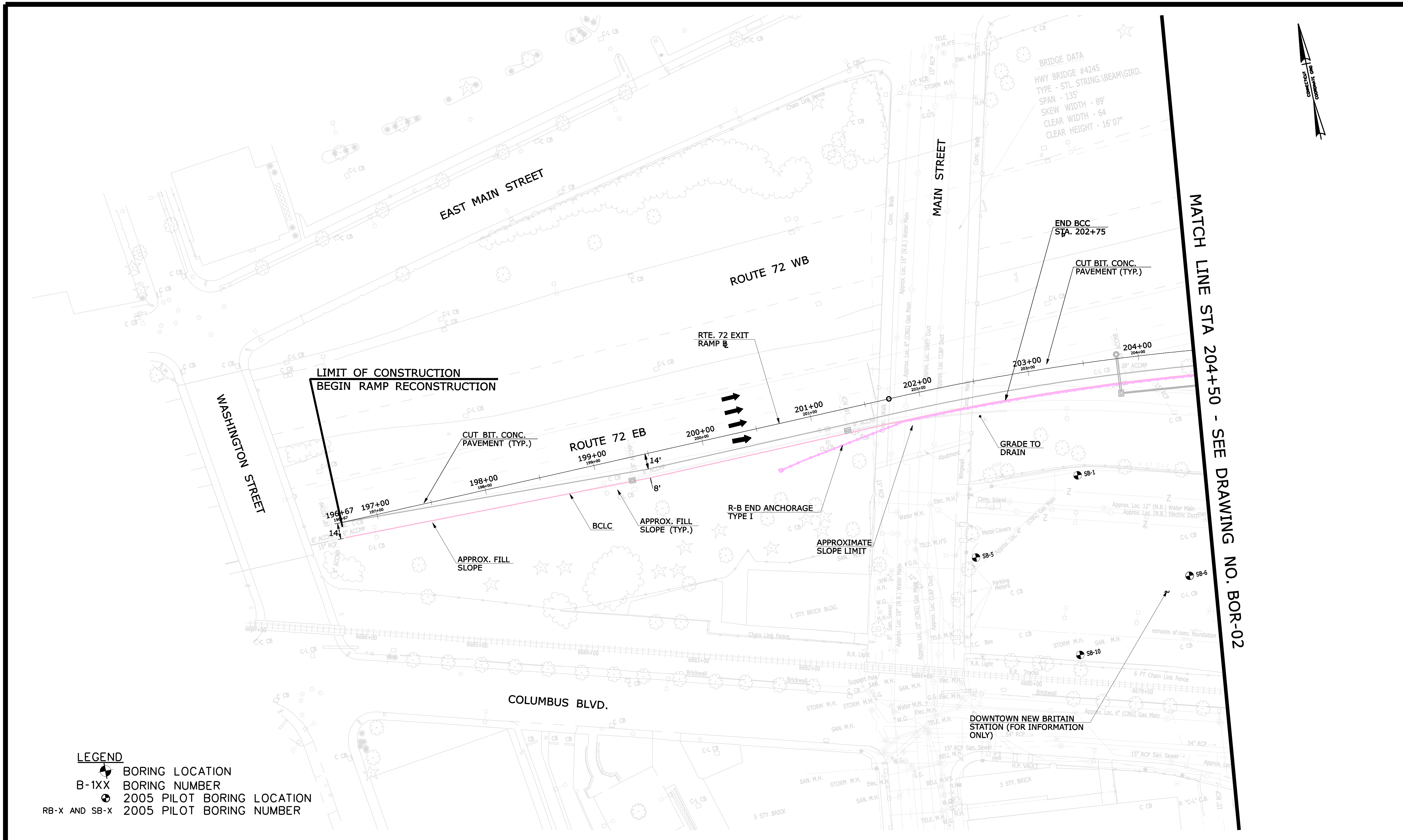
6.0 LIMITATIONS

This report is subject to the limitations attached as Appendix 5.

APPENDIX 1

BORING LOCATION PLAN

AND SUBSURFACE PROFILE



LEGEND

BORING LOCATION

B-1XX BORING NUMBER

2005 PILOT BORING LOCATION

RB-X AND SB-X 2005 PILOT BORING NUMBER

REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET
40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

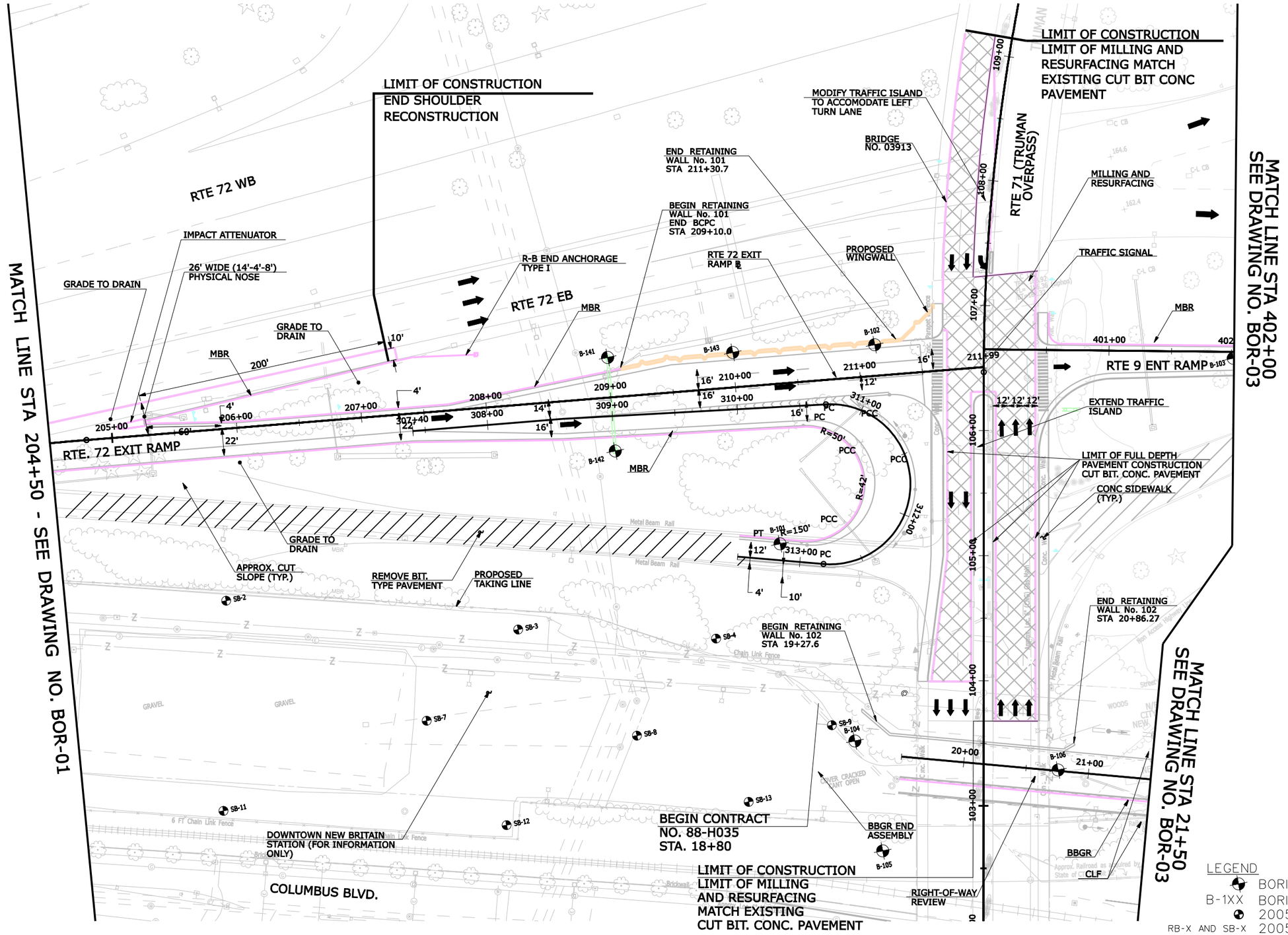
ENGINEER: URS CORPORATION
APPROVED BY: DATE:

URS
URS CORP.
500 ENTERPRISE DRVE, SUITE 3B
ROCKY HILL, CT 06067
(860) 529-8882

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY
CADD FILE: $DGNNAME$
PLOTTED DATE: 4/28/2010

TOWN: NEW BRITAIN
DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-1
SHEET NO.: S



REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET 40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
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STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

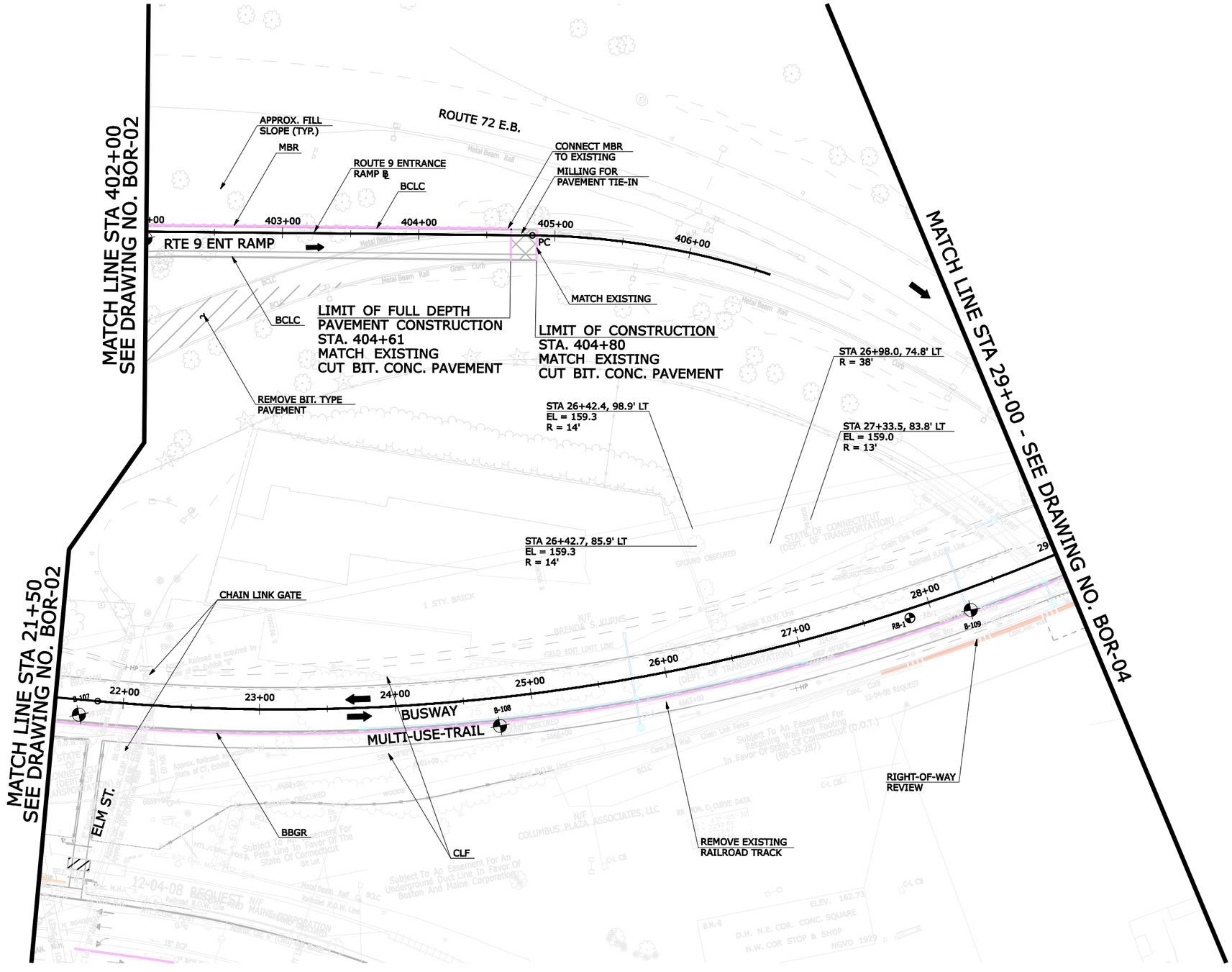
ENGINEER: URS CORPORATION
APPROVED BY: DATE:

URS
URS CORP. 500 ENTERPRISE DRIVE, SUITE 3B ROCKY HILL, CT 06067 (860) 529-8882

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY
CADD FILE: $DGNNAME$ PLOTTED DATE: 4/28/2010

TOWN: NEW BRITAIN
DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-2
SHEET NO.: S



LEGEND

- BORING LOCATION
- B-1XX BORING NUMBER
- 2005 PILOT BORING LOCATION
- RB-X AND SB-X 2005 PILOT BORING NUMBER

REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET
40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

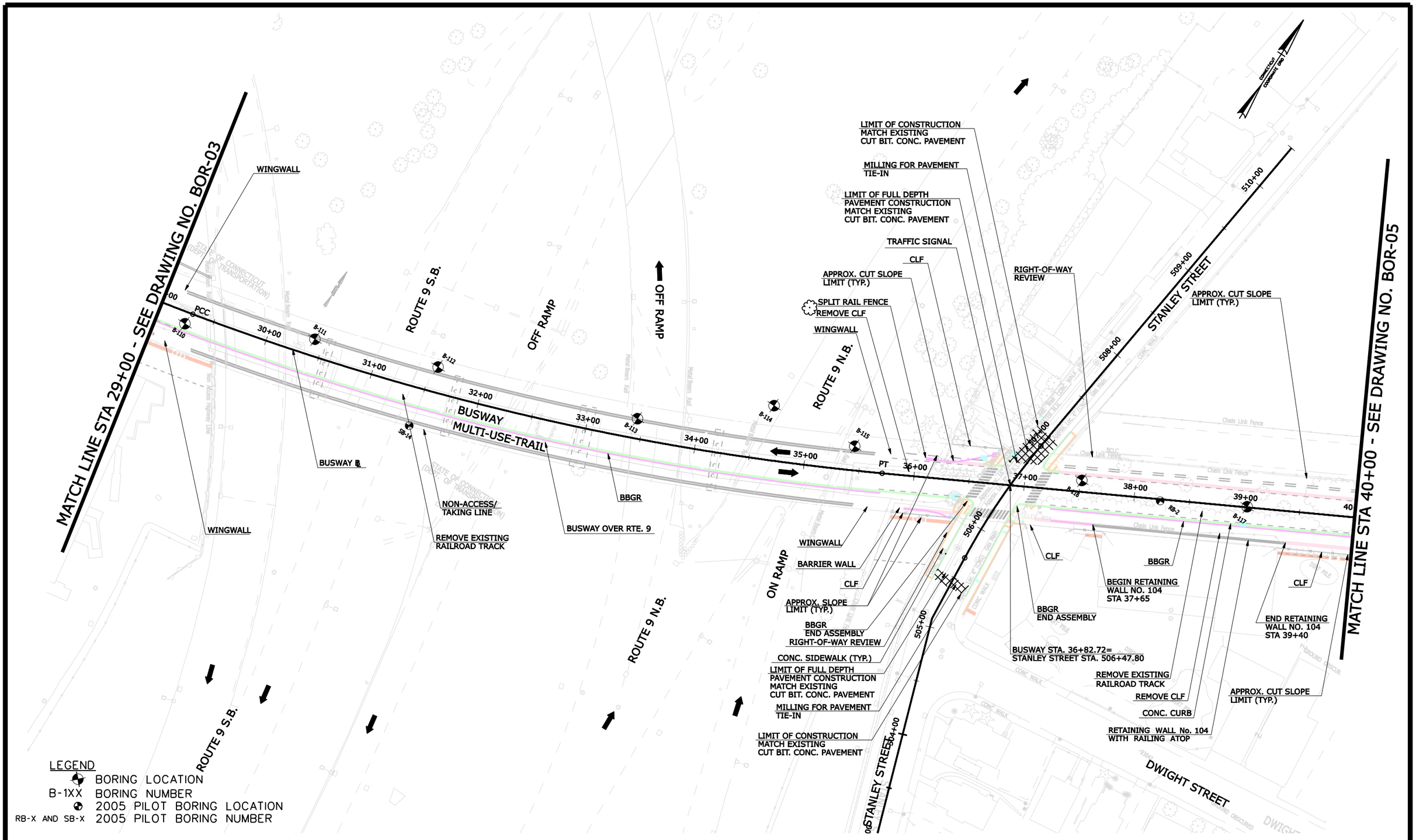
ENGINEER: URS CORPORATION
APPROVED BY: DATE:

URS
URS CORP.
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
(860) 529-8882

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY
CADD FILE: $DGNNAME$ PLOTTED DATE: 4/28/2010

TOWN: NEW BRITAIN
DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-3
SHEET NO.: S



REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET
40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

ENGINEER: URS CORPORATION
APPROVED BY:
DATE:

URS
URS CORP.
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
(860) 529-8882

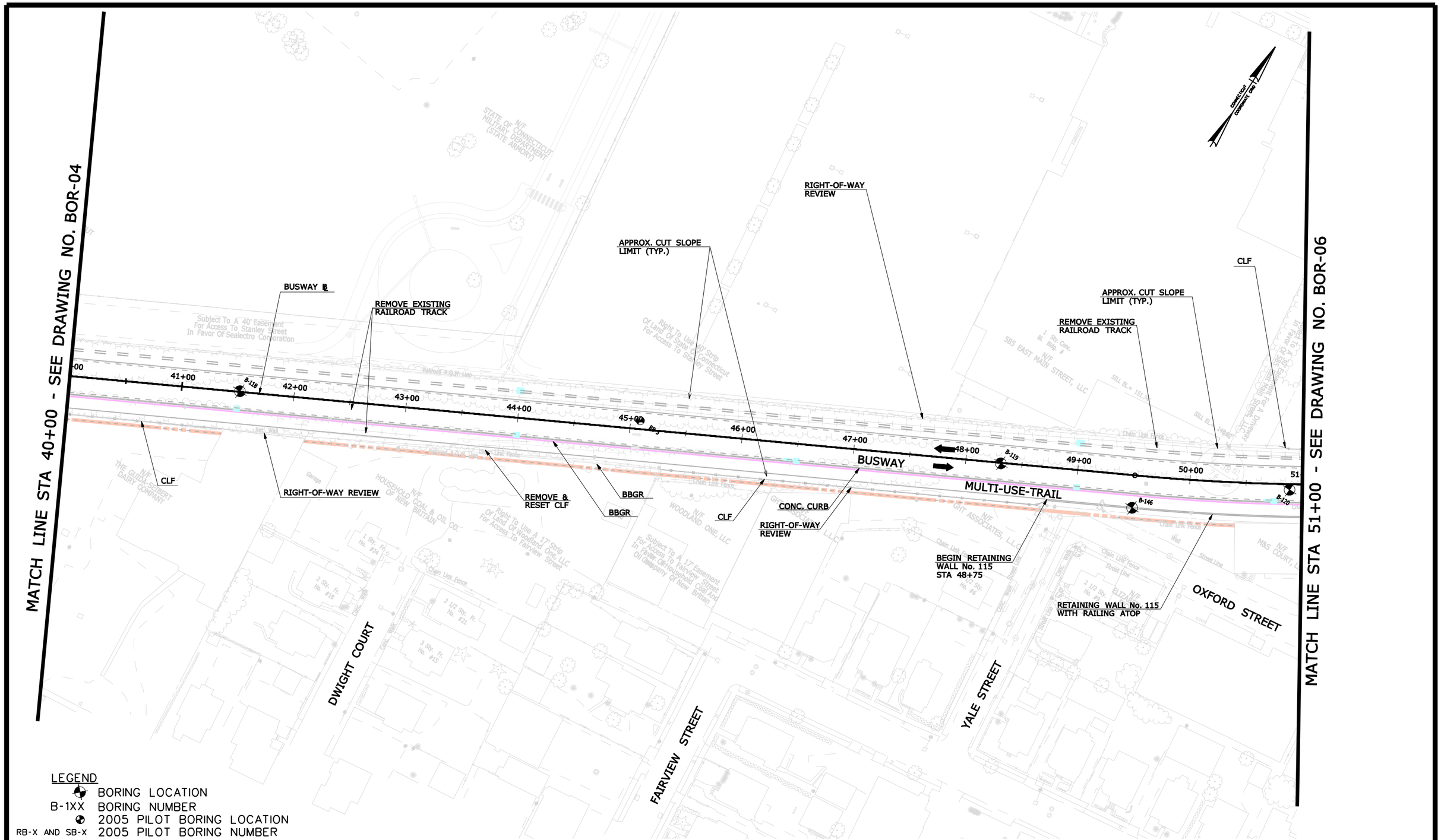
PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

CADD FILE: $DGNNAME$
PLOTTED DATE: 4/28/2010

TOWN: NEW BRITAIN

DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-4
SHEET NO.: S



LEGEND

- BORING LOCATION
- B-1XX BORING NUMBER
- 2005 PILOT BORING LOCATION
- RB-X AND SB-X 2005 PILOT BORING NUMBER

REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET 40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

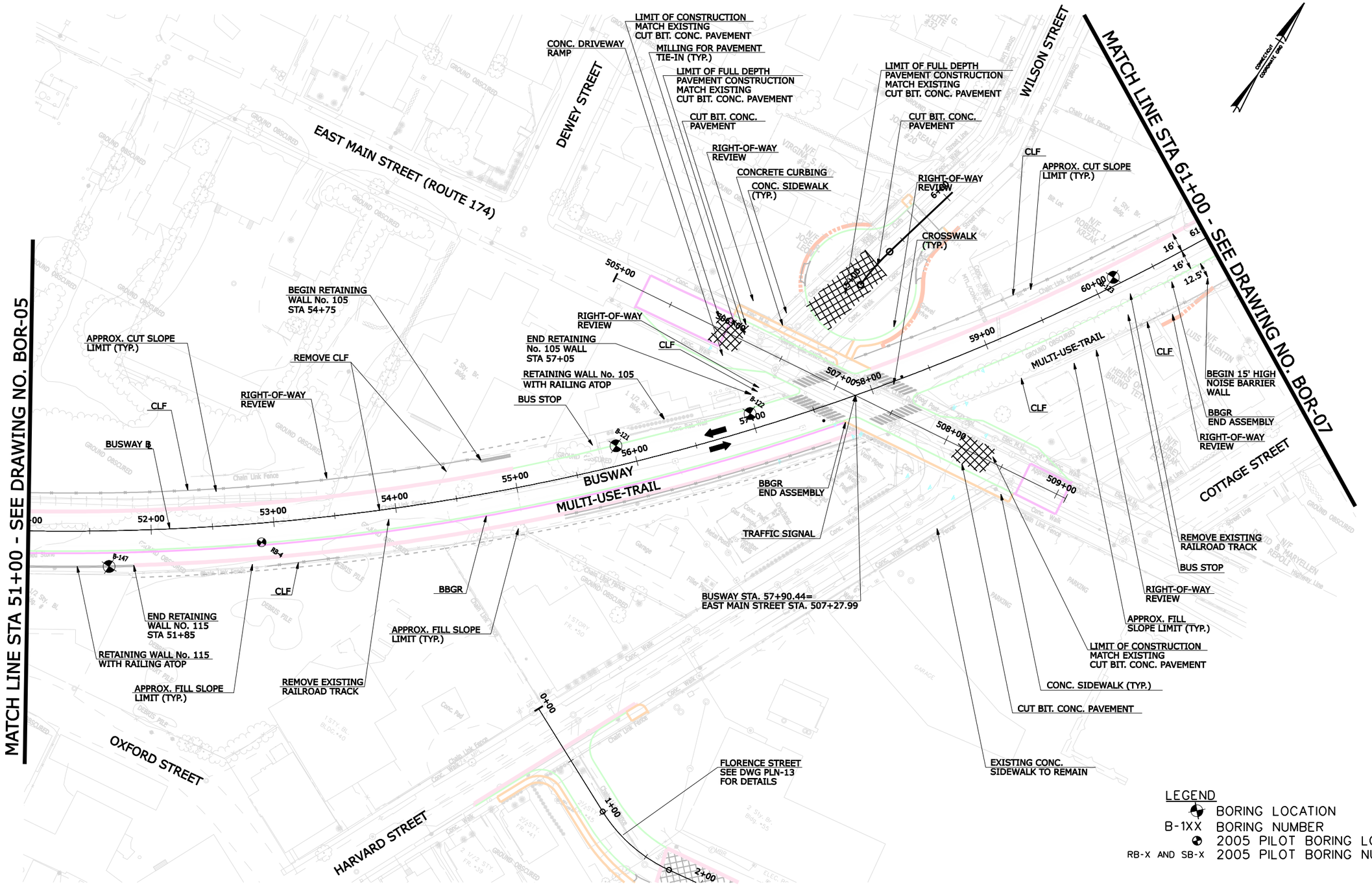
ENGINEER: URS CORPORATION
APPROVED BY: DATE:

URS
URS CORP.
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
(860) 529-8882

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY
CADD FILE: $DGNNAME$ PLOTTED DATE: 4/28/2010

TOWN: NEW BRITAIN
DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-5
SHEET NO.: S



LEGEND

- BORING LOCATION
- B-1XX BORING NUMBER
- 2005 PILOT BORING LOCATION
- RB-X AND SB-X 2005 PILOT BORING NUMBER

REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET
40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

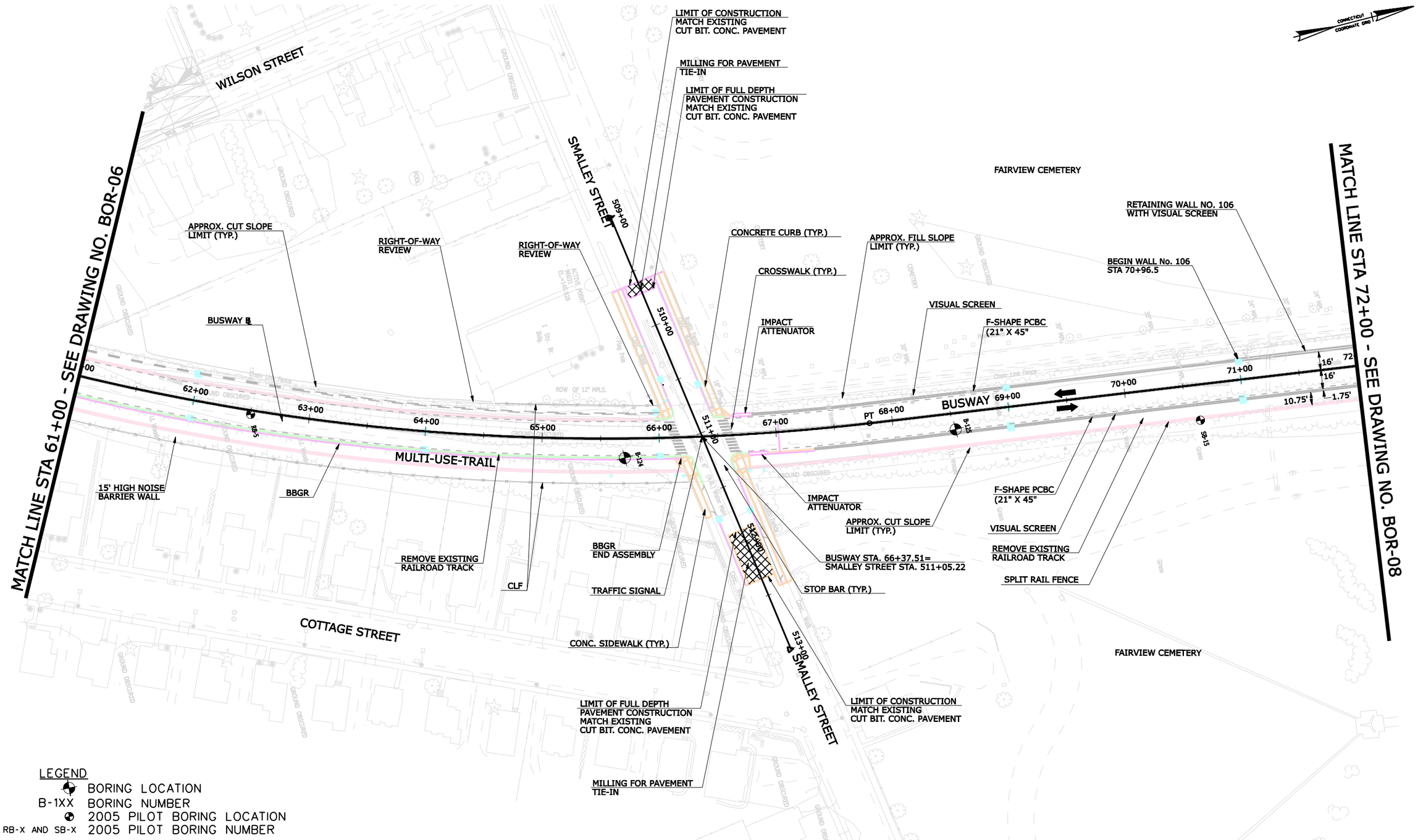
ENGINEER: URS CORPORATION
APPROVED BY: DATE:

URS
URS CORP.
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
(860) 529-8882

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY
CADD FILE: $DGNNAME$ PLOTTED DATE: 4/28/2010

TOWN: NEW BRITAIN
DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-6
SHEET NO.: S



REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET
40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

ENGINEER: URS CORPORATION
APPROVED BY:
DATE:

URS
URS CORP.
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
(860) 529-8882

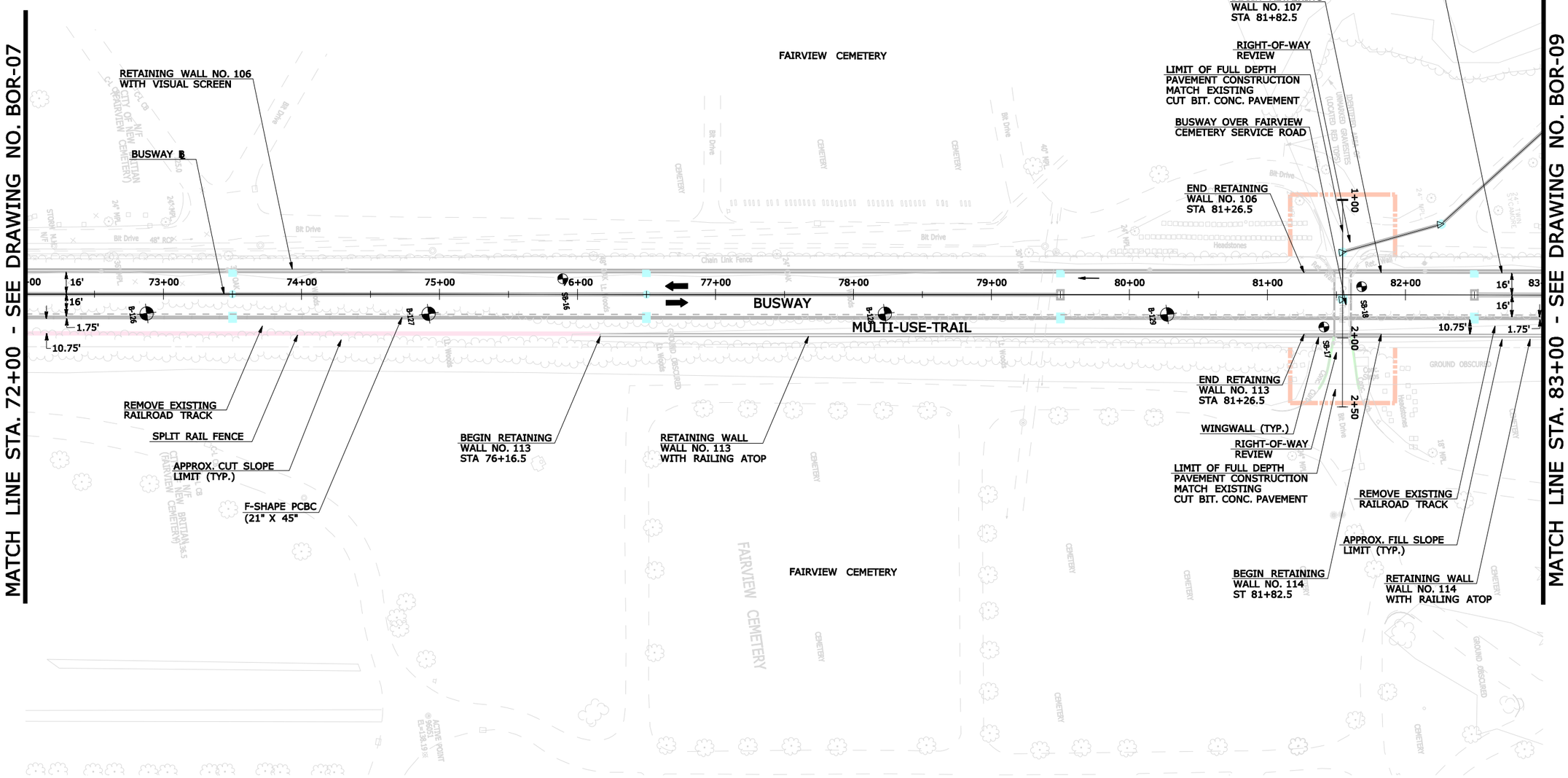
PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY
CADD FILE: $DGNNAME$
PLOTTED DATE: 4/28/2010

TOWN: NEW BRITAIN
DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-7
SHEET NO.: S

LEGEND

- BORING LOCATION
- B-1XX BORING NUMBER
- 2005 PILOT BORING LOCATION
- RB-X AND SB-X 2005 PILOT BORING NUMBER



REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET
40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

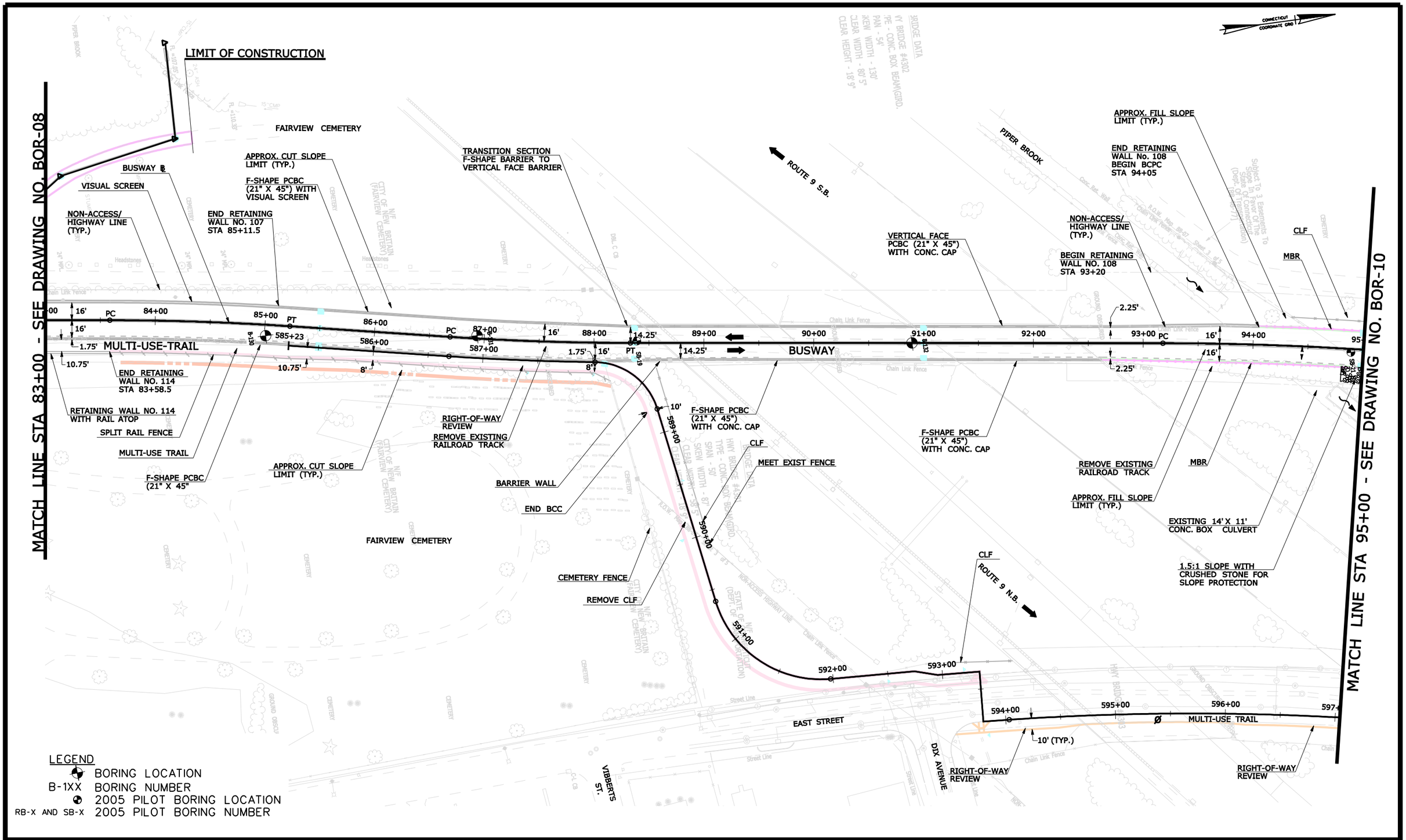
ENGINEER: URS CORPORATION
APPROVED BY: DATE:

URS
URS CORP.
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
(860) 529-8882

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY
CADD FILE: $DGNNAME$ PLOTTED DATE: 4/28/2010

TOWN: NEW BRITAIN
DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-8
SHEET NO.: S



LEGEND

- BORING LOCATION
- B-1XX BORING NUMBER
- 2005 PILOT BORING LOCATION
- RB-X AND SB-X 2005 PILOT BORING NUMBER

REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET 40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
ENGINEER: URS CORPORATION
APPROVED BY: DATE:

URS
URS CORP.
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
(860) 529-8882

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY
CADD FILE: $DGNNAME$ PLOTTED DATE: 4/28/2010

TOWN: NEW BRITAIN
DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-9
SHEET NO.: S

ST. MARY'S CEMETERY

APPROX. FILL SLOPE LIMIT (TYP.)

BUSWAY ℄

CLF

MBR

RETAINING WALL NO. 110

END BCPC BEGIN RETAINING WALL No. 110 STA 100+00

RIGHT-OF-WAY REVIEW

NON-ACCESS/ HIGHWAY LINE (TYP.)

WINGWALL

ALLEN STREET

MATCH LINE STA 95+00 - SEE DRAWING NO. BOR-09

MATCH LINE STA 106+00 - SEE DRAWING NO. BOR-11

96+00 97+00 98+00 99+00 100+00 101+00 102+00 103+00 104+00 105+00

16' 16'

BUSWAY

B-133 RB-6 SB-22 SB-23 SB-24 SB-25

MBR CLF

END BCPC BEGIN RETAINING WALL NO. 109 STA 98+25

1.5:1 SLOPE WITH CRUSHED STONE FOR SLOPE PROTECTION

DETENTION POND

B-144 B-145

PIPER BROOK

NON-ACCESS/ HIGHWAY LINE (TYP.)

CLF

REMOVE EXISTING RAILROAD TRACK

WINGWALL

BUSWAY OVER ALLEN STREEET AND EAST STREET

EXISTING CONC. CHANNEL

ROUTE 9 S.B.

598+00 599+00 600+00 601+00 602+00 603+00 604+00 605+00 606+00 607+00

EAST STREET (ROUTE 175)

MULTI-USE TRAIL

10' 10' 8' 8' 10' 10'

RIGHT-OF-WAY REVIEW

CUT BIT. CONC. PAVEMENT

GRANITE CURBING

EXISTING CONCRETE ENDWALL TO REMAIN

PIPER BROOK

RIGHT-OF-WAY REVIEW

BIT. CONC. DRIVEWAY (COMMERCIAL)

CUT BIT. CONC. PAVEMENT

LEGEND

BORING LOCATION

B-1XX BORING NUMBER

2005 PILOT BORING LOCATION

RB-X AND SB-X 2005 PILOT BORING NUMBER

REV.	DATE	DESCRIPTION	SHEET NO.
		REVISIONS	

SCALE IN FEET 40 0 40

SCALE 1"=80'

DESIGNER: R. VOLPE JR.

DRAFTER: M. BAUER

CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

ENGINEER: URS CORPORATION

APPROVED BY: DATE:

URS

URS CORP. 500 ENTERPRISE DRIVE, SUITE 3B ROCKY HILL, CT 06067 (860) 529-8882

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

CADD FILE: $DGNNAME$ PLOTTED DATE: 5/11/2010

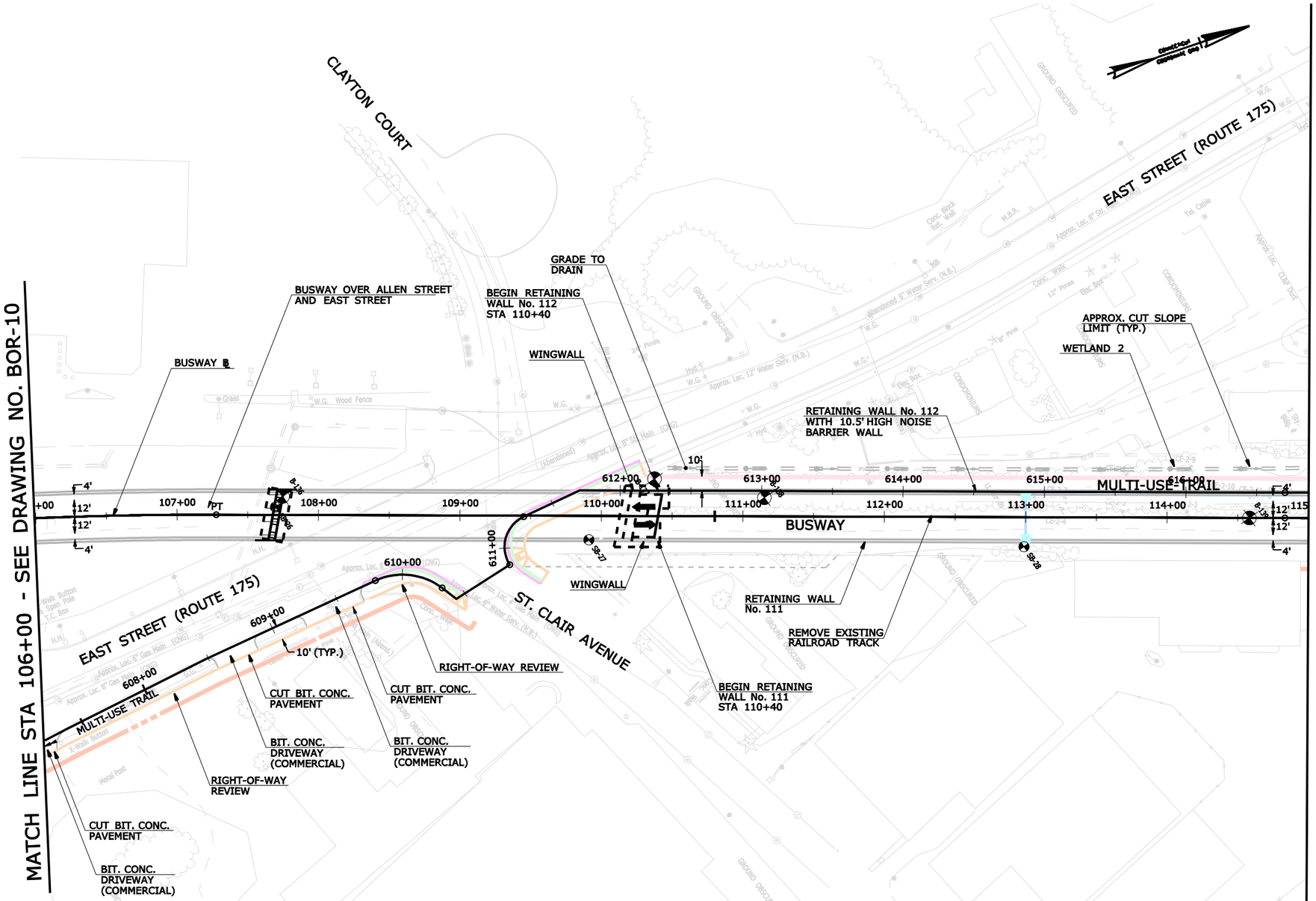
TOWN: NEW BRITAIN

DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035

DRAWING NO.: BOR-10

SHEET NO.: S



LEGEND

- BORING LOCATION
- B-1XX BORING NUMBER
- 2005 PILOT BORING LOCATION
- RB-X AND SB-X 2005 PILOT BORING NUMBER

REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET 40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

ENGINEER: URS CORPORATION
APPROVED BY: DATE:

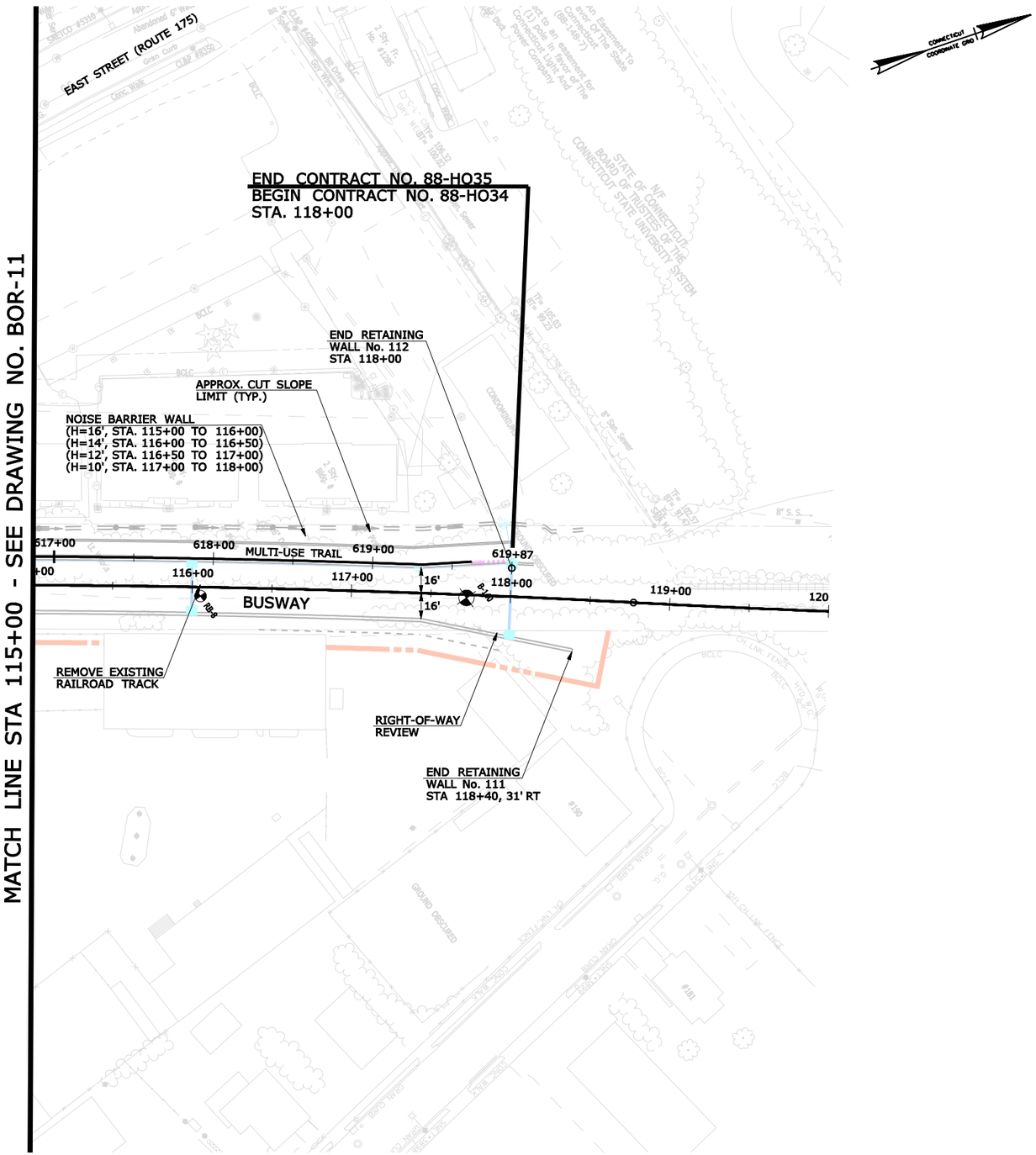
URS
URS CORP. 500 ENTERPRISE DRIVE, SUITE 3B ROCKY HILL, CT 06067 (860) 529-8882

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY
CADD FILE: $DGNNAME$ PLOTTED DATE: 5/10/2010

TOWN: NEW BRITAIN
DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-11
SHEET NO.: S

MATCH LINE STA 115+00 - SEE DRAWING NO. BOR-11



LEGEND

- BORING LOCATION
- B-1XX BORING NUMBER
- 2005 PILOT BORING LOCATION
- RB-X AND SB-X 2005 PILOT BORING NUMBER

REV.	DATE	DESCRIPTION	SHEET. NO.
		REVISIONS	

SCALE IN FEET
40 0 40
SCALE 1"=80'

DESIGNER: R. VOLPE JR.
DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

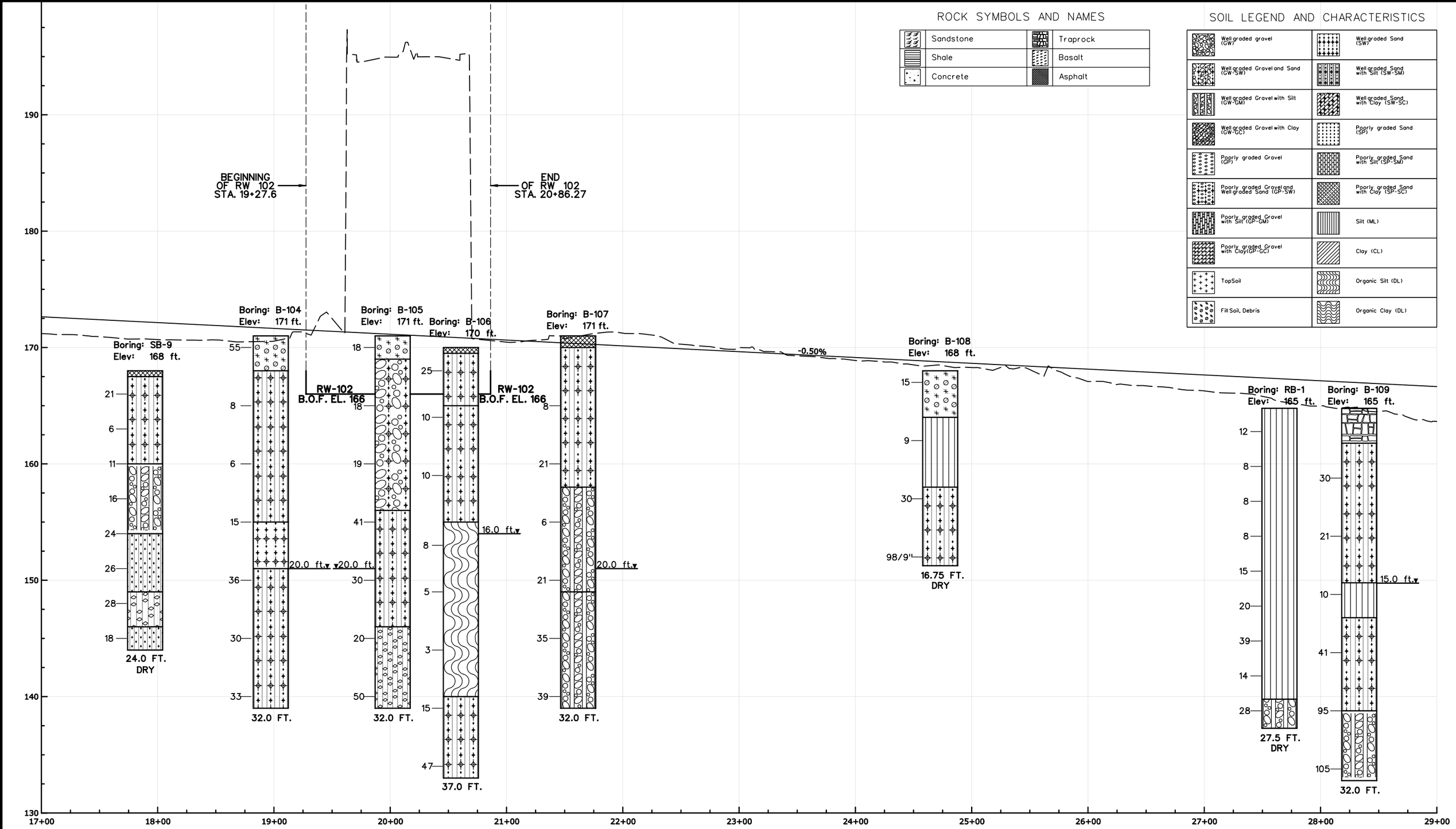
ENGINEER: URS CORPORATION
APPROVED BY: DATE:

URS
URS CORP.
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
(860) 529-8882

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY
CADD FILE: $DGNNAME$ PLOTTED DATE: 4/28/2010

TOWN: NEW BRITAIN
DRAWING TITLE: BORING LOCATION PLAN

PROJECT NO.: 88-H035
DRAWING NO.: BOR-12
SHEET NO.: S



FINAL DESIGN REVIEW

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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 CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

Plotted: 4/29/2010

DESIGNER/DRAFTER: M. BAUER

CHECKED BY: R. GOMEZ

HORIZ. SCALE IN FEET 0 40 80

VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW102_088_H035_PRO1.dgn

SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862

APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

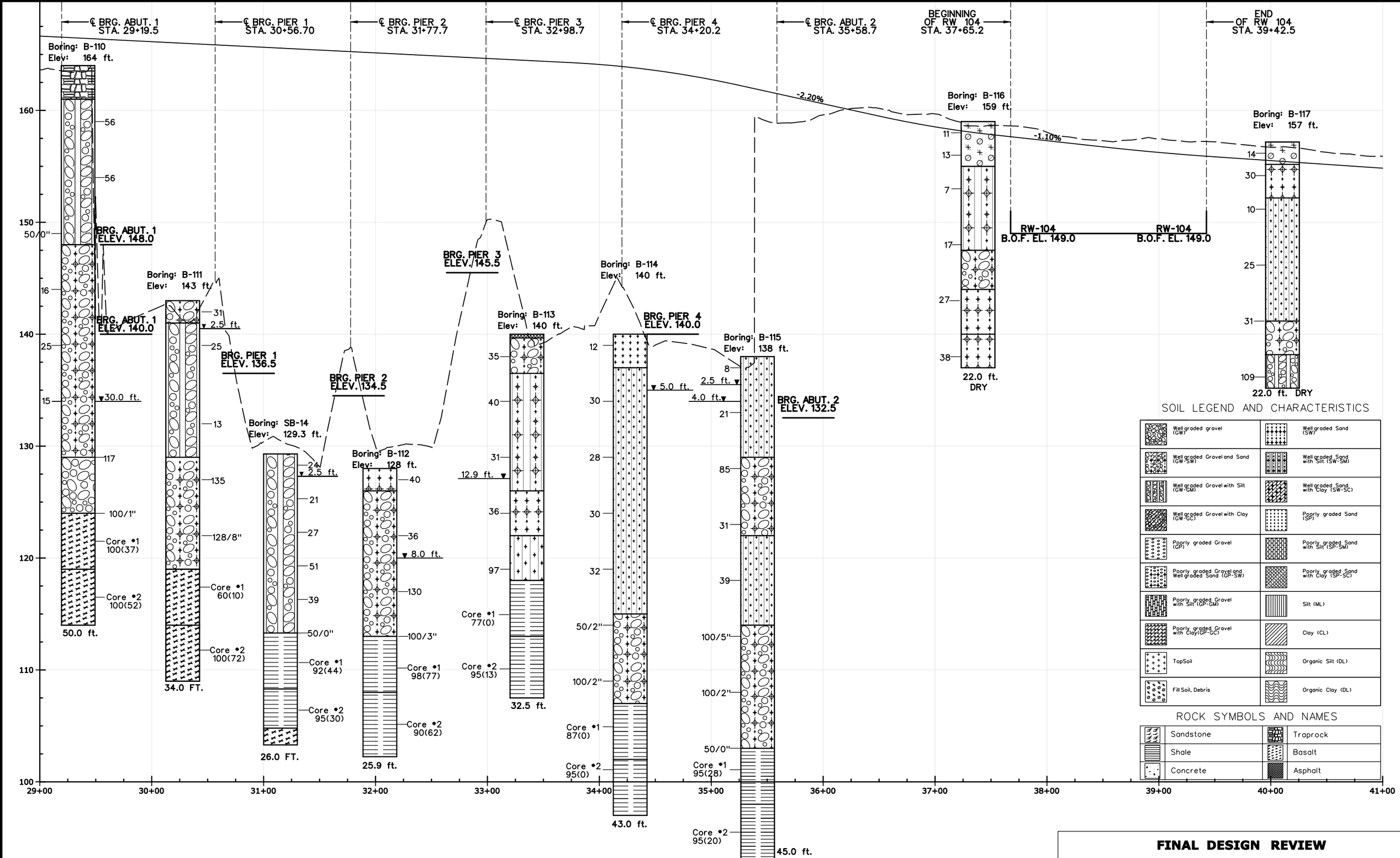
TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 102

PROJECT NO. 88-H035

DRAWING NO. PRO-1

SHEET NO. S



FINAL DESIGN REVIEW

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

DESIGNER/DRAFTER:

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 CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

Plotted: 4/29/2010

M. BAUER
CHECKED BY: R. GOMEZ

HORIZ. SCALE IN FEET 0 40 80
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW104_088_H035_PRO2.dgn

SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862

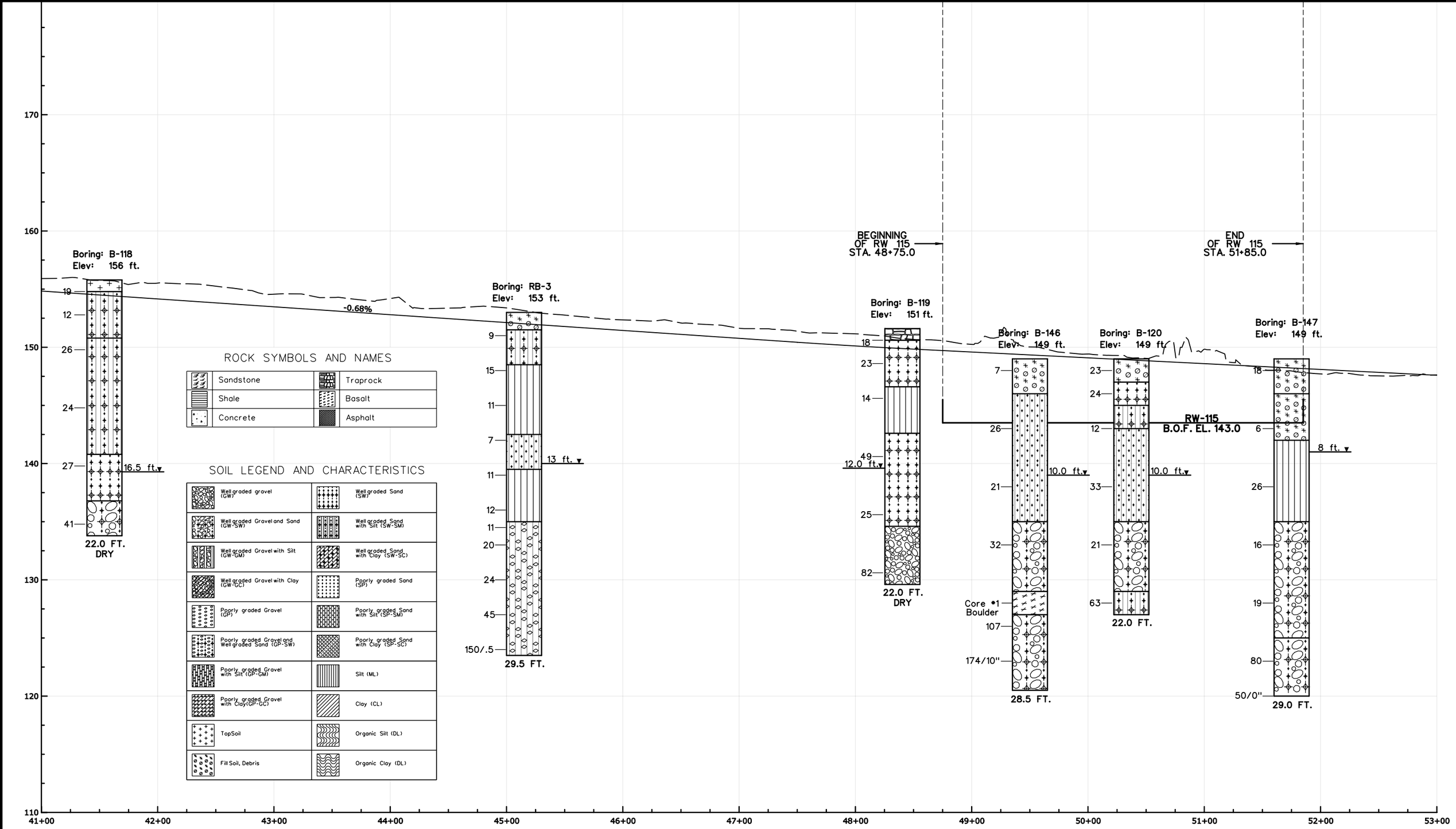
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 104

PROJECT NO. 88-H035
DRAWING NO. PRO-2
SHEET NO. S



FINAL DESIGN REVIEW

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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Plotted: 5/5/2010

DESIGNER/DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 40 80
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW115_088_H035_PRO3.dgn

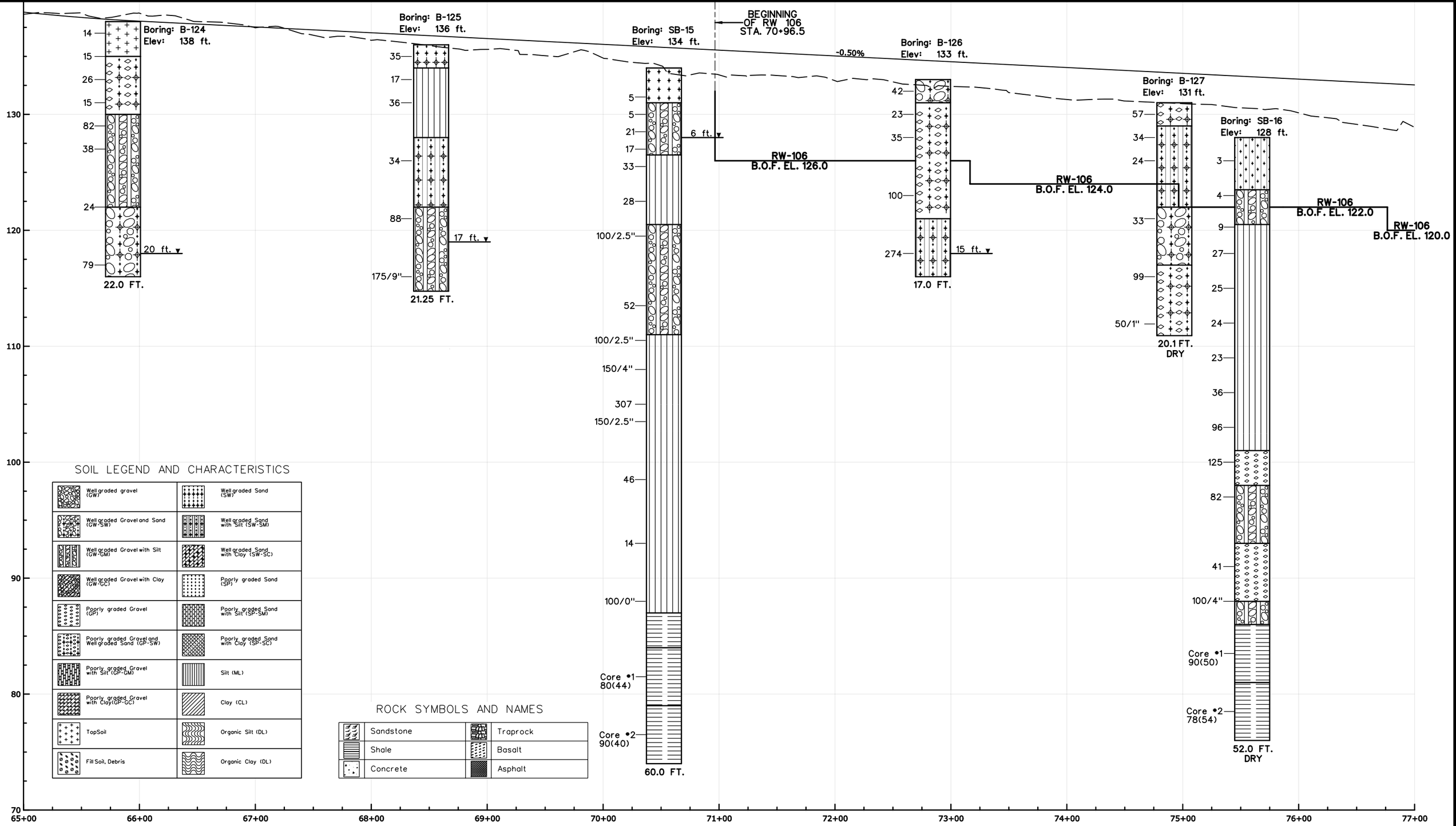
SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RW-115

PROJECT NO. 88-H035
DRAWING NO. PRO-3
SHEET NO. S



SOIL LEGEND AND CHARACTERISTICS

Well graded gravel (GW)	Well graded Sand (SW)
Well graded Gravel and Sand (GW-SW)	Well graded Sand with Silt (SW-SM)
Well graded Gravel with Silt (GW-GM)	Well graded Sand with Clay (SW-SC)
Well graded Gravel with Clay (GW-GC)	Poorly graded Sand (SP)
Poorly graded Gravel (GP)	Poorly graded Sand with Silt (SP-SM)
Poorly graded Gravel and Well graded Sand (GP-SW)	Poorly graded Sand with Clay (SP-SC)
Poorly graded Gravel with Silt (GP-GM)	Silt (ML)
Poorly graded Gravel with Clay (GP-GC)	Clay (CL)
TopSoil	Organic Silt (DL)
Fill Soil, Debris	Organic Clay (DL)

ROCK SYMBOLS AND NAMES

Sandstone	Traprock
Shale	Basalt
Concrete	Asphalt

FINAL DESIGN REVIEW

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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Plotted: 4/29/2010

DESIGNER/DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 40 80
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW106_088_H035_PRO4.dgn

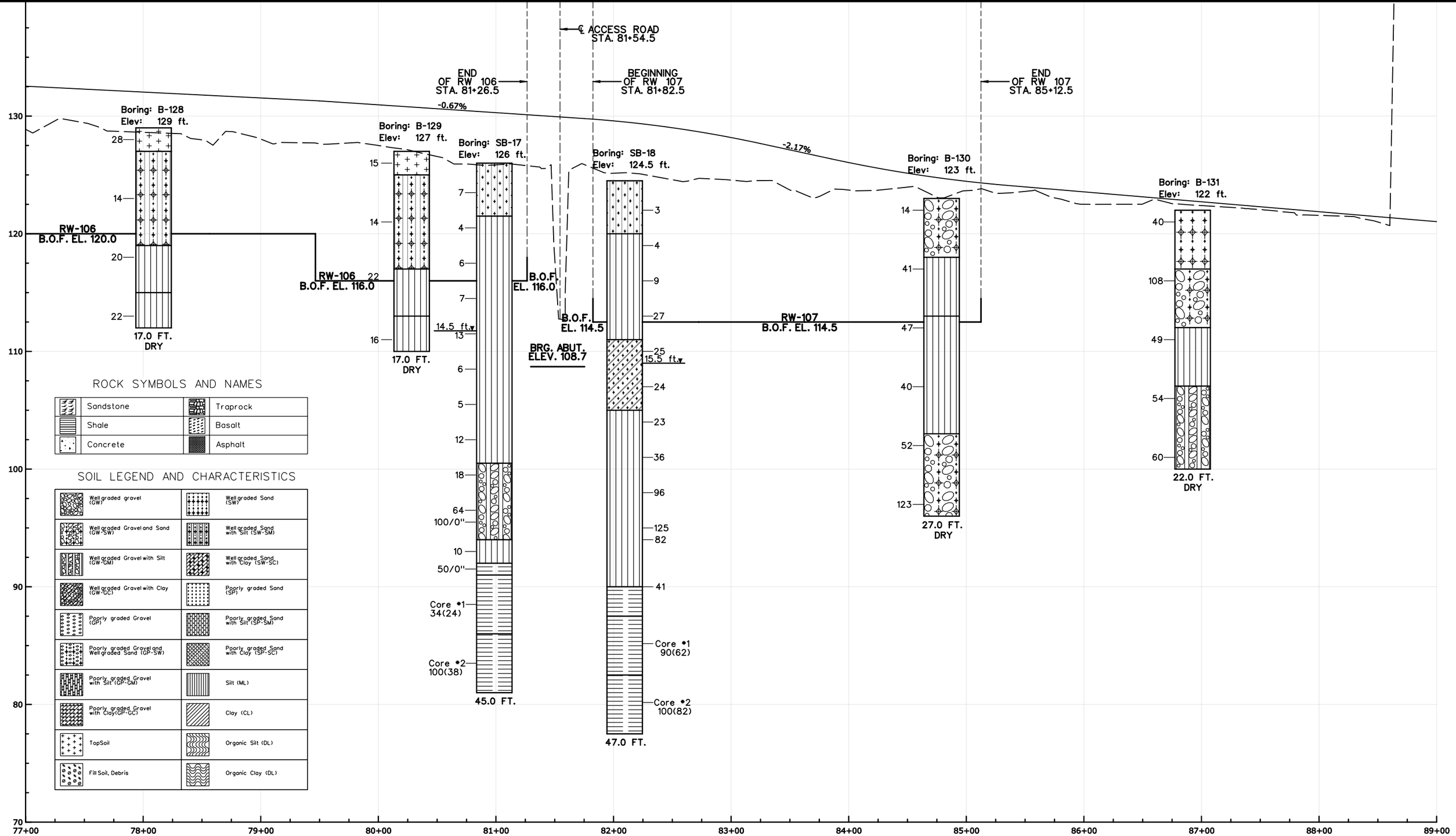
SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 106

PROJECT NO. 88-H035
DRAWING NO. PRO-4
SHEET NO. S



FINAL DESIGN REVIEW

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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Plotted: 4/29/2010

DESIGNER/DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 40 80
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW106_088_H035_PRO5.dgn

SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862

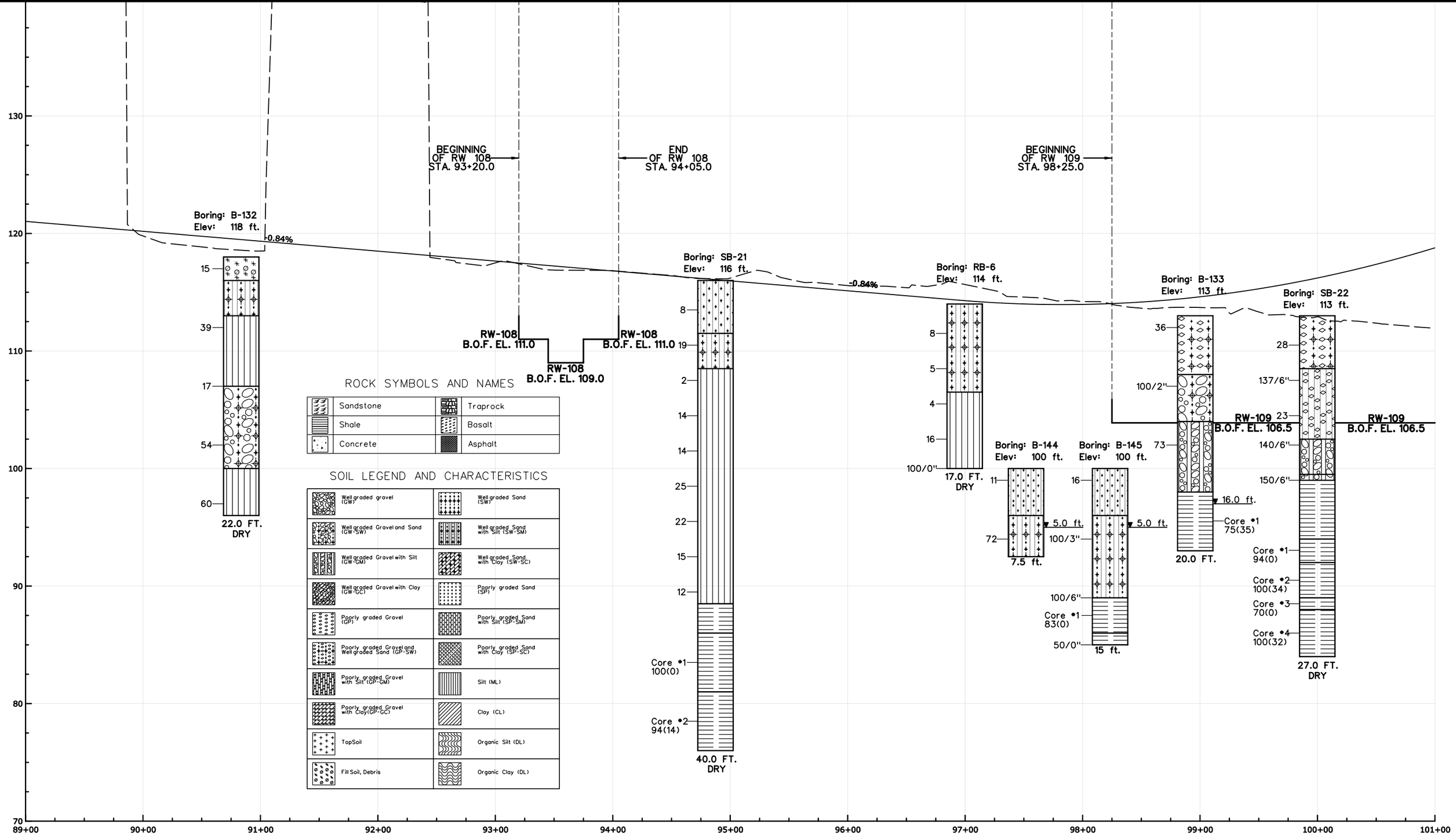
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE
RETAINING WALL NO. 106 & 107

PROJECT NO. 88-H035
DRAWING NO. PRO-5
SHEET NO. S



FINAL DESIGN REVIEW

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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Plotted: 4/29/2010

DESIGNER/DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 40 80
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW108_088_H035_PRO6.dgn

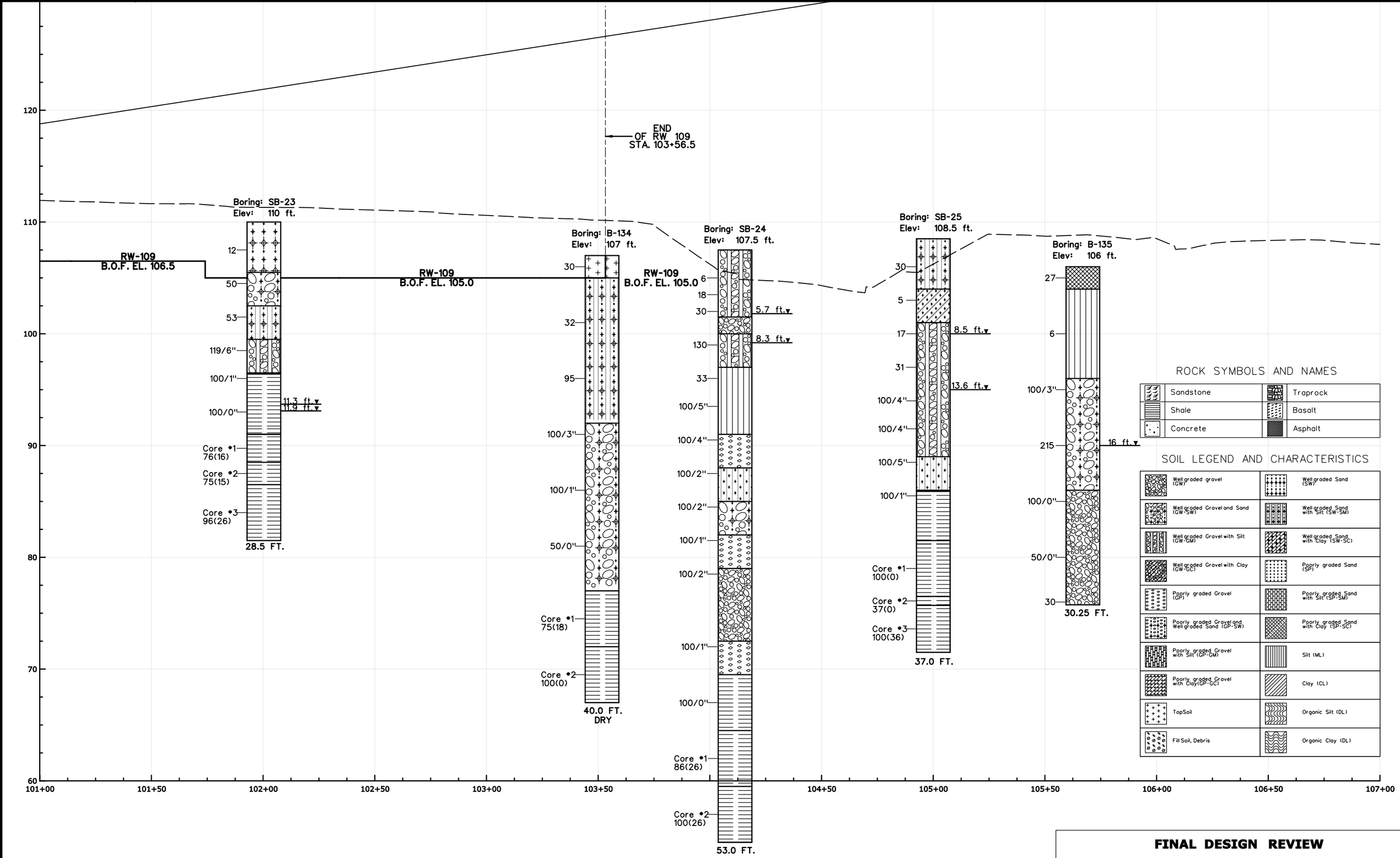
SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 108 & 109

PROJECT NO. 88-H035
DRAWING NO. PRO-6
SHEET NO. S



FINAL DESIGN REVIEW

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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Plotted: 4/29/2010

DESIGNER/DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 10 20
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW109_088_H035_PRO7.dgn

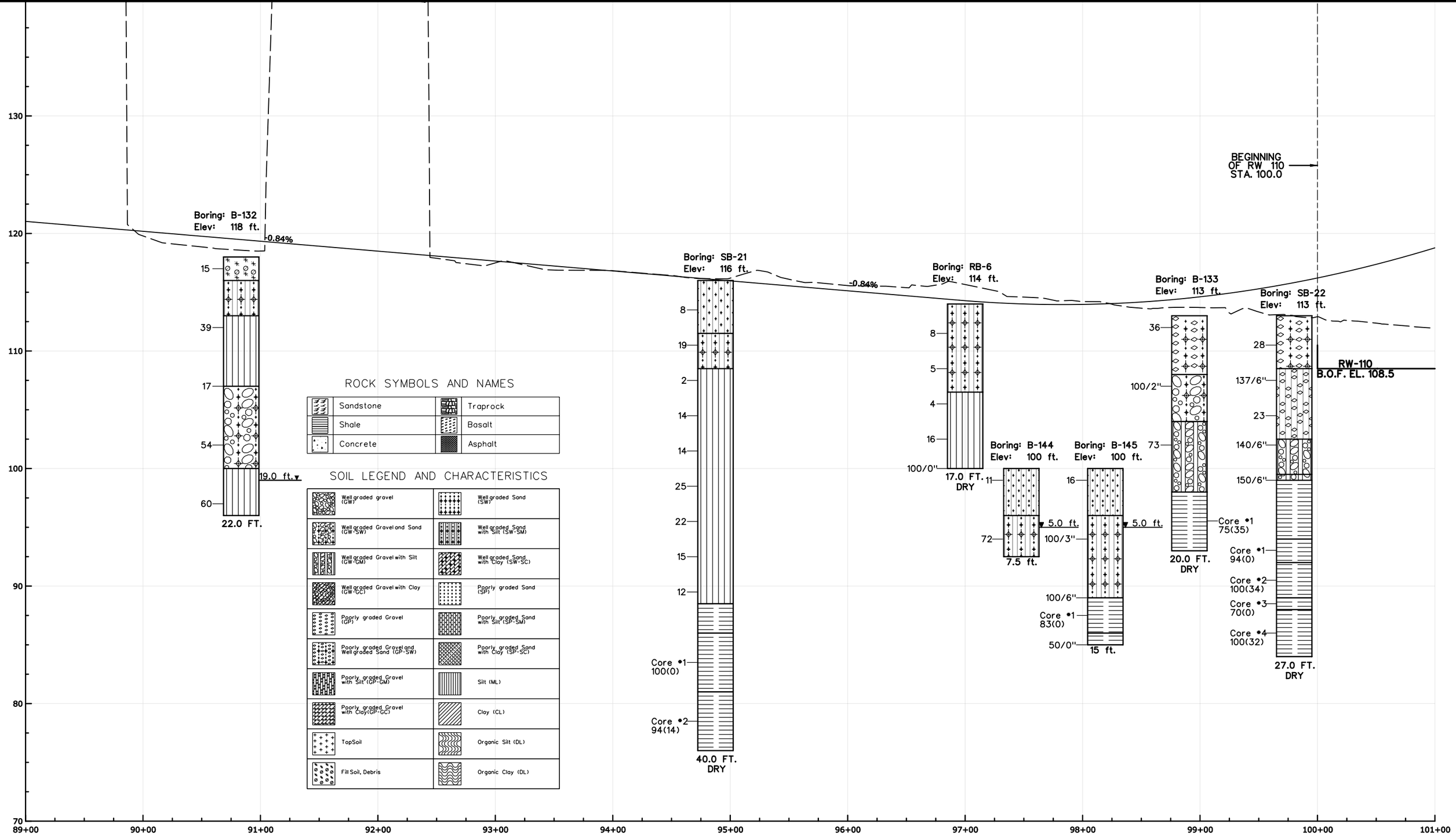
SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 109

PROJECT NO. 88-H035
DRAWING NO. PRO-7
SHEET NO. S



FINAL DESIGN REVIEW

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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 CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

Plotted: 4/29/2010

DESIGNER/DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 40 80
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW110_088_H035_PRO8.dgn

SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862

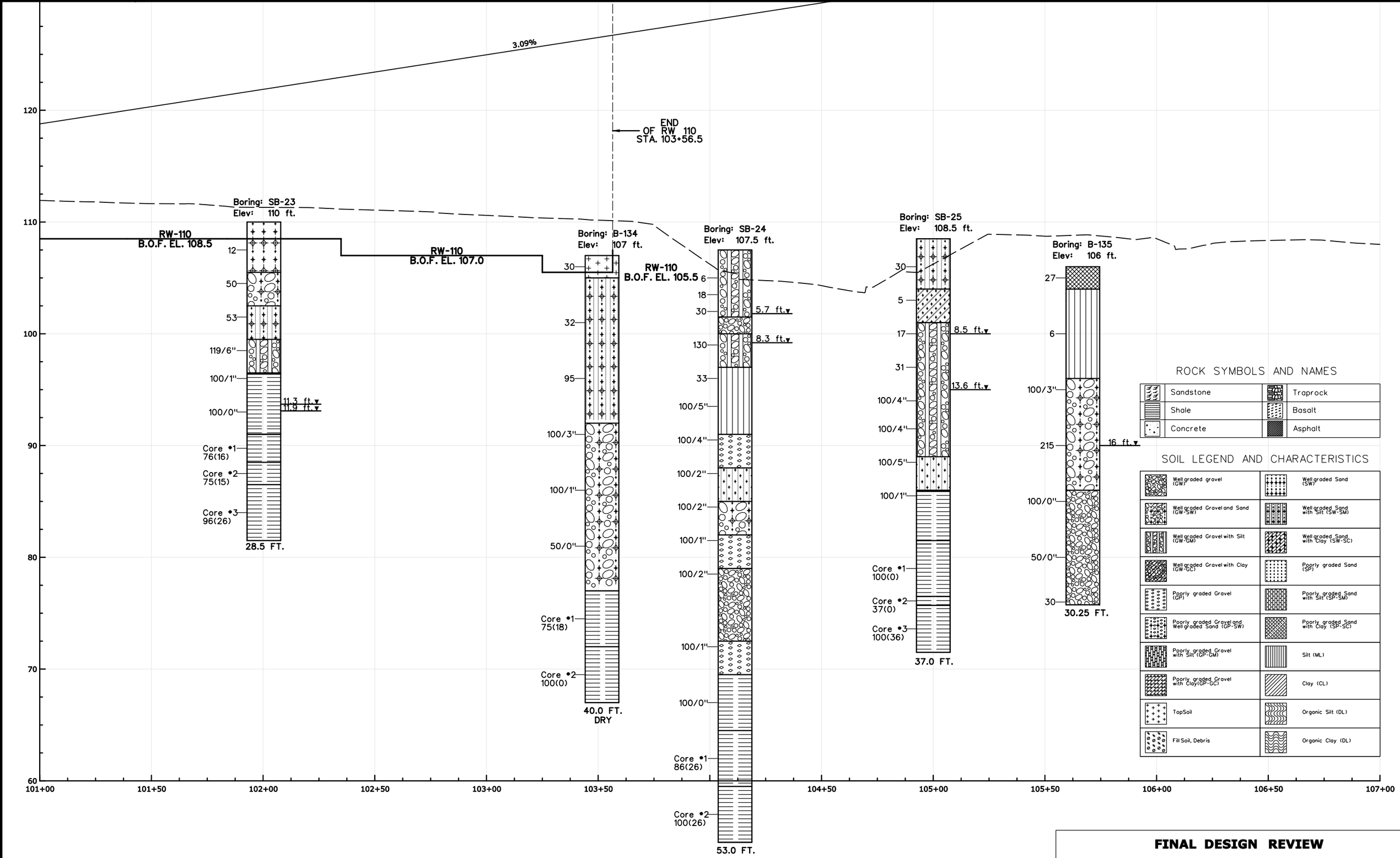
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 110

PROJECT NO. 88-H035
DRAWING NO. PRO-8
SHEET NO. S



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Plotted: 4/29/2010

DESIGNER/DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 20 40
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW110_088_H035_PRO9.dgn

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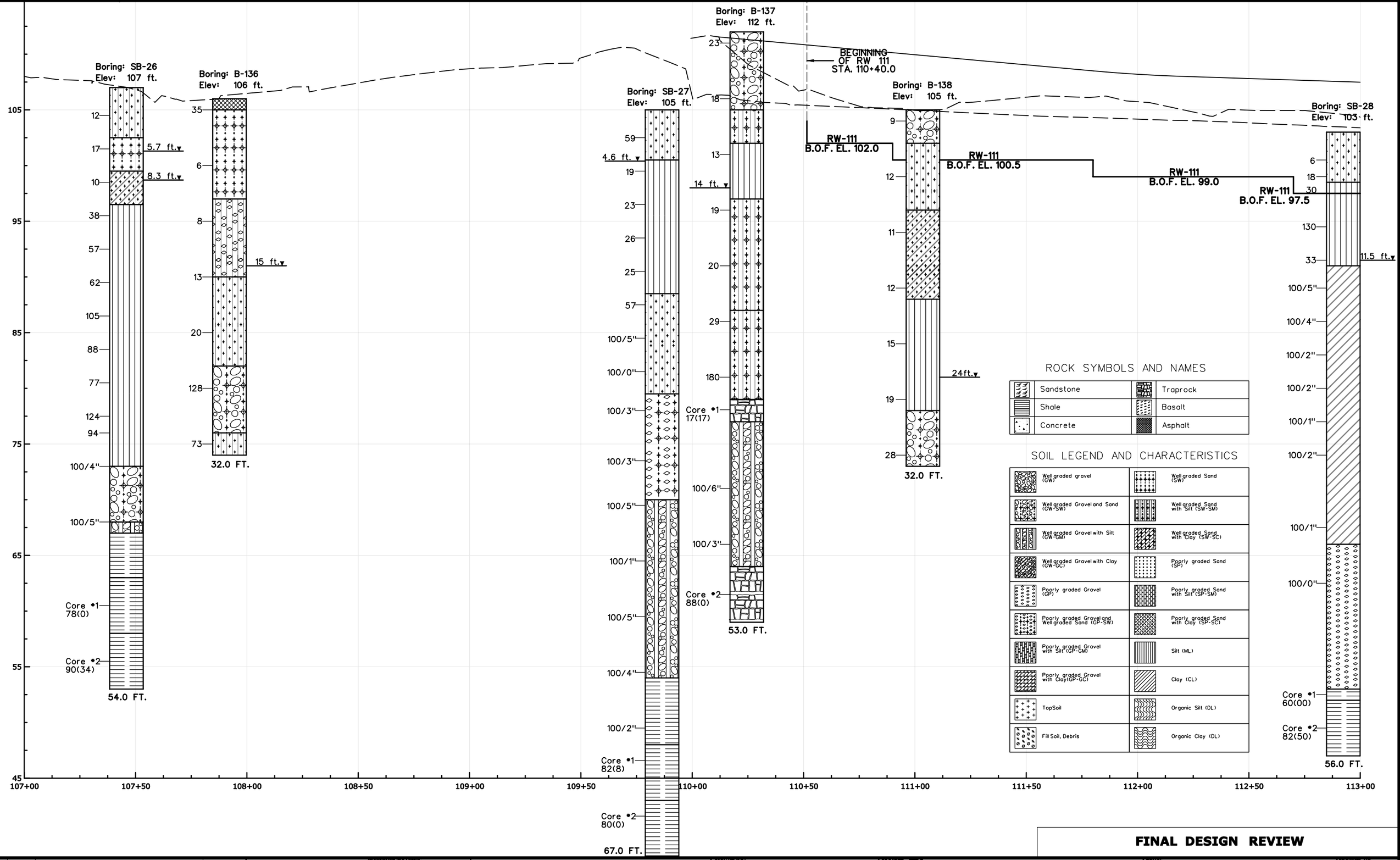
PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 110

PROJECT NO. 88-H035
DRAWING NO. PRO-9
SHEET NO. S



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HORIZ. SCALE IN FEET 0 20 40
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW111_088_H035_PRO10.dgn

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(203) 234-7862

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PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 111

PROJECT NO. 88-H035
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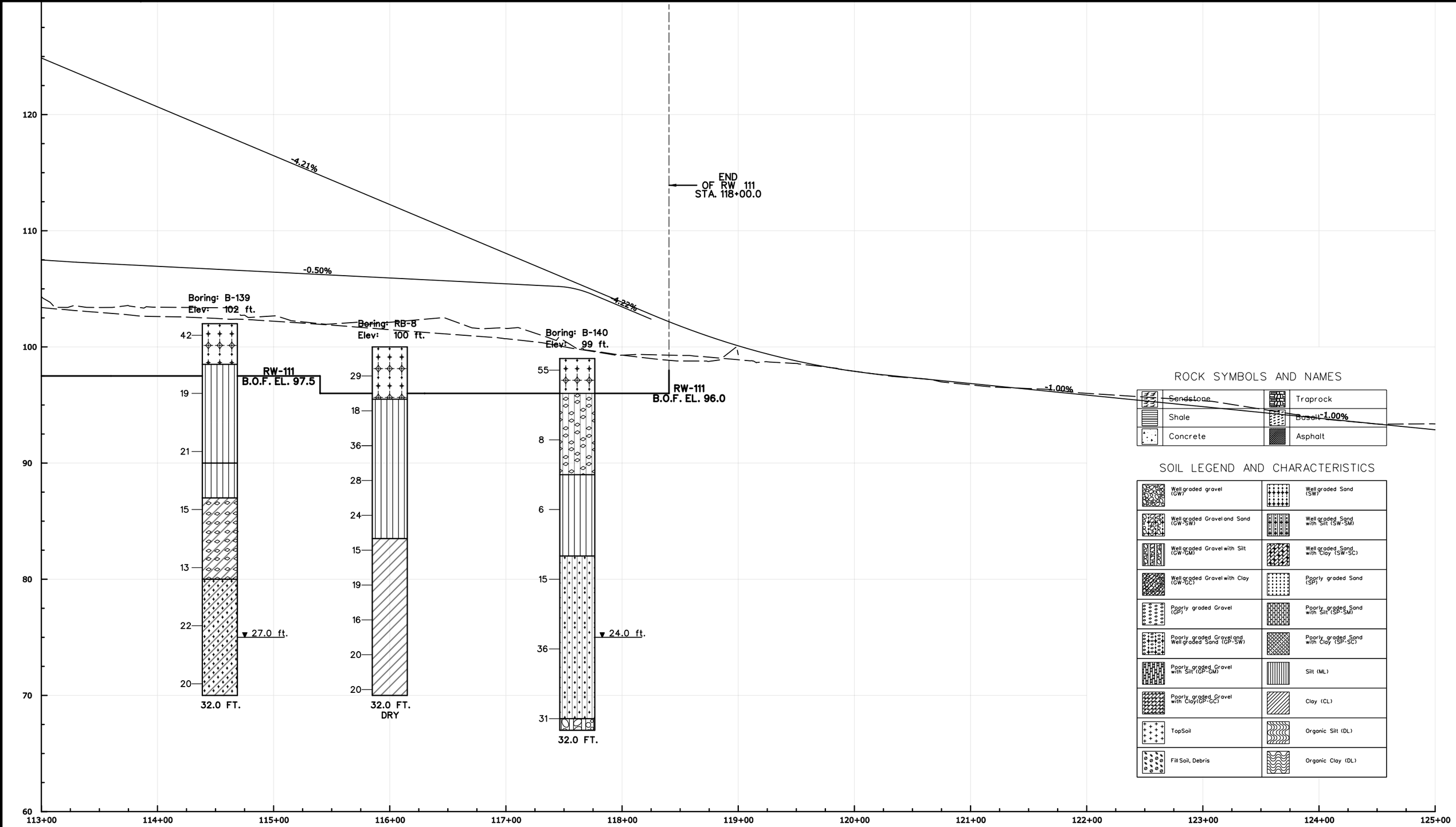
SHEET NO. S



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CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 40 80
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW111_088_H035_PRO11.dgn

SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862

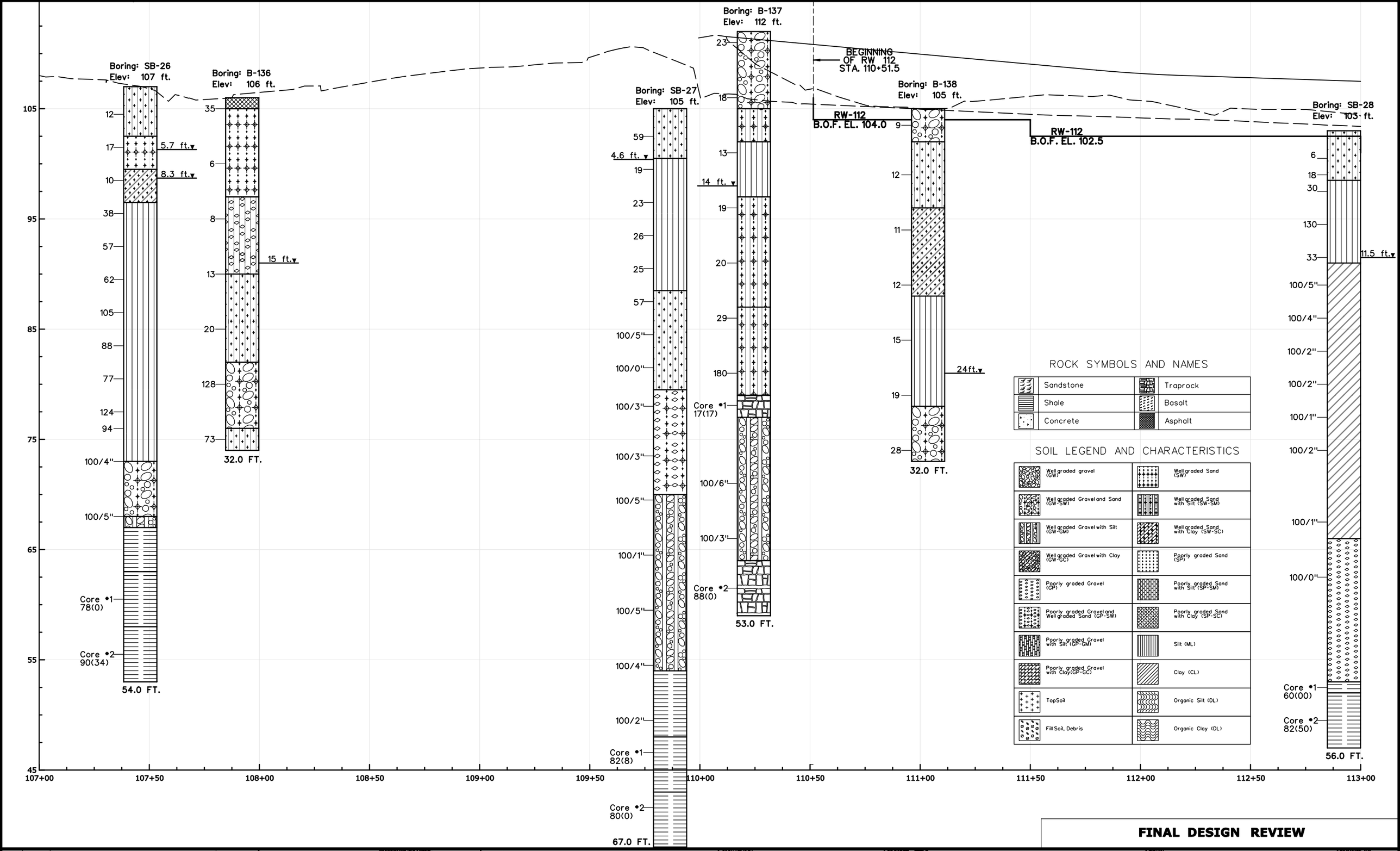
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 111

PROJECT NO. 88-H035
DRAWING NO. PRO-11
SHEET NO. S



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CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 20 40
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW112_088_H035_PRO12.dgn

SIGNATURE/BLOCK:
VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862

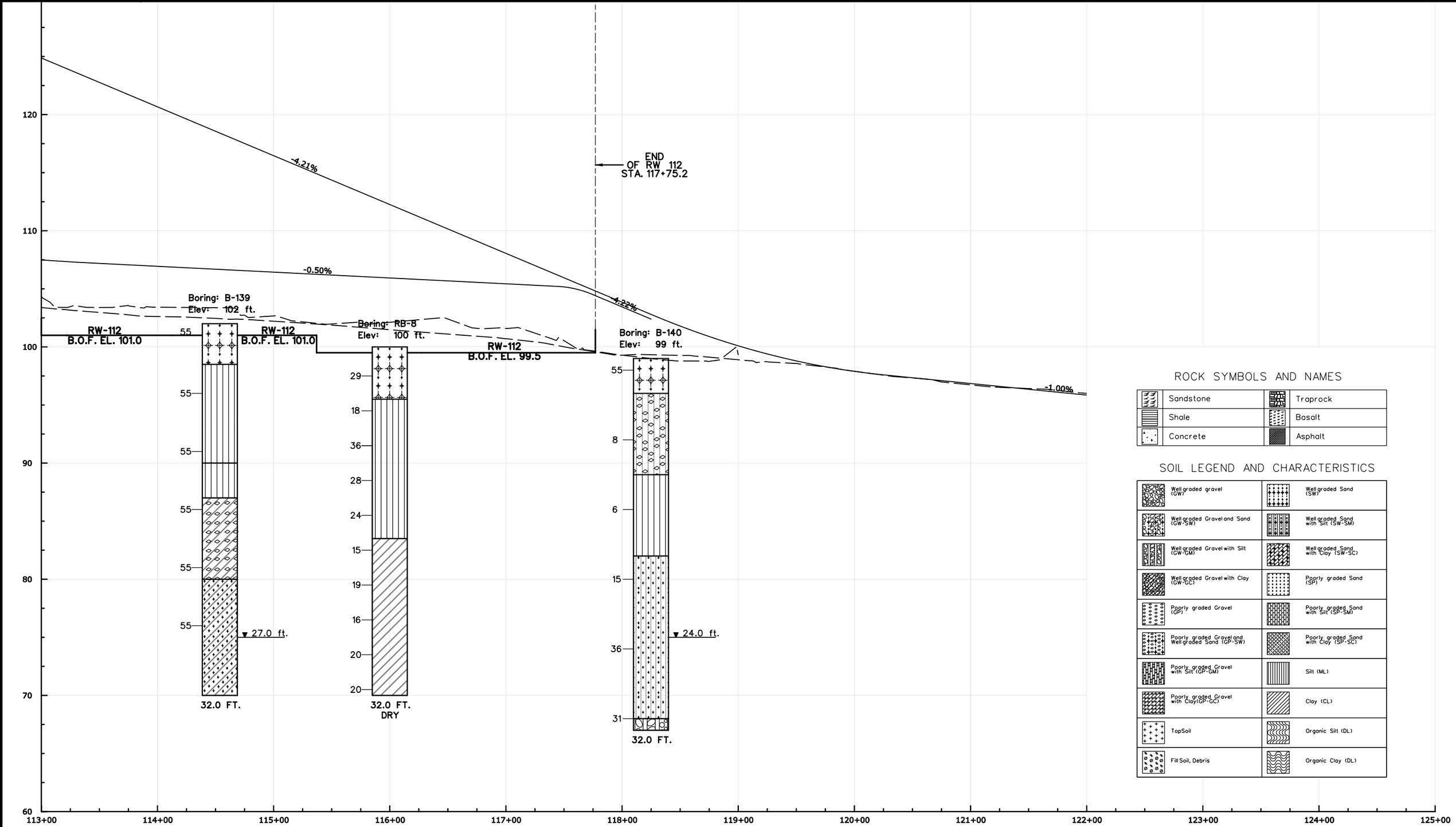
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 112

PROJECT NO. 88-H035
DRAWING NO. PRO-12
SHEET NO. S



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HORIZ. SCALE IN FEET 0 40 80
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW112_088_H035_PRO13.dgn

SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862

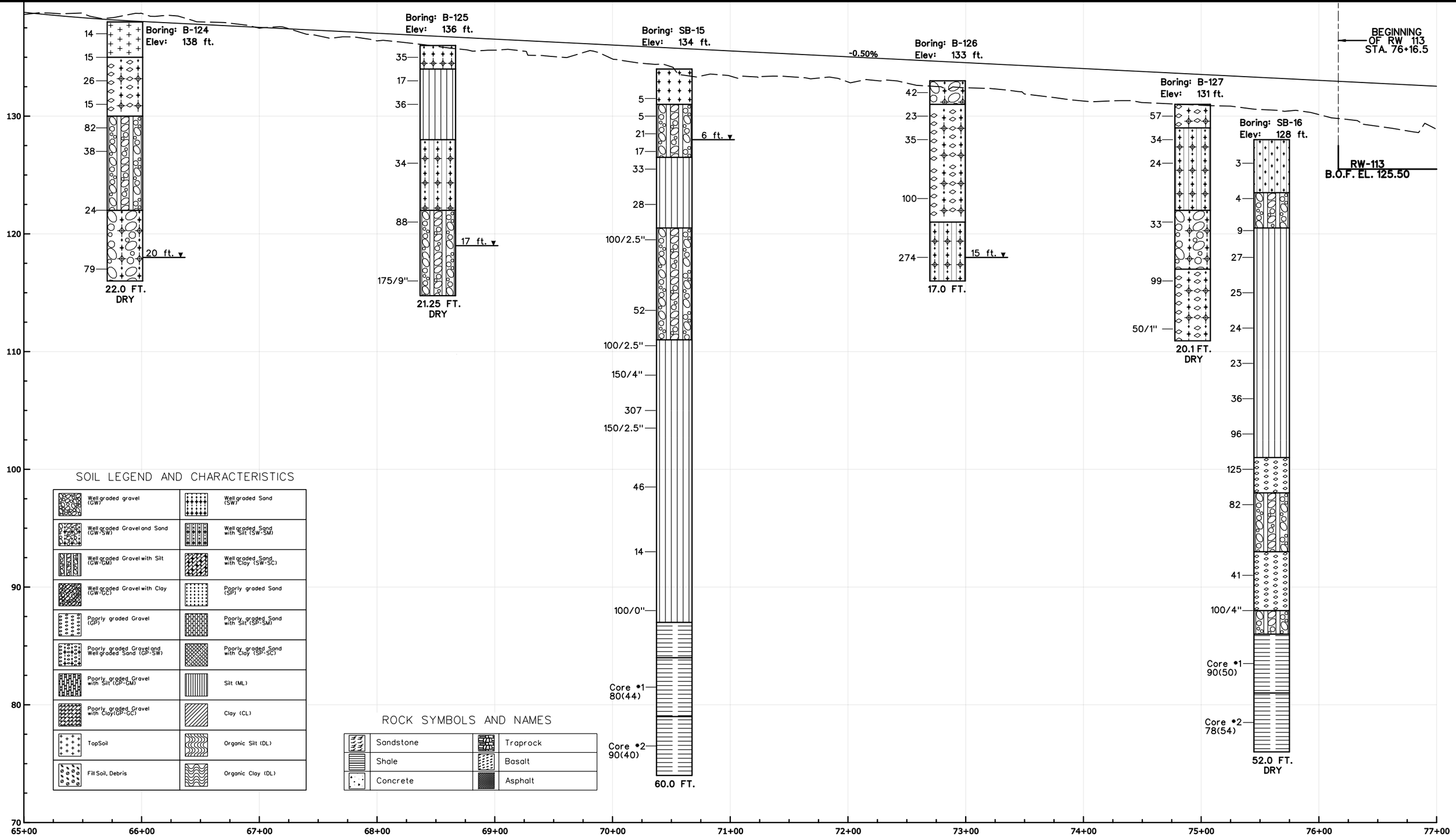
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 112

PROJECT NO. 88-H035
DRAWING NO. PRO-13
SHEET NO. S



SOIL LEGEND AND CHARACTERISTICS

Well graded gravel (GW)	Well graded Sand (SW)
Well graded Gravel and Sand (GW-SW)	Well graded Sand with Silt (SW-SM)
Well graded Gravel with Silt (GW-GM)	Well graded Sand with Clay (SW-SC)
Well graded Gravel with Clay (GW-GC)	Poorly graded Sand (SP)
Poorly graded Gravel (GP)	Poorly graded Sand with Silt (SP-SM)
Poorly graded Gravel and Well graded Sand (GP-SW)	Poorly graded Sand with Clay (SP-SC)
Poorly graded Gravel with Silt (GP-GM)	Silt (ML)
Poorly graded Gravel with Clay (GP-GC)	Clay (CL)
TopSoil	Organic Silt (DL)
Fill Soil, Debris	Organic Clay (DL)

ROCK SYMBOLS AND NAMES

Sandstone	Traprock
Shale	Basalt
Concrete	Asphalt

FINAL DESIGN REVIEW

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CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 40 80
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW113_088_H035_PRO14.dgn

SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862

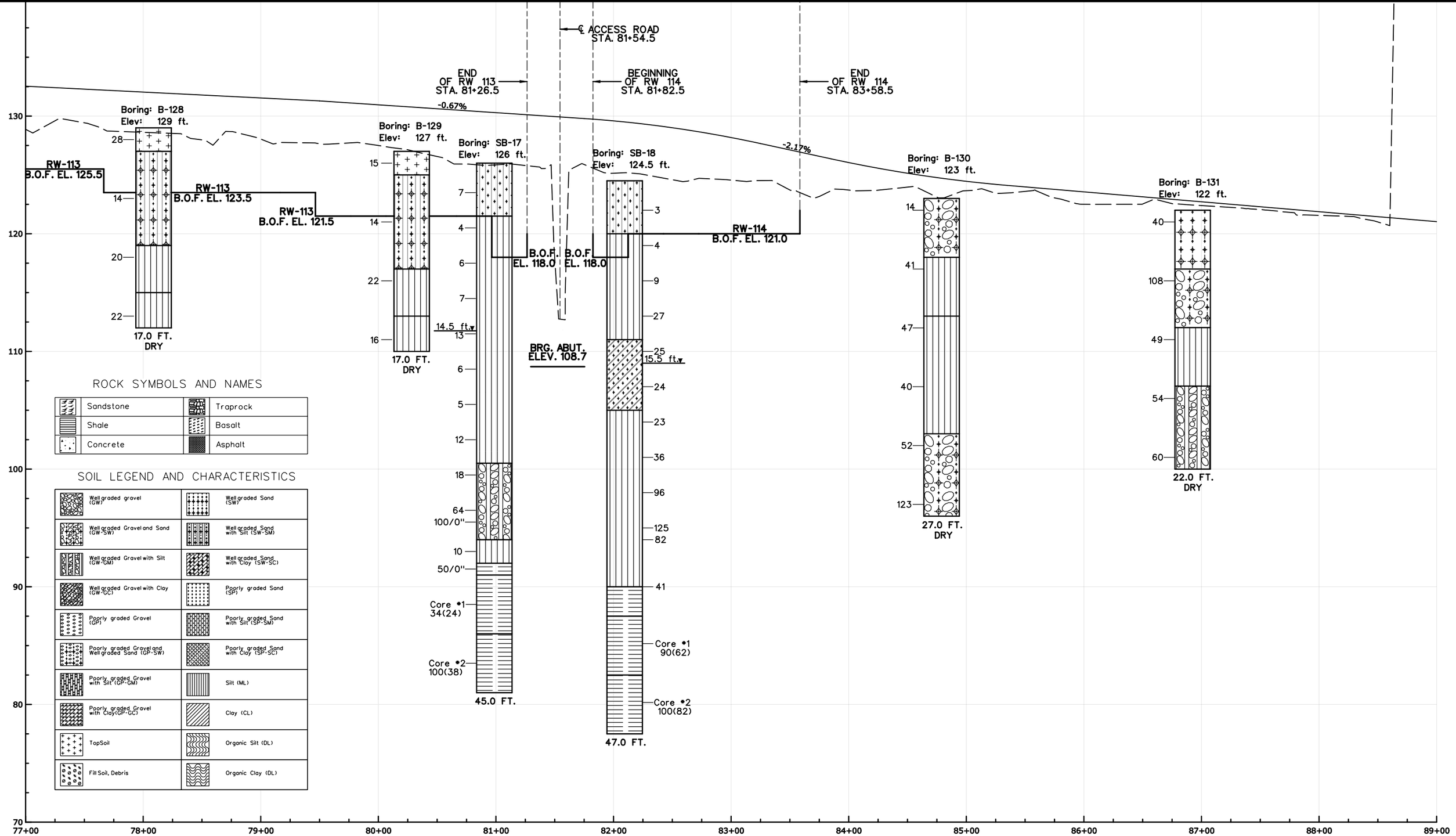
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 113

PROJECT NO. 88-H035
DRAWING NO. PRO-14
SHEET NO. S



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REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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Plotted: 4/29/2010

DESIGNER/DRAFTER: M. BAUER
CHECKED BY: R. GOMEZ
HORIZ. SCALE IN FEET 0 40 80
VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\SB_MSH_RW113_088_H035_PRO15.dgn

SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862

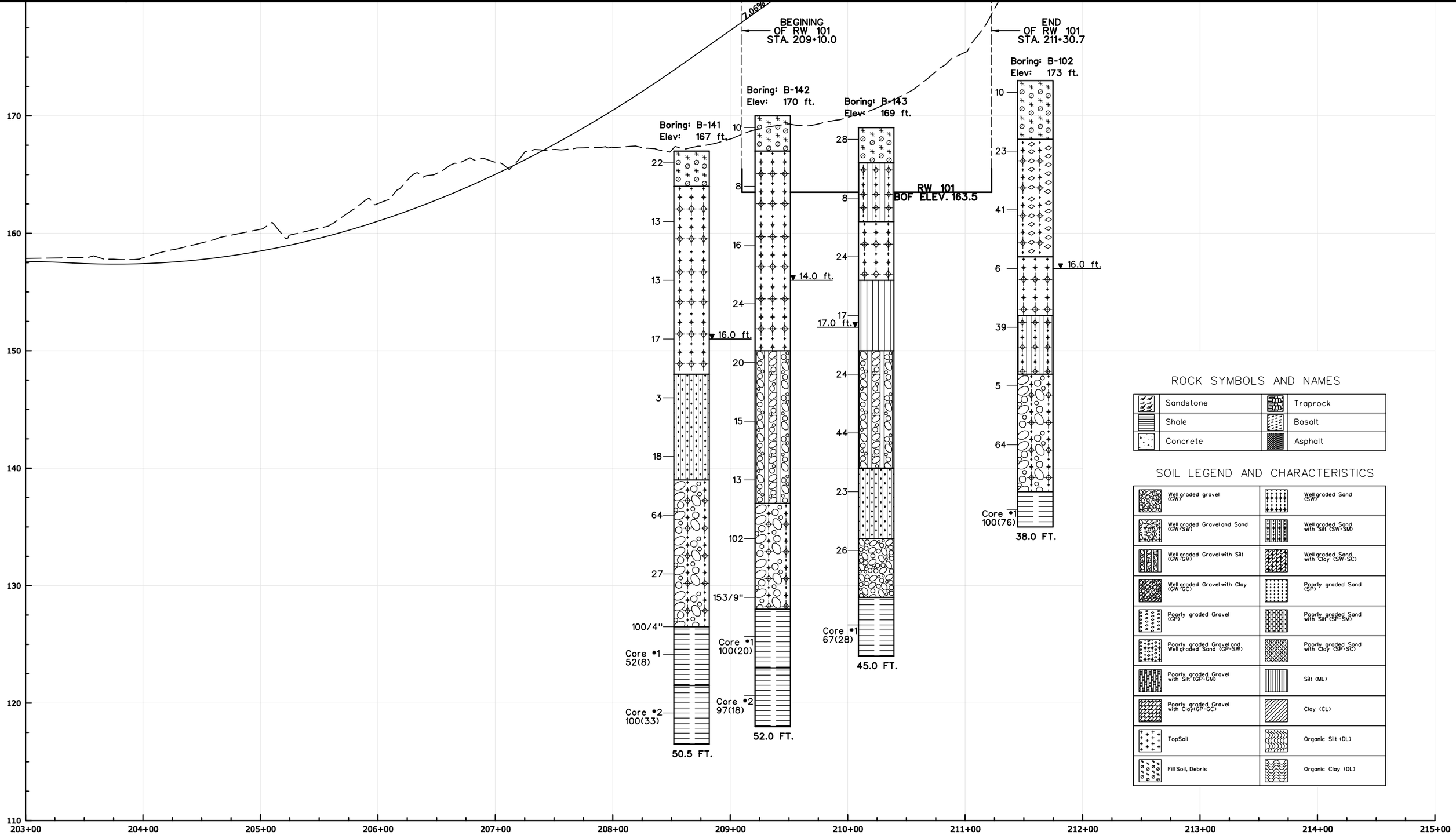
APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 113 & 114

PROJECT NO. 88-H035
DRAWING NO. PRO-15
SHEET NO. S



REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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Plotted: $DATE$

DESIGNER/DRAFTER: M. BAUER

CHECKED BY: R. GOMEZ

HORIZ. SCALE IN FEET 0 40 80

VERT. SCALE IN FEET 0 4 8

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: $FILEA$

SIGNATURE/BLOCK: VN ENGINEERS, INC.
116 WASHINGTON AVE.
NORTH HAVEN, CT 06473
(203) 234-7862

APPROVED BY: DATE:

PROJECT TITLE: NEW BRITAIN - HARTFORD BUSWAY

TOWN: NEW BRITAIN

DRAWING TITLE: SOIL PROFILE RETAINING WALL NO. 101

PROJECT NO. 88-H035

DRAWING NO. PRO-16

SHEET NO.

APPENDIX 2

BORING LOGS

Driller: New England Boring / Trent	**Connecticut DOT Boring Report**		Hole No.: B-101
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 313+18 / 12' Right
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804411
Start Date: 7/27/2007	Route No.:		Easting: 992176
Finish Date: 7/27/2007	Bridge No.:		Surface Elevation: 187
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:		@ 30' after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								187
						10" Asphalt	Asphalt / Road Base	
	SS-1	47, 35, 23, 26	24"	12"			Red Brown F-C SAND, some F-C gravel, trace silt	
						4'		
5	SS-2	14, 11, 12, 22	24"	15"				182
10	SS-3	18, 23, 18, 15	24"	11"			Red Brown F-C SAND, little silt, trace F gravel MC = 9.7%	177
15	SS-4	3, 3, 3, 4	24"	12"				172
						19'		
20	SS-5	29, 23, 16, 20	24"	10"				167
25	SS-6	3, 2, 3, 6	24"	11"			Brown Reclaimed F-C SAND, some F-C gravel, little silt, debris. MC=25.8%	162
						29'		
30	SS-7	4, 8, 9, 4	24"	12"			Red Brown SILT, some F sand, little F gravel	157
							EOB @ 32'	
35								152
40								147

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: 32 Rock: No. of Samples: 7	NOTES: 6" of asphalt and 4" of road base at surface Recovered some construction debris at 23'. (wood, brick, glass)	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Trent	**Connecticut DOT Boring Report**		Hole No.: B-102
Inspector: VN Engineers / Necip	TOWN: New Britain		Stat./Offset: 211+14 / 23' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804552
Start Date: 7/27/2007	Route No.:		Easting: 992282
Finish Date: 7/27/2007	Bridge No.:		Surface Elevation: 173
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations: Dry			@ 16' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								173
	SS-1	3, 4, 6, 11	24"	22"			Brown F-C SAND, little F-C, gravel, little silt, Fill	
5						5'		168
	SS-2	14, 11, 12, 22	24"	18"			Black F-C SAND, some F-M gravel, Debris, Fill	
10	SS-3	18, 23, 18, 15	24"	6"				163
15						15'		158
	SS-4	3, 3, 3, 4	24"	15"			Red Brown F-C SAND, little F-M gravel, trace silt MC = 6.5%	
20						20'		153
	SS-5	29, 23, 16, 20	24"	9"			Red Brown SILT, some F-C sand, some F-C gravel	
25						25'		148
	SS-6	3, 2, 3, 6	24"	9"			Red Brown F-C GRAVEL, some F-C sand, little silt	
30	SS-7	30, 32, 32, 36	24"	0"				143
35						35'		138
	C-1	4 Min					Rock Core Run	
	C-1	6.5 Min	36	36	72%		Rec =36"	
	C-1	5 Min				38'	RQD = 26/36 = 72%	
							Red Brown Sedimentary Shale	
40							EOB @ 38'	133

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: 35' Rock: 3' No. of Samples: 7	NOTES: Recovered some construction debris at 10'. (wood, brick, glass)	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**		Hole No.: B-103
Inspector: VN Engineers / Necip	TOWN: New Britain		Stat./Offset: 402+00 / 5' Right
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804486
Start Date: 7/27/2007	Route No.:		Easting: 992561
Finish Date: 7/27/2007	Bridge No.:		Surface Elevation: 175
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations: Dry	@ after 0 hours		

Depth (ft)	SAMPLES: Sample Type/ No.	SAMPLES: Blows on Sampler per 6 inches	SAMPLES: Pen. (in.)	SAMPLES: Rec. (in.)	SAMPLES: RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	3, 6, 16, 25	24"	15"			Red Brown F-C SAND, some F-C gravel, little silt, cobbles	175
5	SS-2	10, 19, 31, 26	24"	8"		8'		170
							EOB @ 8'	
10								165
15								160
20								155
25								150
30								145
35								140
40								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: 8' Rock: No. of Samples: 2	NOTES: Auger refusal at 8'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: ABC Boring / Jaime Lloret	**Connecticut DOT Boring Report**		Hole No.: B-104
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 19+12 / 9' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804245
Start Date: 7/27/2007	Route No.:		Easting: 992204
Finish Date: 7/27/2007	Bridge No.:		Surface Elevation: 171
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:		@ 20' after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	3, 12, 43, 45	24"	10"		3'	Black topsoil F-C SAND, some F gravel	171
5	SS-2	4, 5, 3, 3	24"	8"			Red Brown F-C SAND, some silt, little F gravel MC = 11.6%	166
10	SS-3	2, 3, 3, 3	24"	9"				161
15	SS-4	3, 5, 10, 6	24"	6"		16'		156
						20'	Red Brown F-C SAND, little Silt	
20	SS-5	9, 14, 22, 32	24"	15"				151
25	SS-6	3, 9, 21, 30	24"	22"			Red Brown F-C SAND, some silt	146
30	SS-7	4, 9, 24, 26	24"	16"		32'		141
							EOB @ 32'	
35								136
40								131

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: 32' Rock: No. of Samples: 7	NOTES: Soil contaminated with gasoline or some kind of fuel at 20'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: ABC Boring / Jamie Lloret	**Connecticut DOT Boring Report**		Hole No.: B-105
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 19+42 / 76' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804154
Start Date: 7/18/2007	Route No.:		Easting: 992209
Finish Date: 7/18/2007	Bridge No.:		Surface Elevation: 171
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 20' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								171
	SS-1	2, 8, 10, 10	24"	9"		2'	Black F-C SAND, some F-M gravel, little ash	
5	SS-2	6, 8, 10, 15	24"	8"			Red Brown F-C SAND, some F-M gravel, trace silt	166
10	SS-3	6, 9, 10, 12	24"	12"				161
15	SS-4	16, 22, 19, 21	24"	12"		15'	Red Brown SILT, some F-C sand, little F-C gravel, trace schist	156
20	SS-5	8, 13, 17, 15	24"	14"			Red Brown SILT, some F-C sand, little F-C gravel, trace schist	151
25	SS-6	5, 10, 10, 11	24"	18"		25'	Red Brown SILT, some F-C gravel, Little F-C sand, trace schist	146
30	SS-7	11, 20, 30, 30	24"	24"				141
35							EOB @ 32'	136
40								131

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: 32' Rock: No. of Samples: 7	NOTES: Samples are very consistent, Sand and gravel become more coarse at 25'. More like glacial till with higher schist content	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: ABC Boring / Jamie Lloret	**Connecticut DOT Boring Report**		Hole No.: B-106
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 20+76 / 1' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804190
Start Date: 7/18/2007	Route No.:		Easting: 992359
Finish Date: 7/18/2007	Bridge No.:		Surface Elevation: 170
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 16' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								170
							4" Asphalt	
	SS-1	18, 14, 11, 10	24"	9"			Brown F-C SAND. Some silt, little gravel, MC = 11.1%	
						5'		
5	SS-2	4, 5, 5, 5	24"	6"				165
10	SS-3	5, 5, 5, 6	24"	10"			Brown F-C SAND, some silt, little F-M gravel	160
						15'		
15		3, 3, 3, 3	24"	0"				155
	SS-4	3, 4, 4, 4	24"	18"			Black Grey Silt, some F sand, trace F gravel	
20	SS-5	2, 2, 3, 5	24"	12"				150
25	SS-6	4, 1, 2, 2	24"	14"			Black Grey Silt, some F sand, trace F gravel	145
						30'		
30	SS-7	6, 7, 8, 10	24"	9"				140
35	SS-8	8, 24, 23, 20	24"	11"			Red Brown SILT, some F-C sand, little F-M gravel, Glacial Till	135
						37'		
							EOB @ 37'	
40								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: 37' Rock: No. of Samples: 8	NOTES: Rock caught in spoon at 15' - 17' No rec. Glacial Till at 30'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: ABC Boring / Jamie Lloret	**Connecticut DOT Boring Report**		Hole No.: B-107
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 21+68 / 11' Right
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804153
Start Date: 7/18/2007	Route No.:		Easting: 992444
Finish Date: 7/18/2007	Bridge No.:		Surface Elevation: 171
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 20' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								171
						1'	1' Asphalt	
5	SS-1	3, 4, 4, 4	24"	8"			Brown F-C SAND, some Silt, trace F gravel MC = 8.1%	166
10	SS-2	8, 11, 10, 13	24"	6"		13'		161
15	SS-3	3, 3, 3, 3	24"	8"			F-C GRAVEL, some Red Brown SILT, little F- C sand, glacial till	156
20	SS-4	10, 11, 10, 17	24"	12"		22'	Red Brown SILT and F-C gravel, little F-C sand,	151
25	SS-5	13, 17, 18, 22	24"	10"			F-C GRAVEL, some Red Brown SILT, little F- C sand, glacial till	146
30	S-6	9, 15, 24, 47	24"	16"		32'		141
							EOB @ 32'	
35								136
40								131

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: 32' Rock: No. of Samples: 6	NOTES: Auger grinding at 12.5' Glacial till at 22' Cobbles and boulders at 31'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller:	ABC Boring / Jamie Lloret	**Connecticut DOT Boring Report**		Hole No.:	B-108
Inspector:	VN Engineers / M. Bauer	TOWN:	New Britain	Stat./Offset:	24+75 / 21' Right
Engineer:	Ray Volpe Jr.	Project No.:	88-H035	Northing:	804084
Start Date:	7/20/2007	Route No.:		Easting:	992746
Finish Date:	7/20/2007	Bridge No.:		Surface Elevation:	168
Project Description:		**New Britain - Hartford Busway**			
Casing Size/Type:	3.25" / HSA	Sampler Type/Size:	Split Spoon / 1 3/8"	Core Barrel Type:	
Hammer Wt.:	Fall:	Hammer Wt.:	140 lb Fall: 30"		
Groundwater Observations:	Dry			@ after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	3, 7, 8, 10	24"	8"				168
						4'	Black F-C SAND, little F-C gravel	
5	SS-2	4, 5, 4, 7	24"	8"				163
						10'	Red Brown F-C SAND, some silt, little F-C gravel	
10	SS-3	13, 13, 17, 21	24"	12"				158
						16'	Red brown SILT, some F-C sand, little F gravel. Cobbles	
15	SS-4	29, 38, 60/3"	15"	6"				153
							EOB @ 16' 9"	
20								148
25								143
30								138
35								133
40								128

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: 17' Rock:	NOTES: Auger grinding at 13' cobbles Auger refusal at 16' 9" Boulders and Cobbles	Sheet 1 of 1
No. of Samples: 4		SM-001-M REV. 1/02

Driller: ABC Boring / Jamie Lloret	**Connecticut DOT Boring Report**		Hole No.: B-109
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 28+27 / 15' Right
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804099
Start Date: 7/19/2007	Route No.:		Easting: 993102
Finish Date: 7/19/2007	Bridge No.:		Surface Elevation: 165
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 15' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								165
						3'	Trap Rock	
5	SS-1	13, 15, 15, 17	24"	6"			Red Brown SILT, some F-C sand, some F-C gravel MC = 8.6%	160
10	SS-2	13, 11, 10, 7	24"	6"				155
						15'		
15	SS-3	4, 3, 7, 13	24"	12"			Red Brown SILT, little F sand, little F gravel	150
						18'		
20	SS-4	18, 20, 21, 20	24"	12"			Red Brown SILT, some F-C sand, some F-M gravel	145
25	SS-5	27, 95	12"	8"		26'		140
30	SS-6	30, 60, 45, 60	24"	14"			Red Brown F-C GRAVEL and SILT, some F-C sand. Cobbles	135
						32'		
35							EOB @ 32'	130
40								125

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: 32' Rock: No. of Samples: 6	NOTES: Till at 18'. Cobbles and schist at 26'. Auger grinding at 26'-30' Auger broke at 28' possible boulder	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: ABC Boring / Jamie Lloret	**Connecticut DOT Boring Report**		Hole No.: B-110
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 29+26 / 11' Right
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804122
Start Date: 7/19/2007	Route No.:		Easting: 993199
Finish Date: 7/19/2007	Bridge No.:		Surface Elevation: 164
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:		@ 30' after 0 hours	

Depth (ft)	Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								164
						3'	Trap Rock	
5	SS-1	20, 32, 24, 25	24"	8"				159
10	SS-2	9, 20, 36, 27	24"	10"			Red Brown SILT, some F-M gravel, little F-C sand, cobbles	154
15	SS-3	10, 50, 50/0"	12"	7"		16'		149
20	SS-4	7, 8, 8, 6	24"	10"			Red Brown F-C SAND and F-C gravel, little silt. Cobbles	144
25	SS-5	8, 14, 11, 12	24"	12"				139
30	SS-6	16, 9, 6, 18	24"	7"				134
35	SS-7	32, 55, 62, 40	24"	8"		35'		129
						40'	Red Brown F-C GRAVEL and F-C Sand, some silt. Cobbles, till Top of Rock	
40		100/1"	1"	0"				124
45	C-1 C-1 C-1 C-1 C-1	3 Min 3 Min 6 Min 6 Min 8 Min	60	60	37%		Rock core run #1 RQD = 22"/60" = 37% Dark Gray Basalt	119
50	C-2 C-2 C-2 C-2 C-2	10 Min 9 Min 4 Min 4 Min 4 Min	60	60	52%	50'	Rock core run #2 RQD = 31"/60" = 52% Dark Gray Basalt	114
							EOB @ 50'	
55								109
60								104

Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50 %

Total Penetration in Earth: 40' Rock: 10' No. of Samples: 7	NOTES: 3' of trap rock Samples are wet at 30' No Recovery at 40' 100/1"	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Trent	**Connecticut DOT Boring Report**		Hole No.: B-111
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 30+42 / 15' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804175
Start Date: 7/25/2007	Route No.:		Easting: 993305
Finish Date: 7/26/2007	Bridge No.:		Surface Elevation: 143
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 4" I.D. / 4" SSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.:300 Fall: 24"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:		@ 7' after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								143
	SS-1	3, 8, 23, 29	24"	10"		2'	Brown F-C SAND, little F-M gravel, Trace quartzite	
5								138
	SS-2	10, 12, 13, 16	24"	16"				
10							Red Brown SILT, some F-C gravel, little F-C sand MC = 10.8%	133
	SS-3	5, 5, 8, 12	24"	16"				
15						14'		128
	SS-4	38, 94, 41, 35	24"	15"			Red Brown F-C SAND and F-C gravel, little silt, trace schist. Cobbles	
20	SS-5	44, 78, 50/2"	14"	6"			Red Brown F-C SAND and F-C gravel, little silt, trace schist. Cobbles	123
						24'	Top of Rock	
25	C-1	5 Min						118
	C-1	5 Min					Rock Core Run # 1	
	C-1	4 Min			10%		24'-29' Rec. 57"	
	C-1	6 Min					RQD = 6"/60" = 10%	
	C-1	6 Min					Gray-Black Basalt	
30	C-2	7 Min						113
	C-2	6 Min					Rock core run #2	
	C-2	4 Min			72%		29'-34' Rec. 57"	
	C-2	5 Min					RQD = 47"/60" = 72%	
	C-2	6 Min				34'	Gray-Black Basalt	
35							EOB @ 34'	108
40								103

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: 24' Rock: 10' No. of Samples: 5	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller:	New England Boring / Trent	**Connecticut DOT Boring Report**		Hole No.:	B-112
Inspector:	VN Engineers / M. Bauer	TOWN:	New Britain	Stat./Offset:	31+56 / 23' Left
Engineer:	Ray Volpe Jr.	Project No.:	88-H035	Northing:	804215
Start Date:	7/23/2007	Route No.:		Easting:	993412
Finish Date:	7/23/2007	Bridge No.:		Surface Elevation:	128
Project Description:		**New Britain - Hartford Busway**			
Casing Size/Type:	4" I.D. / 4" SSA	Sampler Type/Size:	Split Spoon / 1 3/8"	Core Barrel Type:	2" NQ
Hammer Wt.:300	Fall: 24"	Hammer Wt.:	140 lb Fall: 30"		
Groundwater Observations:				@ 8' after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	4, 12, 28, 29	24"	12"		2'	Red Brown F-C SAND, some silt, some F-C gravel MC = 9.2%	128
5	SS-2	27, 18, 18, 40	24"	20"				123
10	SS-3	65, 67, 63, 70	24"	20"			Red Brown F-C SAND and F-C gravel, little silt. Till, Cobbles	118
15	SS-4	100/3"	3"	1"		16'	Top of Rock	113
	C-1	8 Min						
	C-1	8 Min					Rock core run # 1	
	C-1	2 Min			77%		RQD = 46"/60" = 77%	
20	C-1	4 Min						108
	C-1	6 Min						
	C-2	7 Min					Rock core run # 2	
	C-2	7 Min					RQD = 37"/60" = 62%	
	C-2	6 Min			62%			
25	C-2	7 Min						103
	C-2	6 Min						
							EOB @ 26'	
30								98
35								93
40								88

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: 16' Rock: 10' No. of Samples: 4	NOTES: Glacial till from 2' - 15' Began Coring at 15' 9"	Sheet 1 of 1 SM-001-M REV. 1/02

Driller:	New England Boring / Trent	**Connecticut DOT Boring Report**		Hole No.:	B-113
Inspector:	VN Engineers / M. Bauer	TOWN:	New Britain	Stat./Offset:	33+44 / 18' Left
Engineer:	Ray Volpe Jr.	Project No.:	88-H035	Northing:	804274
Start Date:	7/23/2007	Route No.:		Easting:	993588
Finish Date:	7/24/2007	Bridge No.:		Surface Elevation:	140
Project Description:		**New Britain - Hartford Busway**			
Casing Size/Type:	4" I.D. / 4" SSA	Sampler Type/Size:	Split Spoon / 1 3/8"	Core Barrel Type:	2" NQ
Hammer Wt.:	300 Fall: 24"	Hammer Wt.:	140 lb Fall: 30"		
Groundwater Observations:				@ 13' after 0 hours	

Depth (ft)	SAMPLES Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								140
						4"	4" Asphalt	
	SS-1	13, 18, 17, 22	24"	16"		4'	Red Brown F-C SAND and F-C gravel, some silt	
5	SS-2	16, 20, 20, 25	24"	14"				135
10	SS-3	14, 14, 17, 20	24"	18"		14'	Red Brown SILT, some F-M sand.	130
15	SS-4	13, 15, 21, 22	24"	20"		18'	Red Brown F-C SAND, some F-M gravel, little silt MC = 12.1%	125
20	SS-5	42, 40, 57, 80/3"	21"	16"		22'	Red Brown F SAND, Some silt, little schist, trace F gravel	120
25	C-1	7 Min			0%		Rock core run #1 RQD = 0"/60" = 0% Red Brown Shale, Highly fractured, weathered	115
	C-1	10 Min						
	C-1	10 Min						
	C-1	9 Min						
	C-1	5 Min						
30	C-2	5 Min			13%		Rock core run # 2 RQD = 8"/60" = 13% Red Brown Shale Gray Basalt	110
	C-2	10 Min						
	C-2	8 Min						
	C-2	6 Min						
	C-2	6 Min				32'		
35							EOB @ 32.5	105
40								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: 22' Rock: 10' No. of Samples: 5	NOTES: Refusal at 22' 6". Start coring at 22' 6" Core #1 Red Brown Shale, highly fractured Core #2 Red brown Shale. Basalt appears at 31.5	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Trent	**Connecticut DOT Boring Report**	Hole No.: B-114	
Inspector: VN Engineers / M. Bauer	TOWN: New Britain	Stat./Offset: 34+66 / 50' Left	
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing: 804351	
Start Date: 7/26/2007	Route No.:	Easting: 993685	
Finish Date: 7/27/2007	Bridge No.:	Surface Elevation: 140	
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 4" I.D. / 4" SSA	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type: 2" NQ	
Hammer Wt.:300 Fall: 24"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:	@ 5' after 0 hours		

Depth (ft)	SAMPLES Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								140
	SS-1	2, 5, 7, 8					Red Brown F-M SAND, little silt , trace F gravel	
						3'		
5	SS-2	12, 15, 15, 17						135
							Red Brown F-M SAND, some Silt, trace F gravel.	
10	SS-3	14, 14, 14, 15						130
15	SS-4	12, 14, 16, 20					Red Brown F-M SAND, some Silt, trace F gravel. MC = 15.6%	125
20	SS-5	15, 16, 16, 18					Red Brown F-M SAND, some Silt, trace F gravel. MC = 15.6%	120
						25'		
25	SS-6	51, 50/2"					Red Brown F-C Gravel, some F-C sand, little silt. Till	115
30	SS-7	100/2"						110
	C-1	5				33'	Top of Rock	
	C-1	4					Rock Core Run #1 33'-38'	
	C-1	7					33'-38' Rec. 54"	
35	C-1	7			0%		RQD = 0"/60" = 0%	105
	C-1	6					Red Brown Shale Highly fractured	
	C-2	5					Rock Core Run #2 38'-43'	
	C-2	7					38'-43' Rec. 57"	
40	C-2	6			0%		RQD = 0"/60" = 0%	100
	C-2	6					Red Brown Shale Highly fractured	
	C-2	6						

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: 33' Rock: 10' No. of Samples: 7	NOTES: EOB @ 43' EOB @ 43' Depth, EOB @ 98' Elevation	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Trent	**Connecticut DOT Boring Report**		Hole No.: B-115
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 35+44 / 22' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804360
Start Date: 7/24/2007	Route No.:		Easting: 993766
Finish Date: 7/25/2007	Bridge No.:		Surface Elevation: 138
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 4" I.D. / 4" SSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.:300 Fall: 24"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:	@ 4' after 0 hours, @ 2.5' after 24 hours		

Depth (ft)	SAMPLES Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	2, 3, 5, 6	24"	16"				138
5	SS-2	11, 11, 10, 12	24"	20"		9'	Red Brown F-M Sand, and silt. Wet sample at 5'-7'	133
10	SS-3	33, 41, 44, 42	24"	20"		16'	Red Brown F-C SAND and F-C gravel, cobbles	128
15	SS-4	21, 14, 17, 20	24"	18"		24'		123
20	SS-5	15, 20, 19, 21	24"	18"			Red Brown SILT, some F SAND, trace F gravel = 20.3% MC	118
25	SS-6	100/5"	5"	5"		35'	Red Brown F-C GRAVEL, some F-C sand, little schist, trace silt. Till	113
30	SS-7	100/2"	2"	2"				108
35	C-1	6 Min					Top of Rock	103
	C-2	7 Min					Rock core run #1	
	C-3	7 Min			28%		35'-40' Rec. 57"	
	C-4	6 Min					RQD = 16.5"/60" = 28%	
	C-5	7 Min					Red Brown Shale	
40	C-2	8 Min					Rock core run #2	98
	C-2	7 Min					40'-45' Rec. 57"	
	C-2	6 Min			20%		= 12"/60" = 20% RQD	
	C-2	6 Min						
	C-2	7 Min				45'	Red Brown Shale	
45							EOB @ 45'	93
50								88
55								83
60								78

Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50 %

Total Penetration in Earth: 32' Rock:	NOTES: No recovery @ 35'-37'	Sheet
No. of Samples: 7	Sample S-3 contains a completely weathered black-gray rock. It has almost completely disintegrated into soil.	1 of 1
		SM-001-M REV. 1/02

Driller:	New England Boring / Jeff	**Connecticut DOT Boring Report**		Hole No.:	B-116
Inspector:	VN Engineers / M. Bauer	TOWN:	New Britain	Stat./Offset:	37+52 / 10' Right
Engineer:	Ray Volpe Jr.	Project No.:	88-H035	Northing:	804447
Start Date:	7/10/2007	Route No.:		Easting:	993955
Finish Date:	7/10/2007	Bridge No.:		Surface Elevation:	159
Project Description:		**New Britain - Hartford Busway**			
Casing Size/Type:	4" I.D. / 4" SSA	Sampler Type/Size:	Split Spoon / 1 3/8"	Core Barrel Type:	2" NQ
Hammer Wt.:300	Fall: 24"	Hammer Wt.:	140 lb Fall: 30"		
Groundwater Observations:				@ 12' after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								159
	SS-1	4, 5, 6, 5	24"	18"			Black F-C SAND and F-C gravel, little ash	
	SS-2	3, 4, 9, 14	24"	16"		4'		
5								154
	SS-3	3, 3, 4, 5	24"	12"			Red Brown SILT and F-C sand, little F gravel MC = 14.7%	
10								149
	SS-4	9, 8, 9, 14	24"	18"		12'		
						15'	Red Brown SILT and F-C sand, F-C gravel, little schist	
15								144
	SS-5	12, 13, 14, 11	24"	20"			Red Brown F-C SAND, little silt	
						19'		
20							Red Brown F-C SAND, little schist, trace silt	139
	SS-6	18, 17, 21, 30	24"	20"				
							EOB @ 22'	
25								134
30								129
35								124
40								119

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: 22' Rock:	NOTES: EOB @ 22'	Sheet 1 of 1
No. of Samples: 6		SM-001-M REV. 1/02

Driller: New England Boring / Jeff	**Connecticut DOT Boring Report**	Hole No.: B-117	
Inspector: VN Engineers / M. Bauer	TOWN: New Britain	Stat./Offset: 39+02	
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing: 804508	
Start Date: 7/10/2007	Route No.:	Easting: 994093	
Finish Date: 7/10/2007	Bridge No.:	Surface Elevation: 157	
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 4" I.D. / 4" SSA	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type: 2" NQ	
Hammer Wt.:300 Fall: 24"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:	@ 12' after 0 hours		

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								157
	SS-1	7, 7, 7, 10	24"	18"		2'	Brown F-C SAND, little F-C gravel, little silt MC = 5.4%	
	SS-2	16, 15, 15, 16	24"	12"		5'	Red Brown F-C SAND, little F-C gravel, little silt	
5								152
	SS-3	4, 4, 6, 4	24"	17"				
10	SS-4	16, 13, 12, 12	24"	14"			Red Brown SILT, some F-M sand, little F-C gravel	147
15	SS-5	10, 16, 15, 21	24"	18"		16'		142
						19'	Brown M-C SAND, some F-C gravel, little silt	
20	SS-6	22, 44, 65, 50/3"	21"	18"				137
							Red Brown SILT and F sand, some F-C gravel, little schist, cobbles. Glacial till	
							EOB @ 22'	
25								132
30								127
35								122
40								117

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: 22' Rock: No. of Samples: 6	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller:	New England Boring / Jeff	**Connecticut DOT Boring Report**		Hole No.:	B-118
Inspector:	VN Engineers / M. Bauer	TOWN:	New Britain	Stat./Offset:	41+52
Engineer:	Ray Volpe Jr.	Project No.:	88-H035	Northing:	804624
Start Date:	7/10/2007	Route No.:		Easting:	994314
Finish Date:	7/10/2007	Bridge No.:		Surface Elevation:	156
Project Description:		**New Britain - Hartford Busway**			
Casing Size/Type:	4" I.D. / 4" SSA	Sampler Type/Size:	Split Spoon / 1 3/8"	Core Barrel Type:	2" NQ
Hammer Wt.:300	Fall: 24"	Hammer Wt.:	140 lb Fall: 30"		
Groundwater Observations:				@ 17' after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								156
	SS-1	6, 9, 10, 8	24"	1"		1'	Topsoil Black F-C SAND	
	SS-2	5, 4, 8, 10	24"	16"		5'	Red Brown F-C SAND, some silt, trace F gravel MC=13.5%	
5								151
	SS-3	16, 14, 12, 10	24"	20"				
10	SS-4	14, 10, 14, 14	24"	20"		15'	Red Brown F-C SAND, some silt, little F-M gravel	146
15	SS-5	10, 13, 14, 13	24"	15"		19'	Red Brown F-C SAND, little silt, little F gravel	141
20	SS-6	14, 21, 20, 29	24"	18"			Red Brown F-C SAND, and F-C Gravel, some schist. Till	136
							EOB @ 22'	
25								131
30								126
35								121
40								116

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: 22' Rock: No. of Samples: 6	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**	Hole No.: B-119	
Inspector: VN Engineers / Necip	TOWN: New Britain	Stat./Offset: 48+31	
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing: 804940	
Start Date: 7/9/2007	Route No.:	Easting: 994916	
Finish Date: 7/9/2007	Bridge No.:	Surface Elevation: 151	
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 4" I.D. / 4" SSA	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type: 2" NQ	
Hammer Wt.:300 Fall: 24"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:	@ 12' after 0 hours		

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	6, 8, 10, 11	24"	12"		4"	Traprock and C Gravel	151
	SS-2	9, 10, 13, 32	24"	14"		5'	Red brown F-C SAND, little F-C gravel, little silt	
5	SS-3	9, 7, 7, 9	24"	20"		9'	Red Brown SILT, little F sand MC=25%	146
10	SS-4	21, 30, 19, 15	24"	20"		17'	Red Brown F-C SAND, weathered rock	141
15	SS-5	10, 11, 14, 13	24"	18"				136
20	SS-6	20, 32, 50, 25	24"	14"			Red Brown C GRAVEL, glacial till	131
							EOB @ 22'	
25								126
30								121
35								116
40								111

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: 22' Rock: No. of Samples: 6	NOTES: Auger grinding at 17'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**	Hole No.: B-120	
Inspector: VN Engineers / Necip	TOWN: New Britain	Stat./Offset: 50+39 / 5' Right	
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing: 805061	
Start Date: 7/9/2007	Route No.:	Easting: 995143	
Finish Date: 7/9/2007	Bridge No.:	Surface Elevation: 149	
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 4" I.D. / 4" SSA	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type: 2" NQ	
Hammer Wt.:300 Fall: 24"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:	@ 10' after 0 hours		

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								149
	SS-1	6, 9, 14, 45	24"	12"		2'	Brown F-C SAND, some F gravel, little silt	
	SS-2	11, 12, 12, 13	24"	8"		4'	Black F-C SAND, little silt, little C gravel	
5						6'	Brown SILT, some F-C sand, little organic fibers	144
	SS-3	4, 3, 9, 17	24"	16"				
10	SS-4	18, 18, 15, 14	24"	20"		14'	Red Brown SILT, some F-M sand, trace F gravel MC=15.8%	139
15	SS-5	9, 9, 12, 11	24"	24"		20'	Red Brown F-C SAND and F-C gravel, little silt	134
20	SS-6 20'-22'	25, 19, 44, 19	24"	24"			Red Brown Silt, some F-C sand, little C gravel. TILL	129
							EOB @ 22'	
25								124
30								119
35								114
40								109

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: 22' Rock: No. of Samples: 6	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Orrin	**Connecticut DOT Boring Report**		Hole No.: B-121
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 55+86 / 16' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 805390
Start Date: 7/6/2007	Route No.:		Easting: 995513
Finish Date: 7/6/2007	Bridge No.:		Surface Elevation: 146
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 16' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0						10"	10" Asphalt	146
	SS-1	12, 7, 6, 8	24"	18"		3'	Red Brown F-M SAND, some silt, trace F-M gravel	
	SS-2	13, 10, 7, 9	24"	18"				
5	SS-3	11, 7, 6, 13	24"	17"		8'	Red Brown SILT, some F sand	141
10	SS-4	29, 54, 48, 38	24"	18"		12'	Red Brown SILT, some F-C gravel, little F sand, cobbles	136
15	SS-5	9, 11, 17, 26	24"	18"		18'	Red Brown SILT, some F sand, F-M gravel	131
20	SS-6	36, 47, 35, 42	24"	19"			Red Brown SILT some F-C sand, little F-M gravel, cobbles. Glacial till	126
							EOB @ 22'	
25								121
30								116
35								111
40								106

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: 22' Rock: No. of Samples: 6	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller:	New England Boring / Orrin	**Connecticut DOT Boring Report**		Hole No.:	B-122
Inspector:	VN Engineers / M. Bauer	TOWN:	New Britain	Stat./Offset:	57+00 / 13' Left
Engineer:	Ray Volpe Jr.	Project No.:	88-H035	Northing:	805472
Start Date:	7/6/2007	Route No.:		Easting:	995590
Finish Date:	7/6/2007	Bridge No.:		Surface Elevation:	146
Project Description:		**New Britain - Hartford Busway**			
Casing Size/Type:	3.25" I.D. HSA	Sampler Type/Size:	Split Spoon / 1 3/8"	Core Barrel Type:	2" NQ
Hammer Wt.:	Fall:	Hammer Wt.:	140 lb Fall: 30"		
Groundwater Observations:				@ 16' after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								146
						10"	Asphalt	
	SS-1	24, 9, 6, 8	24"	14"				
	SS-2	6, 8, 10, 11	24"	17"		4'	Black F-C SAND and F-C gravel	
5	SS-3	5, 5, 7, 5,	24"	17"			Red Brown SILT, little F sand MC=24.4	141
10	SS-4	9, 12, 11, 13	24"	21"				136
15	SS-5	11, 14, 14, 14	24"	20"			Red Brown SILT, little F sand	131
						18'		
20	SS-6	130	6"	6"			Brown F-C SAND and F-C gravel, little silt, cobbles. Glacial Till	126
							EOB @ 22'	
25								121
30								116
35								111
40								106

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: 22' Rock: No. of Samples: 6	NOTES: Auger grinding 18'-20'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Orrin	**Connecticut DOT Boring Report**	Hole No.: B-123	
Inspector: VN Engineers / M. Bauer	TOWN: New Britain	Stat./Offset: 60+17 / 7' Right	
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing: 805726	
Start Date: 7/3/2007	Route No.:	Easting: 995777	
Finish Date: 7/3/2007	Bridge No.:	Surface Elevation: 143	
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type: 2" NQ	
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:	@ 9' after 0 hours		

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								143
	SS-1	7, 10, 12, 9	24"	2"		2'	Brown Top soil F-C SAND	
	SS-2	20, 12, 5, 10	24"	2"		4'	Black F-C SAND, some F gravel, trace quartz	
5	SS-3	6, 7, 14, 15	24"	19"				138
	SS-4	12, 17, 22, 20	24"	17"		7'	Red Brown F-C SAND, and F-C gravel, some silt	
	SS-5	15, 21, 16, 19	24"	24"				
10	SS-6	5, 10, 7, 9	24"	20"			Red Brown SILT, some F-M sand, little F gravel	133
						15'		
15	SS-7	31, 17, 17, 22	24"	15"				128
							Red Brown SILT and F-M sand, F-C gravel, cobbles. Glacial till	
20	SS-8	20, 92, 50, 100/4"	24"	12"				123
							EOB @ 22'	
25								118
30								113
35								108
40								103

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: 22' Rock: No. of Samples: 8	NOTES: Glacial Till at 15' Auger refusal at 20' possible boulder	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Orrin	**Connecticut DOT Boring Report**		Hole No.: B-124
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 65+71 / 17' Right
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 806229
Start Date: 7/6/2007	Route No.:		Easting: 996008
Finish Date: 7/6/2007	Bridge No.:		Surface Elevation: 138
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 20' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								138
	SS-1	6, 6, 8, 22,	24"	17"			Top Soil F-C SAND and F-M gravel	
	SS-2	9, 6, 9, 17	24"	20"		3'		
5	SS-3	8, 14, 12, 10	24"	21"			Red Brown F-M SAND, some F-m gravel, little silt	133
	SS-4	6, 8, 7, 9	24"	24"		8'		
	SS-5	7, 37, 45, 19	24"	18"				
10	SS-6	10, 21, 17, 19	24"	16"			Red Brown SILT, some F-M gravel, little F-M sand, cobbles	128
15	SS-7	10, 10, 14, 22	24"	22"		16'		123
20	SS-8	20, 32, 47, 47	24"	20"			Red Brown F-C SAND and F-C gravel, little schist, little silt. Glacial till	118
							EOB @ 22'	
25								113
30								108
35								103
40								98

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: 22' Rock: No. of Samples: 8	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**	Hole No.: B-125	
Inspector: VN Engineers / Necip	TOWN: New Britain	Stat./Offset: 68+53 / 14' L	
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing: 806509	
Start Date: 7/6/2007	Route No.:	Easting: 996055	
Finish Date: 7/6/2007	Bridge No.:	Surface Elevation: 136	
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type: 2" NQ	
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:	@ 17' after 0 hours		

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								136
	SS-1	13, 18, 17, 19	24"	12"		2'	Black F-C SAND and white F-C sand, little F-C gravel	
	SS-2	12, 8, 9, 10	24"	14"			Red Brown SILT, little F sand MC=20.5%	
5	SS-3	17, 16, 20, 23	24"	18"		8'		131
10	SS-4	16, 15, 19, 17	24"	13"		14'	Red Brown F-C SAND, some silt, little F-C gravel	126
15	SS-5	26, 43, 45, 46	24"	12"			Red Brown F-C GRAVEL, some silt, little C sand. Glacial Till	121
20	SS-6	54, 75, 100/3"	15"	12"				116
							EOB @ 21' 3"	
25								111
30								106
35								101
40								96

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: 22' Rock: No. of Samples: 6	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Orrin	**Connecticut DOT Boring Report**		Hole No.: B-126
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 72+88 / 14' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 806940
Start Date: 7/6/2007	Route No.:		Easting: 996114
Finish Date: 7/6/2007	Bridge No.:		Surface Elevation: 133
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 15' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								133
	SS-1	10, 13, 29, 37	24"	9"		2'	Brown M-C SAND and F-C gravel	
	SS-2	32, 11, 12, 14	24"	13"				
5								128
	SS-3	12, 11, 24, 20	24"	14"			Red Brown F-M SAND, some F-M gravel, little silt, cobbles	
10								123
	SS-4	24, 25, 75, 48	24"	17"		12'		
15							Red Brown SILT, some F-C sand, little F-M gravel, cobbles. Glacial till	118
	SS-5	54, 128, 146, 176	24"	24"		17'		
							EOB @ 17'	
20								113
25								108
30								103
35								98
40								93

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: 17' Rock: No. of Samples: 5	NOTES:	Sheet 1 of 1
		SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**		Hole No.: B-127
Inspector: VN Engineers / Necip	TOWN: New Britain		Stat./Offset: 74+92 / 14' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 807143
Start Date: 7/6/2007	Route No.:		Easting: 996142
Finish Date: 7/6/2007	Bridge No.:		Surface Elevation: 131.1'
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations: Dry		@ after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								131
	SS-1	6, 8, 49, 27	24"	16"		2'	Black F SAND, some gravel	
	SS-2	21, 16, 18, 14	24"	18"				
5	-	11, 11, 13, 15	24"	0"		9'	Red Brown F-C SAND and silt, little F gravel MC=7.5%	126
10	SS-3	10, 17, 16, 16	24"	18"		14'	Red Brown F-C SAND, some F-C gravel, some silt	121
15	SS-4	17, 38, 61, 70	24"	20"			Red Brown F-C SAND, little F gravel, little silt, cobbles	116
20	SS-5 20'-22'	50/1"	1"	0"			EOB @ 20' 1"	111
25								106
30								101
35								96
40								91

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: 22' Rock: No. of Samples: 5	NOTES: No recovery at 4'-6'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**	Hole No.: B-128	
Inspector: VN Engineers / Necip	TOWN: New Britain	Stat./Offset: 78+23 / 14' Left	
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing: 807470	
Start Date: 7/6/2007	Route No.:	Easting: 996186	
Finish Date: 7/6/2007	Bridge No.:	Surface Elevation: 129	
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type: 2" NQ	
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations: Dry	@ after 0 hours		

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								129
	SS-1	4, 11, 17, 21	24"	14"		2'	Black F-M SAND, some F-C gravel	
5	SS-2	18, 8, 6, 7	24"	18"		10'	Red Brown SILT, some F sand, little F gravel	124
10	SS-3	5, 10, 10, 11	24"	16"		14'	Red Brown SILT, little F sand	119
15	SS-4	8, 12, 10, 19	24"	20"		17'	Red Brown SILT, little F sand, little F gravel	114
							EOB @ 17'	
20								109
25								104
30								99
35								94
40								89

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: 17' Rock: No. of Samples: 4	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**	Hole No.: B-129	
Inspector: VN Engineers / Necip	TOWN: New Britain	Stat./Offset: 80+27 / 14' Left	
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing: 807673	
Start Date: 7/5/2007	Route No.:	Easting: 996214	
Finish Date: 7/5/2007	Bridge No.:	Surface Elevation: 127	
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type: 2" NQ	
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations: Dry	@ after 0 hours		

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								127
	SS-1	5, 6, 9, 16	24"	13"		2'	Black SAND, little F-C gravel	
5	SS-2	7, 5, 9, 11	24"	14"		10'	Red Brown SILT, some F-C sand, little F gravel MC=21.2%	122
10	SS-3	6, 12, 12, 10	24"	20"		14'	Brown F SAND, some silt	117
15	SS-4	11, 8, 8, 12	24"	18"		17'	Dark Brown F SAND, some silt	112
							EOB @ 17'	
20								107
25								102
30								97
35								92
40								87

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: 17' Rock: No. of Samples: 4	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**		Hole No.: B-130
Inspector: VN Engineers / Necip	TOWN: New Britain		Stat./Offset: 85+01 / 10' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 808142
Start Date: 7/5/2007	Route No.:		Easting: 996278
Finish Date: 7/5/2007	Bridge No.:		Surface Elevation: 123
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations: Dry		@ after 0 hours	

Depth (ft)	SAMPLES Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								123
	SS-1	4, 6, 8, 19	24"	13"			Dark Brown F-C SAND, some F-C gravel, little silt.	
5						5'		118
	SS-2	13, 22, 19, 15	24"	13"			Red Brown SILT, some F sand, little F-C gravel	
10						10'		113
	SS-3	19, 26, 21, 24	24"	14"			Brown SILT, some F sand, little F-C gravel	
15	SS-4	19, 20, 20 ,21	24"	18"				108
20						20'		103
	SS-5	9, 26, 26, 40	24"	20"			Brown F-C GRAVEL, some F-C sand, little silt	
25	SS-6	45, 50, 73, 93	24"	18"		27'		98
							EOB @ 27'	
30								93
35								88
40								83

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: 27' Rock: No. of Samples: 6	NOTES:	Sheet 1 of 1
		SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**		Hole No.: B-131
Inspector: VN Engineers / Necip	TOWN: New Britain		Stat./Offset: 86+93 / 3' L
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 808333
Start Date: 7/5/2007	Route No.:		Easting: 996304
Finish Date: 7/5/2007	Bridge No.:		Surface Elevation: 122
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations: Dry	@ after 0 hours		

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								122
	SS-1	8, 14, 26, 22	24"	18"			Red Brown F-C SAND and F gravel, little silt MC = 9.8%	
5						5'		117
	SS-2	19, 28, 80, 47	24"	10"			Red Brown SAND, some C gravel, little silt	
10						10'		112
	SS-3	18, 25, 24, 30	24"	2"			Red Brown SILT, some F sand, some M-C gravel	
15						15'		107
	SS-4	26, 24, 30, 32	24"	17"			Red Brown F silty SAND and F-C gravel. Till	
20	SS-5	28, 29, 31, 34	24"	17"				102
							EOB @ 22'	
25								97
30								92
35								87
40								82

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: 22' Rock: No. of Samples: 5	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller:	New England Boring / Orrin	**Connecticut DOT Boring Report**		Hole No.:	B-132
Inspector:	VN Engineers / M. Bauer	TOWN:	New Britain	Stat./Offset:	90+90
Engineer:	Ray Volpe Jr.	Project No.:	88-H035	Northing:	808724
Start Date:	7/3/2007	Route No.:		Easting:	996363
Finish Date:	7/3/2007	Bridge No.:		Surface Elevation:	118
Project Description:		**New Britain - Hartford Busway**			
Casing Size/Type:	3.25" I.D. HSA	Sampler Type/Size:	Split Spoon / 1 3/8"	Core Barrel Type:	2" NQ
Hammer Wt.:	Fall:	Hammer Wt.:	140 lb Fall: 30"		
Groundwater Observations:				@ 19' after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								118
	SS-1	4, 5, 10, 8	24"	12"		2'	Brown M-C SAND, trace F-M gravel	
5						5'	Red Brown SILT some F-M sand, little C gravel	113
	SS-2	7, 19, 20, 18	24"	16"				
10						11'	Red Brown SILT, some F sand, trace clay	108
	SS-3	9, 9, 8, 10	24"	14"				
15						18'	Red Brown F-C SAND, some F-C gravel, trace sandstone	103
	SS-4	22, 18, 20, 22,	24"	16"				
20							Red Brown F SAND and silt, trace clay	98
	SS-5	12, 27, 30, 29	24"	24"				
25							EOB @ 22'	93
30								88
35								83
40								78

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: 22' Rock: No. of Samples: 5	NOTES: Auger grinding at 16'-18'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**	Hole No.: B-133	
Inspector: VN Engineers / Necip	TOWN: New Britain	Stat./Offset: 98+79 / 7' Right	
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing: 809494	
Start Date: 7/5/2007	Route No.:	Easting: 996531	
Finish Date: 7/5/2007	Bridge No.:	Surface Elevation: 113	
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type: 2" NQ	
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations: Dry	@ 16 after 0 hours		

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								113
	SS-1	7, 14, 22, 27	24"	13"			Brown F-C SAND, some F gravel, little silt	
5						5'		108
	SS-2	25, 100/2"	8"	4"			Red Brown F-C GRAVEL, some F sand, little silt	
10						9'		103
	-	27, 33, 40, 35	24"	0"			Red Brown F-C GRAVEL, some F sand, little silt, cobbles. Till	
15						15'		98
	C-1	4 Min					Rock Core Run #1	
	C-1	2 Min					15'-20' Rec. 45"	
	C-1	3 Min					RQD = 21/60 = 35%	
	C-1	4 Min					Red Brown Silt Stone	
	C-1	4 Min						
20							EOB @ 20'	93
25								88
30								83
35								78
40								73

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: 15' Rock: 5' No. of Samples: 2	NOTES: Auger refusal at 15' Began rock core run at 15'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**		Hole No.: B-134
Inspector: VN Engineers / Necip	TOWN: New Britain		Stat./Offset: 103+88 / 10' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 809964
Start Date: 7/3/2007	Route No.:		Easting: 996723
Finish Date: 7/3/2007	Bridge No.:		Surface Elevation: 107
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 13 after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								107
	SS-1	10, 15, 15, 19	24"	18"		2'	Top soil Black F-C sand	
5	SS-2	13, 15, 17, 18,	24"	16"			Red Brown F-C SAND, some silt, little F gravel MC = 12.80%	102
10	SS-3	46, 47, 48, 36	24"	17"				97
15	SS-4	35, 100/3"	9"	7"		15'		92
20	SS-5	100/1"	1"	1"			Red Brown F-C GRAVEL, some F-C sand, little silt, cobbles. Till	87
25	SS-6	50/0"	0"	0"				82
30						30'	Top of rock @ 30'	77
	C-1	7 Min					Rock core run # 1 30'-35' Rec. 45" RQD = 11"/60" = 18%	
	C-1	5 Min						
	C-1	5 Min						
	C-1	7 Min						
	C-1	5 Min						
35	C-2	5 Min					Rock core run # 2 35'-40' Rec. 50" RQD = 0"/60" = 0%	72
	C-2	8 Min						
	C-2	8 Min						
	C-2	10 Min						
	C-2	7 Min						
40							EOB @ 40'	67

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: 30' Rock: 10' No. of Samples: 6	NOTES: Spoon refusal at 15'-17' and 20'-22'. Cobbles and boulders Used 4" casing and 4" Rollerbit from 15'-30' to bore through till Began coring rock at 30'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Orrin	**Connecticut DOT Boring Report**		Hole No.: B-135
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 105+69 / 3' L
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 810116
Start Date: 7/2/2007	Route No.:		Easting: 996822
Finish Date: 7/2/2007	Bridge No.:		Surface Elevation: 106
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 16' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								106
	SS-1	22, 17, 10, 5	24"	18"		2'	asphalt and gravel base	
5	SS-2	2, 2, 4, 5	24"	17"		10'	Red Brown F SAND and silt, little F-C gravel	101
10	SS-3	100/3"	3"	1"		20'	Red Brown F-C SAND, some F-C gravel, little silt, cobbles. Glacial till	96
15	SS-4	24, 65, 150	18"	14"				91
20	SS-5	25, 100/0"	6"	5"		31'	Gray Brown F-C SAND, some F-C gravel, little schist, little silt, cobbles. Glacial till	86
25	SS-6	100/3"	3"	3"				81
30	SS-7	100/3"	3"	3"			EOB @ 30' 3"	76
35								71
40								66

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: 31' Rock: No. of Samples: 7	NOTES: Auger grinding at 10'-30' glacial till and cobbles	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**		Hole No.: B-136
Inspector: VN Engineers / Necip	TOWN: New Britain		Stat./Offset: 107+75 / 13' L
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 810292
Start Date: 7/2/2007	Route No.:		Easting: 996930
Finish Date: 7/2/2007	Bridge No.:		Surface Elevation: 106
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 15' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	14, 18, 17, 23	24"	8"		1'	Asphalt and gravel base	106
5	SS-2	4, 3, 3, 3	24"	12"		8'	Red Brown F-C SAND, trace silt	101
10	SS-3	2, 3, 5, 7	24"	20"		15'	Red Brown SILT and F gravel, some F-C sand, trace clay	96
15	SS-4	6, 6, 7, 8	24"	24"		23'	Red Brown SILT, little F sand	91
20	SS-5	8, 10, 10, 12	24"	24"		30'	Red Brown F-C SAND, some F-C gravel, little silt	86
25	SS-6	52, 63, 65, 81	24"	14"				81
30	SS-7	44, 35, 38, 50	24"	18"			Red brown F SAND, some silt, trace F gravel	76
35							EOB @ 32'	71
40								66

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: 32' Rock: No. of Samples: 7	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Mike	**Connecticut DOT Boring Report**		Hole No.: B-137
Inspector: VN Engineers / Necip	TOWN: New Britain		Stat./Offset: 110+37 / 26' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 810512
Start Date: 7/2/2007	Route No.:		Easting: 997074
Finish Date: 7/3/2007	Bridge No.:		Surface Elevation: 112
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" I.D. HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 14' after 0 hours

Depth (ft)	SAMPLES Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	5, 11, 12, 10	24"	10"				112
							Red Brown F-C SAND, some F-M gravel, little silt	
5	SS-2	5, 8, 10, 16	24"	15"		7'		107
						10'	Brown F-C SAND, some silt, trace F gravel	
10	SS-3	3, 7, 6, 6	24"	24"				102
						15'	Red Brown SILT, some clay, trace F-C sand MC=25.4%	
15	SS-4	9, 9, 10, 12	24"	0"				97
							Red Brown F-C SAND, some silt, little F-C gravel	
20	SS-4	5, 7, 13, 13	24"	24"				92
						25'		
25	SS-5	12, 15, 14, 19	24"	24"				87
							Brown F-C SAND, some silt, some C gravel	
30	SS-6	38, 80, 100/6"	18"	17"		33'		82
	C-1	2 Min					Rock core run #1 33'-35'	
	C-1	2 Min				35'	Rec. 4" RQD = 4"/24" Gray Boulder	
35								77
40	SS-7	100/6"	24"	6"			Red Brown SILT, some F-C gravel, cobbles, boulders (till)	72
45	SS-8	80, 100/3"	9"	8"				67
						48'	Top of Rock	
	C-2	4 Min					Rock core run # 2	
	C-2	5 Min					47.5'-52.5' Rec. 53"	
50	C-2	4 Min			0%		RQD = 0"/60"	62
	C-2	5 Min					cored Boulders, Till	
	C-2	7 Min					EOB @ 53'	
55								57
60								52

Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50 %

Total Penetration in Earth: 48' Rock: 5' No. of Samples: 8	NOTES: No rec. at 15'-17' Glacial Till at 52.5' Began coring at 47.5'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Orrin	**Connecticut DOT Boring Report**		Hole No.: B-138
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 111+15 / 13' Left
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 840568
Start Date: 7/2/2007	Route No.:		Easting: 997130
Finish Date: 7/2/2007	Bridge No.:		Surface Elevation: 105
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:		@ 24' after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								105
	SS-1	4, 5, 4, 5	24"	12"		3'	Red Brown F-C SAND, some F-C Gravel	
5	SS-2	3, 6, 6, 6	24"	22"		9'	Red Brown SILT, some F-M sand	100
10	SS-3	4, 5, 6, 7	24"	20"			Red Brown SILT, some clay, trace F-C sand MC=22.8%	95
15	SS-4	3, 5, 7, 8	24"	20"		17'		90
20	SS-5	3, 6, 9, 8	24"	3"			Red Brown SILT, some clay	85
25	SS-6	8, 9, 10, 12	24"	1"		27'		80
30	SS-7	2, 5, 23, 10	24"	23"		32'	Red Brown F-C SAND, and F-C gravel, trace silt, cobbles, till	75
35							EOB @ 32'	70
40								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: 32' Rock: No. of Samples: 7	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller:	New England Boring / Orrin	**Connecticut DOT Boring Report**		Hole No.:	B-139
Inspector:	VN Engineers / M. Bauer	TOWN:	New Britain	Stat./Offset:	114+58
Engineer:	Ray Volpe Jr.	Project No.:	88-H035	Northing:	810838
Start Date:	7/3/2007	Route No.:		Easting:	997342
Finish Date:	7/3/2007	Bridge No.:		Surface Elevation:	102
Project Description:		**New Britain - Hartford Busway**			
Casing Size/Type:	3.25" / HSA	Sampler Type/Size:	Split Spoon / 1 3/8"	Core Barrel Type:	
Hammer Wt.:	Fall:	Hammer Wt.:	140 lb Fall: 30"		
Groundwater Observations:		@ 27' after 0 hours			

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								102
	SS-1	11, 17, 25, 20	24"	3"			Black F-C SAND and M-C gravel, little silt	
						3.5'		
5	SS-2	6, 8, 11, 10	24"	1"			Red Brown SILT, little F sand. MC=7.1%	97
10	SS-3	8, 10, 11, 12	24"	23"		12'		92
						15'	Red Brown SILT, some clay, trace F-M gravel	
15	SS-4	6, 7, 8, 12	24"	18"			Red Brown SILT, some clay, little M-C gravel, trace schist	87
20	SS-5	6, 5, 8, 9	24"	18"		22'	Red Brown SILT, some clay, little M-C gravel, trace schist	82
25	SS-6	10, 11, 11, 13	24"	23"			Red Brown SILT, some clay, little F sand	77
30	SS-7	9, 10, 10, 14	24"	24"		32'		72
							EOB @ 32'	
35								67
40								62

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: 32' Rock: No. of Samples: 7	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Orrin	**Connecticut DOT Boring Report**		Hole No.: B-140
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 117+72 / 2' Right
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 811088
Start Date: 7/3/2007	Route No.:		Easting: 997532
Finish Date: 7/3/2007	Bridge No.:		Surface Elevation: 99
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type:
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 24' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0								99
	SS-1	8, 11, 12, 16	24"	14"			Black and Brown M-C SAND, little M-C gravel	
						3'		
5	SS-2	6, 5, 6, 7	24"	14"			Red brown SILT, little M-C gravel, trace clay	94
						10'		
10	SS-3	9, 13, 12, 19	24"	22"			Red Brown SILT, little clay, trace F gravel	89
15	SS-4	6, 10, 18, 14	24"	16"		17'		84
20	SS-5	7, 9, 11, 10	24"	19"			Red Brown SILT, some F Sand	79
25	SS-6	4, 6, 7, 7	24"	24"			Red Brown SILT, some F Sand	74
30	SS-7	4, 6, 17, 21	20"	20"		31'		69
						32'	Red Brown SILT and F-C gravel, some F sand	
35							EOB @ 32'	64
40								59

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: 32' Rock: No. of Samples: 7	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Tim C.	**Connecticut DOT Boring Report**		Hole No.: B-141
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 209+00 / 32' LT
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804584.81
Start Date: 1/6/2010	Route No.:		Easting: 992070.99
Finish Date: 1/6/2010	Bridge No.:		Surface Elevation: 167
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 4" casing	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.:300 Fall: 30"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:		@ 16' after 0 hours	

Depth (ft)	Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	14, 7, 15, 14	24"	9"		Fill 3'	Brown c-f SAND, some c-f gravel, little silt, Debris, Fill	167
5	SS-2	2, 8, 5, 4	24"	3"				162
10	SS-3	9, 7, 6, 8	24"	16"		Sand 19'	Brown c-f SAND, little c-f gravel, trace silt	157
15	SS-4	9, 10, 7, 9	24"	10"				152
20	SS-5	3, 2, 1, 1	24"	20"		Sand & Silt 28'	Red Brown SILT, some f sand, trace f gravel	147
25	SS-6	6, 8, 10, 8	24"	19"				142
30	SS-7	35, 29, 35, 41	24"	5"		Gravel & Sand 40.5'	Red Brown c-f GRAVEL and sand, trace silt, Till	137
35	SS-8	20, 13, 14, 27	24"	18"				132
40	SS-9	100/4"	4"	2"			Top of Rock	127
45	C-1 C-1 C-1 C-1 C-1	5 Min 2 Min 2 Min 4 Min 6 Min	60"	31"		Bedrock	Rock core run #1 40.5'-45.5' Rec.= 31"/60" = 52% RQD= 5"/60" = 8% red brown silty shale highly fractured, slightly weathered East Berlin Formation	122
50	C-2 C-2 C-2 C-2 C-2	8 Min 8 Min 10 Min 7 Min 6 Min	60"	60"		50.5'	Rock core run #2 45.5'-50.5' Rec.= 60"/60" = 100% RQD= 20"/60" = 33% red brown silty shale Moderately fractured, slightly weathered East Berlin Formation	117
55							EOB @ 50.5'	112
60								107

Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50 %

Total Penetration in Earth: 40' Rock: 10' No. of Samples: 9	NOTES:	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Tim C.	**Connecticut DOT Boring Report**		Hole No.: B-142
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 209+00 / 43' RT
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804510.27
Start Date: 1/7/2010	Route No.:		Easting: 992062.29
Finish Date: 1/7/2010	Bridge No.:		Surface Elevation: 170
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 4" casing	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.:300 Fall: 30"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 14' after 0 hours

Depth (ft)	Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	3, 4, 6, 7	24"	11"		Fill 3'	Brown c-f SAND, little silt, trace f gravel, debris, fill	170
5	SS-2	4, 4, 4, 4	24"	15"				165
10	SS-3	11, 8, 8, 13	24"	20"		Sand 20'	Red Brown c-f SAND, little c-f gravel, trace silt	160
15	SS-4	16, 13, 11, 11	24"	11"				155
20	SS-5	9, 10, 10, 8	24"	9"				150
25	SS-6	12, 9, 6, 8	24"	0"		Gravel & Silt 33'	Red Brown c-f GRAVEL, some silt, little f sand	145
30	SS-7	10, 6, 7, 9	24"	9"				140
35	SS-8	24, 58, 44, 14	24"	8"		Till 42'	Red Brown c-f GRAVEL, some c-f sand, little silt, bedrock fragments, till	135
40	SS-9	22, 53, 100/3"	15"	1"			Top of Rock	130
45	C-1 C-1 C-1 C-1 C-1	3 Min 3 Min 3 Min 4 Min 4 Min	60"	58"		Bedrock	Rock core run #1 42'-47' Rec.= 58"/60" = 97% RQD= 12"/60" = 20% red brown silty shale Moderately fractured, slightly weathered East Berlin Formation	125
50	C-2 C-2 C-2 C-2 C-2	3 Min 4 Min 3 Min 3 Min 3 Min	60"	54"		52'	Rock core run #2 47'-52' Rec.= 54"/60" = 90% RQD= 11"/60" = 18% red brown silty shale Moderately fractured, slightly weathered East Berlin Formation	120
55							EOB @ 52'	115
60								110

Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50 %

Total Penetration in Earth: 42' Rock: 10' No. of Samples: 9	NOTES: Spoon refusal at 41' 3". Began coring rock at 42'.	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Tim C.	**Connecticut DOT Boring Report**		Hole No.: B-143
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 210+00 / 30' LT
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 804569.13
Start Date: 1/8/2010	Route No.:		Easting: 992169.84
Finish Date: 1/8/2010	Bridge No.:		Surface Elevation: 169
Project Description:	**New Britain - Hartford Busway**		
Casing Size/Type: 4" casing	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" NQ
Hammer Wt.:300 Fall: 30"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:		@ 17 after 0 hours	

Depth (ft)	Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	7, 8, 20, 29	24"	23"		Fill 3'	Brown c-f SAND, little f gravel, little silt, glass, brick, fill.	169
5	SS-2	4, 4, 4, 3	24"	19"		Silt & Sand 8'	Tan SILTY SAND, MC = 17.4%, Non-Plastic	164
10	SS-3	12, 11, 13, 14	24"	22"		Sand 13'	Brown WELL GRADED SAND, with silt, MC = 8.3%	159
15	SS-4	14, 13, 4, 2	24"	8"		Silt 19'	Red Brown SILT, with sand, MC = 17.7%	154
20	SS-5	12, 13, 11, 16	24"	7"		Gravel & Silt 29'	Red Brown c-f GRAVEL, some silt, little c-f sand, soil contaminated with gasoline	149
25	SS-6	12, 19, 25, 16	24"	6"				144
30	SS-7	11, 12, 11, 4	24"	20"		Silt 35'	Red Brown SILT, some f sand, little c-f gravel	139
35	SS-8	15, 15, 11, 9	24"	10"		Gravel & Silt 40'	Red Brown c-f GRAVEL, little silt, weathered bedrock,Till Top of Rock	134
40	C-1 C-1 C-1 C-1 C-1	6 Min 3 Min 4 Min 3 Min 3 Min	60"	40"	28%	Bedrock 45'	Rock core run #1 40'-45' Rec.= 40"/60" = 67% RQD= 16.5"/60" = 28% red brown silty shale Moderately fractured, slightly weathered East Berlin Formation	129
45	C-2 C-2 C-2 C-2 C-2		60"	0"	0%	EOB	The core barrel became stuck after the first attempt at C-2. The driller was eventually able to recover the core barrel but it was empty. We attempted to roller bit the hole to try to clear out any rock debris that caused the jam. We were not getting a wash and the roller bit got stuck as well. We concluded that there is a fissure in the bedrock at about 42' down which prevented the wash from coming up and out of the casing. No core was recovered at this depth however, we learned that seams and fissures exist in the bedrock in this area.	124
50								119
55								114
60								109

Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50 %

Total Penetration in Earth: 40' Rock: 10' No. of Samples: 8	NOTES: Top of rock at 40'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller:	New England Boring / Tim C.	**Connecticut DOT Boring Report**		Hole No.:	B-144
Inspector:	VN Engineers / M. Bauer	TOWN:	New Britain	Stat./Offset:	97+20 / 105' RT
Engineer:	Ray Volpe Jr.	Project No.:	88-H035	Northing:	809312.59
Start Date:	1/4/2010	Route No.:		Easting:	996579.26
Finish Date:	1/4/2010	Bridge No.:		Surface Elevation:	100
Project Description:		**New Britain - Hartford Busway Extra Work**			
Casing Size/Type:	3.25" / HSA	Sampler Type/Size:	Split Spoon / 1 3/8"	Core Barrel Type:	
Hammer Wt.:	Fall:	Hammer Wt.:	140 lb Fall: 30"		
Groundwater Observations:				@ 5' after 0 hours	

Depth (ft)	SAMPLES Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	2, 5, 6, 5	24"	18"		Silt & Sand	Red Brown SILT and f sand, little c-f gravel	100
						4'		
5	SS-2	29, 26, 46, 100/3"	21"	17"		Till	Red Brown SILT and c-f sand, some c-f gravel, Bedrock fragments, Till	95
						7.5'		
10							EOB @ 7.5'	90
15								85
20								80
25								75
30								70
35								65
40								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: 7.5' Rock: 0' No. of Samples: 2	NOTES: Auger refusal at 7.5'	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Tim C.	**Connecticut DOT Boring Report**	Hole No.: B-145	
Inspector: VN Engineers / M. Bauer	TOWN: New Britain	Stat./Offset: 98+30 / 145' RT	
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing: 809405.46	
Start Date: 1/4/2010	Route No.:	Easting: 996645.77	
Finish Date: 1/4/2010	Bridge No.:	Surface Elevation: 100	
Project Description:	**New Britain - Hartford Busway Extra Work**		
Casing Size/Type: 3.25" / HSA	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type:	
Hammer Wt.: Fall:	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:	@ 5' after 0 hours		

Depth (ft)	SAMPLES Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	1, 6, 10, 13	24"	16"		Silt & Sand	Red Brown SILT and f sand, little c-f gravel	100
						4'		
5	SS-2	23, 100/3"	9"	7"		Till	Red Brown SILT and c-f sand, some c-f gravel, Bedrock fragments, Till	95
10	SS-3	100/6"	6"	5"			Red Brown c-f gravel, some silt, fractured siltstone	90
	C-1	5 Min					Rock core #1 10.5'-13.5'	
	C-1	3 Min	36"	30"	0%		Rec.= 30"/36" = 83% red brown silty shale	
	C-1	3 Min					highly fractured, slightly weathered	
							East Berlin Formation	
15	SS-4	50/0"	0"	0"			EOB @ 15'	85
20								80
25								75
30								70
35								65
40								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: 15' Rock: 0' No. of Samples: 3	NOTES: Auger refusal at 15'. Spoon refusal at 15'.	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Tim C.	**Connecticut DOT Boring Report**	Hole No.:	B-146
Inspector: VN Engineers / M. Bauer	TOWN: New Britain	Stat./Offset:	49+50 / 29' RT
Engineer: Ray Volpe Jr.	Project No.: 88-H035	Northing:	804971.47
Start Date: 1/4/2010	Route No.:	Easting:	995035.38
Finish Date: 1/5/2010	Bridge No.:	Surface Elevation:	149
Project Description:	**New Britain - Hartford Busway Extra Work**		
Casing Size/Type: 3" casing	Sampler Type/Size: Split Spoon / 1 3/8"	Core Barrel Type:	2" HQ
Hammer Wt.: 300 Fall: 30"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:		@ 10' after 0 hours	

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	4, 4, 3, 8	24"	16"		Fill	Black c-f SAND, little c-f gravel, railroad debris, plant fibers, fill	149
						3'		
5	SS-2	8, 10, 16, 23	24"	21"		Silt and Sand	Red Brown SILTY SAND, MC = 14.2% Non-plastic	144
10	SS-3	9, 10, 11, 9	24"	21"				139
						14'		
15	SS-4	8, 12, 20, 13	24"	17"		Gravel and Sand	Red Brown c-f SAND, some silt, little c-f gravel	134
20	C-1 C-1	5 Min 3 Min	24"	7"		boulder	Rock core run #1 Basalt Boulder	129
	SS-5	41, 40, 67, 62	24"	18"		Till	Red Brown - Brown c-f GRAVEL, some c-f sand, little silt, Till	
25	SS-6	60, 74, 100/4"	16"	11"				124
30							EOB @ 28.5	119
35								114
40								109

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: 28.5' Rock: 0' No. of Samples: 6	NOTES: Cobbles and boulders encountered at 20' to EOB. Casing refusal at 28.5'.	Sheet 1 of 1 SM-001-M REV. 1/02

Driller: New England Boring / Tim C.	**Connecticut DOT Boring Report**		Hole No.: B-147
Inspector: VN Engineers / M. Bauer	TOWN: New Britain		Stat./Offset: 51+75 / 29' RT
Engineer: Ray Volpe Jr.	Project No.: 88-H035		Northing: 805083.18
Start Date: 1/5/2010	Route No.:		Easting: 995221.76
Finish Date: 1/5/2010	Bridge No.:		Surface Elevation: 149
Project Description:	**New Britain - Hartford Busway Extra Work**		
Casing Size/Type: 4" casing	Sampler Type/Size: Split Spoon / 1 3/8"		Core Barrel Type: 2" HQ
Hammer Wt.: 300 Fall: 30"	Hammer Wt.: 140 lb Fall: 30"		
Groundwater Observations:			@ 8' after 0 hours

Depth (ft)	SAMPLES: Sample Type/ No.	Blows on Sampler per 6 inches	Pen. (in.)	Rec. (in.)	RQD %	Generalized Strata Description	Material Description and Notes	Elevation (ft)
0	SS-1	7, 9, 9, 5	24"	12"		Fill 3'	Black c-f SAND, little c-f gravel, railroad debris, plant fibers, fill	149
5	SS-2	2, 2, 4, 7	24"	18"		Fill 7'	Red Brown SILTY SAND, with gravel, fill MC = 33.5%	144
10	SS-3	10, 11, 15, 15	24"	24"		Silt 14'	Tan SILT with sand, MC = 18.4%, Non-plastic	139
15	SS-4	9, 8, 8, 7	24"	11"		Gravel and Sand	Red Brown c-f GRAVEL, some c-f sand, little silt	134
20	SS-5	17, 11, 8, 8	24"	12"		24'	Red Brown c-f GRAVEL, some c-f sand, little silt	129
25	SS-6	27, 44, 36, 33	24"	16"		Till	Red Brown - Brown c-f GRAVEL, some c-f sand, little silt, Till	124
30	SS-7	50/0"	0"	0"			EOB @ 29	119
35								114
40								109

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: 29 Rock: 0' No. of Samples: 6	NOTES: Boring location offset 20' due to overhead cables. Casing refusal at 29'.	Sheet 1 of 1 SM-001-M REV. 1/02

The following boring logs have been transcribed or copied from the below source:

New Britain-Hartford Busway
Final Pilot Substructure and Rock Report

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-1**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804514.9
Start Date: 02/11/03	Route No.:	Easting: 991495.9
Finish Date: 02/12/03	Bridge No.:	Surface Elevation: 174.9
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 30.1' after: 0 hours, @29.2' after: 24 hours, @29.2' after: 40 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	
1	W-N		1.5				ELEV. 174.6	174
2	S-1	100/0.3	0.3	0.2			POORLY GRADED GRAVEL WITH SAND (GP) - light brown to black fine to medium gravel, some fine to coarse sand, trace silt; wet, very dense, NP; (FILL).	173
3	W-N		2.7					172
4								171
5	S-2	47 32 30	1.5	0.5			POORLY GRADED GRAVEL WITH SAND (GP) - dark to light brown to black fine to medium gravel, some fine to coarse sand, trace silt; wet, very dense, NP; (FILL).	170
6	W-N		1.5					169
7								168
8	S-3	30 28 24	1.5	0.5			POORLY GRADED GRAVEL WITH SAND (GP) - dark to light brown to black fine to medium gravel, some fine to coarse sand, trace silt; wet, very dense, NP; (FILL).	167
9	W-N		1.5					166
10								165
11	S-4	42 50 45	1.5	1.0			POORLY GRADED GRAVEL WITH SAND (GP) - dark to light brown to black fine to medium gravel, and fine to coarse sand, trace silt; wet, very dense, NP; (FILL).	164
12	W-N		1.5					163
13								162
14	S-5	100/0.5	0.5	0.5			POORLY GRADED GRAVEL WITH SAND (GP) - dark to light brown to black fine to medium gravel, and fine to coarse sand, trace silt; wet, very dense, NP; (FILL).	161
15	W-N		2.5					160
16						16.5'	ELEV. 158.4	159
17	S-6	53 31 45	1.5	1.0			SANDY SILT WITH GRAVEL (ML) - reddish brown silt, some fine to coarse sand, trace fine to medium gravel; moist, very dense, NP; (FILL).	158
18	W-N		1.5					157
19								156
		55					GRAVELLY SILT WITH SAND (ML) - reddish brown	155

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

Total Penetration in Earth: 51.0' Rock: 5.0' No. of Samples: 13	NOTES:	Sheet 1 of 3 SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-1**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804514.9
Start Date: 02/11/03	Route No.:	Easting: 991495.9
Finish Date: 02/12/03	Bridge No.:	Surface Elevation: 174.9
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 30.1' after: 0 hours, @29.2' after: 24 hours, @29.2' after: 40 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	45 45	1.5	0.8			silt, and fine to medium gravel, some fine sand; moist, very dense, NP; (TILL).	
21								154
22	W-N		1.5					153
23	S-8	31 53 55	1.5	1.0			SANDY SILT WITH GRAVEL (ML) - reddish brown silt, some fine to coarse sand, little fine gravel; moist, hard, NPL; (TILL) .	152
24								151
25	W-N		1.5					150
26	S-9	34 50 50	1.5	0.66			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to medium gravel, little fine to coarse sand; moist, very dense, NP; (TILL).	149
27								148
28	W-N		1.5					147
29	S-10	40 59 54	1.5				GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to medium gravel, little fine to coarse sand; moist, very dense, NP; (TILL).	146
30	S-11	83 100/0.5	1.0	0.1			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to medium gravel, little fine to coarse sand; moist, very dense, NP; (TILL).	145
31								144
32	W-N		3.0					143
33								142
34	S-12	100/0.3	0.3	0.2		34.0'	ELEV. 140.9	141
35							WELL GRADED GRAVEL WITH SAND (GW) - dark brown to black fine to medium gravel, some fine to coarse sand, trace silt; wet, very dense, NP; (TILL).	140
36								139
37	W-N		4.7					138
38								137
39	S-13	100/0.2	0.2	0.2		39.0'	ELEV. 135.9	136
							WELL GRADED GRAVEL WITH SAND (GW) - dark	135

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

Total Penetration in Earth: 51.0' Rock: 5.0' No. of Samples: 13	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-1**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804514.9
Start Date: 02/11/03	Route No.:	Easting: 991495.9
Finish Date: 02/12/03	Bridge No.:	Surface Elevation: 174.9
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 30.1' after: 0 hours, @29.2' after: 24 hours, @29.2' after: 40 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES: Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40						40.0'	brown and gray fine to coarse gravel, little fine to coarse sand, trace silt; wet, very dense, NP; (DECOMPOSED ROCK).	
41	W-N		2.8					134
							ELEV. 134.9	
42							Lost drill water at 41.0'. SANDY SILTSTONE; light to dark gray; soft to medium hard; highly to completely weathered; very broken with sandy silt seams throughout.	133
	C-1		1.0	0.9 / 90%	0.0 / 0%			
43								132
44	W-N		2.0					131
45								130
46	C-2		2.0	1.0 / 50%	0.0 / 0%			129
47								128
48								127
49								126
50	W-N		7.0					125
51								124
52								123
53								122
54								121
55	C-3		2.0	0.8 / 40%	0.0 / 0%		SANDY SILTSTONE; light to dark gray; soft to medium hard; highly to completely weathered.	120
56							ELEV. 118.9	119
							End of boring at 56.0'	
57								118
58								117
59								116
								115

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

Total Penetration in Earth: 51.0' Rock: 5.0' No. of Samples: 13	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-2**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804453.9
Start Date: 02/07/03	Route No.:	Easting: 991733.8
Finish Date: 02/10/03	Bridge No.:	Surface Elevation: 170.4
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 21.7' after: 0 hours, @21.8' after: 24 hours, @21.8' after: 42 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	
1	W-N		1.5				ELEV. 170.1	170
							CONCRETE	
	S-1	100/0.3	0.3	0.3		1.5'	ELEV. 168.9	169
2							SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, some silt, trace fine to coarse gravel; wet, very dense, NP; (FILL).	
3	W-N		2.7					168
4								167
5	S-2	20 21 24	1.5	0.7			SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, some silt, trace fine to coarse gravel; wet, very dense, NP; (FILL).	166 165
6								164
7	W-N		1.5					
						7.5'	ELEV. 162.9	163
8	S-3	113 52 48	1.5	0.8			POORLY GRADED SAND WITH GRAVEL (SP-SM) - reddish brown fine to coarse sand, some fine to medium gravel, little silt; wet, very dense, NP; (TILL).	162
9								161
10	W-N		1.5					160
11	S-4	50 45 46	1.5	0.8			POORLY GRADED SAND WITH GRAVEL (SP-SM) - reddish brown fine to coarse sand, and fine to medium gravel, little silt; wet, very dense, NP; (TILL).	159
12								158
13	W-N		1.5					
						13.5'	ELEV. 156.9	157
14	S-5	95 53 57	1.5	0.7			SILTY SAND (SM) - reddish brown fine to coarse sand, some silt, trace fine gravel; moist, very dense, NP; (TILL).	156
15								155
16	W-N		1.5					154
17	S-6	39 31 40	1.5	1.0			SILTY SAND (SM) - reddish brown fine to coarse sand, some silt, trace fine gravel; moist, very dense, NP; (TILL).	153
18								152
19	W-N		1.5					
		24				19.5'	ELEV. 150.9	151

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

Total Penetration in Earth: 40.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet 1 of 3 SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-2**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804453.9
Start Date: 02/07/03	Route No.:	Easting: 991733.8
Finish Date: 02/10/03	Bridge No.:	Surface Elevation: 170.4
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 21.7' after: 0 hours, @21.8' after: 24 hours, @21.8' after: 42 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	25 23	1.5	0.7			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown fine to medium gravel, some fine to coarse sand, trace silt; wet, very dense, NP; (TILL).	150
21								149
22	W-N		1.5					148
23	S-8	24 19 14	1.5	0.3			POORLY GRADED GRAVEL (GP) - reddish brown fine to medium gravel, trace fine to coarse sand; wet, dense, NP; (TILL).	147
24								146
25	W-N		1.5			25.5'	ELEV. 144.9	145
26	S-9	16 14 15	1.5	0.5			POORLY GRADED SAND WITH GRAVEL (SP) - brown to black fine to coarse sand, some fine to medium gravel, trace silt; wet, dense, NP; (TILL).	144
27								143
28	W-N		1.5			28.5'	ELEV. 141.9	142
29	S-10	100/0.5	0.5	0.5			POORLY GRADED GRAVEL WITH SAND (GP) - brown to black fine to coarse gravel, little coarse sand; wet, very dense, NP; (TILL).	141
30								140
31	W-N		5.0					139
32								138
33								137
34	S-11	68 100/0.5	1.0	0.5			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown fine to medium gravel, some fine to coarse sand, trace silt; wet, very dense, NP; (TILL).	136
35								135
36								134
37	W-N		5.0					133
38						38.0'	ELEV. 132.4	132
39								131

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

Total Penetration in Earth: 40.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-2**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804453.9
Start Date: 02/07/03	Route No.:	Easting: 991733.8
Finish Date: 02/10/03	Bridge No.:	Surface Elevation: 170.4
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 21.7' after: 0 hours, @21.8' after: 24 hours, @21.8' after: 42 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40				2.3	0.0		SANDSTONE; red to gray; medium hard; slightly weathered; cross-bedded throughout.	130
41								129
42	C-1		5.0					128
43								127
44								126
45				46%	0%			
				5.0	1.6		SANDSTONE; red to gray; medium hard; slightly weathered; fine to medium-grained; cross-bedded throughout.	125
46								124
47	C-2		5.0					123
48							SANDSTONE; red; hard; fresh to slightly weathered; very fine to fine-grained.	122
49								121
50				100%	32%		ELEV. 120.4	
							End of boring at 50.0'	120
51								119
52								118
53								117
54								116
55								115
56								114
57								113
58								112
59								111

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

Total Penetration in Earth: 40.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-3**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804385.5
Start Date: 02/05/03	Route No.:	Easting: 991958.2
Finish Date: 02/06/03	Bridge No.:	Surface Elevation: 167.2
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/ 4"	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 19.8' after: 0 hours, @6.5' after: 24 hours, @7.9' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	167
1							ELEV. 166.9 CONCRETE	166
2	W-N		4.5			2.0'	ELEV. 165.2	165
3								164
4								163
5	S-1	3 8 11	1.5	0.0			SILTY SAND WITH GRAVEL (SM) - red to brown fine to coarse sand, some silt, trace fine gravel: wet, medium dense, NP; (FILL).	162
6								161
7	W-N		1.5					160
8	S-2	8 120/0.0	0.5	0.2		7.5'	ELEV. 159.7	159
9	W-N		2.5				SANDY GRAVEL (GP) - red to brown fine to medium gravel, little fine to coarse sand; wet, very dense; (FILL).	158
10						10.5'	ELEV. 156.7	157
11	S-3	16 15 15	1.5	0.7			SILTY SAND WITH GRAVEL (SM) - red to brown fine to coarse sand, some silt, trace fine to medium gravel: wet, dense, NP; (FILL).	156
12								155
13	W-N		1.5					154
14	S-4	18 15 18	1.5	0.8			SILTY SAND WITH GRAVEL (SM) - red to brown fine to coarse sand, some silt, trace fine to medium gravel: wet, dense, NP; (FILL).	153
15								152
16	W-N		1.5					151
17	S-5	16 17 23	1.5	0.8			SILTY SAND WITH GRAVEL (SM) - red to brown fine to coarse sand, some silt, trace fine to medium gravel: wet, dense, NP; (FILL).	150
18								149
19	W-N		1.5					148
		9					SILTY SAND WITH GRAVEL (SM) - red to brown fine	

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

Total Penetration in Earth: 39.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-3**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804385.5
Start Date: 02/05/03	Route No.:	Easting: 991958.2
Finish Date: 02/06/03	Bridge No.:	Surface Elevation: 167.2
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/ 4"	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 19.8' after: 0 hours, @6.5' after: 24 hours, @7.9' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-6	10 11	1.5	1.0			to coarse sand, some silt, trace fine to medium gravel: wet, dense, -PL; (FILL).	147
21								146
22	W-N		1.5					145
						22.5'	ELEV. 144.7	
23	S-7	WOH 2 4	1.5	1.5			SILTY CLAY WITH SAND (CL-ML) - light to dark brown clay, some silt, trace fine sand; wet, very stiff, +PL; (FILL).	144
24								143
25	W-N		1.5					142
26	S-8	8 9 12	1.5	1.0			SILTY CLAY WITH SAND (CL-ML) - light to dark brown clay, some silt, trace fine sand; wet, medium stiff, +PL; (FILL).	141
27								140
28	W-N		1.5					139
						28.0'	ELEV. 139.2	
29	S-9	23 28 24	1.5	0.0			POORLY GRADED GRAVEL WITH SILT (GP-GM) - light to dark brown, fine to coarse gravel, some fine to coarse sand, little silt; wet, very dense, -PL; (TILL).	138
30	S-10	22 24 23	1.5	1.5			POORLY GRADED GRAVEL WITH SILT (GP-GM) - light to dark brown, fine to coarse gravel, some fine to coarse sand, little silt; wet, very dense, -PL; (TILL).	137
31								136
32	W-N		2.5					135
33								134
34	S-11	62 100/0.4	0.9	0.5			POORLY GRADED GRAVEL WITH SILT (GP-GM) - light to dark brown, fine to coarse gravel, some fine to coarse sand, little silt; wet, very dense, -PL; (TILL).	133
35	W-N		4.1					132
36								131
37								130
38								129
39				2.7	0.9	39.0'	ELEV. 128.2	128
							SANDSTONE; red to gray, very fine to coarse;	

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

Total Penetration in Earth: 39.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-3**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804385.5
Start Date: 02/05/03	Route No.:	Easting: 991958.2
Finish Date: 02/06/03	Bridge No.:	Surface Elevation: 167.2
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/ 4"	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 19.8' after: 0 hours, @6.5' after: 24 hours, @7.9' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES: Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40							medium hard; moderate to highly weathered; calcite inclusions present throughout.	127
41	C-1		5.0					126
42								125
43								124
44				54%	18%			
	C-2		3.5	3.3 / 94%	1.8 / 51%		SANDSTONE; red to gray, very fine to coarse; medium hard; moderate to highly weathered; calcite inclusions present throughout.	123
45								122
46								121
47								120
48	C-3		1.5	0.3 / 20%	0 / 0%		SANDSTONE; red to gray, very fine to coarse; medium hard; moderate to highly weathered; calcite inclusions present throughout.	119
49							ELEV. 118.2 End of Boring at 49.0'	118
50								117
51								116
52								115
53								114
54								113
55								112
56								111
57								110
58								109
59								108

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

Total Penetration in Earth: 39.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet 3 of 3 SM-001-M REV. 1/02

Driller: R. Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-4**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804347.4
Start Date: 02/14/03	Route No.:	Easting: 992111.9
Finish Date: 02/19/03	Bridge No.:	Surface Elevation: 167.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 18.0' after: 0 hours, @17.5' after: 24 hours, @16.9' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0–1	A-N		1.5					167
1–2	S-1	21 15 21	1.5	1.0			SILTY SAND WITH GRAVEL (SM) - brown and black fine to coarse sand, some silt, trace fine to medium gravel; dry, dense, NP; (FILL).	166
2–3	A-N		1.5					165
3–4	S-2	20 31 50/0.1	1.1	0.7			SILTY SAND WITH GRAVEL (SM) - reddish brown and black fine to coarse sand, some silt, little fine to medium gravel; dry, very dense, NP; (FILL).	164
4–5	A-N		1.9					163
5–6	S-3	11 15 16	1.5	0.3			SILTY CLAY (CL) - tan, gray, black clay, some silt, trace fine sand; moist, hard, -PL; (FILL).	162
6–7	A-N		1.5					161
7.5'							ELEV. 159.8	160
7–8	S-4	15 32 38	1.5	1.0			SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, some silt, trace fine to medium gravel; dry, very dense, NP; (FILL).	159
8–9	A-N		1.5					158
10.5'							ELEV. 156.8	157
9–10	S-5	3 3 12	1.5	1.4			SILTY CLAY (CL) - reddish brown clay, some silt, trace fine sand; wet, stiff, +PL; (FILL).	156
10–11	A-N		1.5					155
13.5'							ELEV. 153.8	154
11–12	S-6	35 50/0.4	0.9	0.0				153
12–13	A-N		2.6					152
19.5'		36					ELEV. 147.8	151
								150
								149
								148

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

Total Penetration in Earth: 30.5' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: R. Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-4**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804347.4
Start Date: 02/14/03	Route No.:	Easting: 992111.9
Finish Date: 02/19/03	Bridge No.:	Surface Elevation: 167.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 18.0' after: 0 hours, @17.5' after: 24 hours, @16.9' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	46 40	1.5	1.0			SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, some silt, some fine to coarse gravel; moist, very dense, NP; (TILL).	147
21								146
22	A-N		1.5					145
23	S-8	22 32 25	1.5	0.6			SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, some silt, some fine to coarse gravel; moist, very dense, NP; (TILL).	144
24								143
25	A-N		1.5					142
						25.5'	ELEV. 141.8	
26	S-9	39 45 40	1.5	0.7			WELL GRADED GRAVEL WITH SAND (GW) - reddish brown fine to medium gravel, some fine to coarse sand; wet, very dense, NP; (TILL).	141
27								140
28	A-N		1.5					139
29	S-10	50/0.0	0.0	0.0				138
30	A-N		2.0					137
						30.5'	ELEV. 136.8	
31				4.6	4.3		SANDSTONE; red, hard, fresh to slightly weathered, fine-grained, micaceous, cross-bedded throughout.	136
32								135
33	C-1		5.0					134
34								133
35				92%	86%			132
36				5.0	4.7		SANDSTONE; red, hard, fresh to slightly weathered, fine-grained, micaceous, cross-bedded throughout.	131
37								130
38	C-2		5.0					129
39								128

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

Total Penetration in Earth: 30.5' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: R. Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-4**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804347.4
Start Date: 02/14/03	Route No.:	Easting: 992111.9
Finish Date: 02/19/03	Bridge No.:	Surface Elevation: 167.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 18.0' after: 0 hours, @17.5' after: 24 hours, @16.9' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40				100%	94%		ELEV. 126.8	127
41							End of boring at 40.5'.	126
42								125
43								124
44								123
45								122
46								121
47								120
48								119
49								118
50								117
51								116
52								115
53								114
54								113
55								112
56								111
57								110
58								109
59								108

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

Total Penetration in Earth: 30.5' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: J. Ison/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-5**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804460.2
Start Date: 02/12/03	Route No.:	Easting: 991391.8
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 175.6
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 12.0' after: 0 hours, @25.8' after: 24 hours, @25.4' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	
1	A-N		1.5				ELEV. 175.3	175
2	S-1	35 32 26	1.5	0.9			SANDY SILT WITH GRAVEL (ML) - light brown silt, some fine to coarse sand, little fine to medium gravel; dry, very dense, NP; (FILL).	174
3								173
4	A-N		1.5					172
5	S-2	14 11 12	1.5	0.8			GRAVELLY SILT WITH SAND (ML) - light brown silt, some fine to medium gravel, little fine to coarse sand; dry, dense, NP; (FILL).	171
6								170
7	A-N		1.5					169
8	S-3	20 9 35	1.5	0.7			GRAVELLY SILT WITH SAND (ML) - light brown silt, some fine to medium gravel, little fine to coarse sand; dry, dense, NP; (FILL).	168
9								167
10	A-N		1.5					166
11	S-4	46 72 100/0.3	1.3	0.0				165
12								164
13	A-N		1.7					163
14	S-5	100/0.1	0.1	0.1		13.5'	ELEV. 162.1	162
15	A-N		2.9				POORLY GRADED GRAVEL (GP) - gray medium to coarse gravel, trace silt; dry, very dense, NP; (TILL).	161
16								160
17	S-6	100/0.3	0.3	0.1		16.5'	ELEV. 159.1	159
18	A-N		2.7				WELL GRADED GRAVEL (GW) - gray medium to coarse gravel, trace silt; dry, very dense, NP; (TILL).	158
19								157
		67				19.5'	ELEV. 156.1	156

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

Total Penetration in Earth: 35.0' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: J. Ison/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-5**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804460.2
Start Date: 02/12/03	Route No.:	Easting: 991391.8
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 175.6
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 12.0' after: 0 hours, @25.8' after: 24 hours, @25.4' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	100/0.2	0.7	0.5			SANDY SILT (ML) - reddish brown silt, some fine to medium sand, trace fine gravel; dry, very dense, NP; (TILL).	155
21	W-N		2.3					154
22								
23	S-8	48 100/0.4	0.9	0.9			SANDY SILT WITH GRAVEL (ML) - reddish brown silt, some fine to medium sand, little fine gravel; dry, very dense, NP; (TILL).	153
24	W-N		2.1					152
25								151
26	S-9	62 91 47	1.5	1.5			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, little fine to coarse sand; dry, very dense, NP; (TILL).	150
27	W-N		1.5					149
28								148
						28.5'	ELEV. 147.1	147
29	S-10	16 24 31	1.5	1.0			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown fine to coarse gravel, and fine to coarse sand, little silt; wet, very dense, NP; (DECOMPOSED ROCK).	146
30								
31								145
32	W-N		5.0			32.0'	ELEV. 143.6	144
33								143
34								142
35				4.7	1.7		SANDSTONE; red and gray; medium hard to hard; slightly to moderately weathered; fine to medium-grained; calcite inclusions present throughout.	141
36	C-1		5.0					140
37								139
38								138
39								137
								136

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

Total Penetration in Earth: 35.0' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: J. Ison/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-5**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804460.2
Start Date: 02/12/03	Route No.:	Easting: 991391.8
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 175.6
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 12.0' after: 0 hours, @25.8' after: 24 hours, @25.4' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40	C-2		5.0	94% / 4.6	34% / 2.4		SANDSTONE, fine to medium; red and gray; medium hard to hard; slightly to moderately weathered; calcite inclusions present and cross-bedded throughout.	135
41								134
42								133
43								132
44								131
45				92%	48%		ELEV. 130.6	
							End of boring at 45.0'	130
46								129
47								128
48								127
49								126
50								125
51								124
52								123
53								122
54								121
55								120
56								119
57								118
58								117
59								116

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

Total Penetration in Earth: 35.0' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-6**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804406.4
Start Date: 02/10/03	Route No.:	Easting: 991577.0
Finish Date: 02/11/03	Bridge No.:	Surface Elevation: 172.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 22.7' after: 0 hours, @23.3' after: 24 hours, @23.3' after: 28 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	172
1	A-N		1.5				ELEV. 171.8	171
2	S-1	23 47 46	1.5	0.8			SANDY SILT WITH GRAVEL (ML) - light to dark brown silt, little fine to medium sand, little fine to medium gravel; dry, very dense, NP; (FILL).	170
3								169
4	A-N		1.5					168
5	S-2	5 7 7	1.5	0.4			SANDY SILT WITH GRAVEL (ML) - light to dark brown silt, little fine to medium sand, little fine to medium gravel; dry, medium dense, NP; (FILL).	167
6								166
7	A-N		1.5					165
8	S-3	27 6 9	1.5	0.0			SANDY SILT WITH GRAVEL (ML) - light to dark brown silt, little fine to medium sand, little fine to medium gravel; dry, medium dense, NP; (FILL).	164
9								163
10	A-N		1.5					162
11	S-4	39 54 50/0.3	1.3	0.8			SANDY SILT WITH GRAVEL (ML) - light to dark brown silt, some fine to medium gravel, little fine to coarse sand; moist, very dense, NP; (TILL).	161
12								160
13	A-N		1.7					159
14	S-5	44 44 34	1.5	0.3			SANDY SILT WITH GRAVEL (ML) - light to dark brown silt, some fine to coarse gravel, little fine to coarse sand; moist, very dense, NP; (TILL).	158
15								157
16	A-N		1.5					156
						16.5'	ELEV. 155.6	
17	S-6	42 49 45	1.5	0.2			SILTY GRAVEL (GM) - light brown fine to medium gravel, some silt; moist, hard, +PL; (TILL).	155
18								154
19	A-N		1.5					153
		12				19.5'	ELEV. 152.6	

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

Total Penetration in Earth: 45.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-6**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804406.4
Start Date: 02/10/03	Route No.:	Easting: 991577.0
Finish Date: 02/11/03	Bridge No.:	Surface Elevation: 172.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 22.7' after: 0 hours, @23.3' after: 24 hours, @23.3' after: 28 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	27 37	1.5	1.0			SILTY SAND WITH GRAVEL (SM) - light to dark brown fine to coarse sand, some silt, some fine to coarse gravel; moist, very dense, NP; (TILL).	152
21								151
22	A-N		1.5					150
23	S-8	24 35 35	1.5	0.2			SILTY SAND WITH GRAVEL (SM) - light to dark brown fine to medium sand, some silt, some fine to medium gravel; moist, very dense, NP; (TILL).	149
24								148
25	A-N		1.5					147
26	S-9	19 15 14	1.5	1.0			SILTY SAND WITH GRAVEL (SM) - light to dark brown fine to coarse sand, some silt, little fine to medium gravel; wet, very dense, NP; (TILL).	146
27								145
28	A-N		1.5					144
29	S-10	25 19 3	1.5	0.0				143
30						30.0'	ELEV. 142.1	142
31	S-11	12 13 13	1.5	0.8			POORLY GRADED SAND WITH GRAVEL (SP) - light to dark brown fine to coarse sand, and fine to medium gravel, trace silt; wet, dense, NP; (TILL).	141
32								140
33	W-N		3.5					139
34								138
35						35.0'	ELEV. 137.1	137
36	S-12	17 14 14	1.5	0.3			WELL GRADED SAND (SW) - light to dark brown fine to coarse sand, trace silt; wet, dense, NP; (TILL).	136
37								135
38	W-N		3.5			38.0'	ELEV. 134.1	134
39							Lost drill water at 39.0'.	133

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

Total Penetration in Earth: 45.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-6**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804406.4
Start Date: 02/10/03	Route No.:	Easting: 991577.0
Finish Date: 02/11/03	Bridge No.:	Surface Elevation: 172.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 22.7' after: 0 hours, @23.3' after: 24 hours, @23.3' after: 28 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40	S-13	50/0.0	0.0	0.0				132
41							Lost drill water at 41.0'.	131
42	W-N		5.0					130
43								129
44								128
45				4.0	2.1		SILTSTONE; light to dark gray; hard; slightly to moderately weathered; micaceous; very broken from 45.0 to 46.9'.	127
46								126
47	C-1		5.0					125
48								124
49								123
50				80%	42%			122
				4.8	3.8			
51						51.0'	ELEV. 121.1	121
52	C-2		5.0				SANDSTONE; light to dark gray; hard; slightly weathered; very fine-grained; calcite inclusions present throughout.	120
53								119
54								118
55				96%	76%		ELEV. 117.1	117
							End of boring at 55.0'	
56								116
57								115
58								114
59								113

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

Total Penetration in Earth: 45.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet 3 of 3
		SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-7**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804328.3
Start Date: 02/06/03	Route No.:	Easting: 991872.2
Finish Date: 02/10/03	Bridge No.:	Surface Elevation: 169.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 20.0' after: 0 hours, @20.1' after: 24 hours, @20.1' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	169
1	A-N		1.5				ELEV. 169.0	
2	S-1	8 11 22	1.5	0.4			SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, some silt, trace fine to medium gravel; dry, dense, NP; (FILL).	168 167
3								
4	A-N		1.5					166
5	S-2	3 5 7	1.5	0.4			SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, some silt, trace fine to medium gravel; dry, medium dense, NP; (FILL).	165 164
6								
7	A-N		1.5					163
						7.5'	ELEV. 161.8	162
8	S-3	6 47 50/0.3	1.3	0.5			SANDY SILT (ML) - reddish brown silt, some fine to coarse sand, trace fine gravel; moist, hard, -PL; (FILL).	161
9								
10	A-N		1.7					160
						10.5'	ELEV. 158.8	159
11	S-4	40 50/0.5	0.9	0.7			SILTY GRAVEL WITH SAND (GM) - reddish brown fine to coarse gravel, some silt, little fine to coarse sand; moist, very dense, NP; (FILL).	158
12	A-N		2.1					157
13								
						13.5'	ELEV. 155.8	156
14	S-5	29 30 23	1.5	0.5			POORLY GRADED GRAVEL WITH SAND (GP-GM) - reddish brown fine to coarse gravel, some fine to coarse sand, little silt; moist, very dense; (FILL).	155
15								
16	A-N		1.5					154
						16.5'	ELEV. 152.8	153
17	S-6	21 16 16	1.5	0.6			SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, some silt, little fine to medium gravel; dry, dense, NP; (FILL).	152
18								
19	A-N		1.5					151
								150
		8					SILTY SAND WITH GRAVEL (SM) - reddish brown	

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 45.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet 1 of 3 SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-7**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804328.3
Start Date: 02/06/03	Route No.:	Easting: 991872.2
Finish Date: 02/10/03	Bridge No.:	Surface Elevation: 169.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 20.0' after: 0 hours, @20.1' after: 24 hours, @20.1' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	10 11	1.5	0.9			fine to coarse sand, some silt, little fine to medium gravel; wet, dense, NP; (FILL).	149
21								148
22	A-N		1.5					147
						22.5'	ELEV. 146.8	
23	S-8	12 7 5	1.5	1.0			CLAYEY SILT WITH SAND (CL-ML) - reddish brown silt, some clay, little fine sand; wet, stiff, -PL; (FILL).	146
24								145
25	A-N		1.5					144
26	ST-1		2.0	0.0				143
27								142
28	A-N		1.0					141
						28.5'	ELEV. 140.8	
29	S-9	11 33 48	1.5	0.7			SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, some silt, little fine to medium gravel; dry, very dense, NP; (TILL).	140
30						30.0'	ELEV. 139.3	139
31	S-10	24 23 17	1.5	0.4			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown fine to medium gravel, some fine to coarse sand, little silt; wet, dense, NP; (TILL).	138
32								137
33	W-N		3.5					136
34								135
35						35.0'	ELEV. 134.3	
36	S-11	17 22 29	1.5	0.5			SILTY SAND (SM) - reddish brown fine to coarse sand, some silt, trace fine to coarse gravel; dry, dense, NP; (TILL).	134
37								133
38								132
						38.5'	ELEV. 130.8	
39								131
								130

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

Total Penetration in Earth: 45.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-7**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804328.3
Start Date: 02/06/03	Route No.:	Easting: 991872.2
Finish Date: 02/10/03	Bridge No.:	Surface Elevation: 169.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 20.0' after: 0 hours, @20.1' after: 24 hours, @20.1' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40								129
41	W-N		8.5					128
42								127
43								126
44								125
45				3.8	0		SANDSTONE WITH INTERBEDDED SHALE; red to black, medium hard to hard, moderately to highly weathered, calcite inclusions present throughout.	124
46								123
47	C-1		5.0					122
48								121
49								120
50				76%	0%			119
51				4.8	3.2	51.1'	ELEV. 118.2 SILTSTONE; reddish gray to dark gray, hard, slightly weathered, calcite inclusions present throughout.	118
52	C-2		5.0					117
53								116
54								115
55				96%	64%		ELEV. 114.3 End of boring at 55.0'	114
56								113
57								112
58								111
59								110

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

Total Penetration in Earth: 45.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet 3 of 3 SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-8**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804283.7
Start Date: 02/5/03	Route No.:	Easting: 992034.7
Finish Date: 02/6/03	Bridge No.:	Surface Elevation: 168.7
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/ 4"	Sampler Type/Size: SS/ 1-3/8 I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 19.6' after: 0 hours, @19.5' after: 24 hours, @19.5' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.4'	ASPHALT	
1	A-N		1.5				ELEV. 168.3	168
							SILTY SAND WITH GRAVEL (SM) - dark brown to brown fine to coarse sand, some silt, trace fine gravel; moist, very dense, -PL; (FILL).	167
2	S-1	18 50/0.2	0.7	0.5		2.5'	ELEV. 166.2	166
3	A-N		2.3					165
4								
5	S-2	26 18 10	1.5	0.66			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, little fine to coarse sand; moist, very stiff, -PL; (FILL).	164
6								163
7	A-N		1.5					162
8	S-3	9 8 12	1.5	1.0			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, little fine to coarse sand; moist, very stiff, -PL; (FILL).	161
9								160
10	A-N		1.5					159
11	S-4	19 14 15	1.5	1.4			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, little fine to coarse sand; moist, very stiff, -PL; (FILL).	158
12								157
13	A-N		1.5					156
						13.5'	ELEV. 155.2	
14	S-5	16 20 47	1.5	1.0			SILTY GRAVEL WITH SAND (GM) - reddish brown, fine gravel, and silt, little fine sand; moist, very dense, -PL; (FILL).	155
15								154
16	A-N		1.5					153
17	S-6	50/0.3	0.3	0.3			SILTY GRAVEL WITH SAND (GM) - reddish brown, fine gravel, and silt, little fine sand; moist, very dense, -PL; (FILL).	152
18	A-N		2.7					151
19								150
		37					SILTY GRAVEL WITH SAND (GM) - reddish brown,	149

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

Total Penetration in Earth: 40.0' Rock: 10.0' No. of Samples: 12	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-8**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804283.7
Start Date: 02/5/03	Route No.:	Easting: 992034.7
Finish Date: 02/6/03	Bridge No.:	Surface Elevation: 168.7
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/ 4"	Sampler Type/Size: SS/ 1-3/8 I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 19.6' after: 0 hours, @19.5' after: 24 hours, @19.5' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	41 55	1.5	0.5			fine gravel, and silt, little fine sand; moist, very dense, -PL; (FILL).	148
21								
22	A-N		1.5					147
23	S-8	31 18 17	1.5	0.5			SILTY GRAVEL WITH SAND (GM) - reddish brown, fine gravel, and silt, little fine sand; moist, very dense, -PL; (FILL).	146
24								145
25	A-N		1.5					144
						25.5'	ELEV. 143.2	
26	S-9	20 11 13	1.5	0.66			POORLY GRADED SAND WITH SILT (SP-SM) - reddish brown, fine to coarse sand, little fine gravel, little silt; wet, dense, -PL; (FILL).	143
27								142
28	A-N		1.5					141
						28.5'	ELEV. 140.2	
29	S-10	20 13 13	1.5	0.66			WELL GRADED GRAVEL WITH SAND (GW) - reddish brown to black fine to medium gravel, little fine to coarse sand; wet, dense; (FILL).	140
30								139
31	S-11	13 11 12	1.5	0.5			WELL GRADED GRAVEL WITH SAND (GW) - reddish brown to black fine to medium gravel, little fine to coarse sand; wet, dense; (FILL).	138
32								137
33	W-N		3.5					136
34								135
35								134
36	S-12	16 17 26	1.5	0.66			WELL GRADED GRAVEL WITH SAND (GW) - reddish brown to black fine to medium gravel, little fine to coarse sand; wet, dense; (FILL).	133
37								132
							ELEV. 131.2	
38	W-N		3.5				SANDSTONE, red to gray, very fine to medium grained, medium hard, fresh to slightly weathered; cross-bedded throughout.	131
39								130
								129

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

Total Penetration in Earth: 40.0' Rock: 10.0' No. of Samples: 12	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-8**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804283.7
Start Date: 02/5/03	Route No.:	Easting: 992034.7
Finish Date: 02/6/03	Bridge No.:	Surface Elevation: 168.7
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/ 4"	Sampler Type/Size: SS/ 1-3/8 I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 19.6' after: 0 hours, @19.5' after: 24 hours, @19.5' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40				4.9	4.7			
41								128
42	C-1		5.0					127
43								126
44								125
45				98%	94%			124
46				5.0	3.8		SANDSTONE, red to gray, very fine to medium grained, medium hard, fresh to slightly weathered; cross-bedded throughout.	123
47	C-2		5.0					122
48								121
49								120
50				100%	76%			119
							ELEV. 118.7	
51							End of Boring at 50.0'	118
52								117
53								116
54								115
55								114
56								113
57								112
58								111
59								110
								109

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

Total Penetration in Earth: 40.0' Rock: 10.0' No. of Samples: 12	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-9**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 18+92 / 20' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804261.3
Start Date: 02/05/03	Route No.:	Easting: 992189.1
Finish Date: 02/05/03	Bridge No.:	Surface Elevation: 168.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/ 4"	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ after: hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	168
1	A-N		1.5				ELEV. 167.8	167
2	S-1	27 21 25	1.5	0.75			SANDY SILT WITH GRAVEL (ML) - reddish brown silt, some fine to medium sand, little fine gravel; dry, hard, -PL; (FILL).	166
3								165
4	A-N		1.5					164
5	S-2	8 6 11	1.5	1.1			CLAYEY SILT WITH GRAVEL (ML) - reddish brown silt, some clay , little fine gravel, trace sand; dry, very stiff, -PL; (FILL).	163
6								162
7	A-N		1.5					161
8	S-3	31 11 10	1.5	0.66		7.5'	ELEV. 160.6 SILTY GRAVEL WITH SAND (GM) - reddish brown fine to coarse gravel, some silt, trace fine sand; dry, medium dense, -PL; (FILL).	160
9								159
10	A-N		1.5					158
11	S-4	13 16 21	1.5	1.3			SILTY GRAVEL WITH SAND (GM) - reddish brown fine to coarse gravel, some silt, trace fine sand; dry, medium dense, -PL; wood fragments present (FILL).	157
12								156
13	A-N		1.5					155
14	S-5	20 24 29	1.5	1.4		13.5'	ELEV. 154.6 SILTY SAND WITH GRAVEL (SM) - reddish brown fine to medium sand, some silt, little fine to medium gravel; moist, very dense; (FILL).	154
15								153
16	A-N		1.5					152
17	S-6	24 26 16	1.5	1.2			SILTY SAND WITH GRAVEL (SM) - reddish brown fine to medium sand, some silt, little fine to medium gravel; moist, dense; organic odor present (FILL).	151
18								150
19	A-N		1.5					149
		14				19.5'	ELEV. 148.6	

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

Total Penetration in Earth: 24.0' Rock: 0.0 No. of Samples: 8	NOTES: Boring terminated at 24.0' due to contaminated soil.	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-9**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 18+92 / 20' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804261.3
Start Date: 02/05/03	Route No.:	Easting: 992189.1
Finish Date: 02/05/03	Bridge No.:	Surface Elevation: 168.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/ 4"	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ after: hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	28 21	1.5	0.4			POORLY GRADED GRAVEL WITH SAND (GP-GM) - reddish brown to black fine to medium gravel, some fine sand, trace silt; wet, very dense, -PL; petroleum odor present (FILL).	148
21								147
22	A-N		1.5					146
						22.5'	ELEV. 145.6	
23	S-8	21 18 19	1.5	1.5			SILTY SAND WITH GRAVEL (SM) - reddish brown to black fine sand, some silt, little fine gravel; wet, dense, -PL; petroleum odor present (FILL).	145
24							ELEV. 144.1	144
							Boring Terminated at 24.0'	
25								143
26								142
27								141
28								140
29								139
30								138
31								137
32								136
33								135
34								134
35								133
36								132
37								131
38								130
39								129

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

Total Penetration in Earth: 24.0' Rock: 0.0 No. of Samples: 8	NOTES: Boring terminated at 24.0' due to contaminated soil.	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: R. Ingram/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-10**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804355.8
Start Date: 02/12/03	Route No.:	Easting: 991466.5
Finish Date: 02/12/03	Bridge No.:	Surface Elevation: 174.2
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 18.7' after: 17 hours, @23.7' after: 31 hours, @24.0 after: 52 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	174
1	A-N		1.5				ELEV. 173.9	173
2	S-1	11 10 6	1.5	0.8			SANDY SILT WITH GRAVEL (ML) - reddish brown and black silt, some fine to medium sand, little fine gravel; dry, dense, NP; (FILL).	172
3								171
4	A-N		1.5					170
5	S-2	12 12 8	1.5	0.8			SANDY SILT (ML) - reddish brown and black silt, some fine to medium sand, trace fine gravel; dry, dense, NP; (FILL).	169
6								168
7	A-N		1.5					167
8	S-3	10 10 5	1.5	0.4		7.5'	ELEV. 166.7 SILTY GRAVEL WITH SAND (GM) - reddish brown to black fine to coarse gravel, some silt, little fine to medium sand; dry, medium dense, NP; (FILL)	166
9								165
10	A-N		1.5					164
11	S-4	20 50/0.4	0.9	0.7		10.5'	ELEV. 163.7 GRAVELLY SILT WITH SAND (ML) - reddish brown, gray and black silt, some fine to medium gravel, little fine to coarse sand, trace clay; dry, very dense, NP; (FILL).	163
12	A-N		2.1					162
13								161
14	S-5	54 50/0.3	0.8	0.0			GRAVELLY SILT WITH SAND (ML) - reddish brown, gray and black silt, some fine to medium gravel, little fine to coarse sand, trace clay; dry, very dense, NP; (FILL).	160
15	A-N		2.2					159
16								158
17	S-6	34 50/0.2	0.7	0.5		16.5'	ELEV. 157.7 POORLY GRADED GRAVEL WITH SAND (GP) - gray to brown fine to coarse gravel, some fine to coarse sand, trace silt; moist, very dense, NP; (TILL).	157
18	A-N		2.3					156
19								155
		15				19.5'	ELEV. 154.7	

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 43.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: R. Ingram/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-10**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804355.8
Start Date: 02/12/03	Route No.:	Easting: 991466.5
Finish Date: 02/12/03	Bridge No.:	Surface Elevation: 174.2
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 18.7' after: 17 hours, @23.7' after: 31 hours, @24.0 after: 52 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	20 17	1.5	0.8			WELL GRADED SAND WITH GRAVEL (SW) - light to dark brown fine to coarse sand, little fine gravel, little silt; moist, dense, NP; (TILL).	154
21								153
22	A-N		1.5					152
23	S-8	8 13 12	1.5	1.0			WELL GRADED SAND WITH SILT (SW) - light to dark brown fine to coarse sand, some silt, trace fine gravel; moist, dense, NP; (TILL).	151
24								150
25	A-N		1.5					149
26	S-9	12 24 22	1.5	0.7			WELL GRADED SAND WITH SILT (SW) - light to dark brown fine to coarse sand, some silt; moist, dense, NP; (TILL).	148
27								147
28	A-N		1.5					146
						28.5'	ELEV. 145.7	
29	S-10	12 16 21	1.5	0.7			POORLY GRADED GRAVEL WITH SAND (GP) - gray to brown fine to coarse gravel, and fine to coarse sand, little silt; moist, very dense, NP; (TILL).	145
30						30.0'	ELEV. 144.2	144
31	S-11	17 20 20	1.5	0.8			WELL GRADED SAND WITH SILT (SW) - reddish brown fine to coarse sand, little silt, trace fine gravel; moist, dense, NP; (TILL).	143
32								142
33	W-N		3.5					141
34								140
35	S-12	36 46 74	1.5	0.0				139
36								138
37								137
38	W-N		3.5					136
39								135

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

Total Penetration in Earth: 43.0' Rock: 10.0'
No. of Samples: 13

NOTES:

SM-001-M REV. 1/02

Driller: R. Ingram/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-10**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804355.8
Start Date: 02/12/03	Route No.:	Easting: 991466.5
Finish Date: 02/12/03	Bridge No.:	Surface Elevation: 174.2
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 18.7' after: 17 hours, @23.7' after: 31 hours, @24.0 after: 52 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40	S-13	35 55 100/0.2	1.2	0.8		40.0'	ELEV. 134.2	134
41						41.5'	SANDY SILT WITH GRAVEL (ML) - reddish brown silt, some fine to medium sand, little fine gravel; moist, very dense, NP; (DECOMPOSED ROCK).	133
42	A-N		1.8				ELEV. 132.7	132
43	C-1		5.0	4.4 88%	4.0 80%		SANDSTONE; red and gray, hard, fresh to slighly weathered, calcite inclusions present throughout, fine to medium-grained.	131
44								130
45								129
46								128
47								127
48	C-2		5.0	4.5 90%	2.7 54%		SANDSTONE; red and gray, hard, fresh to slightly weathered, calcite inclusions present throughtout, very fine to fine-grained.	126
49								125
50								124
51								123
52								122
53							ELEV. 121.2	121
54							End of boring at 53.0'	120
55								119
56								118
57								117
58								116
59								115

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

Total Penetration in Earth: 43.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-11**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineers	Project No.: 171-0305	Northing: 804289.5
Start Date: 02/12/03	Route No.:	Easting: 991698.7
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 171.7
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 22.8' after: 0 hours, @22.8' after: 23.5hours, @22.8' after: 44.0hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	
1	W-N		1.5				ELEV. 171.4	171
2	S-1	14 16 12	1.5	0.8			SILTY SAND (SM) - reddish brown to black fine to coarse sand, some silt, trace gravel; dry, dense, NP; organics present (FILL).	170
3								169
4	W-N		1.5					168
5	S-2	15 19 24	1.5	1.0		4.5'	ELEV. 167.2 SANDY SILT WITH GRAVEL (ML) - reddish brown silt, some fine to coarse sand, little fine gravel; dry, very dense, NP; (FILL).	167
6								166
7	W-N		1.5					165
8	S-3	22 39 60	1.5	0.3		7.5'	ELEV. 164.2 POORLY GRADED GRAVEL (GP) - reddish brown fine to coarse gravel; moist, very dense, NP; (TILL).	164
9								163
10	W-N		1.5					162
11	S-4	60 66 55	1.5	0.8			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown fine to coarse gravel, some fine to coarse sand, some silt; moist, very dense, NP; (TILL).	161
12								160
13	W-N		1.5					159
14	S-5	52 95 38	1.5	1.0			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown fine to coarse gravel, some fine to coarse sand, some silt; moist, very dense, NP; (TILL).	158
15								157
16	W-N		1.5					156
17	S-6	28 38 18	1.5	0.5			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown fine to coarse gravel, some fine to coarse sand, trace silt; moist, very dense, NP; (TILL).	155
18								154
19	W-N		1.5					153
		13					POORLY GRADED GRAVEL WITH SAND (GP) -	152

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

Total Penetration in Earth: 47.0' Rock: 3.0' No. of Samples: 13	NOTES: Boring terminated at 50.0' due to shearing of core bit.	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-11**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineers	Project No.: 171-0305	Northing: 804289.5
Start Date: 02/12/03	Route No.:	Easting: 991698.7
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 171.7
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 22.8' after: 0 hours, @22.8' after: 23.5hours, @22.8' after: 44.0hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	15 19	1.5	0.0			reddish brown fine to coarse gravel, some fine to coarse sand, trace silt; moist, very dense, NP; (TILL).	151
21								
22	W-N		1.5					150
23	S-8	10 14 14	1.5	0.3			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown to black fine to medium gravel, some fine to coarse sand, little silt; wet, medium dense, NP; (TILL).	149
24								148
25	W-N		1.5					147
26	S-9	14 19 16	1.5	0.5			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown to black fine to medium gravel, some fine to coarse sand, little silt; wet, dense, NP; (TILL).	146
27								145
28	W-N		1.5					144
29	S-10	20 19 20	1.5	0.1			POORLY GRADED GRAVEL (GP) - reddish brown to black fine to medium gravel, trace fine to medium sand, little silt; wet, dense, NP; (TILL).	143
30						30.0'	ELEV. 141.7	142
31	S-11	24 15 14	1.5	0.3			WELL GRADED GRAVEL WITH SAND (GP) - reddish brown to black fine to medium gravel, little fine to coarse sand; wet, medium dense, NP; (TILL).	141
32								140
33	W-N		2.5					139
34						34.0'	ELEV. 137.7	138
35	S-12	66 59 40	1.5	0.1			POORLY GRADED GRAVEL (GP) - reddish brown to black fine to medium gravel; wet, very dense, NP; (TILL).	137
36								136
37	W-N		3.5					135
38								134
39								133
	S-13	44 29	1.5	0.5			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown to black fine to medium gravel, some	132

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

Total Penetration in Earth: 47.0' Rock: 3.0' No. of Samples: 13	NOTES: Boring terminated at 50.0' due to shearing of core bit.	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-11**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineers	Project No.: 171-0305	Northing: 804289.5
Start Date: 02/12/03	Route No.:	Easting: 991698.7
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 171.7
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 22.8' after: 0 hours, @22.8' after: 23.5hours, @22.8' after: 44.0hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40		28					fine to coarse sand, little silt; wet, very dense, NP; (TILL).	
41								131
42								130
43						43.0'	Lost drill water at 42.5'. ELEV. 128.7	129
44	W-N		6.5					128
45								127
46								126
47								125
48	C-1		3.0	1.7 / 57%	0.0 / 0%		SANDSTONE; red and gray, medium hard to hard, moderately weathered, fine to medium-grained; calcite inclusions and tensile fractures present throughout.	124
49								123
50						49.5'	ELEV. 122.2 BASALT; dark gray to black, very hard, slightly to moderately weathered.	122
51							ELEV. 121.7 Boring terminated at 50.0'	121
52								120
53								119
54								118
55								117
56								116
57								115
58								114
59								113
								112

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

Total Penetration in Earth: 47.0' Rock: 3.0' No. of Samples: 13	NOTES: Boring terminated at 50.0' due to shearing of core bit.	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-12**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804233.9
Start Date: 02/13/03	Route No.:	Easting: 991918.4
Finish Date: 02/14/03	Bridge No.:	Surface Elevation: 170.4
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 23.7' after: 0 hours, @21.5' after: 23 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	
1	A-N		1.5				ELEV. 170.1	170
2	S-1	7 7 5	1.5	0.4			SANDY SILT WITH GRAVEL (ML) - red and brown silt, some fine to coarse sand, little fine to coarse gravel; dry, medium dense, NP; (FILL).	169 168
3								
4	A-N		1.5					167
5	S-2	19 15 18	1.5	1.3			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, little fine to coarse sand; dry, dense, NP; (FILL).	166 165
6								
7	A-N		1.5					164
						7.5'	ELEV. 162.9	163
8	S-3	8 9 7	1.5	0.2			POORLY GRADED GRAVEL (GP) - reddish brown fine to coarse gravel, little silt, little fine to coarse sand; moist, medium dense, NP; (FILL).	162
9								
10	A-N		1.5					161
						10.5'	ELEV. 159.9	160
11	S-4	5 16 47	1.5	1.3			SANDY SILT (ML) - red and light to dark brown silt, some fine to coarse sand, trace coarse gravel; dry, hard, -PL; (FILL).	159
12								
13	A-N		1.5					158
						13.5'	ELEV. 156.9	157
14	S-5	44 50/0.3	0.8	0.5			POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown fine to coarse gravel, little silt, little fine to coarse sand; dry, very dense, NP; (TILL).	156
15	A-N		2.2					155
16								
						16.5'	ELEV. 153.9	154
17	S-6	46 52 30	1.5	1.1			SILTY SAND WITH GRAVEL (SM) - red and light to dark brown fine to coarse sand, some silt, little fine gravel; dry, very dense, NP; (TILL).	153
18								
19	A-N		1.5					152
		17				19.5'	ELEV. 150.9	151

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

Total Penetration in Earth: 42.0' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-12**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804233.9
Start Date: 02/13/03	Route No.:	Easting: 991918.4
Finish Date: 02/14/03	Bridge No.:	Surface Elevation: 170.4
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 23.7' after: 0 hours, @21.5' after: 23 hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	17 18	1.5	1.5			WELL GRADED SAND WITH SILT (SW) - reddish brown fine to coarse sand, some silt, trace fine gravel; dry, dense, NP; (TILL).	150
21								149
22	A-N		1.5					148
						22.5'	ELEV. 147.9	
23	S-8	17 28 22	1.5	1.5			GRAVELLY SILT (ML) - reddish brown silt, some fine to coarse gravel; moist, very dense, NP; (TILL).	147
24								146
25	A-N		1.5					145
						25.5'	ELEV. 144.9	
26	S-9	7 9 9	1.5	0.8			WELL GRADED SAND WITH GRAVEL (SW) - reddish brown fine to coarse sand, little fine gravel, trace silt; wet, medium dense, NP; (TILL).	144
27								143
28	A-N		1.5					142
						28.5'	ELEV. 141.9	
29	S-10	40 50/0.3	0.8	0.3			POORLY GRADED GRAVEL (GP) - reddish brown to black fine to coarse gravel, trace fine to coarse sand ; wet, very dense, NP; (DECOMPOSED ROCK).	141
						29.5'	ELEV. 140.9	
30							Lost drill water at 30.0'.	140
31								139
32								138
33								137
34							Lost drill water at 34.0'.	136
35	A-N		12.9					135
36								134
37								133
38								132
39								131

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

Total Penetration in Earth: 42.0' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: R. Ingrams/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-12**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804233.9
Start Date: 02/13/03	Route No.:	Easting: 991918.4
Finish Date: 02/14/03	Bridge No.:	Surface Elevation: 170.4
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 23.7' after: 0 hours, @21.5' after: 23 hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40								130
41								129
42								128
43	C-1		5.0	4.0	1.6		SANDSTONE; red and gray, hard, slightly weathered, very fine to medium-grained.	127
44								126
45								125
46				80%	32%			124
47	C-2		5.0	5.0	3.6		SANDSTONE; red and gray, hard, slightly weathered, very fine to medium-grained.	123
48								122
49								121
50								120
51				100%	72%			119
52							ELEV. 118.4 End of boring at 52.0'	118
53								117
54								116
55								115
56								114
57								113
58								112
59								111

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

Total Penetration in Earth: 42.0' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet 3 of 3 SM-001-M REV. 1/02

Driller: Makedura/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-13**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804214.2
Start Date: 02/14/03	Route No.:	Easting: 992111.9
Finish Date: 02/20/03	Bridge No.:	Surface Elevation: 169.0
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 19.8' after: 16 hours, @19.8' after: 44 hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0						0.3'	ASPHALT	
1	W-N		1.5				ELEV. 168.7	168
2	S-1	56 42 30	1.5	1.5			GRAVELLY SILT (ML) - reddish brown silt, some fine to medium gravel; dry, very dense, NP; (FILL).	167
3								166
4	W-N		1.5					165
5	S-2	17 11 13	1.5	1.0			GRAVELLY SILT (ML) - reddish brown silt, some fine to coarse gravel; dry, medium dense, NP; (FILL).	164
6								163
7	W-N		1.5					162
8	S-3	19 12 15	1.5	1.2			GRAVELLY SILT (ML) - reddish brown silt, some fine to coarse gravel, trace fine to medium sand; dry, medium dense, NP; (FILL).	161
9								160
10	W-N		1.5					159
11	S-4	9 9 7	1.5	1.0		10.5'	ELEV. 158.5 POORLY GRADED GRAVEL WITH SAND (GP) - reddish brown fine to coarse gravel, little fine to coarse sand, trace silt; moist, medium dense, NP; (FILL).	158
12								157
13	W-N		1.5					156
14	S-5	41 25 26	1.5	1.0		13.5'	ELEV. 155.5 GRAVELLY SILT (ML) - reddish brown silt, some fine to medium gravel, little clay, trace fine sand; moist, very dense, NP; (FILL).	155
15								154
16	W-N		1.5					153
17	S-6	27 29 26	1.5	0.5			GRAVELLY SILT (ML) - reddish brown silt, some fine to medium gravel, little clay, trace fine sand; moist, very dense, NP; (FILL).	152
18								151
19	W-N		1.5					150
		19				19.5'	ELEV. 149.5	

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

Total Penetration in Earth: 38.1' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: Makedura/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-13**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804214.2
Start Date: 02/14/03	Route No.:	Easting: 992111.9
Finish Date: 02/20/03	Bridge No.:	Surface Elevation: 169.0
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 19.8' after: 16 hours, @19.8' after: 44 hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	21 20	1.5	1.0			WELL GRADED GRAVEL WITH SAND (GW) - reddish brown fine to coarse gravel, little fine to coarse sand, trace silt; wet, dense, NP; (TILL).	
21	W-N		1.5					148
22								147
23	S-8	15 14 16	1.5	0.7			WELL GRADED GRAVEL WITH SAND (GW) - reddish brown fine to coarse gravel, little fine to coarse sand, trace silt; wet, dense, NP; (TILL).	146
24	W-N		1.5					145
25								144
26	S-9	19 15 11	1.5	0.5			WELL GRADED GRAVEL WITH SAND (GW) - reddish brown fine to coarse gravel, little fine to coarse sand, trace silt; wet, medium dense, NP; (TILL).	143
27	W-N		1.5					142
28								141
						28.5'	ELEV. 140.5	
29	S-10	65 100/0.1	0.6	0.3			POORLY GRADED GRAVEL (GP) - reddish brown fine to coarse gravel; wet, very dense, NP; (DECOMPOSED ROCK).	140
30	W-N		7.9					139
31								138
32								137
33						33.0'	ELEV. 136.0	136
34								135
35								134
36							Lost drill water at 36.0'.	133
37	C-1		0.9	0.7 / 78%	0.0 / 0%		SANDSTONE; gray, hard, fresh to slightly weathered, fine grained (Meta-sedimentary).	132
						37.8'	ELEV. 131.2	
38	W-N		1.1				BASALT; black, very hard, slightly weathered, broken throughout.	131
39				3.2	3.1	39.0'	ELEV. 130.0	130
							SANDSTONE; red, hard to very hard, fresh,	

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

Total Penetration in Earth: 38.1' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Makedura/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-13**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804214.2
Start Date: 02/14/03	Route No.:	Easting: 992111.9
Finish Date: 02/20/03	Bridge No.:	Surface Elevation: 169.0
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 19.8' after: 16 hours, @19.8' after: 44 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40							micaceous, cross-bedded throughout, very fine to fine-grained (Meta-sedimentary).	129
41	C-2		5.0					128
42								127
43								126
44				64%	62%			125
45	C-3		2.0	1.6 / 80%	1.3 / 65%		SANDSTONE; red, hard to very hard, fresh, micaceous, cross-bedded throughout, very fine to fine-grained.	124
46								123
47	C-4		3.0	1.5 / 50%	1.3 / 43%		SANDSTONE; red, hard to very hard, fresh, micaceous, cross-bedded throughout, very fine to fine-grained.	122
48								121
49							ELEV. 120.0	120
50							End of Boring at 49.0'.	119
51								118
52								117
53								116
54								115
55								114
56								113
57								112
58								111
59								110

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

Total Penetration in Earth: 38.1' Rock: 10.0' No. of Samples: 10	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-14**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 31+45 / 35' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804156.4
Start Date: 03/14/03	Route No.: New Britain - Hartford	Easting: 993419.4
Finish Date: 03/14/03	Bridge No.:	Surface Elevation: 129.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 2.0' after: 0 hours, @ after: hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0								129
1	W-N		1.5					128
2	S-1	34 24 36	1.5	1.0			SILTY GRAVEL (GM) - reddish brown fine to coarse gravel, little silt, trace fine sand; moist, very dense, NP; (FILL).	127
3								126
4	W-N		1.5					125
5	S-2	12 21 39	1.5	1.0			SILTY GRAVEL (GM) - reddish brown fine to coarse gravel, little silt, trace fine sand; moist, very dense, NP; (TILL).	124
6								123
7	W-N		1.5					122
8	S-3	22 27 29	1.5	0.5			SILTY GRAVEL (GM) - reddish brown fine to coarse gravel, little silt, trace fine sand; moist, very dense, NP; (TILL).	121
9								120
10	W-N		1.5					119
11	S-4	30 51 43	1.5	1.0			SILTY GRAVEL (GM) - reddish brown fine to coarse gravel, little silt, trace fine sand; moist, very dense, NP; (TILL).	118
12								117
13	W-N		1.5					116
14	S-5	27 39 54	1.5	0.8			SILTY GRAVEL (GM) - reddish brown fine to coarse gravel, little silt, trace fine sand; moist, very dense, NP; (TILL).	115
15	W-N		1.0					114
16	S-6	50/0.0	0.0	0.0	2.2	16.0'	ELEV. 113.3	113
17				4.2			SILTSTONE WITH INTERBEDDED SANDSTONE; reddish brown, hard, slightly weathered.	112
18	C-1		5.0					111
19								110

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 16.0' Rock: 10.0' No. of Samples: 6	NOTES:	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-14**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 31+45 / 35' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804156.4
Start Date: 03/14/03	Route No.: New Britain - Hartford	Easting: 993419.4
Finish Date: 03/14/03	Bridge No.:	Surface Elevation: 129.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 2.0' after: 0 hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20								109
21				84%	44%			
				3.8	1.5		SILTSTONE WITH INTERBEDDED SANDSTONE; reddish brown, medium hard to hard, slightly to moderately weathered.	108
22								107
23								106
	C-2		5.0					
24								105
						24.5'	ELEV. 104.8	
25							BASALT; dark gray to black, hard, slightly to moderately weathered, vuggy, calcite inclusions in vertical fractures.	104
				76%	30%			
26							ELEV. 103.3	103
27							End of Boring at 26.0'.	102
28								101
29								100
30								99
31								98
32								97
33								96
34								95
35								94
36								93
37								92
38								91
39								90

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

Total Penetration in Earth: 16.0' Rock: 10.0' No. of Samples: 6	NOTES:	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-15**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 70+62 / 30' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 806714.6
Start Date: 02/05/03	Route No.: New Britain - Hartford	Easting: 996100.1
Finish Date: 02/06/03	Bridge No.:	Surface Elevation: 134.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 6.0' after: 0 hours, @6.0' after: 24 hours, @6.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0	W-N		1.5				POORLY GRADED SAND (SP)- reddish brown fine to medium sand, little silt, trace fine to medium gravel; moist, loose, NP; (FILL).	134
1								133
2	S-1	6 5 4	1.5	1.0				132
3						3.0'	ELEV. 131.1	131
4	S-2	3 5 15	1.5	0.3			SILTY GRAVEL (GM)- reddish brown coarse gravel, little fine to medium sand, little silt, trace clay; moist, medium dense, NP; (FILL).	130
5	S-3	20 21 16	1.5	1.0			SILTY GRAVEL (GM)- reddish brown coarse gravel, little fine to medium sand, little silt, trace clay; moist, dense, NP; (FILL).	129
6								128
7	S-4	10 17 20	1.5	0.0				127
						7.5'	ELEV. 126.6	
8	S-5	36 33 42	1.5	1.2			SILT WITH GRAVEL (ML)- reddish brown silt, little fine to coarse gravel; moist, dense, -PL.	126
9								125
10	W-N		1.5					124
11	S-6	19 28 33	1.5	0.7			SILT WITH GRAVEL (ML)- reddish brown silt, little fine to coarse gravel; moist, dense, -PL.	123
12								122
13	W-N		1.5					121
						13.5'	ELEV. 120.6	
14	S-7	63 100/0.2	0.7	0.4			SILTY GRAVEL (GM)- reddish brown fine to coarse, little fine sand; moist, very dense, NP.	120
15								119
16								118
17	W-N		5.8					117
18								116
19								115

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

Total Penetration in Earth: 50.0' Rock: 10.0' No. of Samples: 15	NOTES:	Sheet 1 of 4 SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-15**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 70+62 / 30' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 806714.6
Start Date: 02/05/03	Route No.: New Britain - Hartford	Easting: 996100.1
Finish Date: 02/06/03	Bridge No.:	Surface Elevation: 134.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 6.0' after: 0 hours, @6.0' after: 24 hours, @6.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-8	27 52 100/0.3	1.3	1.0			SILTY GRAVEL (GM)- reddish brown fine to coarse, little fine sand; moist, very dense, NP.	114
21								113
22	W-N		1.7					112
23	S-9	99 100/0.2	0.7	0.7		23.0'	ELEV. 111.1 SILT (ML)- reddish brown silt, little fine sand; moist, very dense, NP; with cobbles.	111
24								110
25	W-N		2.3					109
26	S-10	150/0.3	0.3	0.3			GRAVELLY SILT (ML)- reddish brown silt, some fine to medium gravel; moist, very dense, NP.	108
27	W-N		2.2					107
28								106
29	S-11	95 307 287	1.5	0.9				105
30	S-12	78 150/0.2	0.7	0.7			SILT (ML)- reddish brown silt, little fine to medium gravel, trace fine sand; moist, very dense, NP.	104
31								103
32								102
33	W-N		4.3					101
34								100
35	S-13	32 46 72	1.5	1.1			SILT (ML)- reddish brown silt, little fine to medium gravel, trace fine sand; moist, very dense, NP.	99
36								98
37								97
38	W-N		3.5					96
39								95

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

Total Penetration in Earth: 50.0' Rock: 10.0' No. of Samples: 15	NOTES:	Sheet **2** of **4** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-15**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 70+62 / 30' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 806714.6
Start Date: 02/05/03	Route No.: New Britain - Hartford	Easting: 996100.1
Finish Date: 02/06/03	Bridge No.:	Surface Elevation: 134.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 6.0' after: 0 hours, @6.0' after: 24 hours, @6.0' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40	S-14	14 14 18	1.5	1.3			SILT (ML)- reddish brown silt, little fine to medium gravel, trace fine sand, trace clay; moist, very dense, NP.	94
41								93
42	W-N		3.5					92
43								91
44								90
45	S-15	150 100/0.0	0.5	0.5			SILT (ML)- reddish brown silt, little fine to medium gravel, trace fine sand, trace clay; moist, very dense, NP.	89
46	W-N		4.5					88
47						47.0'	ELEV. 87.1	87
48								86
49								85
50	C-1		5.0	4.0	2.2		SHALE; reddish brown, soft to hard, slightly to moderately weathered.	84
51								83
52								82
53								81
54								80
55	C-2		5.0	80% 4.5	44% 2.0		SHALE; reddish brown, soft to hard, slightly to moderately weathered.	79
56								78
57								77
58								76
59								75

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

Total Penetration in Earth: 50.0' Rock: 10.0' No. of Samples: 15	NOTES:	Sheet **3** of **4** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-15**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 70+62 / 30' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 806714.6
Start Date: 02/05/03	Route No.: New Britain - Hartford	Easting: 996100.1
Finish Date: 02/06/03	Bridge No.:	Surface Elevation: 134.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 6.0' after: 0 hours, @6.0' after: 24 hours, @6.0' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
60				90%	40%		ELEV. 74.1	74
							End of Boring at 60.0'	
61								73
62								72
63								71
64								70
65								69
66								68
67								67
68								66
69								65
70								64
71								63
72								62
73								61
74								60
75								59
76								58
77								57
78								56
79								55

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

Total Penetration in Earth: 50.0' Rock: 10.0' No. of Samples: 15	NOTES:	Sheet **4** of **4** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-16**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 75+89 / 11' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 807243.0
Start Date: 02/07/03	Route No.:	Easting: 996130.0
Finish Date: 02/09/03	Bridge No.:	Surface Elevation: 128.5
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ after: hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0–1	W-N		1.5					128
1–2	S-1	1 3 8	1.5	0.7			SILTY SAND (SM)- tan and black fine to medium sand, little silt; moist, medium dense, NP; (FILL).	127
2–3								126
3–4	W-N		1.5					125
4.5'							ELEV. 124.0	124
4–5	S-2	2 4 10	1.5	0.5			SILTY GRAVEL (GM)- brown fine to coarse gravel, little silt, trace fine sand; wet, medium dense, NP; (FILL).	123
5–6								122
6–7	W-N		1.5					
7.5'							ELEV. 121.0	121
7–8	S-3	4 9 11	1.5	1.4			SILT (ML)- reddish brown silt; moist, medium dense, NP.	120
8–9								119
9–10	S-4	20 27 22	1.5	0.0				118
10–11	W-N		1.5					117
11–12	S-5	22 25 26	1.5	1.3			SILT (ML)- reddish brown silt, trace clay; moist, very dense, NP.	116
12–13								115
13–14	W-N		1.5					114
14–15	S-6	13 24 77	1.5	1.1			GRAVELLY SILT (ML)- gray-brown silt, some fine to coarse gravel, trace fine sand; moist, very dense, NP.	113
15–16								112
16–17	W-N		1.5					111
17–18	S-7	22 23 24	1.5	0.7			GRAVELLY SILT (ML)- gray-brown silt, some fine to coarse gravel, trace fine sand; moist, dense, NP.	110
18–19								109

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

Total Penetration in Earth: 42.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet 1 of 3 SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-16**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 75+89 / 11' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 807243.0
Start Date: 02/07/03	Route No.:	Easting: 996130.0
Finish Date: 02/09/03	Bridge No.:	Surface Elevation: 128.5
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ after: hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	W-N		1.5					108
21	S-8	28 36 34	1.5	0.5			GRAVELLY SILT (ML)- gray-brown silt, some fine to coarse gravel, trace fine sand; moist, very dense, NP.	107
22								
23	W-N		1.5					106
24	S-9	101 96 100/0.2	1.2	1.0			GRAVELLY SILT (ML)- gray-brown silt, some fine to coarse gravel, trace fine sand; moist, very dense, NP.	105
25								104
26	W-N		1.8					103
27	S-10	98 125 50/0.0	1.0	0.5		27.0'	ELEV. 101.5 POORLY GRADED GRAVEL (GP)- black medium to coarse gravel; wet, very dense, NP; gravel is basalt rock fragments.	102
28								101
29	W-N		2.0					100
30	S-11	40 82 144	1.5	1.2		30.0'	ELEV. 98.5 GRAVELLY SILT (ML)- gray-brown silt, some fine to coarse gravel, trace fine sand, trace clay; moist, very dense, NP.	99
31								98
32	W-N		3.5					97
33								96
34								95
35	S-12	32 41 100/0.2	1.2	0.5		35.0'	ELEV. 93.5 POORLY GRADED GRAVEL (GP)- black medium to coarse gravel; wet, very dense, NP; gravel is basalt rock fragments.	94
36								93
37	W-N		3.8					92
38								91
39								90
								89

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

Total Penetration in Earth: 42.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-16**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 75+89 / 11' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 807243.0
Start Date: 02/07/03	Route No.:	Easting: 996130.0
Finish Date: 02/09/03	Bridge No.:	Surface Elevation: 128.5
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ after: hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40	S-13	100/0.3	0.3	0.3		40.0'	ELEV. 88.5	88
41	W-N		1.7				SILTY GRAVEL (GM)- brown fine to coarse gravel, little silt; dry, very dense, NP; gravel is weathered shale fragments (DECOMPOSED ROCK).	87
42				4.5	2.5	42.0'	ELEV. 86.5 SHALE; reddish brown, hard, slightly weathered.	86
43								85
44	C-1		5.0					84
45								83
46								82
47				90%	50%			
				3.9	2.7		SHALE; reddish brown, hard, slightly weathered, occasional interbedded sandstone and calcite lined vugs.	81
48								80
49	C-2		5.0					79
50								78
51								77
				78%	54%			
52							ELEV. 76.5 End of Boring at 52.0'	76
53								75
54								74
55								73
56								72
57								71
58								70
59								69

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

Total Penetration in Earth: 42.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-17**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 81+41 / 23' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 807784.9
Start Date: 02/12/03	Route No.:	Easting: 996238.8
Finish Date: 02/20/03	Bridge No.:	Surface Elevation: 126.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 14.7 after: 24 hours, @14.6 after: 48 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0								126
1	W-N		1.5					
								125
2	S-1	4 7 16	1.5	0.2			SILTY SAND (SM)- yellow-brown fine to medium sand, little silt; dry, medium dense, NP; (FILL).	124
3								
4	W-N		1.5					123
						4.5'	ELEV. 121.8	122
5	S-2	4 4 4	1.5	1.3			SILT (ML)- yellow-brown silt, trace fine sand, trace clay; moist, stiff, -PL.	121
6								
7	W-N		1.5					120
								119
8	S-3	7 6 6	1.5	1.0			SILT (ML)- yellow-brown silt, little clay; moist, very stiff, +PL.	118
9								
10	W-N		1.5					117
								116
11	S-4	7 7 9	1.5	1.4			SILT (ML)- yellow-brown silt, trace clay; moist, very stiff, NPL.	115
12								
13	W-N		1.5					114
								113
14	S-5	6 13 12	1.5	0.3			SILT (ML)- yellow-brown silt, trace clay; moist, very stiff, +PL.	112
15								
16	W-N		1.5					111
								110
17	S-6	4 6 10	1.5	1.5			SILT (ML)- yellow-brown silt, trace clay; moist, very stiff, +PL.	109
18								
19	W-N		1.5					108
								107
		5					SILT (ML)- yellow-brown silt, trace clay; moist, stiff,	

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

Total Penetration in Earth: 35.0' Rock: 10.0' No. of Samples: 12	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-17**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 81+41 / 23' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 807784.9
Start Date: 02/12/03	Route No.:	Easting: 996238.8
Finish Date: 02/20/03	Bridge No.:	Surface Elevation: 126.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 14.7 after: 24 hours, @14.6 after: 48 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	5 5	1.5	1.3			+PL.	106
21								105
22	W-N		1.5					104
23	S-8	10 12 22	1.5	1.3			SILT (ML)- yellow-brown silt, trace fine to medium gravel, trace clay; moist, hard, +PL.	103
24								102
25	W-N		1.5					101
						25.5'	ELEV. 100.8	
26	S-9	9 18 28	1.5	0.8			SILTY GRAVEL (GM)- yellow-brown fine to coarse gravel, some silt, trace fine sand; moist, dense, NP.	100
27								99
28	W-N		1.5					98
29	S-10	52 64 68	1.5	1.2			SILTY GRAVEL (GM)- yellow-brown fine to coarse gravel, some silt, trace fine sand; moist, very dense, NP.	97
30	S-11	100/0.0	0.0	0.0			Boulder at 30.0'	96
31	W-N		2.0					95
32						32.0'	ELEV. 94.3	94
33	S-12	16 10 22	1.5	1.2			SILT (ML)- reddish brown silt, trace fine sand, trace clay; moist, hard, +PL.	93
34	W-N		1.5			34.0'	ELEV. 92.3	92
35	S-13	50/0.0	0.0	0.0	1.2		SILTSTONE; light gray mottled reddish brown, medium hard to hard, moderately to slightly weathered, calcareous	91
36				1.7				90
37	C-1		5.0					89
38								88
39								87

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

Total Penetration in Earth: 35.0' Rock: 10.0' No. of Samples: 12	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-17**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 81+41 / 23' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 807784.9
Start Date: 02/12/03	Route No.:	Easting: 996238.8
Finish Date: 02/20/03	Bridge No.:	Surface Elevation: 126.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 14.7 after: 24 hours, @14.6 after: 48 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40				34%	24%		SILTSTONE; reddish brown, medium hard to hard, moderately to slightly weathered, calcareous	86
41				5.0	1.9			85
42								84
43	C-2		5.0					83
44								82
45				100%	38%		ELEV. 81.3	81
							End of boring at 45.0	
46								80
47								79
48								78
49								77
50								76
51								75
52								74
53								73
54								72
55								71
56								70
57								69
58								68
59								67

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

Total Penetration in Earth: 35.0' Rock: 10.0' No. of Samples: 12	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: Rob Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-18**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 81+68 / 6' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 807816.0
Start Date: 02/24/03	Route No.:	Easting: 996213.6
Finish Date: 02/24/03	Bridge No.:	Surface Elevation: 124.5
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8"I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 15.6 after: 0 hours, @12.8 after: 24 hours, @13.3 after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0–1	W-N		1.5					124
2	S-1	6 4 4	1.5	0.3			SILTY SAND (SM) - black very fine to medium sand, some silt; dry to moist, loose, NP; (FILL).	123
3								122
4	W-N		1.5					121
						4.5'	ELEV. 120.0	120
5	S-2	2 3 2	1.5	0.7			SILT WITH SAND (ML) - reddish brown silt, little very fine sand; moist, loose, NP.	119
6								118
7	W-N		1.5					117
8	S-3	6 7 9	1.5	0.9			SILT WITH SAND (ML) - reddish brown silt, little very fine sand; moist, medium dense, NP.	116
9								115
10	W-N		1.5					114
11	S-4	7 7 7	1.5	0.6			SILT WITH SAND (ML) - reddish brown silt, little very fine sand; moist, medium dense, NP.	113
12								112
13	W-N		1.5					
						13.5'	ELEV. 111.0	111
14	S-5	9 9 10	1.5	0.7			SILTY CLAY (CL/ML) - reddish brown clay, some silt; moist, very stiff, +PL.	110
15								109
16	W-N		1.5					108
17	S-6	33 38 41	1.5	0.0				107
18								106
19	W-N		1.5					
		21				19.5'	ELEV. 105.0	105

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

Total Penetration in Earth: 37.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: Rob Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-18**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 81+68 / 6' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 807816.0
Start Date: 02/24/03	Route No.:	Easting: 996213.6
Finish Date: 02/24/03	Bridge No.:	Surface Elevation: 124.5
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8"I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 15.6 after: 0 hours, @12.8 after: 24 hours, @13.3 after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	18 20	1.5	1.0			SILT WITH SAND (ML) - reddish brown silt, little very fine sand; moist, dense, NP.	104
21								
22	W-N		1.5					103
23	S-8	9 16 18	1.5	1.2			SILT WITH SAND (ML) - reddish brown silt, little very fine sand; moist, dense, NP.	102
24								101
25	W-N		1.5					100
26	S-9	11 17 15	1.5	0.0			sample retainer broke on S-9 resulting in no recovery	99
27								98
28	W-N		1.5					97
29	S-10	12 10 11	1.5	0.7			SILT WITH SAND (ML) - reddish brown silt, little very fine sand, trace fine gravel; moist, medium dense, NP.	96
30								95
31	S-11	12 17 12	1.5	1.5			SILT WITH SAND (ML) - reddish brown silt, little very fine sand; moist, medium dense, NP.	94
32								93
33	W-N		3.5					92
34								91
						34.5'	ELEV. 90.0	90
35	S-12	50/0.0	0.0	0.0				89
36	W-N		2.0					88
37				4.5	3.1		SILTSTONE; reddish brown, medium hard to hard, slightly weathered, calcareous.	87
38								86
39	C-1		5.0					85

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

Total Penetration in Earth: 37.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Rob Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-18**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 81+68 / 6' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 807816.0
Start Date: 02/24/03	Route No.:	Easting: 996213.6
Finish Date: 02/24/03	Bridge No.:	Surface Elevation: 124.5
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8"I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 15.6 after: 0 hours, @12.8 after: 24 hours, @13.3 after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40								84
41								83
				90%	62%			
42				5.0	4.1		SILTSTONE; reddish brown, medium hard to hard, slightly weathered, calcareous.	82
43								81
44	C-2		5.0					80
45								79
46								78
				100%	82%			
47							ELEV. 77.5	
							End of boring at 47.0'	77
48								76
49								75
50								74
51								73
52								72
53								71
54								70
55								69
56								68
57								67
58								66
59								65

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

Total Penetration in Earth: 37.0' Rock: 10.0' No. of Samples: 11	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: Rob Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-19**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 88+39 / 2' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 808476.6
Start Date: 02/25/03	Route No.:	Easting: 996238.4
Finish Date: 02/26/03	Bridge No.:	Surface Elevation: 121.0
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8"I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 19.8 after: 0 hours, @19.0 after: 24 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0–1	W-N		1.5					120
2	S-1	11 17 18	1.5	1.1			SILTY SAND WITH GRAVEL (SM) - black, gray and reddish brown fine to coarse sand, some silt, little fine to coarse gravel; dry to moist, dense; (FILL).	119
3								118
4	W-N		1.5					117
						4.5'	ELEV. 116.5	
5	S-2	10 10 10	1.5	1.0			SILT WITH SAND (ML) - reddish brown silt, little fine to very fine sand, trace coarse gravel; moist, medium dense, NP.	116
6								115
7	W-N		1.5					114
8	S-3	11 9 9	1.5	1.4			SILT WITH SAND (ML) - reddish brown silt, little fine to very fine sand, trace coarse gravel; moist, medium dense, NP.	113
9								112
10	W-N		1.5					111
						10.5'	ELEV. 110.5	
11	S-4	42 70/0.4	0.9	0.4			SILTY GRAVEL WITH SAND (GM) - reddish brown fine to coarse gravel, some silt, little fine sand; dry, very dense, NP.	110
12	W-N		2.1					109
13								108
						13.5'	ELEV. 107.5	
14	S-5	25 26 28	1.5	1.3			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to medium gravel, little fine to very fine sand; moist, very dense, NP.	107
15								106
16	W-N		1.5					105
17	S-6	16 17 27	1.5	0.7			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to medium gravel, little fine to very fine sand; moist, dense, NP.	104
18								103
19	W-N		1.5					102
	S-7	50/0.4	0.4	0.4			GRAVELLY SILT WITH SAND (ML) - reddish brown	

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 43.5' Rock: 8.0' No. of Samples: 12	NOTES:	Sheet 1 of 3 SM-001-M REV. 1/02

Driller: Rob Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-19**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 88+39 / 2' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 808476.6
Start Date: 02/25/03	Route No.:	Easting: 996238.4
Finish Date: 02/26/03	Bridge No.:	Surface Elevation: 121.0
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8"I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 19.8 after: 0 hours, @19.0 after: 24 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20							silt, some fine to medium gravel, little fine to very fine sand; moist, very dense, NP.	
21	W-N		2.6					100
22								99
23	S-8	47 20 22	1.5	0.0				98
24								97
25	W-N		1.5					96
26	S-9	50/0.3	0.3	0.3			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to medium gravel, little fine to very fine sand; moist, very dense, NP.	95
27							boulder/cobbles from 26.5-29.0, no sample possible	94
28	W-N		4.2					93
29								92
30	S-10	100/0.3	0.3	0.3			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to medium gravel, little fine to very fine sand; moist, very dense, NP.	91
31								90
32								89
33	W-N		4.7					88
34								87
35	S-11	78 100/0.1	0.6	0.6		35.0' 35.6'	ELEV. 86.0 CLAYEY GRAVEL WITH SAND (GC) - reddish brown fine to coarse gravel, some clay, little fine to coarse sand; dry, very dense, NP.	86
36								85
37							ELEV. 85.4	84
38	W-N		4.4					83
39								82

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

Total Penetration in Earth: 43.5' Rock: 8.0' No. of Samples: 12	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Rob Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-19**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 88+39 / 2' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 808476.6
Start Date: 02/25/03	Route No.:	Easting: 996238.4
Finish Date: 02/26/03	Bridge No.:	Surface Elevation: 121.0
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8"I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 19.8 after: 0 hours, @19.0 after: 24 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40				3.3	1.7		SANDY SILTSTONE; reddish brown, medium hard to hard, moderately to slightly weathered, calcareous.	81
41								80
42								79
43	C-1		5.0					78
44								77
45				66%	34%			76
46				1.5	0.0		SANDY SILTSTONE; reddish brown, very soft to hard, decomposed to moderately weathered, calcareous; soft seams throughout.	75
47	C-2		3.0					74
48				50%	0%			73
49	W-N		2.0					72
50							SANDY SILTSTONE; reddish brown, very soft, decomposed.	71
51	S-12	41 63 100	1.5	1.5				70
							ELEV. 69.5	
52							End of boring at 51.5'	69
53								68
54								67
55								66
56								65
57								64
58								63
59								62

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

Total Penetration in Earth: 43.5' Rock: 8.0' No. of Samples: 12	NOTES:	Sheet 3 of 3 SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-21**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 94+89 / 3' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809119.4
Start Date: 02/27/03	Route No.:	Easting: 996426.2
Finish Date: 02/27/03	Bridge No.:	Surface Elevation: 115.9
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8"I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 14.3 after: 0 hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0								
1	W-N		1.5					115
2	S-1	6 8 9	1.5	0.8			SILTY GRAVEL WITH SAND (GM) - reddish brown, gray and black fine to coarse gravel, some silt, little fine to coarse sand; dry to moist, medium dense, NP; (FILL).	114
3								113
4	W-N		1.5					112
						4.5'	ELEV. 111.4	
5	S-2	19 19 10	1.5	0.8			SILTY SAND WITH GRAVEL (SM) - black and reddish brown fine to coarse sand, some silt, little medium to coarse gravel; moist, medium dense, NP.	111
6								110
7	W-N		1.5					109
						7.5'	ELEV. 108.4	
8	S-3	2 2 4	1.5	0.2			SILT WITH GRAVEL (ML) - reddish brown silt, little coarse gravel; moist, loose, NP.	108
9								107
10	W-N		1.5					106
11	S-4	12 14 14	1.5	0.7			SILT WITH SAND (ML) - reddish brown silt, little fine to coarse sand; dry, medium dense, NP.	105
12								104
13	W-N		1.5					103
14	S-5	18 14 15	1.5	0.7			SILT WITH SAND (ML) - reddish brown silt, little fine to coarse sand, trace fine gravel; dry, medium dense, NP.	102
15								101
16	W-N		1.5					100
17	S-6	28 25 30	1.5	0.9			SILT WITH SAND (ML) - reddish brown silt, little fine to coarse sand; dry, very dense, NP.	99
18								98
19	W-N		1.5					97
		17					SILT WITH SAND (ML) - reddish brown silt, little fine	96

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

Total Penetration in Earth: 30.0' Rock: 10.0' No. of Samples: 9	NOTES:	Sheet 1 of 3 SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-21**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 94+89 / 3' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809119.4
Start Date: 02/27/03	Route No.:	Easting: 996426.2
Finish Date: 02/27/03	Bridge No.:	Surface Elevation: 115.9
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8"I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 14.3 after: 0 hours, @ after: hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	22 20	1.5	1.0			to coarse sand, trace fine gravel; dry, dense, NP.	
21								95
22	W-N		1.5					94
23	S-8	15 15 22	1.5	1.2			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, little fine to coarse sand; moist, dense, NP.	93
24								92
25	W-N		1.5					91
26	S-9	14 12 34	1.5	1.0			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, little fine to coarse sand; moist, dense, NP.	90
27								89
						27.5'	ELEV. 88.4	
28	W-N		3.0					88
29								87
30				5.0	0.0		SHALE; reddish brown, soft to medium hard, moderately to slightly weathered; sandy seams throughout.	86
31								85
32	C-1		5.0					84
33								83
34								82
				100%	0%			
35				4.7	0.7	35.0'	ELEV. 80.9	81
36							SILTSTONE; reddish brown, soft to hard, moderately to slightly weathered, calcareous.	80
37	C-2		5.0					79
38								78
39								77
								76

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

Total Penetration in Earth: 30.0' Rock: 10.0' No. of Samples: 9	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Harrington/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-21**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 94+89 / 3' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809119.4
Start Date: 02/27/03	Route No.:	Easting: 996426.2
Finish Date: 02/27/03	Bridge No.:	Surface Elevation: 115.9
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4"I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8"I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 14.3 after: 0 hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40				94%	14%		ELEV. 75.9	
							End of boring at 40.0'	
41								75
42								74
43								73
44								72
45								71
46								70
47								69
48								68
49								67
50								66
51								65
52								64
53								63
54								62
55								61
56								60
57								59
58								58
59								57
								56

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

Total Penetration in Earth: 30.0' Rock: 10.0' No. of Samples: 9	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-22**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 100+06 / 1' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809615.3
Start Date: 02/25/03	Route No.:	Easting: 996569.1
Finish Date: 02/25/03	Bridge No.:	Surface Elevation: 112.8
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 11.7' after: 0 hours, @10.6' after: 24 hours, @10.9' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0–1	W-N		1.5					112
2–3	S-1	36 28 24	1.5	1.2			POORLY GRADED SAND WITH GRAVEL (SP) - dark brown to black fine to coarse sand, some fine to medium gravel, little silt; moist, very dense, NP; (FILL).	111, 110
4	W-N		1.5					109
4.5'							ELEV. 108.3	
5	S-2	48 137/0.5	1.0	0.5			POORLY GRADED GRAVEL WITH SILT (GP-GM) - red fine to medium gravel, some silt, little fine to coarse sand; moist, very dense, NP; (FILL).	108
6–7	W-N		2.0					107, 106
8–9	S-3	22 23 21	1.5	1.2			POORLY GRADED GRAVEL WITH SILT (GP-GM) - red fine to medium gravel, some silt, little fine to coarse sand; moist, dense, NP; (FILL).	105, 104
10	W-N		1.5					103
10.5'							ELEV. 102.3	
11	S-4	140/0.5	0.5	0.3			GRAVELLY SILT (ML) - reddish brown silt, and fine to coarse gravel; moist, very dense, NP.	102
12	W-N		2.5					101
13								100
13.5'							ELEV. 99.3	
14	S-5	150/0.5	0.5	0.5				99
14.0'							POORLY GRADED GRAVEL WITH SILT (GP-GM) - red fine to medium gravel, little silt; moist, very dense, NP; (DECOMPOSED ROCK).	
							ELEV. 98.8	
15								98
16–17	W-N		5.0					97, 96
18								95
19				1.7	0.0		SANDY SILTSTONE; red, medium hard, moderately weathered; vugs and micaceous throughout.	94, 93

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

Total Penetration in Earth: 19.0' Rock: 10.0' No. of Samples: 5	NOTES:	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-22**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 100+06 / 1' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809615.3
Start Date: 02/25/03	Route No.:	Easting: 996569.1
Finish Date: 02/25/03	Bridge No.:	Surface Elevation: 112.8
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 11.7' after: 0 hours, @10.6' after: 24 hours, @10.9' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	C-1		1.8	94%	0%			
21	C-2		3.2	3.2 / 100%	1.1 / 34%		SANDY SILTSTONE; red, medium hard, moderately weathered; vugs and micaceous throughout.	92
22								91
23								90
24	C-3		1.0	0.7 / 70%	0.0 / 0%		SANDY SILTSTONE; red, medium hard, moderately weathered; vugs and micaceous throughout.	89
25	C-4		4.0	4.0 / 100%	1.3 / 32%		SANDY SILTSTONE; red, medium hard, moderately weathered; vugs and micaceous throughout.	88
26								87
27								86
28								85
29							ELEV. 83.8	84
30							End of boring at 29.0'.	83
31								82
32								81
33								80
34								79
35								78
36								77
37								76
38								75
39								74
								73

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

Total Penetration in Earth: 19.0' Rock: 10.0' No. of Samples: 5	NOTES:	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: Galvin/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-23**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 102+00 /14' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809786.5
Start Date: 02/24/03	Route No.:	Easting: 996658.3
Finish Date: 02/25/03	Bridge No.:	Surface Elevation: 110.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 15.1' after: 0 hours, @11.9' after: 24 hours, @11.3' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0	W-N		1.5					110
1								109
2	S-1	6 12 15	1.5	1.0			WELL GRADED SAND WITH GRAVEL (SW) - reddish brown and black fine to coarse sand, little fine to medium gravel; dry, medium dense, NP; (FILL).	108
3	W-N		1.5					107
4								106
4.5'							ELEV. 105.6	
5	S-2	22 50 40	1.5	1.0			POORLY GRADED GRAVEL WITH SAND (GP-SP) - reddish brown fine to coarse gravel, little fine to coarse sand, trace silt; moist, very dense, NP; (FILL).	105
6	W-N		1.5					104
7								103
7.5'							ELEV. 102.6	
8	S-3	81 53 50	1.5	1.5			WELL GRADED SAND WITH SILT (SW-SM) - reddish brown fine to coarse sand, some silt, little fine to medium gravel; wet, very dense, NP.	102
9	W-N		1.5					101
10								100
10.5'							ELEV. 99.6	
11	S-4	73 119/0.5	1.0	0.8			GRAVELLY SILT (ML) - reddish brown silt, some fine to medium gravel, trace fine sand; wet, very dense, NP.	99
12	W-N		2.0					98
13								97
13.5'							ELEV. 96.6	
13.6'	S-5	100/0.1	0.1	0.1			WELL GRADED GRAVEL (GW) - red fine to coarse gravel; wet, very dense, NP (DECOMPOSED ROCK).	
14								96
							ELEV. 96.5	
15	W-N		2.9					95
16								94
17	S-6	100/0.0	0.0	0.0				93
18	W-N		3.0					92
19				1.9	0.4			91
19.4'							SANDSTONE; red, medium hard to hard, slightly to moderately weathered, micaceous, vugs, and calcite	

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 19.0' Rock: 9.5' No. of Samples: 6	NOTES:	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: Galvin/ Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-23**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 102+00 /14' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809786.5
Start Date: 02/24/03	Route No.:	Easting: 996658.3
Finish Date: 02/25/03	Bridge No.:	Surface Elevation: 110.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 15.1' after: 0 hours, @11.9' after: 24 hours, @11.3' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	C-1		2.5				inclusions throughout. ELEV. 90.7	90
21				76%	16%		SILTSTONE; red, medium hard to hard, slightly weathered, micaceous, vugs, and calcite inclusions throughout.	89
22	C-2		2.0	1.5	0.3			88
23				75%	15%			87
24	C-3		5.0	4.8	1.3		SILTSTONE; red, medium hard to hard, slightly weathered, micaceous, vugs, and calcite inclusions throughout.	86
25								85
26								84
27								83
28				96%	26%		ELEV. 81.6	82
29							End of boring at 28.5'.	81
30								80
31								79
32								78
33								77
34								76
35								75
36								74
37								73
38								72
39								71

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

Total Penetration in Earth: 19.0' Rock: 9.5' No. of Samples: 6	NOTES:	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: Nitch/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-24**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 104+00 /16' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809962.9
Start Date: 02/11/03	Route No.:	Easting: 996751.2
Finish Date: 02/25/03	Bridge No.:	Surface Elevation: 107.4
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 5.7' after: 24 hours, @8.3' after: 48 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0–1	W-N		1.5					107
2	S-1	5 6 5	1.5	0.0				106, 105
3–4	S-2	8 18 122	1.5	0.1			SILTY GRAVEL (GM) - yellow-brown fine to coarse gravel, little silt; dry, medium dense to very dense, NP; (FILL).	104
5	S-3	18 30 100/0.3	1.3	0.8			SILTY GRAVEL (GM) - yellow-brown fine to coarse gravel, little silt; moist, very dense, NP; (FILL).	103, 102
6						6.0'	ELEV. 101.4	
7	W-N		1.7				Boulder at 6.0'	101
7.5'							ELEV. 99.9	100
8	S-4	52 130	1.0	0.5			SILTY GRAVEL (GM) - yellow-brown fine to coarse gravel, little silt; dry, medium dense to very dense, NP; (FILL).	99
9–10	W-N		2.0					98
10.5'							ELEV. 96.9	97
11	S-5	24 33 33	1.5	1.0			SILT (ML) - reddish brown silt, trace fine gravel; moist, very dense, NP.	96
12–13	W-N		1.5					95
14	S-6	100/0.4	0.4	0.0				94
15–16	W-N		2.6					93, 92
16.5'							ELEV. 90.9	91
17	S-7	100/0.3	0.3	0.3			POORLY GRADED GRAVEL (GP) - reddish brown fine to coarse gravel, trace silt, trace fine sand; wet, very dense, NP.	
18–19	W-N		2.7					90, 89
19.5'							ELEV. 87.9	88
	S-8	100/0.2	0.2	0.2				

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 43.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: Nitch/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-24**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 104+00 /16' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809962.9
Start Date: 02/11/03	Route No.:	Easting: 996751.2
Finish Date: 02/25/03	Bridge No.:	Surface Elevation: 107.4
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 5.7' after: 24 hours, @8.3' after: 48 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20							SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, little silt, little fine to medium gravel; wet, very dense, NP.	87
21	W-N		2.8					86
22						22.5'	ELEV. 84.9	85
23	S-9	100/0.2	0.2	0.2			WELL GRADED GRAVEL WITH SAND (GW-SW) - reddish brown fine to coarse gravel, some fine to coarse sand, trace silt; wet, very dense, NP.	84
24	W-N		2.8					83
25						25.5'	ELEV. 81.9	82
26	S-10	100/0.1	0.1	0.1			POORLY GRADED GRAVEL (GP) - red fine to coarse gravel; wet, very dense, NP.	81
27	W-N		2.9					80
28						28.5'	ELEV. 78.9	79
29	S-11	100/0.2	0.2	0.2			WELL GRADED GRAVEL (GW) - red fine to medium gravel; wet, very dense, NP.	78
30								77
31								76
32	W-N		6.3					75
33								74
34								73
35	S-12	100/0.1	0.1	0.1		35.0'	ELEV. 72.4	72
36							POORLY GRADED GRAVEL (GP) - red fine to coarse gravel; wet, very dense, NP.	71
37	W-N		4.9					70
38						38.0'	ELEV. 69.4	69
39								68

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

Total Penetration in Earth: 43.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Nitch/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-24**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 104+00 /16' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809962.9
Start Date: 02/11/03	Route No.:	Easting: 996751.2
Finish Date: 02/25/03	Bridge No.:	Surface Elevation: 107.4
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 5.7' after: 24 hours, @8.3' after: 48 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40	S-13	100/0.0	0.0	0.0				67
41	W-N		3.0					66
42								65
43	C-1		5.0	4.3	1.3		SANDY SILTSONE; red medium hard to hard, moderately weathered, micaceous, vugs, and calcite inclusions throughout.	64
44								63
45								62
46								61
47				86%	26%			60
48	C-2		5.0	5.0	1.3		SANDY SILTSONE; red medium hard to hard, moderately weathered, micaceous, vugs, and calcite inclusions throughout.	59
49								58
50								57
51								56
52								55
53				100%	26%		ELEV. 54.4	
54							End of Boring at 53.0'.	54
55								53
56								52
57								51
58								50
59								49
								48

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

Total Penetration in Earth: 43.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: T. Galvin/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-25**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 105+00 / 6' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810060.2
Start Date: 02/25/03	Route No.:	Easting: 996782.3
Finish Date: 02/26/03	Bridge No.:	Surface Elevation: 108.6
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 8.5' after: 0 hours, @13.6' after: 24 hours, @13.9' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0–1	W-N		1.5					108
2–3	S-1	42 30 25	1.5	0.7			SILTY SAND WITH GRAVEL (SM) - reddish brown to black fine to coarse sand, some silt, some fine to coarse gravel; dry, very dense, NP; (FILL).	107, 106
3–4	W-N		1.5					105
4.5'							ELEV. 104.1	104
5–6	S-2	16 5 2	1.5	0.9			SILTY CLAY (CL-ML) - reddish brown clay, some silt, trace fine to medium sand; moist, medium stiff, +PL; organics present (FILL).	103
6–7	W-N		1.5					102
7.5'							ELEV. 101.1	101
8–9	S-3	20 17 24	1.5	1.0			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, little fine to medium sand; moist, medium dense, NP.	100
9–10	W-N		1.5					99
11–12	S-4	29 31 30	1.5	1.2			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, trace fine to medium sand; moist, very dense, NP.	98, 97
12–13	W-N		1.5					96
14	S-5	48 100/0.3	0.8	0.7			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, little fine to medium sand; moist, very dense, NP.	95
15–16	W-N		2.2					94, 93
17	S-6	100/0.3	0.8	0.3			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, trace fine to medium sand; moist, very dense, NP.	92
18–19	W-N		2.2					91, 90
19.5'		70					ELEV. 89.1	89

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

Total Penetration in Earth: 27.0' Rock: 10.0' No. of Samples: 8	NOTES:	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: T. Galvin/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-25**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 105+00 / 6' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810060.2
Start Date: 02/25/03	Route No.:	Easting: 996782.3
Finish Date: 02/26/03	Bridge No.:	Surface Elevation: 108.6
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 8.5' after: 0 hours, @13.6' after: 24 hours, @13.9' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	100/0.4	0.9	0.8			SILTY SAND WITH GRAVEL (SM) - dark brown fine to medium sand, some silt, some fine to medium gravel; moist, very dense, NP	88
21	W-N		2.1					87
22						22.5'	ELEV. 86.1	86
23	S-8	100/0.1	0.1	0.1		22.6'	POORLY GRADED GRAVEL (GP) - red fine to coarse gravel, trace silt, trace fine to coarse sand; wet, very dense, NP (DECOMPOSED ROCK).	85
24							ELEV. 86.0	
25	W-N		4.4					84
26								83
27								82
28				5.0	0.0		SILTY SANDSTONE; red, medium hard to hard, moderately to highly weathered, very fine to medium-grained, calcite inclusions throughout.	81
29	C-1		5.0					80
30								79
31								78
32				100%	0%			77
33	C-2		0.8	0.3 / 37%	0.0 / 0%	32.8'	SILTY SANDSTONE; red, medium hard to hard, moderately to highly weathered, very fine to fine-grained, calcite inclusions throughout.	76
34				4.2	1.5		ELEV. 75.8	75
35	C-3		4.2				SANDY SILTSTONE; red, medium hard to hard, moderately weathered, micaceous, vugs and calcite inclusions throughout.	74
36								73
37				100%	36%		ELEV. 71.6	72
38							End of Boring at 37.0'.	71
39								70
								69

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 27.0' Rock: 10.0' No. of Samples: 8	NOTES:	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-26**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 107+69 / 5' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810283.6
Start Date: 02/21/03	Route No.:	Easting: 996934.1
Finish Date: 02/24/03	Bridge No.:	Surface Elevation: 107.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ 15.0' after: 0 hours, @15.0' after: 24 hours, @15.0' after: 48 hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0								107
1	W-N		1.5					106
2	S-1	14 7 5	1.5	1.5			SANDY SILT WITH GRAVEL (ML) - reddish brown to black silt, some fine to coarse sand, little fine to medium gravel; moist, medium dense, NP; (FILL).	105
3								104
4	W-N		1.5					103
						4.5'	ELEV. 102.6	
5	S-2	9 9 8	1.5	0.3			SILTY SAND (SM) - reddish brown fine to coarse sand, little silt, trace fine gravel; wet, medium dense, NP; (FILL).	102
6								101
7	W-N		1.5					100
						7.5'	ELEV. 99.6	
8	S-3	5 6 4	1.5	1.0			SILTY CLAY (ML-CL) - reddish brown silt, some clay, trace fine gravel; moist, stiff, +PL; (FILL).	99
9								98
10	W-N		1.5					97
						10.5'	ELEV. 96.6	
11	S-4	6 9 29	1.5	0.7			GRAVELLY SILT WITH SAND (ML) - reddish brown to black silt, some fine to coarse gravel, trace fine sand; moist, hard, -PL; (FILL).	96
12								95
13	W-N		1.5					94
14	S-5	22 26 31	1.5	1.5			GRAVELLY SILT WITH SAND (ML) - reddish brown to black silt, some fine to coarse gravel, little fine to coarse sand; moist, hard, -PL; (FILL).	93
15								92
16	W-N		1.5					91
17	S-6	35 31 31	1.5	1.5			GRAVELLY SILT WITH SAND (ML) - reddish brown to black silt, some fine to coarse gravel, little fine to coarse sand; moist, hard, NPL; (FILL).	90
18								89
19	W-N		1.5					88
		26						

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

Total Penetration in Earth: 44.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-26**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 107+69 / 5' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810283.6
Start Date: 02/21/03	Route No.:	Easting: 996934.1
Finish Date: 02/24/03	Bridge No.:	Surface Elevation: 107.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 15.0' after: 0 hours, @15.0' after: 24 hours, @15.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	32 73	1.5	0.0				87
21								86
22	W-N		1.5					85
23	S-8	58 48 40	1.5	1.5			SILT WITH SAND (ML) - reddish brown to black silt, little fine to coarse sand, trace fine gravel; moist, very dense, NP.	84
24								83
25	W-N		1.5					82
26	S-9	35 35 42	1.5	1.3			SILT WITH SAND (ML) - reddish brown to black silt, little fine to coarse sand, trace fine gravel; moist, very dense, NP.	81
27								80
28	W-N		1.5					79
29	S-10	51 60 64	1.5	0.5			SILT WITH SAND (ML) - reddish brown to black silt, little fine to coarse sand, trace fine gravel; wet, very dense, NP.	78
30	S-11	65 48 46	1.5	0.7			SANDY SILT WITH GRAVEL (ML) - reddish brown silt, some fine to coarse sand, little fine to medium gravel; wet, very dense, NP.	77
31								76
32	W-N		2.5					75
33								74
34						34.0'	ELEV. 73.1	73
35	S-12	73 100/0.3	0.8	0.7			WELL GRADED SAND WITH GRAVEL (SW) - reddish brown fine to coarse sand, some fine to medium gravel, trace silt; moist, very dense, NP.	72
36								71
37	W-N		4.2					70
38								69
39	S-13	100/0.4	0.4	0.4		39.0'	ELEV. 68.1 GRAVELLY SILT (ML) - reddish brown to black silt,	68

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 44.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: Makudera/ GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-26**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 107+69 / 5' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810283.6
Start Date: 02/21/03	Route No.:	Easting: 996934.1
Finish Date: 02/24/03	Bridge No.:	Surface Elevation: 107.1
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 15.0' after: 0 hours, @15.0' after: 24 hours, @15.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40						40.0'	some fine to coarse gravel; moist, very dense, NP. ELEV. 67.1	67
41								66
42	W-N		4.6					65
43								64
44				3.9	0.0		SANDSTONE; red, medium hard to hard, moderately weathered; vugs, calcite inclusions, and cross bedding throughout, micaceous, very fine-grained.	63
45								62
46	C-1		5.0					61
47								60
48				78%	0%			59
49				4.5	1.7		SANDSTONE; red, medium hard to hard, moderately weathered; vugs, calcite inclusions, and cross bedding throughout, micaceous, very fine-grained.	58
50								57
51	C-2		5.0					56
52								55
53								54
54				90%	34%		ELEV. 53.1	53
							End of boring at 54.0'.	
55								52
56								51
57								50
58								49
59								48

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

Total Penetration in Earth: 44.0' Rock: 10.0' No. of Samples: 13	NOTES:	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: J. Nitch/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-27**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 109+91 /17' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810450.0
Start Date: 02/20/03	Route No.:	Easting: 997082.3
Finish Date: 02/21/03	Bridge No.:	Surface Elevation: 105.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 2.5 after: 0 hours, @4.6 after: 24 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0								105
1	A-N		1.5					104
2	S-1	21 35 24	1.5	0.4			SILTY SAND WITH GRAVEL (SM) - gray, reddish brown and black fine to medium sand, some silt, little to some medium to coarse gravel; moist, very dense, NP (FILL).	103
3								102
4	A-N		1.5			4.5'	ELEV. 100.8	101
5	S-2	8 9 10	1.5	1.5			SILT (ML) - reddish brown silt; moist, very stiff, +PL.	100
6								99
7	A-N		1.5					98
8	S-3	6 9 14	1.5	1.5			SILT (ML) - reddish brown silt; moist, very stiff, +PL.	97
9								96
10	A-N		1.5					95
11	S-4	7 11 15	1.5	1.2			SILT (ML) - reddish brown silt; moist, very stiff, +PL.	94
12								93
13	A-N		1.5					92
14	S-5	5 10 15	1.5	1.2			SILT (ML) - reddish brown silt; moist, very stiff, +PL.	91
15								90
16	A-N		1.5			16.5'	ELEV. 88.8	89
17	S-6	45 42 15	1.5	1.0			SILTY SAND WITH GRAVEL (SM) - reddish brown fine sand, some silt, little to some medium to coarse gravel; moist, very dense, NP.	88
18								87
19	A-N		1.5					86
		51					SILTY SAND WITH GRAVEL (SM) - reddish brown	

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

Total Penetration in Earth: 57.0' Rock: 10.0' No. of Samples: 15	NOTES:	Sheet 1 of 4 SM-001-M REV. 1/02

Driller: J. Nitch/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-27**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 109+91 /17' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810450.0
Start Date: 02/20/03	Route No.:	Easting: 997082.3
Finish Date: 02/21/03	Bridge No.:	Surface Elevation: 105.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 2.5 after: 0 hours, @4.6 after: 24 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	100/0.4	0.9	0.5			fine sand, some silt, little to some medium to coarse gravel; moist, very dense, NP.	85
	A-N		0.6					
21							Auger refusal at 21.0', switched to casing and wash	84
22	W-N		1.5					83
23	S-8	100/0.0	0.0	0.0			cobble from 22.5'-23.3'	82
24	W-N		3.0					81
25								80
						25.5'	ELEV. 79.8	
26	S-9	60 100/0.3	0.8	0.7			POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM) - reddish brown and gray coarse gravel, little silt, little very fine sand; moist, very dense, NP; cobbles throughout.	79
27								78
28	W-N		3.7				cobbles from 28.0-30.0, no sample possible	77
29								76
30	S-10	73 100/0.3	0.8	0.8			POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM) - reddish brown and gray coarse gravel, little silt, little very fine sand; moist, very dense, NP; cobbles throughout.	75
31								74
32							boulder from 30.8'-33.0'	73
33	W-N		4.2					72
34								71
35	S-11	100/0.4	0.4	0.2		35.0'	ELEV. 70.3	70
36							GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine coarse gravel, little to some very fine to coarse sand; moist, hard, +PL.	69
37								68
38	W-N		4.6					67
39								66

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

Total Penetration in Earth: 57.0' Rock: 10.0' No. of Samples: 15	NOTES:	Sheet **2** of **4** SM-001-M REV. 1/02

Driller: J. Nitch/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-27**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 109+91 /17' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810450.0
Start Date: 02/20/03	Route No.:	Easting: 997082.3
Finish Date: 02/21/03	Bridge No.:	Surface Elevation: 105.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 2.5 after: 0 hours, @4.6 after: 24 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40	S-12	100/0.1	0.1	0.1			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine coarse gravel, little to some very fine to coarse sand; moist, hard, +PL.	65
41								64
42	W-N		4.9					63
43								62
44								61
45	S-13	100/0.4	0.4	0.4			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine coarse gravel, little to some very fine to coarse sand; moist, hard, +PL.	60
46								59
47	W-N		4.6					58
48								57
49								56
50	S-14	100/0.3	0.3	0.3			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine coarse gravel, little to some very fine to coarse sand; moist, hard, +PL.	55
51						51.0'	ELEV. 54.3	54
52	W-N		4.7					53
53								52
54								51
55	S-15	100/0.2	0.2	0.0				50
56	W-N		1.8					49
57				4.1	0.4		SANDY SILTSTONE; reddish brown, medium hard to hard, moderately to slightly weathered, calcareous, vugs throughout	48
58								47
59	C-1		5.0					46

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

Total Penetration in Earth: 57.0' Rock: 10.0' No. of Samples: 15	NOTES:	Sheet **3** of **4** SM-001-M REV. 1/02

Driller: J. Nitch/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **SB-27**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 109+91 /17' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810450.0
Start Date: 02/20/03	Route No.:	Easting: 997082.3
Finish Date: 02/21/03	Bridge No.:	Surface Elevation: 105.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 2.5 after: 0 hours, @4.6 after: 24 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
60								45
61								44
62				82%	8%			
				4.0	0.0		SANDY SILTSTONE; reddish brown, medium hard to hard, moderately to slightly weathered, calcareous, vugs throughout	43
63								42
64	C-2		5.0					41
65								40
66								39
67				80%	0%		ELEV. 38.3	
							End of boring at 67.0	38
68								37
69								36
70								35
71								34
72								33
73								32
74								31
75								30
76								29
77								28
78								27
79								26

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

Total Penetration in Earth: 57.0' Rock: 10.0' No. of Samples: 15	NOTES:	Sheet **4** of **4** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-28**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 112+99 /21' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810696.8
Start Date: 02/12/03	Route No.:	Easting: 997265.9
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 103.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 11.5 after: 0 hours, @11.5 after: 24 hours, @11.5 after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0	W-N		1.5					103
1								102
2	S-1	6 9 6	1.5	0.5			SILTY SAND (SM)- black fine to medium sand, little silt, trace fine gravel; dry, medium dense, NP; (FILL).	101
3								100
4	W-N		1.5					99
						4.5'	ELEV. 98.8	
5	S-2	7 5 4	1.5	1.0			SILT (ML)- yellow-brown silt, little fine sand, trace fine gravel; moist, loose, NP.	98
6								97
7	W-N		1.5					96
8	S-3	1 2 3	1.5	1.4			SILT (ML)- gray-brown silt, trace fine sand, trace clay; wet, loose, +PL.	95
9								94
10	W-N		1.5					93
11	S-4	5 9 10	1.5	0.2			SILT (ML)- gray-brown silt, trace fine sand, trace clay; wet, medium dense, +PL.	92
12						12.0'	ELEV. 91.3	
13	S-5	8 9 12	1.5	0.7			LEAN CLAY (CL)- gray clay, trace silt; moist, very stiff, +PL.	91
14	S-6	6 6 9	1.5	1.5			LEAN CLAY (CL)- gray clay, trace silt; moist, stiff, +PL.	90
15								89
16	W-N		1.5					88
17	S-7	6 8 11	1.5	1.5			LEAN CLAY (CL)- gray clay, trace silt; moist, very stiff, +PL.	87
18								86
19	W-N		1.5					85
		6					LEAN CLAY (CL)- gray clay, trace silt; moist, very stiff,	84

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

Total Penetration in Earth: 26.0' Rock: 0.0' No. of Samples: 9	NOTES: Driller lost Shelby Tube in hole at 26.0'. Boring abandoned and relocated 3' south.	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-28**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 112+99 /21' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810696.8
Start Date: 02/12/03	Route No.:	Easting: 997265.9
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 103.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/ 2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 11.5 after: 0 hours, @11.5 after: 24 hours, @11.5 after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-8	8 13	1.5	1.0			+PL.	83
21								82
22	W-N		1.5					81
23	S-9	5 10 10	1.5	1.5			LEAN CLAY (CL)- gray clay, trace silt; moist, very stiff, +PL.	80
24								79
25	ST-1		2.0	0.0				78
26							ELEV. 77.3 Boring Terminated at 26.0'	77
27								76
28								75
29								74
30								73
31								72
32								71
33								70
34								69
35								68
36								67
37								66
38								65
39								64

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

Total Penetration in Earth: 26.0' Rock: 0.0' No. of Samples: 9	NOTES: Driller lost Shelby Tube in hole at 26.0'. Boring abandoned and relocated 3' south.	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-28A**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 112+99 /21' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing:
Start Date: 02/13/03	Route No.:	Easting:
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 103.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ after: hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0								103
1								102
2								101
3								100
4								99
5								98
6								97
7								96
8								95
9								94
10	W-N		21.0					93
11								92
12								91
13								90
14								89
15								88
16								87
17								86
18								85
19								84

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

Total Penetration in Earth: 50.0' Rock: 6.0' No. of Samples: 5	NOTES: Boring located 3' south of SB-28.	Sheet **1** of **3** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-28A**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 112+99 /21' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing:
Start Date: 02/13/03	Route No.:	Easting:
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 103.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ after: hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20								83
21						21.0'	ELEV. 82.3	82
22	ST-1A		2.0	1.3			LEAN CLAY (CL)- gray clay, trace silt; moist, +PL.	81
23								80
24	W-N		2.5					79
25								78
26	S-10	7 11 14	1.5	1.3			LEAN CLAY (CL)- gray clay, trace silt; moist, very stiff, +PL.	77
27								76
28	W-N		1.5					75
29	S-11	6 10 9	1.5	1.4			LEAN CLAY (CL)- gray clay, trace silt; moist, very stiff, +PL.	74
30								73
31								72
32	W-N		3.5					71
33								70
34	S-12	24 13 24	1.5	0.0				69
35								68
36	S-13	13 12 12	1.5	0.8			LEAN CLAY (CL)- gray clay, trace medium to coarse gravel, trace silt; moist, very stiff, +PL.	67
37						37.0'	ELEV. 66.3	66
38	W-N		3.5				Weathered shale fragments in wash water at approximately 37.0'.	65
39								64

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

Total Penetration in Earth: 50.0' Rock: 6.0' No. of Samples: 5	NOTES: Boring located 3' south of SB-28.	Sheet **2** of **3** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **SB-28A**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 112+99 /21' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing:
Start Date: 02/13/03	Route No.:	Easting:
Finish Date: 02/13/03	Bridge No.:	Surface Elevation: 103.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ after: hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
40	S-14	120/0.2	0.2	0.1			POORLY GRADED GRAVEL (GP)- gray to black medium to coarse gravel; wet, very dense, NP; gravel is weathered shale fragments.	63
41								62
42								61
43								60
44								59
45	W-N		9.8					58
46								57
47								56
48								55
49								54
50	C-1		1.0	0.6 / 60%	0.0 / 0%	50.0'	ELEV. 53.3 SANDSTONE; reddish brown, hard, fresh to slightly weathered.	53
51				4.1	2.5		SANDSTONE; reddish brown, hard, fresh to slightly weathered.	52
52								51
53	C-2		5.0					50
54								49
55								48
56				82%	50%		ELEV. 47.3 End of Boring at 56.0'	47
57								46
58								45
59								44

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

Total Penetration in Earth: 50.0' Rock: 6.0' No. of Samples: 5	NOTES: Boring located 3' south of SB-28.	Sheet **3** of **3** SM-001-M REV. 1/02

Driller: J. Nitch/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **RB-1**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 27+83 / 7' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804102.9
Start Date: 03/05/03	Route No.: New Britain - Hartford	Easting: 993057.1
Finish Date: 03/05/03	Bridge No.:	Surface Elevation: 165.2
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3//8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ DRY after: 0 hours, @2.0' C after: 24 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0								165
1	A-N		1.5					164
2	S-1	20 12 9	1.5	1.3			SILT WITH GRAVEL (ML) - brown silt, little medium to coarse gravel, trace fine sand; moist, medium dense, NP.	163
3								162
4	A-N		1.5					161
5	S-2	6 8 8	1.5	0.3			SILT WITH GRAVEL (ML) - brown silt, little medium to coarse gravel, trace fine sand; moist, medium dense, NP.	160
6								159
7	A-N		1.5					158
8	S-3	10 8 6	1.5	0.6			SILT (ML) - brown silt, trace fine to medium gravel; moist, medium dense, NP.	157
9								156
10	A-N		1.5					155
11	S-4	7 8 8	1.5	1.1			SILT (ML) - brown silt, trace fine to medium gravel; moist, medium dense, NP.	154
12								153
13	A-N		1.5					152
14	S-5	13 15 15	1.5	1.2			SILT (ML) - brown silt, trace fine to medium gravel; moist, medium dense, NP.	151
15								150
16	A-N		1.5					149
17	S-6	18 20 28	1.5	1.0			SILT (ML) - gray-brown silt, trace fine to medium gravel; moist, dense, NP.	148
18								147
19	A-N		1.5					146
		20					SILT (ML) - gray-brown silt, trace fine to medium	

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

Total Penetration in Earth: 27.5' Rock: 0.0' No. of Samples: 9	NOTES:	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: J. Nitch/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **RB-1**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 27+83 / 7' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804102.9
Start Date: 03/05/03	Route No.: New Britain - Hartford	Easting: 993057.1
Finish Date: 03/05/03	Bridge No.:	Surface Elevation: 165.2
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3//8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ DRY after: 0 hours, @2.0' C after: 24 hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	39 30	1.5	0.8			gravel; moist, very dense, NP.	145
21								144
22	A-N		1.5					143
23	S-8	12 14 14	1.5	0.2			SILT (ML) - gray-brown silt, trace fine to medium gravel; moist, medium dense, NP.	142
24								141
25	A-N		1.5					140
						25.5'	ELEV. 139.7	
26	S-9	38 28 17	1.5	0.8			SILTY GRAVEL (GM) - gray and brown fine to coarse gravel, little silt, trace medium sand; moist, dense, NP; gravel is sandstone fragments (DECOMPOSED ROCK).	139
27	A-N		0.5					138
							ELEV. 137.7	
28							Boring Terminated at 27.5'.	137
29								136
30								135
31								134
32								133
33								132
34								131
35								130
36								129
37								128
38								127
39								126

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

Total Penetration in Earth: 27.5' Rock: 0.0' No. of Samples: 9	NOTES:	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **RB-2**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 38+24 / 1' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804470.4
Start Date: 02/10/03	Route No.:	Easting: 994025.1
Finish Date: 02/10/03	Bridge No.:	Surface Elevation: 157.6
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 8.0' after: 0 hours, @16.0' after: 24 hours, @16.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0							Cinders (FILL).	
1	W-N		1.5					157
						1.5'	ELEV. 156.1	156
2	S-1	22 19 29	1.5	1.3			SILT WITH GRAVEL (ML)- reddish brown silt, little fine to coarse gravel, trace fine sand; dry, dense, NP; (FILL).	
3								155
4	W-N		1.5					154
5	S-2	14 10 13	1.5	1.2			SILT WITH GRAVEL (ML)- reddish brown silt, little fine to coarse gravel, trace fine sand; moist, medium dense, NP; (FILL).	153
6								152
7	W-N		1.5					151
8	S-3	4 4 5	1.5	1.3			SILT WITH GRAVEL (ML)- reddish brown silt, little fine to coarse gravel, trace fine sand; moist, loose, NP; (FILL).	150
9								149
10	W-N		1.5					148
11	S-4	12 14 13	1.5	1.2			SILT (ML)- gray-brown silt, trace fine sand, trace fine gravel, trace clay; moist, medium dense, NPL; occasional gleyed clay seams.	147
12								146
13	W-N		1.5					145
14	S-5	9 11 11	1.5	1.3			SILT (ML)- gray-brown silt, trace fine sand, trace fine gravel, trace clay; wet, medium dense, NPL; occasional gleyed clay seams.	144
15								143
16	W-N		1.5					142
17	S-6	7 11 9	1.5	1.5			SILT (ML)- gray-brown silt, trace fine sand, trace fine gravel, trace clay; moist, medium dense, NPL.	141
18								140
19	W-N		1.5					139
		6					SILT (ML)- gray-brown silt, trace fine sand, trace fine	138

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

Total Penetration in Earth: 30.0' Rock: 0.0' No. of Samples: 10	NOTES:	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **RB-2**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 38+24 / 1' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804470.4
Start Date: 02/10/03	Route No.:	Easting: 994025.1
Finish Date: 02/10/03	Bridge No.:	Surface Elevation: 157.6
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 8.0' after: 0 hours, @16.0' after: 24 hours, @16.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	8 8	1.5	1.5			gravel, trace clay; moist, medium dense, NPL.	137
21								
22	W-N		1.5					136
23	S-8	7 10 10	1.5	1.3			SILT (ML)- gray-brown silt, trace fine sand, trace fine gravel, trace clay; moist, medium dense, NPL.	135
24								134
25	W-N		1.5					133
26	S-9	18 18 21	1.5	1.4			SILT (ML)- gray-brown silt, trace fine sand, trace fine gravel, trace clay; moist, dense, NPL.	132
27								131
28	W-N		1.5					130
29	S-10	7 11 16	1.5	1.5			SILT (ML)- gray-brown silt, trace fine sand, trace fine gravel, little clay; moist, medium dense, NPL.	129
30							ELEV. 127.6	128
31							End of Boring at 30.0'	127
32								126
33								125
34								124
35								123
36								122
37								121
38								120
39								119
								118

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

Total Penetration in Earth: 30.0' Rock: 0.0' No. of Samples: 10	NOTES:	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **RB-3**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 45+08 / 7' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804797.5
Start Date: 02/10/03	Route No.:	Easting: 994626.8
Finish Date: 02/10/03	Bridge No.:	Surface Elevation: 153.0
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 13.0' after: 0 hours, @13.0' after: 24 hours, @13.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0							Cinders (FILL).	
1	W-N		1.5					152
						1.5'	ELEV. 151.5	
2	S-1	7 9 5	1.5	1.2			SILTY SAND (SM)- reddish brown fine to medium sand, little silt; dry, medium dense, NP; (FILL).	151
3								150
4	W-N		1.5					149
						4.5'	ELEV. 148.5	
5	S-2	5 15 15	1.5	1.4			SILT (ML)- yellow-brown silt, trace clay; moist, medium dense, +PL.	148
6								147
7	W-N		1.5					146
8	S-3	9 11 18	1.5	1.3			SILT WITH SAND (ML)- brown silt, little fine sand; moist, medium dense, NP.	145
9								144
10	W-N		1.5					143
						10.5'	ELEV. 142.5	
11	S-4	7 7 9	1.5	1.0			POORLY GRADED SAND WITH SILT (SP-SM)- brown fine sand, little silt; wet, medium dense, NP.	142
12								141
13	W-N		1.5					140
						13.5'	ELEV. 139.5	
14	S-5	5 11 14	1.5	1.0			SILT WITH GRAVEL (ML)- brown silt, little fine gravel, little fine sand; moist, medium dense, NP.	139
15								138
16	W-N		1.5					137
17	S-6	12 12 15	1.5	0.0				136
18						18.0'	ELEV. 135.0	135
19	S-7	9 11 13	1.5	0.8			POORLY GRADED GRAVEL WITH SILT (GP-GM)- brown fine to medium gravel, little fine sand, little silt; wet, medium dense, NP.	134
		21					POORLY GRADED GRAVEL WITH SILT (GP-GM)-	

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 29.5' Rock: 0.0' No. of Samples: 11	NOTES:	Sheet 1 of 2 SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **RB-3**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 45+08 / 7' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 804797.5
Start Date: 02/10/03	Route No.:	Easting: 994626.8
Finish Date: 02/10/03	Bridge No.:	Surface Elevation: 153.0
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 13.0' after: 0 hours, @13.0' after: 24 hours, @13.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-8	20 22	1.5	1.0			brown fine to coarse gravel, little fine sand, little silt; wet, dense, NP.	
21								132
22	W-N		1.5					131
23	S-9	31 24 25	1.5	0.0				130
24							Boulder at 24.0'	129
25	W-N		1.5					128
26	S-10	52 45 130	1.5	0.8			POORLY GRADED GRAVEL WITH SILT (GP-GM)- brown fine to medium gravel, little fine sand, little silt; moist, very dense, NP.	127
27								126
28	W-N		1.5					125
29	S-11	64 150/0.5	1.0	0.5			POORLY GRADED GRAVEL WITH SILT (GP-GM)- brown fine to medium gravel, little fine sand, little silt; moist, very dense, NP.	124
30							ELEV. 123.5 End of Boring at 29.5'	123
31								122
32								121
33								120
34								119
35								118
36								117
37								116
38								115
39								114

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

Total Penetration in Earth: 29.5' Rock: 0.0' No. of Samples: 11	NOTES:	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **RB-4**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 52+89 / 16' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 805167.5
Start Date: 02/06/03	Route No.: New Britain - Hartford	Easting: 995315.0
Finish Date: 02/07/03	Bridge No.:	Surface Elevation: 147.2
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3//8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 7.0' after: 0 hours, @7.0' after: 24 hours, @7.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0								147
1	W-N		1.5					146
2	S-1	5 5 8	1.5	1.2			SILT (ML)- reddish brown and black silt, little fine to medium sand; moist, loose, NP; (FILL).	145
3								144
4	W-N		1.5					143
5	S-2	6 10 22	1.5	1.4			SILT (ML)- reddish brown and tan silt, trace fine sand; moist, medium dense, NP; (FILL).	142
6								141
7	W-N		1.5					140
						7.5'	ELEV. 139.7	
8	S-3	12 10 12	1.5	1.0			POORLY GRADED SAND WITH SILT (SP)- reddish brown fine to medium sand, trace silt; wet, medium dense, NP; (FILL).	139
9								138
10	W-N		1.5					137
						10.5'	ELEV. 136.7	
11	S-4	16 20 24	1.5	1.1			SILT (ML)- reddish brown silt, trace fine sand; wet, dense, NP.	136
12								135
13	W-N		1.5					134
14	S-5	7 7 10	1.5	1.2			SILT WITH SAND (ML)- reddish brown silt, little fine sand; wet, medium dense, NP.	133
15								132
16	W-N		1.5					131
						16.5'	ELEV. 130.7	
17	S-6	7 8 12	1.5	1.0			POORLY GRADED SAND WITH SILT (SP)- brown fine to medium sand, trace silt; wet, medium dense, NP.	130
18								129
19	W-N		1.5					128
		7					POORLY GRADED SAND WITH SILT (SP)- brown	

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 30.0' Rock: 0.0' No. of Samples: 10	NOTES:	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: J. Galvin/GeoLogic	**Connecticut DOT Boring Report**	Hole No.: **RB-4**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 52+89 / 16' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 805167.5
Start Date: 02/06/03	Route No.: New Britain - Hartford	Easting: 995315.0
Finish Date: 02/07/03	Bridge No.:	Surface Elevation: 147.2
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3//8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 7.0' after: 0 hours, @7.0' after: 24 hours, @7.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	9 11	1.5	1.0			fine to medium sand, trace silt; wet, medium dense, NP.	127
21								126
22	W-N		1.5					125
						22.5'	ELEV. 124.7	
23	S-8	10 9 14	1.5	1.2			SILT (ML)- reddish brown silt, trace fine sand; wet, medium dense, NP.	124
24								123
25	W-N		1.5					122
26	S-9	14 18 21	1.5	1.1			SILT (ML)- reddish brown silt, little fine sand; wet, dense, NP.	121
27								120
28	W-N		1.5					119
						28.5'	ELEV. 118.7	
29	S-10	74 55 63	1.5	1.0			SILTY SAND WITH GRAVEL (SM)- brown fine to coarse sand, little silt, little fine to medium gravel; wet, very dense, NP.	118
30							ELEV. 117.2	117
31							End of Boring at 30.0'	116
32								115
33								114
34								113
35								112
36								111
37								110
38								109
39								108

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

Total Penetration in Earth: 30.0' Rock: 0.0' No. of Samples: 10	NOTES:	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: J. Galvin/Geologic	**Connecticut DOT Boring Report**	Hole No.: **RB-5**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 62+50 / 3' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 805929.5
Start Date: 02/05/03	Route No.: New Britain - Hartford	Easting: 995892.3
Finish Date: 02/06/03	Bridge No.:	Surface Elevation: 140.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 4.0' after: 0 hours, @4.0' after: 24 hours, @4.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0								140
1	W-N		1.5					139
2	S-1	17 24 48	1.5	1.0			POORLY GRADED SAND (SP)- reddish brown and black fine sand, little silt, trace medium to coarse gravel; moist, very dense, NP; (FILL).	138
3								137
4	W-N		1.5					136
						4.5'	ELEV. 135.8	
5	S-2	12 17 33	1.5	1.1			SILT (ML)- reddish brown silt, little fine to medium sand, little fine to medium gravel; moist, dense, NP.	135
6								134
7	W-N		1.5					133
8	S-3	21 19 24	1.5	1.0			SILT (ML)- reddish brown silt, little fine to medium sand, little fine to medium gravel; moist, dense, NP.	132
9								131
10	W-N		1.5					130
11	S-4	10 13 16	1.5	0.9			SILT (ML)- reddish brown silt, little fine to medium sand, little fine to medium gravel; moist, dense, NP.	129
12								128
13	W-N		1.5					127
14	S-5	12 15 17	1.5	0.3			SILT (ML)- reddish brown silt, little fine to medium sand, little fine to medium gravel; moist, dense, NP.	126
15								125
16	W-N		1.5					124
17	S-6	12 18 74	1.5	1.0			SILT (ML)- reddish brown silt, little fine to medium sand, little medium to coarse gravel; moist, dense, NP; with cobbles.	123
18								122
19	W-N		1.5					121
		33					SILT (ML)- reddish brown silt, little fine to medium	

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 30.8' Rock: 0.0' No. of Samples: 10	NOTES:	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: J. Galvin/Geologic	**Connecticut DOT Boring Report**	Hole No.: **RB-5**
Inspector: E. Glisan	Town: New Britain / Newington, CT	Stat./Offset: 62+50 / 3' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 805929.5
Start Date: 02/05/03	Route No.: New Britain - Hartford	Easting: 995892.3
Finish Date: 02/06/03	Bridge No.:	Surface Elevation: 140.3
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HW/4" I.D.	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NX/2-1/8" I.D.
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ 4.0' after: 0 hours, @4.0' after: 24 hours, @4.0' after: 48 hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	44 47	1.5	1.2			sand, little medium to coarse gravel; moist, dense, NP; with cobbles.	120
21								119
22	W-N		1.5					118
23	S-8	31 34 117	1.5	0.8			SILT (ML)- reddish brown silt, little fine to medium sand, little medium to coarse gravel; moist, dense, NP; with cobbles.	117
24								116
25	W-N		1.5					115
26	S-9	73 33 44	1.5	1.2			SILT (ML)- reddish brown silt, little fine to medium sand, little medium to coarse gravel; moist, dense, NP; with cobbles.	114
27								113
28	W-N		2.5					112
29							Boulder @ 28.5'	111
30	S-10	84 97 120/0.3	1.3	1.0			SILT (ML)- reddish brown silt, little fine to medium sand, little medium to coarse gravel; moist, dense, NP; with cobbles.	110
31							ELEV. 109.5	109
32							End of Boring at 30.8'	108
33								107
34								106
35								105
36								104
37								103
38								102
39								101

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

Total Penetration in Earth: 30.8' Rock: 0.0' No. of Samples: 10	NOTES:	Sheet **2** of **2** SM-001-M REV. 1/02

Driller: J. Nitch/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **RB-6**
Inspector: Mark Martin	Town: New Britain / Newington, CT	Stat./Offset: 97+22 / 1' L
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 809346.2
Start Date: 02/25/03	Route No.:	Easting: 996477.1
Finish Date: 02/25/03	Bridge No.:	Surface Elevation: 114.7
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HSA	Sampler Type/Size: SS/1-3/8" I.D.	Core Barrel Type: NA
Hammer Wt.: NA Fall: NA	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ DRY after: 0 hours, @ after: hours, @ after: hours		

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0–1	A-N		1.5					114
2	S-1	7 8 18	1.5	0.5			SILTY SAND WITH GRAVEL (SM) - black fine to coarse sand, some silt, little fine to medium gravel; moist, medium dense, NP. (FILL).	113
3								112
4	A-N		1.5					111
5	S-2	7 5 5	1.5	0.2			gravel block spoon on S-2	110
6								109
7	A-N		1.5					108
7.5'							ELEV. 107.2	
8	S-3	4 4 10	1.5	0.1			SILT WITH SAND (ML) - reddish brown silt, little very fine sand; moist, medium dense, NP.	107
9								106
10	A-N		1.5					105
11	S-4	8 16 26	1.5	0.8			GRAVELLY SILT WITH SAND (ML) - reddish brown silt, some fine to coarse gravel, little fine sand; dry, dense, NP.	104
12								103
13	A-N		1.5					102
14	S-5	100/0.0	0.0	0.0				101
	A-N		0.5				Auger refusal at 14.0'	
							ELEV. 100.7	
15							End of boring at 14.0'	100
16								99
17								98
18								97
19								96
								95

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

Total Penetration in Earth: 14.0' Rock: 0 No. of Samples: 5	NOTES: Boring backfilled with cuttings on 2/25/03.	Sheet **1** of **1** SM-001-M REV. 1/02

Driller: R. Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **RB-8**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 116+05 / 8' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810953.3
Start Date: 02/26/03	Route No.:	Easting: 997434.0
Finish Date: 02/26/03	Bridge No.:	Surface Elevation: 100.6
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HSA	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NA
Hammer Wt.: NA Fall: NA	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ C after: 0 hours, @ after: hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT_E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
0								
1	A-N		1.5					100
2	S-1	6 14 15	1.5	0.8			WELL GRADED SAND WITH GRAVEL (SW) - reddish brown to black fine to coarse sand, little fine to medium gravel, trace silt; moist, medium dense, NP; (FILL).	99
3								98
4	A-N		1.5					97
						4.5'	ELEV. 96.1	96
5	S-2	5 9 9	1.5	1.5			CLAYEY SILT WITH GRAVEL (ML) - reddish brown silt, some clay, little fine to coarse gravel; moist, very stiff, -PL .	
6								95
7	A-N		1.5					94
8	S-3	15 16 20	1.5	1.5			CLAYEY SILT WITH GRAVEL (ML) - reddish brown silt, some clay, little fine to medium gravel; moist, very stiff, -PL .	93
9								92
10	A-N		1.5					91
11	S-4	9 13 15	1.5	1.3			SILT (ML) - reddish brown silt, little clay, trace fine gravel, moist, very stiff, -PL.	90
12								89
13	A-N		1.5					88
14	S-5	11 10 14	1.5	1.5			SILT (ML) - reddish brown silt, little clay; moist, very stiff , -PL.	87
15								86
16	A-N		1.5					85
						16.5'	ELEV. 84.1	84
17	S-6	4 6 9	1.5	1.5			CLAYEY SILT (CL-ML) - reddish brown silt, some clay; moist, stiff, -PL.	
18								83
19	A-N		1.5					82
		7					CLAYEY SILT (CL-ML) - reddish brown silt, some	81

Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger

Proportions Used: Trace = 1 - 10%, Little = 10 -20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 30.0' Rock: 0.0' No. of Samples: 10	NOTES:	Sheet **1** of **2** SM-001-M REV. 1/02

Driller: R. Ingram/Seaboard	**Connecticut DOT Boring Report**	Hole No.: **RB-8**
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset: 116+05 / 8' R
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 810953.3
Start Date: 02/26/03	Route No.:	Easting: 997434.0
Finish Date: 02/26/03	Bridge No.:	Surface Elevation: 100.6
Project Description: New Britain - Hartford Busway		
Casing Type/Size: HSA	Sampler Type/Size: SS/ 1-3/8" I.D.	Core Barrel Type: NA
Hammer Wt.: NA Fall: NA	Hammer Wt.: 140 Fall: 30"	

Groundwater Obs. @ C after: 0 hours, @ after: hours, @ after: hours

Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)

Depth (ft.)	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)	Generalized Strata Description	Material Description and Notes	Elevation (ft.)
20	S-7	9 10	1.5	1.5			clay; moist, very stiff, -PL.	
21								80
22	A-N		1.5					79
23	S-8	7 8 8	1.5	1.5			CLAYEY SILT (CL-ML) - reddish brown silt, some clay, trace fine to medium gravel; moist, very stiff, -PL.	78
24								77
25	A-N		1.5					76
26	S-9	6 10 10	1.5	1.5			CLAYEY SILT (CL-ML) - reddish brown silt, some clay; moist, very stiff, -PL.	75
27								74
28	A-N		1.5					73
29	S-10	5 10 10	1.5	1.5			CLAYEY SILT (CL-ML) - reddish brown silt, some clay; moist, very stiff, -PL.	72
30							ELEV. 70.6	71
31							End of boring at 30.0'.	70
32								69
33								68
34								67
35								66
36								65
37								64
38								63
39								62
								61

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

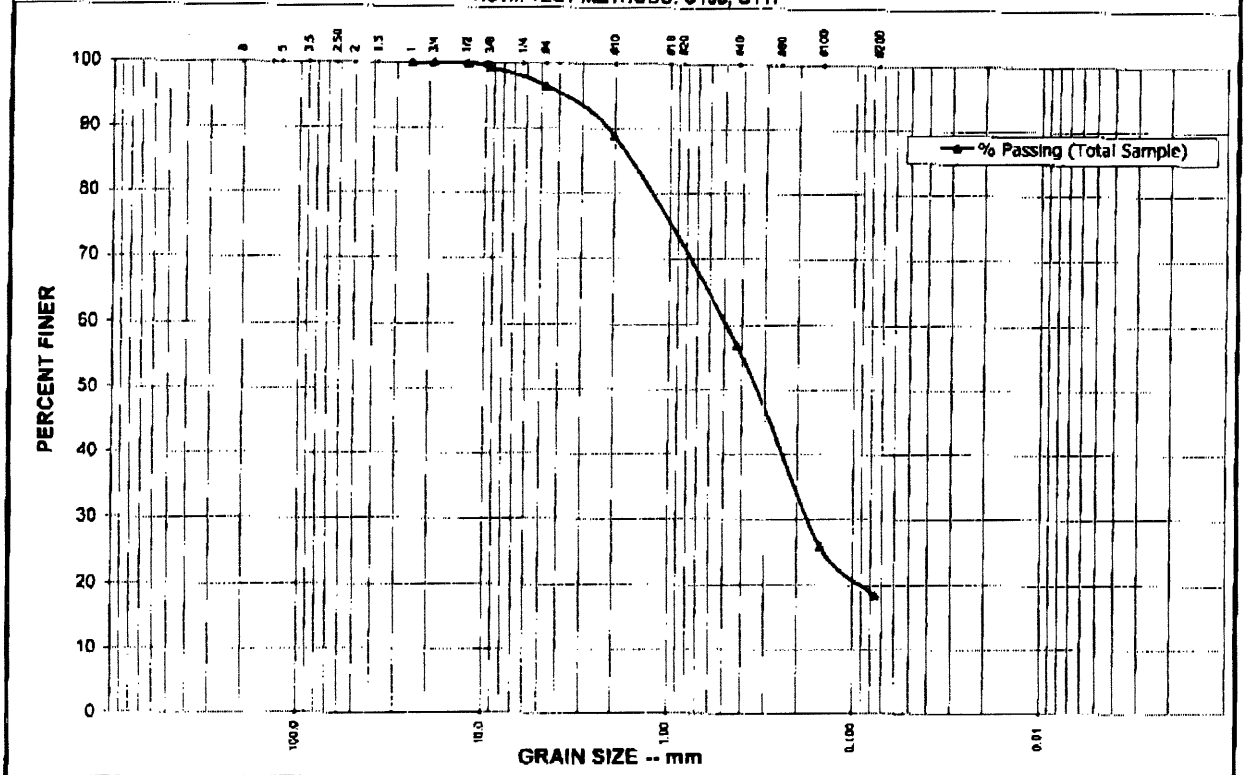
Total Penetration in Earth: 30.0' Rock: 0.0' No. of Samples: 10	NOTES:	Sheet **2** of **2** SM-001-M REV. 1/02

APPENDIX 3

LABORATORY TESTING RESULTS

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		10.0	41.0	49.0	Silt (>0.002mm)	Clay (<0.002mm)
0.0	3.4	% Sand		78.2	18.4	

Classification: BROWN C-F SAND, little Silt, trace fine Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	2.00	99.4			
6.3	1/4"					
4.75	#4	11.00	96.6			
2.00	#10	36.00	88.8			
1.00	#18					
0.425	#40	139.00	56.7			
0.250	#60					
0.150	#100	236.00	25.9			
0.075	#200	262.00	18.4			
	Total Dry Wt.	321				
	Split Wt.					

Project: VN Engineers,Inc.	Project No.: J2031487C	Date: 8/10/2007	
City: North Haven,CT	Specification: Not Provided	Lab No: C1863-07	
Source: B101 S-4, 15'-17'	Sampled from: Provided by client		

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1746
www.jgieastern.com

Remarks: Natural moisture content = 9.7%

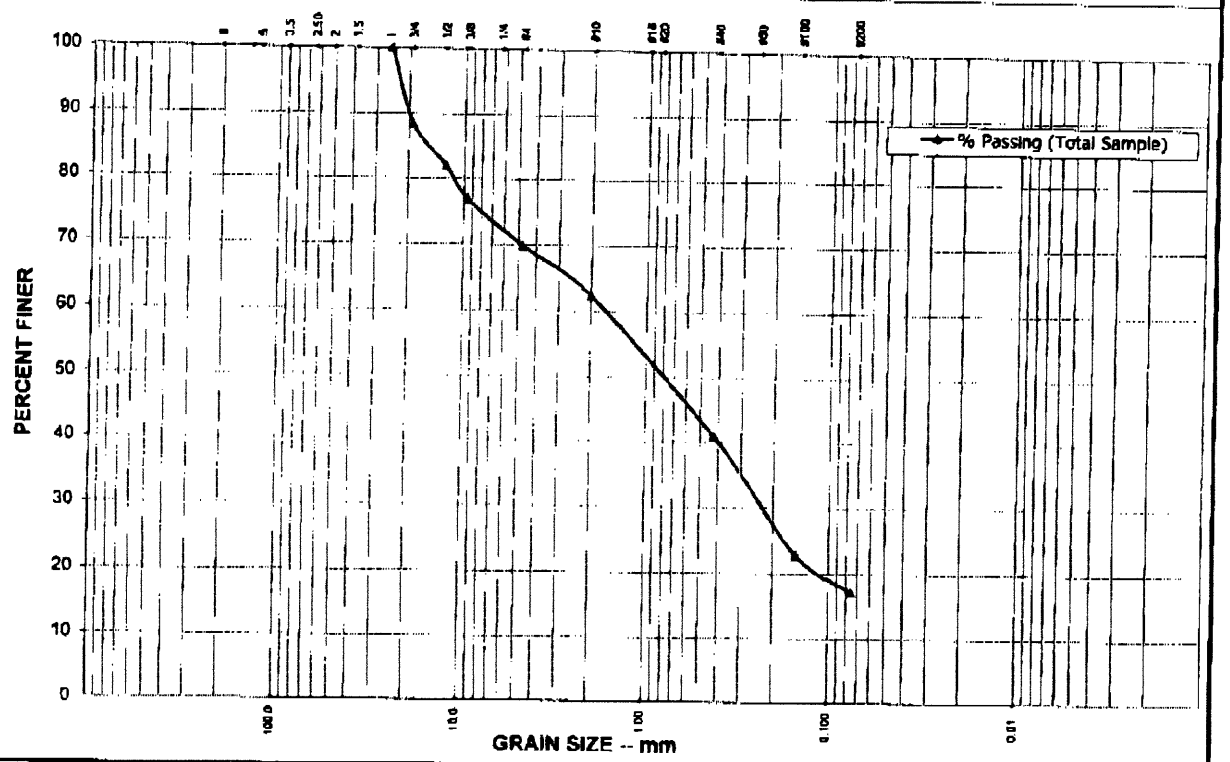
Tested By: M.F. Date: 8/11/2007

Reviewed By: [illegible] Date: 8/13/07

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		14.2	40.7	45.1	Silt (>0.002mm)	Clay (<0.002mm)
0.0	30.2	% Sand		52.8	17.2	

Classification: BROWN RECLAIMED C-F SAND, some C-F Gravel, little Silt

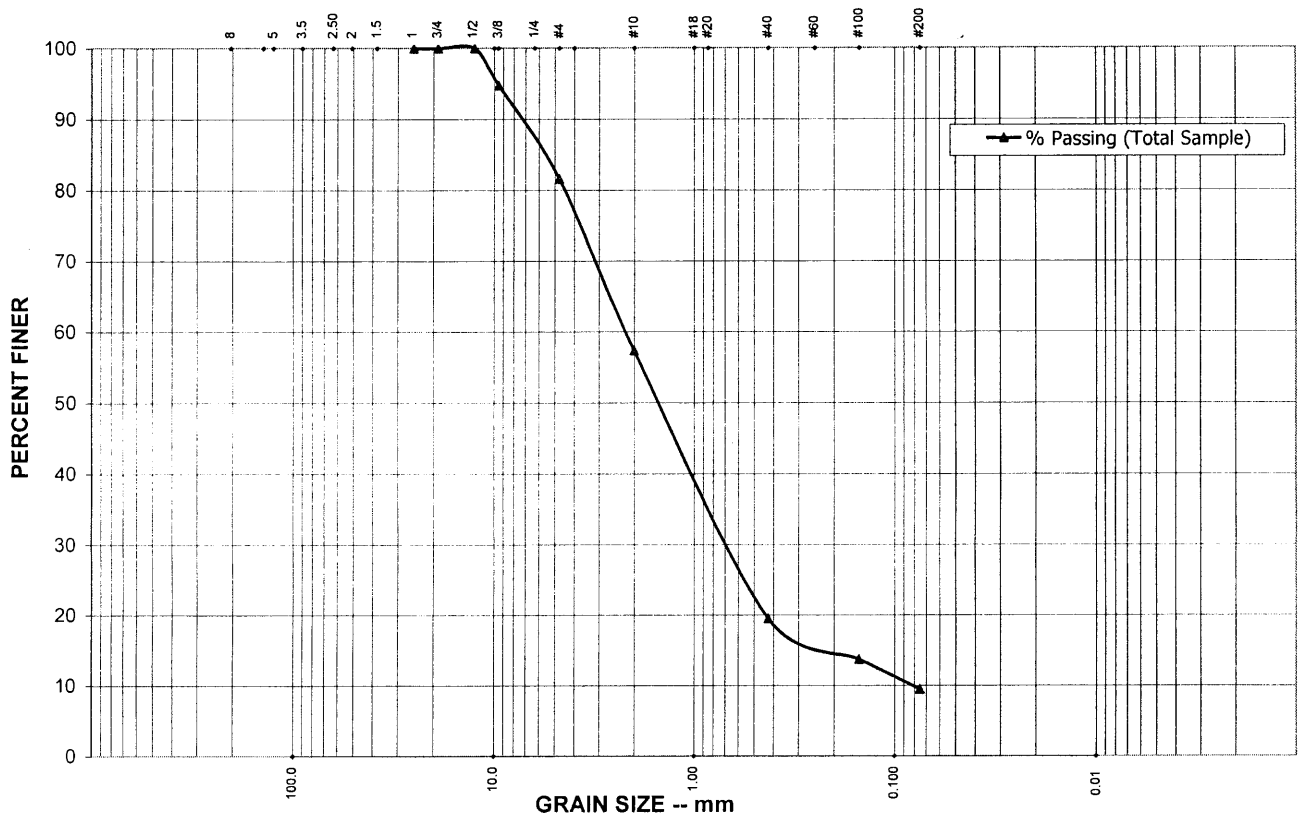
Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	25.00	88.4			
12.5	1/2"	39.00	81.9			
9.5	3/8"	50.00	76.7			
6.3	1/4"					
4.75	#4	65.00	69.8			
2.00	#10	81.00	62.3			
1.00	#18					
0.425	#40	127.00	40.9			
0.250	#60					
0.150	#100	166.00	22.8			
0.075	#200	178.00	17.2			
	Total Dry Wt.	215				
	Split Wt.					

Project: VN Engineers,Inc.	Project No.: J2031487C	Date: 8/10/2007	
City: North Haven,CT	Specification: Not Provided	Lab No: C1862-07	
Source: B101 S-6, 25'-27'	Sampled from: Provided by client		
JGI EASTERN, Inc.	Remarks: Natural moisture content = 25.6%		
114 Woodlawn Road Berlin, CT 06037 (860) 829-1725 fax: (860) 829-1745 www.jgieastern.com	Tested By: M.F.	Date: 8/11/2007	
	Reviewed By:	Date: 8/13/07	

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		33.6	52.6	13.9	Silt (>0.002mm)	Clay (<0.002mm)
0.0	18.4	% Sand		72.1	9.5	

Classification: BROWN C-F SAND, little C-F Gravel, trace Silt

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	10.00	94.7			
6.3	1/4"					
4.75	#4	35.00	81.6			
2.00	#10	81.00	57.4			
1.00	#18					
0.425	#40	153.00	19.5			
0.250	#60					
0.150	#100	164.00	13.7			
0.075	#200	172.00	9.5			
	Total Dry Wt.	190				
	Split Wt.					

Project:	**VN Engineers,Inc.**	Project No.:	**J2031487C**	Date:	**8/9/2007**
City:	North Haven,CT	Specification:	Not Provided	Lab No:	**C1851-07**
Source:	B102 S-4, 15'-17'	Sampled from:	Provided by client		

JGI EASTERN, Inc. A Terracon COMPANY

114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks: Natural moisture content = 6.5%

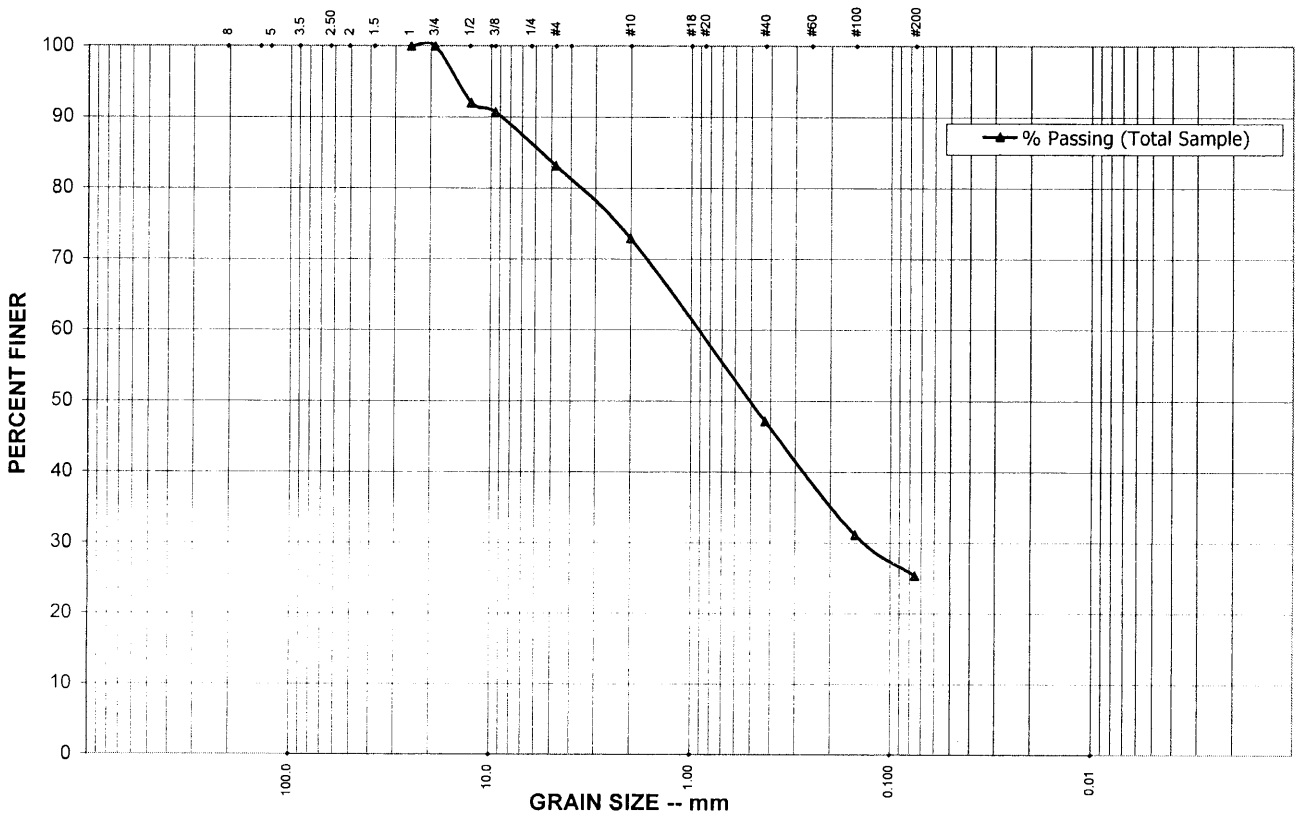
Tested By: M.F. Date: 8/10/2007

Reviewed By: KJTS Date: 8/11/07

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		17.7	44.6	37.7	Silt (>0.002mm)	Clay (<0.002mm)
0.0	16.9	% Sand		57.8	25.3	

Classification: BROWN C-F SAND, some Sand, little fine Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	0.00	100.0			
12.5	1/2"	18.00	92.0			
9.5	3/8"	21.00	90.7			
6.3	1/4"					
4.75	#4	38.00	83.1			
2.00	#10	61.00	72.9			
1.00	#18					
0.425	#40	119.00	47.1			
0.250	#60					
0.150	#100	155.00	31.1			
0.075	#200	168.00	25.3			
	Total Dry Wt.	225				
	Split Wt.					

Project:	**VN Engineers,Inc.**	Project No.:	**J2031487C**	Date:	**8/9/2007**
City:	North Haven,CT	Specification:	Not Provided	Lab No:	**C1854-07**
Source:	B104 S-3, 10'-12'	Sampled from:	Provided by client		

JGI EASTERN, Inc. A Terracon COMPANY

114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks: Natural moisture content = 11.6%

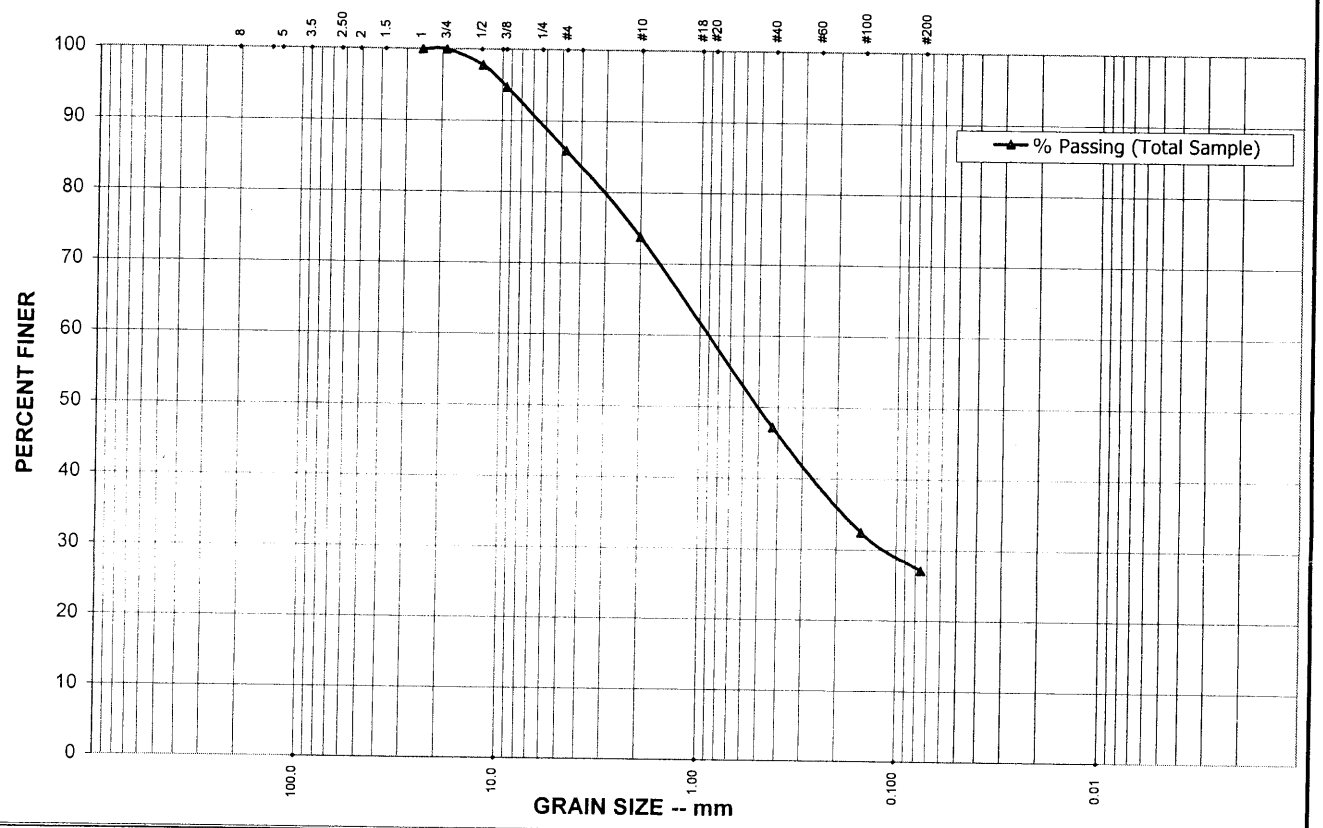
Tested By: M.F. Date: 8/10/2007

Reviewed By: KGM Date: 8/11/07

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		20.5	45.5	34.1	Silt (>0.002mm)	Clay (<0.002mm)
0.0	14.2	% Sand		58.7	27.1	

Classification: BROWN C-F SAND, some Silt, little Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	0.00	100.0			
12.5	1/2"	5.00	97.8			
9.5	3/8"	12.00	94.7			
6.3	1/4"					
4.75	#4	32.00	85.8			
2.00	#10	59.00	73.8			
1.00	#18					
0.425	#40	119.00	47.1			
0.250	#60					
0.150	#100	152.00	32.4			
0.075	#200	164.00	27.1			
	Total Dry Wt.	225				
	Split Wt.					

Project: **VN Engineers,Inc.**	Project No.: **J2031487C**	Date: **8/9/2007**	
City: North Haven,CT	Specification: Not Provided	Lab No: **C1848-07**	
Source: B106 S-1, 1'-3'	Sampled from: Provided by client		

JGI EASTERN, Inc. A Terracon COMPANY

114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks: Natural moisture content = 11.1%

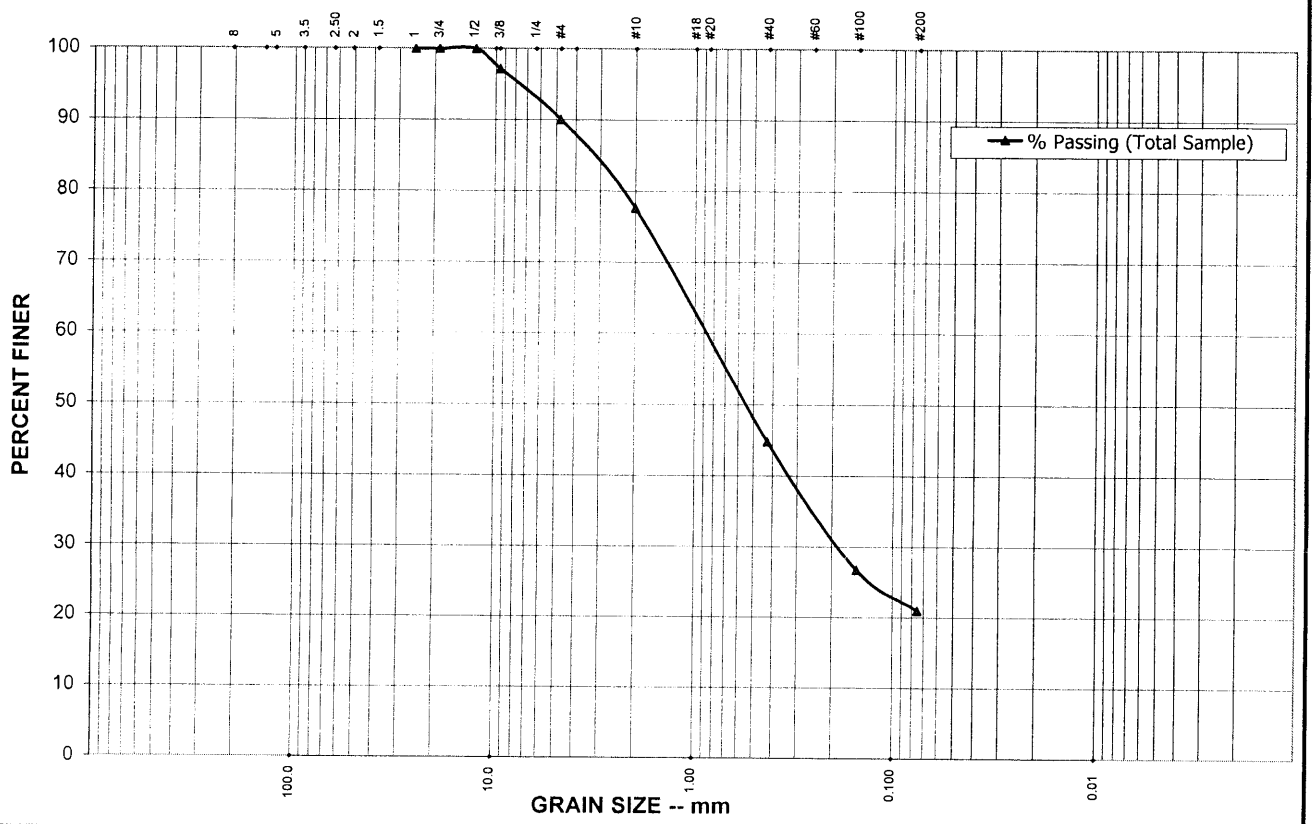
Tested By: M.F. Date: 8/10/2007

Reviewed By: KMS Date: 8/11/07

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		17.9	47.6	34.5	Silt (>0.002mm)	Clay (<0.002mm)
0.0	10.0	% Sand		69.0	21.0	

Classification: BROWN C-F SAND, some Silt, trace fine Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	6.00	97.1			
6.3	1/4"					
4.75	#4	21.00	90.0			
2.00	#10	47.00	77.6			
1.00	#18					
0.425	#40	116.00	44.8			
0.250	#60					
0.150	#100	154.00	26.7			
0.075	#200	166.00	21.0			
	Total Dry Wt.	210				
	Split Wt.					

Project:	**VN Engineers,Inc.**	Project No.:	**J2031487C**	Date:	**8/9/2007**
City:	North Haven,CT	Specification:	Not Provided	Lab No:	**C1850-07**
Source:	B107 S-1, 5'-7'	Sampled from:	Provided by client		

JGI EASTERN, Inc. A Terracon COMPANY

114 Woodlawn Road

Berlin, CT 06037

(860) 829-1725 fax: (860) 829-1745

www.jgieastern.com

Remarks: Natural moisture content = 8.1%

Tested By: M.F. Date: 8/10/2007

Reviewed By: KTS Date: 8/14/07

ASTM C136GSP1, Rev. 5

PLASTICITY TEST REPORT

Report Number: J2031487C.0038
Service Date: 12/23/09
Report Date: 12/28/09

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

VN Engineers, Inc.
Attn: Sofia Nirshberg, P.E.
116 Washington Avenue
North Haven, CT 06473

Project

VN Engineering Testing Services
Laboratory Testing Services
Various Locations, CT

Project Number J2031487C

Material Information

Source of Material: New Britain HTFD Busway
Proposed Use: Not provided
Soil Description: Not performed

Classification: Not performed

Sample Information

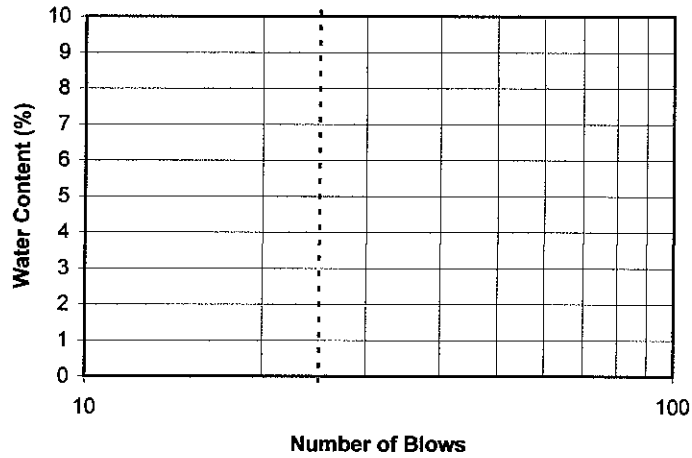
Sample Location: B-108, SS-1, 0 - 2 feet
Sampled By: Made by Client
Sample Date: 12/23/09

Laboratory Test Data

	Result	Requirements
Liquid Limit:	Non-plastic	
Plastic Limit:	Non-plastic	
Plasticity Index:	Non-plastic	
In-Place Moist. (%):		

Liquid Limit Method: Method A
Sample Preparation: Dry

Liquid Limit Determination



Comments:
Soil is Non-Plastic

Terracon Rep: Made by Client
Reported To:
Contractor:
Report Distribution:

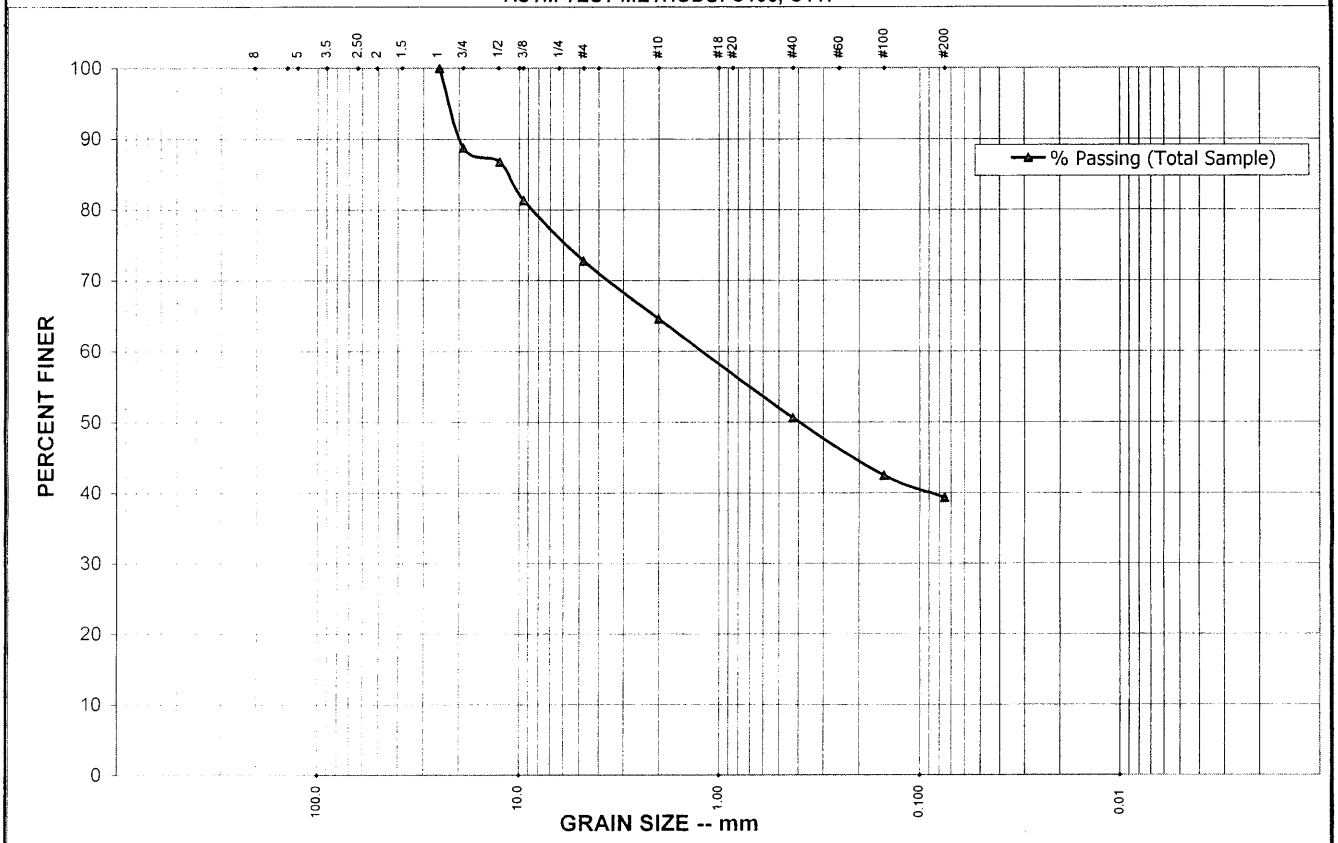
Reviewed By: for Kevin J. Brigandi
Principal, Department Manager

Test Methods: ASTM D4318

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		24.4	41.9	33.7	Silt (>0.002mm)	Clay (<0.002mm)
0.0	27.2	% Sand		33.5	39.3	

Classification: BROWN SILT, some C-F Sand and C-F Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	29.00	88.7			
12.5	1/2"	34.00	86.8			
9.5	3/8"	48.00	81.3			
6.3	1/4"					
4.75	#4	70.00	72.8			
2.00	#10	91.00	64.6			
1.00	#18					
0.425	#40	127.00	50.6			
0.250	#60					
0.150	#100	148.00	42.4			
0.075	#200	156.00	39.3			
	Total Dry Wt.	257				
	Split Wt.					

Project:	**VN Engineers,Inc.**	Project No.:	**J2031487C**	Date:	**8/9/2007**
City:	North Haven,CT	Specification:	Not Provided	Lab No:	**C1849-07**
Source:	B109 S-1, 5'-7'	Sampled from:	Provided by client		

JGI EASTERN, Inc.
A Terracon COMPANY

114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks: Natural moisture content = 8.6%

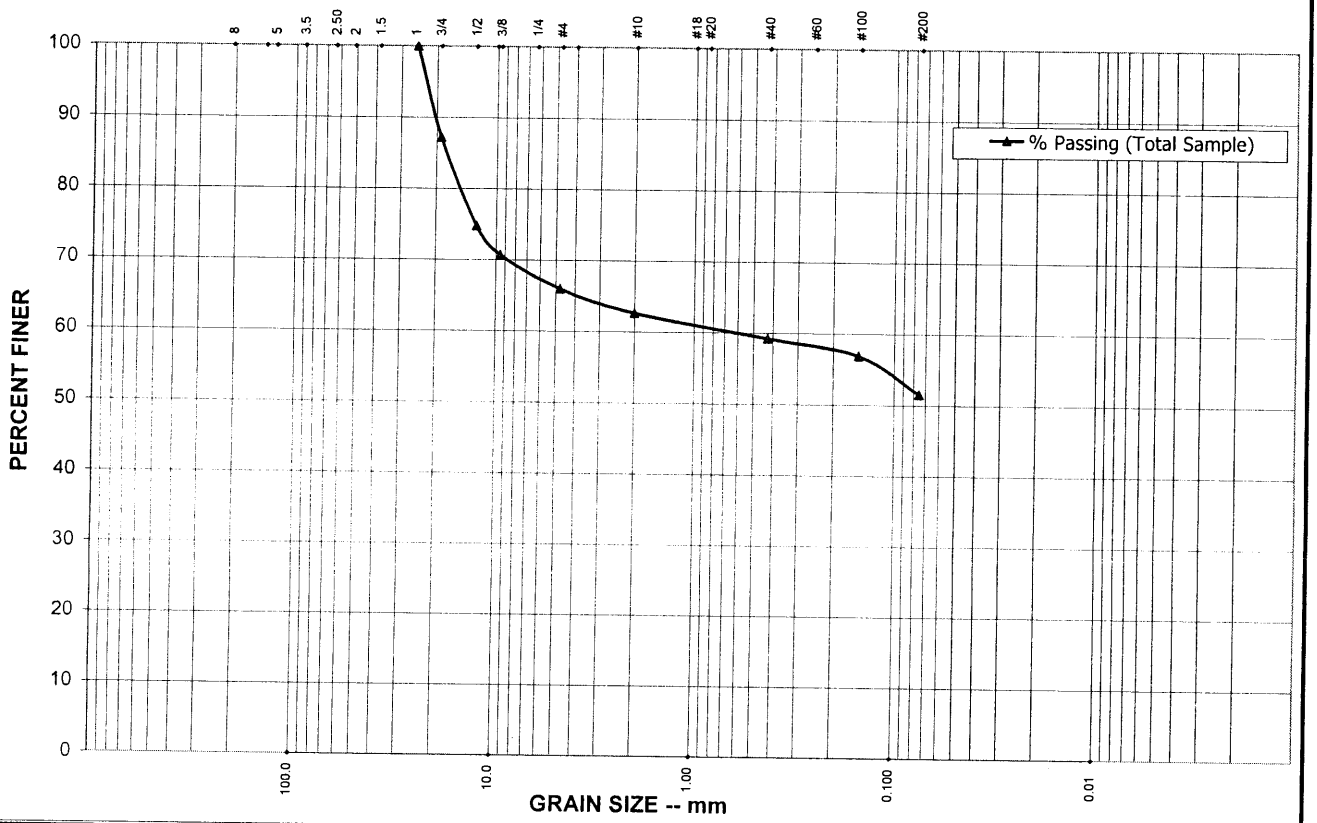
Tested By: M.F. Date: 8/10/2007

Reviewed By: [illegible] Date: 8/10/07

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		23.3	23.3	53.5	Silt (>0.002mm)	Clay (<0.002mm)
0.0	34.0	% Sand		14.5	51.5	

Classification: BROWN SILT, some C-F Gravel, little C-F Sand

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	38.00	87.2			
12.5	1/2"	75.00	74.7			
9.5	3/8"	87.00	70.7			
6.3	1/4"					
4.75	#4	101.00	66.0			
2.00	#10	111.00	62.6			
1.00	#18					
0.425	#40	121.00	59.3			
0.250	#60					
0.150	#100	128.00	56.9			
0.075	#200	144.00	51.5			
	Total Dry Wt.	297				
	Split Wt.					

Project:	**VN Engineers,Inc.**	Project No.: **J2031487C**	Date: **8/9/2007**
City:	North Haven,CT	Specification: Not Provided	Lab No: **C1847-07**
Source:	B111 S-2, 5'-7'	Sampled from: Provided by client	

JGI EASTERN, Inc.
A Terracon COMPANY

114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks: Natural moisture content = 10.8%

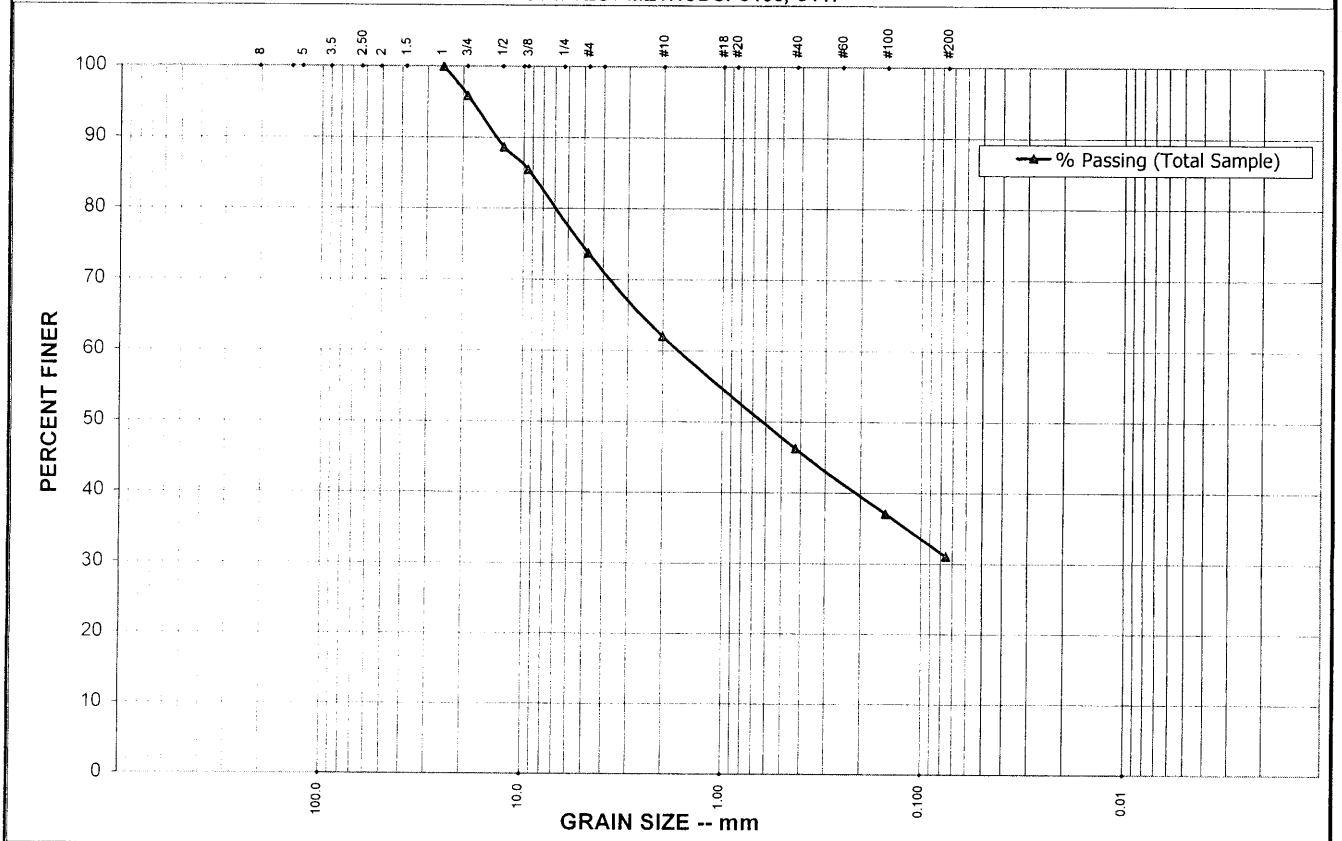
Tested By: M.F. Date: 8/10/2007

Reviewed By: [signature] Date: 8/11/07

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		27.4	37.0	35.6	Silt (>0.002mm)	Clay (<0.002mm)
0.0	26.3	% Sand		42.7	31.0	

Classification: BROWN C-F SAND, some Silt and C-F Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	13.00	95.9			
12.5	1/2"	36.00	88.6			
9.5	3/8"	46.00	85.4			
6.3	1/4"					
4.75	#4	83.00	73.7			
2.00	#10	120.00	62.0			
1.00	#18					
0.425	#40	170.00	46.2			
0.250	#60					
0.150	#100	199.00	37.0			
0.075	#200	218.00	31.0			
	Total Dry Wt.	316				
	Split Wt.					

Project:	VN Engineers,Inc.	Project No.:	J2031487C	Date:	8/9/2007
City:	North Haven,CT	Specification:	Not Provided	Lab No:	C1858-07
Source:	B112 S-1, 0'-2'	Sampled from:	Provided by client		

JGI EASTERN, Inc. A Terracon Company

114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks: Natural moisture content = 9.2%

Tested By: M.F. Date: 8/10/2007

Reviewed By: [signature] Date: 8/11/07

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117

% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		25.1	43.3	31.5	Silt (>0.002mm)	Clay (<0.002mm)
0.0	27.5	% Sand		61.3	11.2	

Classification: BROWN C-F SAND, some C-F Gravel, little Silt

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	0.00	100.0			
12.5	1/2"	14.00	95.8			
9.5	3/8"	35.00	89.4			
6.3	1/4"					
4.75	#4	91.00	72.5			
2.00	#10	142.00	57.1			
1.00	#18					
0.425	#40	230.00	30.5			
0.250	#60					
0.150	#100	281.00	15.1			
0.075	#200	294.00	11.2			
	Total Dry Wt.	331				
	Split Wt.					

Project:	**VN Engineers,Inc.**	Project No.:	**J2031487C**	Date:	**8/9/2007**
City:	North Haven,CT	Specification:	Not Provided	Lab No:	**C1852-07**
Source:	B113 S-4, 15'-17'	Sampled from:	Provided by client		

JGI EASTERN, Inc. A Terracon COMPANY

114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks: Natural moisture content = 12.1%

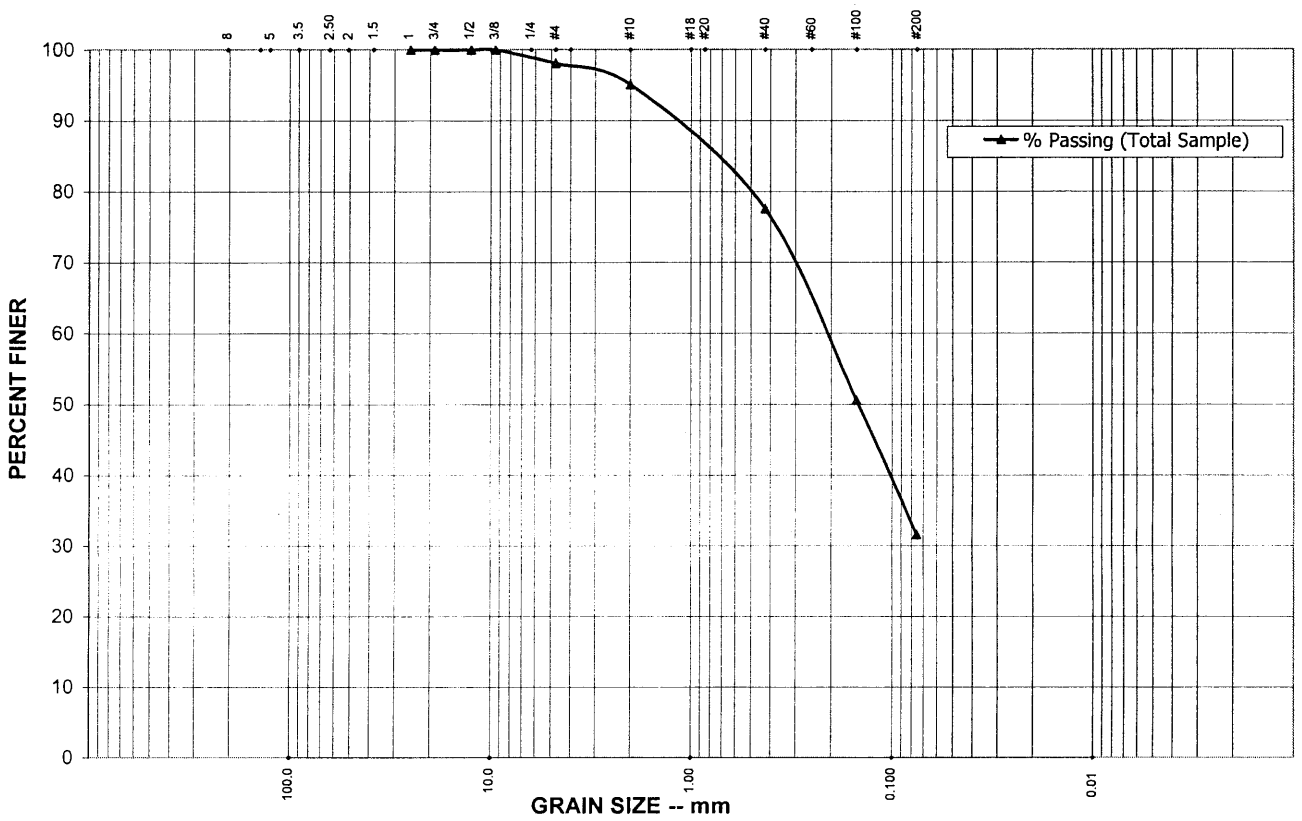
Tested By: M.F. Date: 8/10/2007

Reviewed By: KGS Date: 8/14/07

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		4.6	26.3	69.1	Silt (>0.002mm)	Clay (<0.002mm)
0.0	1.9		% Sand	66.5	31.6	

Classification: BROWN C-F SAND, some Silt, trace fine Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	0.00	100.0			
6.3	1/4"					
4.75	#4	5.00	98.1			
2.00	#10	13.00	95.1			
1.00	#18					
0.425	#40	59.00	77.6			
0.250	#60					
0.150	#100	130.00	50.6			
0.075	#200	180.00	31.6			
	Total Dry Wt.	263				
	Split Wt.					

Project:	**VN Engineers,Inc.**	Project No.:	**J2031487C**	Date:	**8/9/2007**
City:	North Haven,CT	Specification:	Not Provided	Lab No:	**C1853-07**
Source:	B114 S-5, 20'-22'	Sampled from:	Provided by client		

JGI EASTERN, Inc.
A Terracon COMPANY

114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks: Natural moisture content = 15.6%

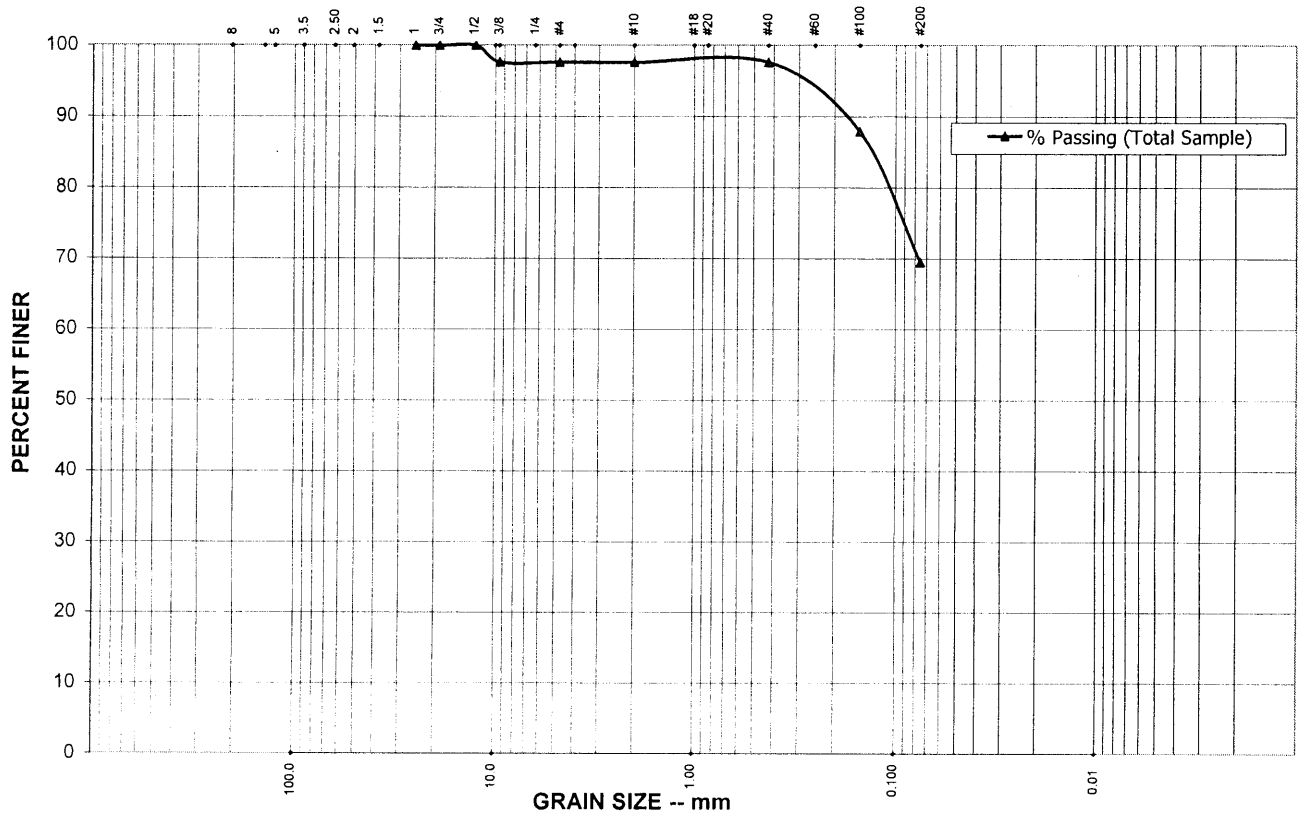
Tested By: M.F. Date: 8/10/2007

Reviewed By: KJS Date: 8/11/07

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		0.0	0.0	100.0	Silt (>0.002mm)	Clay (<0.002mm)
0.0	2.3	% Sand		28.1	69.5	

Classification: BROWN SILT, some C-F Sand, trace fine Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	6.00	97.7			
6.3	1/4"					
4.75	#4	6.00	97.7			
2.00	#10	6.00	97.7			
1.00	#18					
0.425	#40	6.00	97.7			
0.250	#60					
0.150	#100	31.00	87.9			
0.075	#200	78.00	69.5			
	Total Dry Wt.	256				
	Split Wt.					

Project:	**VN Engineers,Inc.**	Project No.:	**J2031487C**	Date:	**8/9/2007**
City:	North Haven,CT	Specification:	Not Provided	Lab No:	**C1857-07**
Source:	B115 S-4, 15'-17'	Sampled from:	Provided by client		

JGI EASTERN, Inc. A Terracon COMPANY

114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks: Natural moisture content = 20.3%

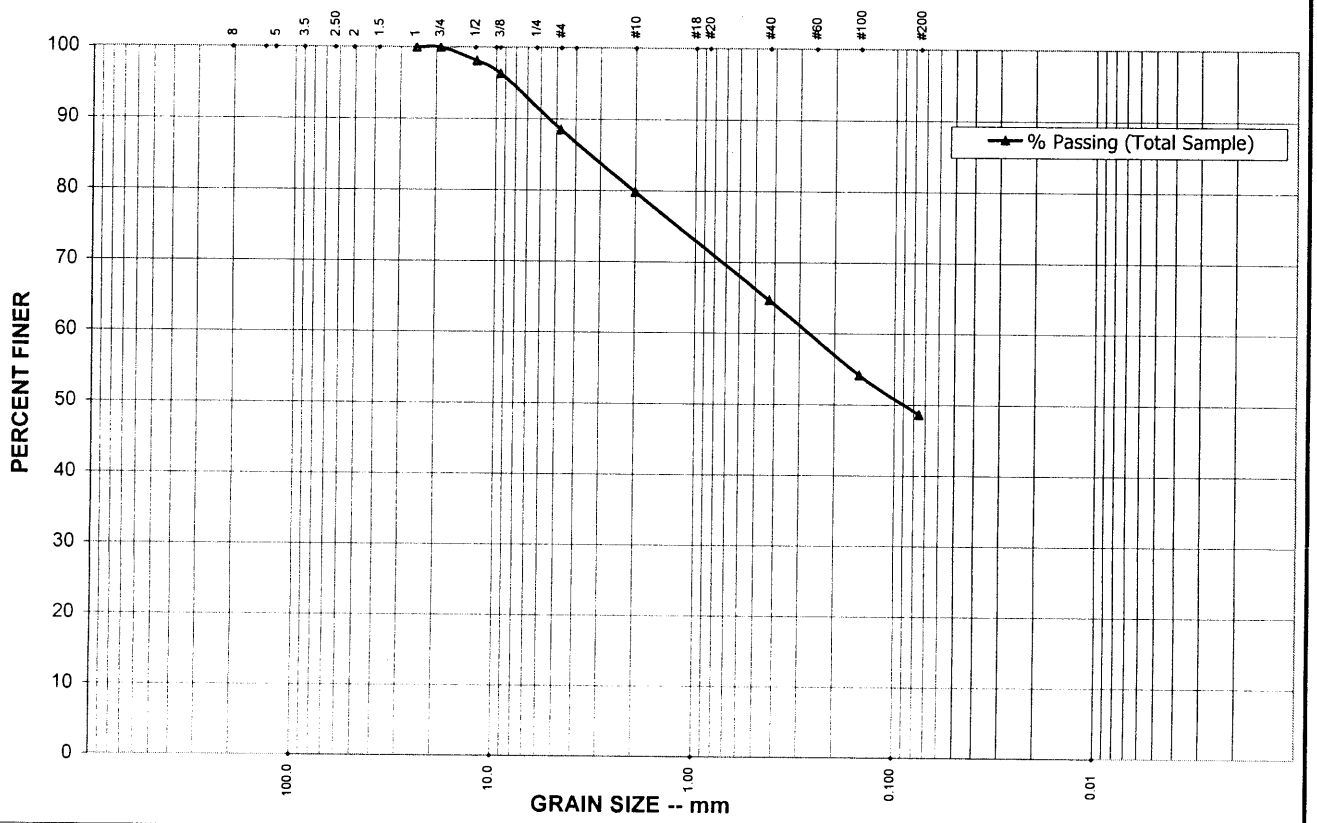
Tested By: M.F. Date: 8/10/2007

Reviewed By: [signature] Date: 8/11/07

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		21.8	37.9	40.2	Silt (>0.002mm)	Clay (<0.002mm)
0.0	11.5	% Sand		39.9	48.6	

Classification: BROWN SILT, and C-F Sand, little fine Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	0.00	100.0			
12.5	1/2"	4.00	98.2			
9.5	3/8"	8.00	96.3			
6.3	1/4"					
4.75	#4	25.00	88.5			
2.00	#10	44.00	79.8			
1.00	#18					
0.425	#40	77.00	64.7			
0.250	#60					
0.150	#100	100.00	54.1			
0.075	#200	112.00	48.6			
	Total Dry Wt.	218				
	Split Wt.					

Project:	**VN Engineers,Inc.**	Project No.:	**J2031487C**	Date:	**8/9/2007**
City:	North Haven,CT	Specification:	Not Provided	Lab No:	**C1855-07**
Source:	B116 S-3, 5'-7'	Sampled from:	Provided by client		

JGI EASTERN, Inc. A Terracon COMPANY

114 Woodlawn Road

Berlin, CT 06037

(860) 829-1725 fax: (860) 829-1745

www.jgieastern.com

Remarks: Natural moisture content = 14.7%

Tested By: M.F. Date: 8/10/2007

Reviewed By: KSB Date: 8/11/07

ASTM C136GSP1, Rev. 5

PLASTICITY TEST REPORT

Report Number: J2031487C.0039
Service Date: 12/23/09
Report Date: 12/28/09

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

VN Engineers, Inc.
Attn: Sofia Nirshberg, P.E.
116 Washington Avenue
North Haven, CT 06473

Project

VN Engineering Testing Services
Laboratory Testing Services
Various Locations, CT

Project Number J2031487C

Material Information

Source of Material: New Britain HTFD Busway
Proposed Use: Not provided
Soil Description: Not performed

Classification: Not performed

Sample Information

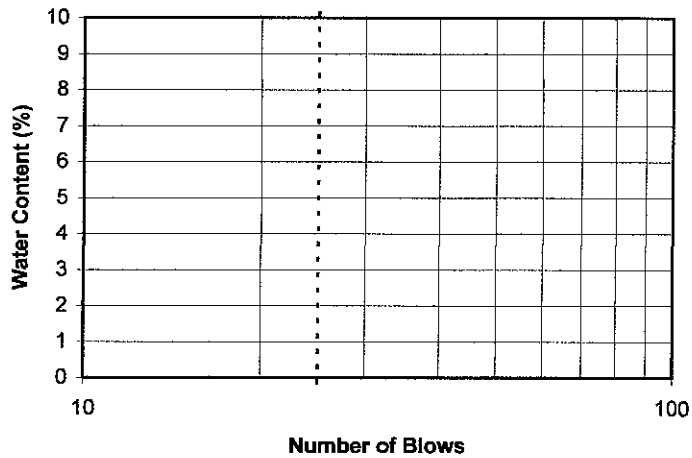
Sample Location: B-116, SS-1, 0 - 2 feet
Sampled By: Made by Client
Sample Date: 12/23/09

Laboratory Test Data

	Result	Requirements
Liquid Limit:	Non-plastic	
Plastic Limit:	Non-plastic	
Plasticity Index:	Non-plastic	
In-Place Moist. (%):		

Liquid Limit Method: Method A
Sample Preparation: Dry

Liquid Limit Determination



Comments:
Soil is Non-Plastic

Terracon Rep: Made by Client
Reported To:
Contractor:
Report Distribution:

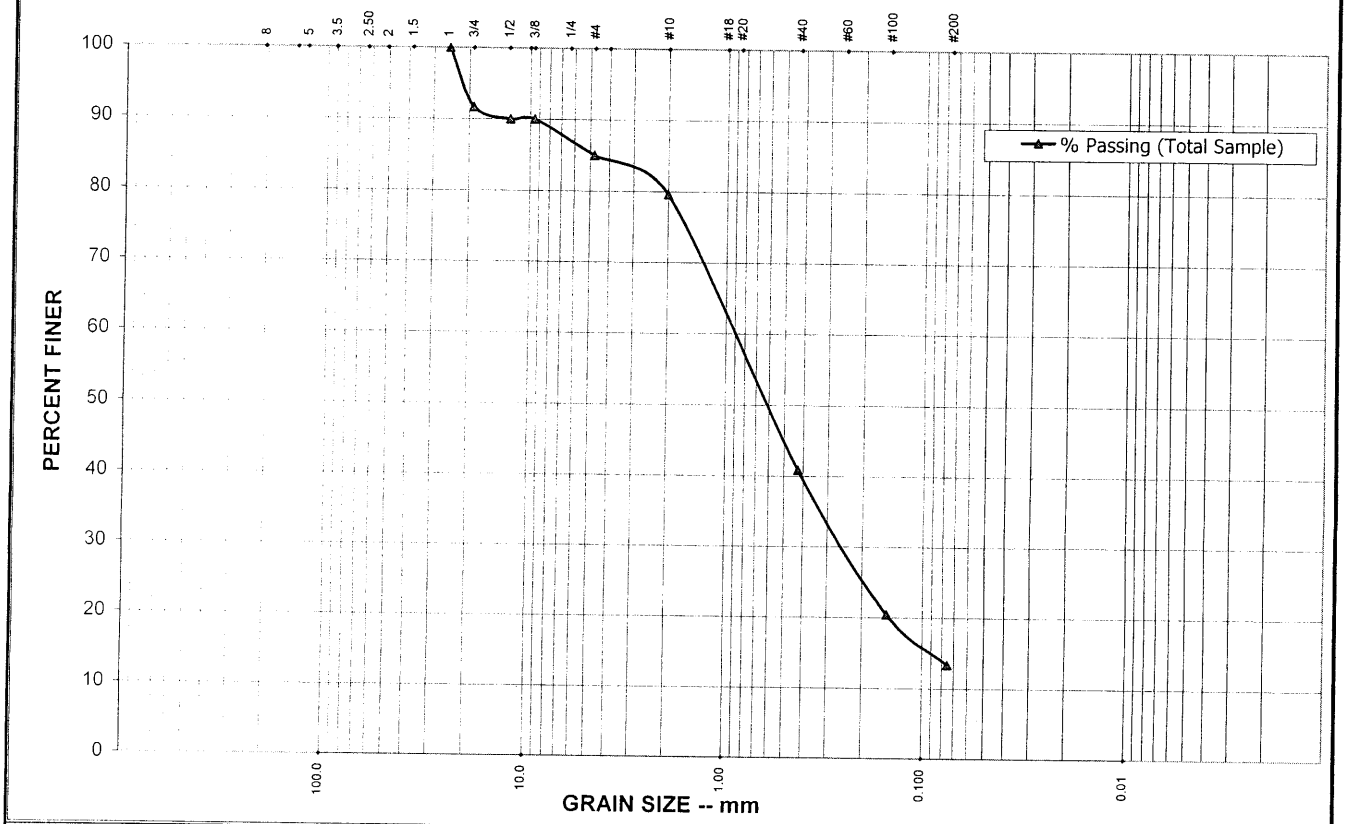
Reviewed By:
Kevin J. Brigandi
Principal, Department Manager

Test Methods: ASTM D4318

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		7.6	54.1	38.4	Silt (>0.002mm)	Clay (<0.002mm)
0.0	15.0		% Sand	71.7	13.3	

Classification: BROWN C-F SAND, little C-F Gravel and Silt

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	20.00	91.7			
12.5	1/2"	24.00	90.0			
9.5	3/8"	24.00	90.0			
6.3	1/4"					
4.75	#4	36.00	85.0			
2.00	#10	49.00	79.6			
1.00	#18					
0.425	#40	142.00	40.8			
0.250	#60					
0.150	#100	191.00	20.4			
0.075	#200	208.00	13.3			
	Total Dry Wt.	240				
	Split Wt.					

Project:	VN Engineers,Inc.	Project No.:	J2031487C	Date:	8/9/2007
City:	North Haven,CT	Specification:	Not Provided	Lab No:	C1856-07
Source:	B117 S-1, 0'-2'	Sampled from:	Provided by client		

EASTERN, Inc.
A Terracon COMPANY
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Remarks: Natural moisture content = 5.4%

Tested By: M.F. Date: 8/10/2007

Reviewed By: [illegible] Date: 8/14/07

ASTM C136GSP1, Rev. 5

PLASTICITY TEST REPORT

Report Number: J2031487C.0040
Service Date: 12/23/09
Report Date: 12/29/09

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

VN Engineers, Inc.
Attn: Sofia Nirshberg, P.E.
116 Washington Avenue
North Haven, CT 06473

Project

VN Engineering Testing Services
Laboratory Testing Services
Various Locations, CT

Project Number J2031487C

Material Information

Source of Material: New Britain HTFD Busway
Proposed Use: Not provided
Soil Description: Not performed

Classification: Not performed

Sample Information

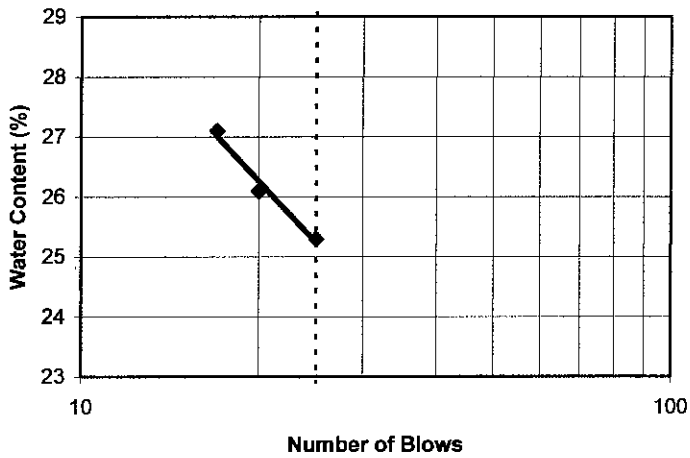
Sample Location: B-117, SS-2, 4 - 6 feet
Sampled By: Made by Client
Sample Date: 12/23/09

Laboratory Test Data

	Result	Requirements
Liquid Limit:	25	
Plastic Limit:	20	
Plasticity Index:	5	
In-Place Moist. (%):		

Liquid Limit Method: Method A
Sample Preparation: Dry

Liquid Limit Determination



Terracon Rep: Made by Client
Reported To:
Contractor:
Report Distribution:

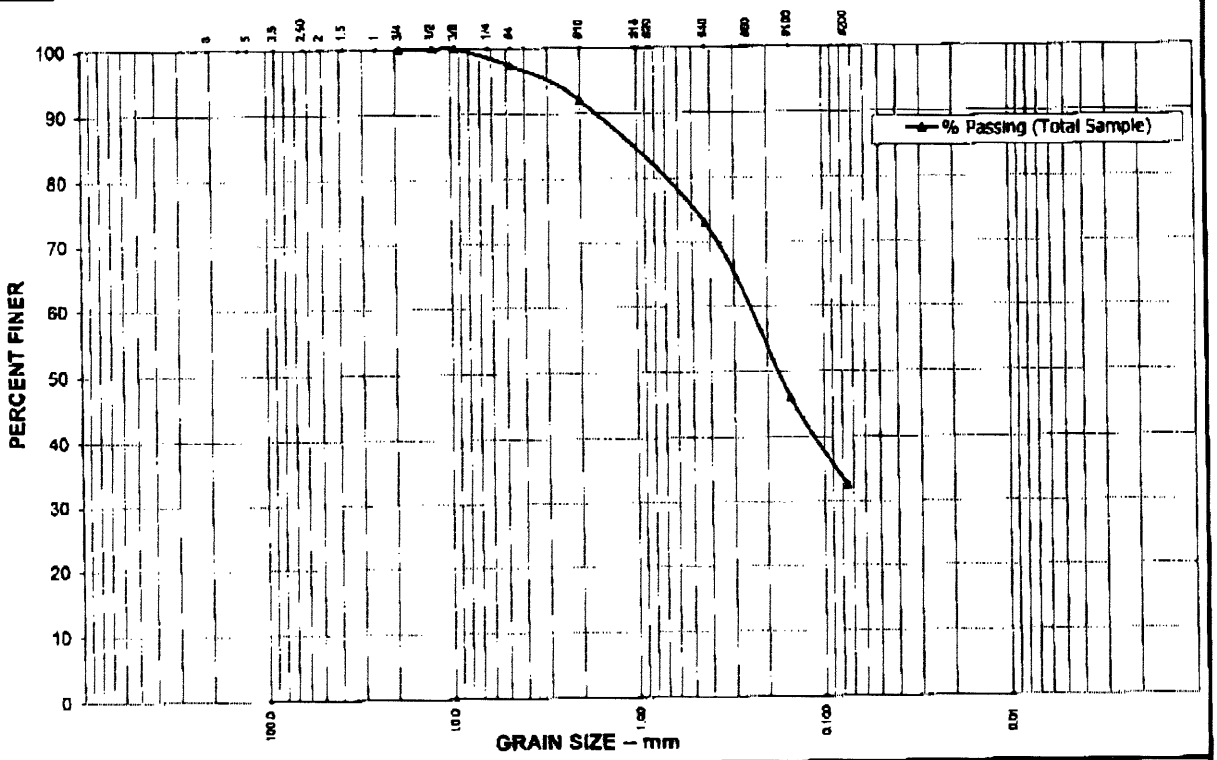
Reviewed By: for Kevin J. Brigandi
Principal, Department Manager

Test Methods: ASTM D4318

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		8.3	29.2	62.5	Silt (>0.002mm)	Clay (<0.002mm)
0.0	2.7		% Sand	64.8	32.4	

Classification: RED BROWN C-F Sand, some Silt, trace Fine Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	0.00	100.0			
6.3	1/4"					
4.75	#4	0.01	97.3			
2.00	#10	0.03	91.9			
1.00	#18					
0.425	#40	0.10	73.0			
0.250	#60					
0.150	#100	0.20	45.9			
0.075	#200	0.25	32.4			
	Total Dry Wt.	0.37				
	Split Wt.					

Project:	VN Engineers,Inc.	Project No.: J2031487C	Date: 7/10/2007
City:	North Haven,CT	Specification: Not Provided	Lab No: C1732-07
Source:	B118, S-2, 2'-4'	Sampled from: Provided by client , Job No. 27-107	
		Remarks: Natural moisture content = 13.5%	

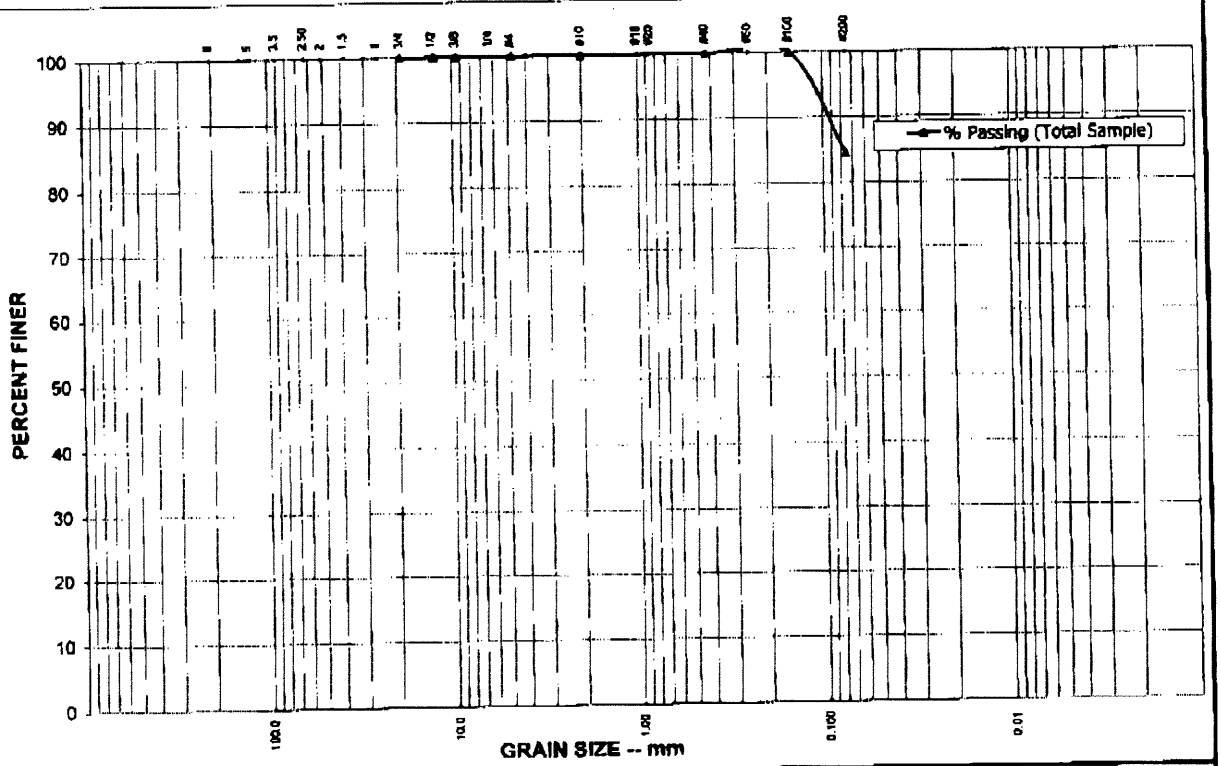
JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Tested By: M.F. Date: 7/19/2007
Reviewed By: Date:

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		0.0	0.0	100.0	Silt (>0.002mm)	Clay (<0.002mm)
0.0	0.0		% Sand	15.6	84.4	

Classification: RED BROWN SILT, little Fine Sand

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	0.00	100.0			
6.3	1/4"					
4.75	#4	0.00	100.0			
2.00	#10	0.00	100.0			
1.00	#18					
0.425	#40	0.00	100.0			
0.250	#60					
0.150	#100	0.00	100.0			
0.075	#200	0.05	84.4			
	Total Dry Wt.	0.32				
	Split Wt.					

Project:	VN Engineers,Inc.	Project No.: J2031487C	Date: 7/10/2007
City:	North Haven,CT	Specification: Not Provided	Lab No: C1736-07
Source:	B119,S-3, 4'-8'	Sampled from: Provided by client . Job No. 27-107	
		Remarks: Natural moisture content = 25.0%	

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1726 fax: (860) 829-1745
www.jgieastern.com

Tested By: M.F. Date: 7/21/2007
Reviewed By: Date:

ASTM C136GSP1, Rev. 5

PLASTICITY TEST REPORT

Report Number: J2031487C.0041
Service Date: 12/23/09
Report Date: 12/28/09

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

VN Engineers, Inc.
Attn: Sofia Nirshberg, P.E.
116 Washington Avenue
North Haven, CT 06473

Project

VN Engineering Testing Services
Laboratory Testing Services
Various Locations, CT

Project Number J2031487C

Material Information

Source of Material: B-119, SS-2, 2 - 4 feet
Proposed Use: Not provided
Soil Description: Not performed

Classification: Not performed

Sample Information

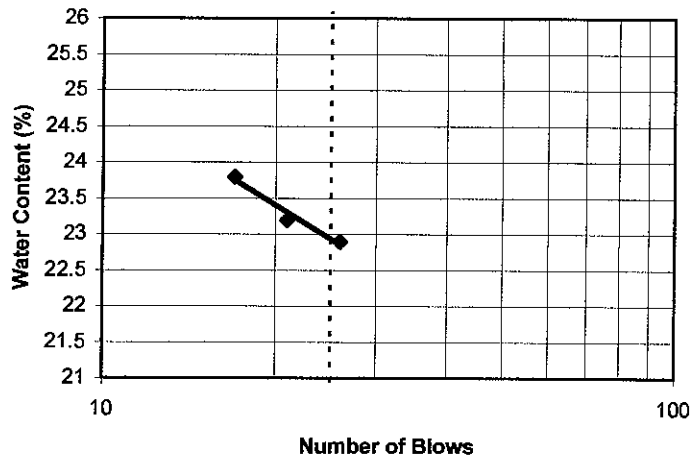
Sample Location:
Sampled By: Made by Client
Sample Date: 12/23/09

Laboratory Test Data

	Result	Requirements
Liquid Limit:	23	
Plastic Limit:	20	
Plasticity Index:	3	
In-Place Moist. (%):		

Liquid Limit Method: Method A
Sample Preparation: Dry

Liquid Limit Determination



Terracon Rep: Made by Client
Reported To:
Contractor:
Report Distribution:

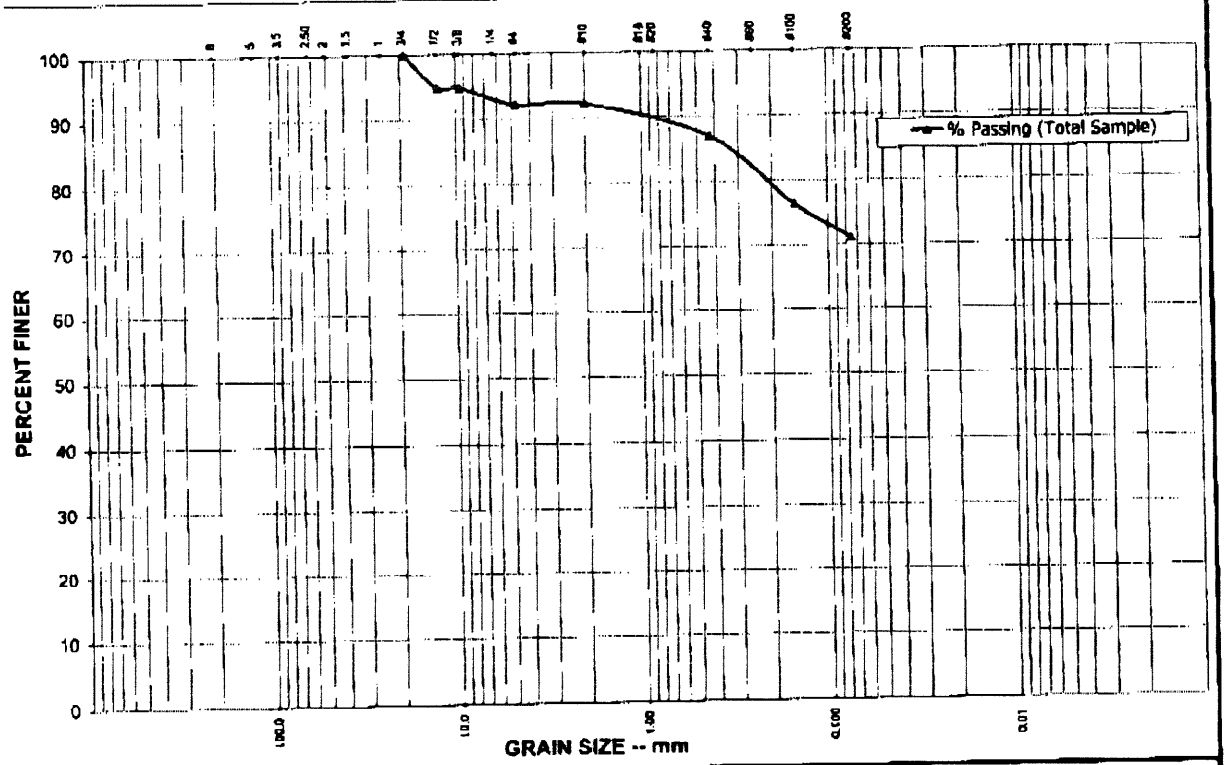
Reviewed By: for Kevin J. Brigandi
Principal, Department Manager

Test Methods: ASTM D4318

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C138, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		0.0	25.0	75.0	Silt (>0.002mm)	Clay (<0.002mm)
0.0	7.9		% Sand	21.1	71.1	

Classification: RED BROWN SILT, some M-F Sand, trace Fine Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.02	94.7			
9.5	3/8"	0.02	94.7			
6.3	1/4"					
4.75	#4	0.03	92.1			
2.00	#10	0.03	92.1			
1.00	#18					
0.425	#40	0.05	86.8			
0.250	#60					
0.150	#100	0.09	76.3			
0.075	#200	0.11	71.1			
	Total Dry Wt.	0.38				
	Split Wt.					

Project: VN Engineers,Inc.	Project No.: J2031487C	Date: 7/10/2007	
City: North Haven,CT	Specification: Not Provided	Lab No: C1736-07	
Source: B120, S-4, 10'-12'	Sampled from: Provided by client , Job No. 27-107		
JGI EASTERN, Inc. 114 Woodlawn Road Berlin, CT 06037 (860) 829-1725 fax: (860) 829-1746 www.jgieastern.com	Remarks: Natural moisture content = 15.8%		
	Tested By: M.F.	Date: 7/21/2007	
	Reviewed By:	Date:	

ASTM C136GSP1, Rev. 5

PLASTICITY TEST REPORT

Report Number: J2031487C.0042
Service Date: 12/23/09
Report Date: 12/28/09

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

VN Engineers, Inc.
Attn: Sofia Nirshberg, P.E.
116 Washington Avenue
North Haven, CT 06473

Project

VN Engineering Testing Services
Laboratory Testing Services
Various Locations, CT

Project Number J2031487C

Material Information

Source of Material: New Britain HTFD Busway
Proposed Use: Not provided
Soil Description: Not performed

Classification: Not performed

Sample Information

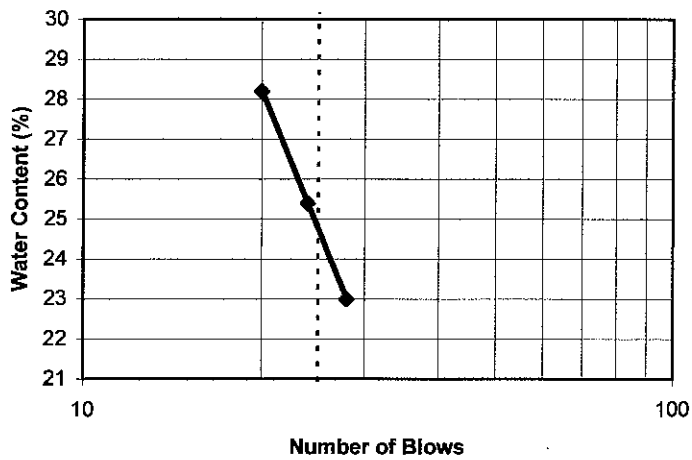
Sample Location: B-121, SS-1, 1 - 3 feet
Sampled By: Made by Client
Sample Date: 12/23/09

Laboratory Test Data

	Result	Requirements
Liquid Limit:	25	
Plastic Limit:	20	
Plasticity Index:	5	
In-Place Moist. (%):		

Liquid Limit Method: Method A
Sample Preparation: Dry

Liquid Limit Determination



Terracon Rep: Made by Client
Reported To:
Contractor:
Report Distribution:

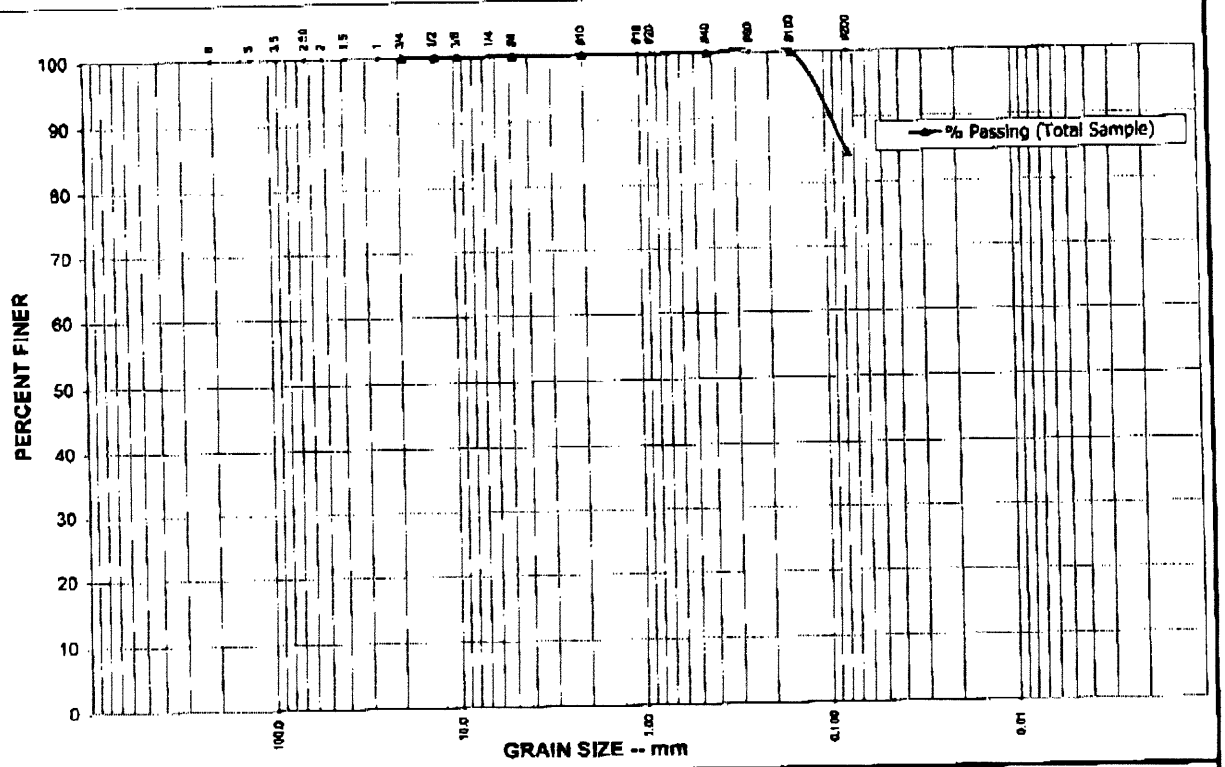
Reviewed By: _____
Kevin J. Brigandi
Principal, Department Manager

Test Methods: ASTM D4318

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		0.0	0.0	100.0	Silt (>0.002mm)	Clay (<0.002mm)
0.0	0.0	% Sand		15.6	84.4	

Classification: RED BROWN Silt, little Fine sand

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	0.00	100.0			
6.3	1/4"					
4.75	#4	0.00	100.0			
2.00	#10	0.00	100.0			
1.00	#18					
0.425	#40	0.00	100.0			
0.250	#60					
0.150	#100	0.00	100.0			
0.075	#200	0.07	84.4			
	Total Dry Wt.	0.45				
	Split Wt.					

Project: VN Engineers,Inc.	Project No.: J2031487C	Date: 7/10/2007	
City: North Haven,CT	Specification: Not Provided	Lab No: C1727-07	
Source: B122, S-3, 5'-7'	Sampled from: Provided by client , Job No. 27-107		
JGI EASTERN, Inc.	114 Woodlawn Road Berlin, CT 06037 (860) 828-1725 fax: (860) 829-1745 www.jgieastern.com	Remarks: Natural moisture content = 24.4%	
		Tested By: M.F.	Date: 7/19/2007
		Reviewed By:	Date:

ASTM C136GSP1, Rev. 5

PLASTICITY TEST REPORT

Report Number: J2031487C.0043
Service Date: 12/23/09
Report Date: 12/29/09

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

VN Engineers, Inc.
Attn: Sofia Nirshberg, P.E.
116 Washington Avenue
North Haven, CT 06473

Project

VN Engineering Testing Services
Laboratory Testing Services
Various Locations, CT

Project Number J2031487C

Material Information

Source of Material: New Britain HTFD Busway
Proposed Use: Not provided
Soil Description: Not performed

Classification: Not performed

Sample Information

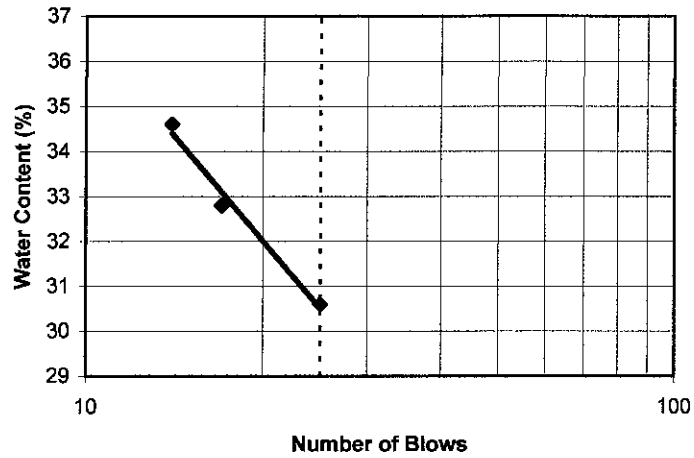
Sample Location: B-123, SS-1, 0 - 2 feet
Sampled By: Made by Client
Sample Date: 12/23/09

Laboratory Test Data

	Result	Requirements
Liquid Limit:	31	
Plastic Limit:	26	
Plasticity Index:	5	
In-Place Moist. (%):		

Liquid Limit Method: Method A
Sample Preparation: Dry

Liquid Limit Determination



Terracon Rep: Made by Client
Reported To:
Contractor:
Report Distribution:

Reviewed By: for Kevin J. Brigandi
Principal, Department Manager

Test Methods: ASTM D4318

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to

PLASTICITY TEST REPORT

Report Number: J2031487C.0044
Service Date: 12/23/09
Report Date: 12/28/09

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

VN Engineers, Inc.
Attn: Sofia Nirshberg, P.E.
116 Washington Avenue
North Haven, CT 06473

Project

VN Engineering Testing Services
Laboratory Testing Services
Various Locations, CT

Project Number J2031487C

Material Information

Source of Material: New Britain HTFD Busway
Proposed Use: Not provided
Soil Description: Not performed

Classification: Not performed

Sample Information

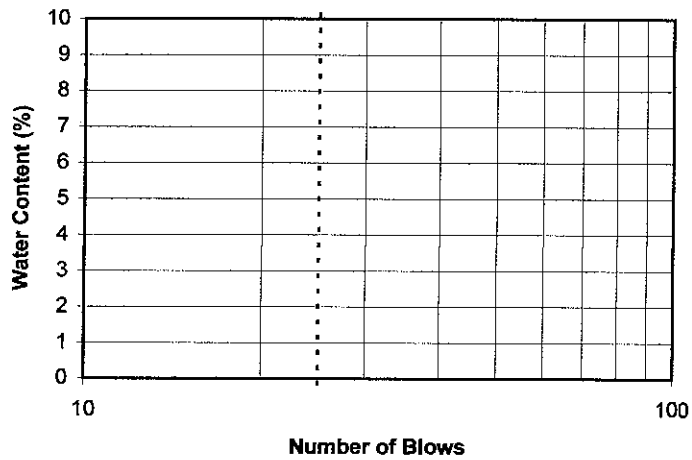
Sample Location: B-124, SS-1, 0 - 2 feet
Sampled By: Made by Client
Sample Date: 12/23/09

Laboratory Test Data

	Result	Requirements
Liquid Limit:	Non-plastic	
Plastic Limit:	Non-plastic	
Plasticity Index:	Non-plastic	
In-Place Moist. (%):		

Liquid Limit Method: Method A
Sample Preparation: Dry

Liquid Limit Determination



Comments:
Soil is Non-Plastic

Terracon Rep: Made by Client
Reported To:
Contractor:
Report Distribution:

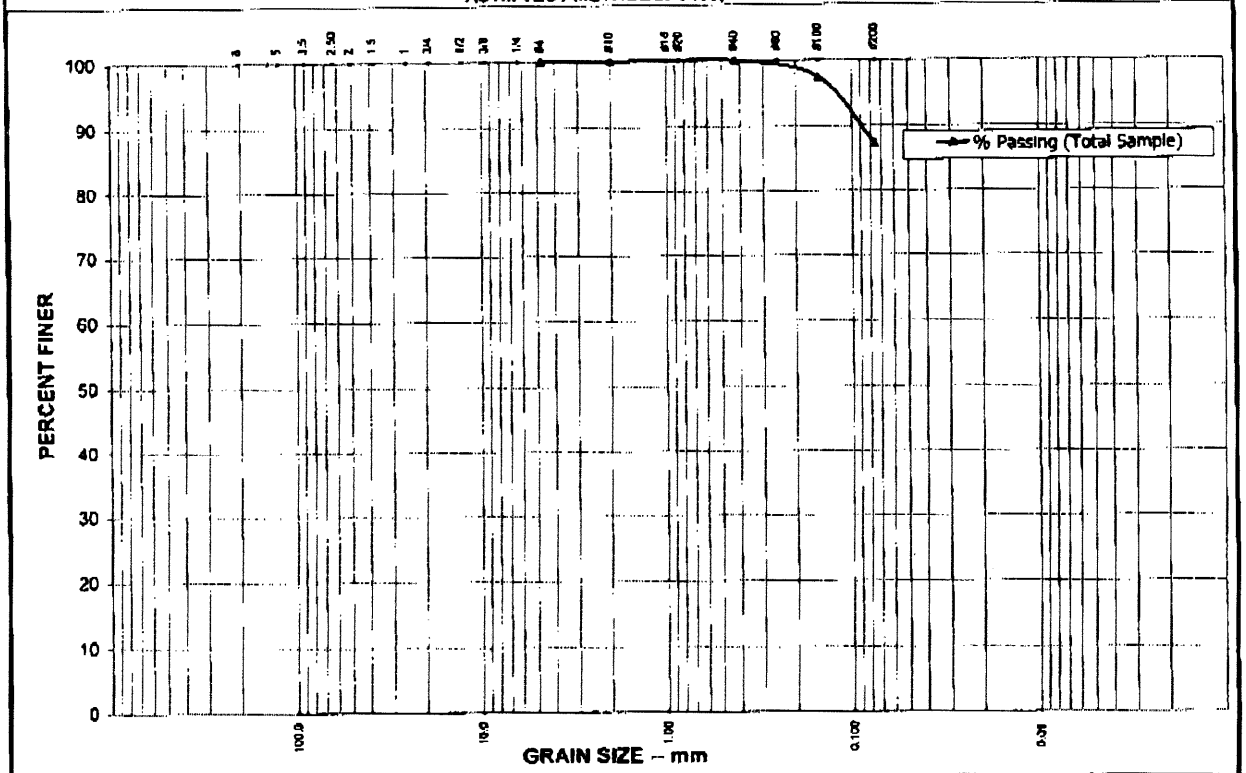
Reviewed By: for Kevin J. Brigandi
Principal, Department Manager

Test Methods: ASTM D4318

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		0.0	0.0	100.0	Silt (>0.002mm)	Clay (<0.002mm)
0.0	0.0		% Sand	12.8	87.2	

Classification: RED BROWN SILT, little Fine Sand

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"					
12.5	1/2"					
9.5	3/8"					
6.3	1/4"					
4.75	#4	0.00	100.0			
2.00	#10	0.00	100.0			
1.00	#18					
0.425	#40	0.00	100.0			
0.250	#60					
0.150	#100	0.01	97.4			
0.075	#200	0.05	87.2			
	Total Dry Wt.	0.39				
	Split Wt.					

Project:	VN Engineers,Inc.	Project No.: J2031487C	Date: 7/10/2007
City:	North Haven,CT	Specification: Not Provided	Lab No: C1713-07
Source:	B125, S-2, 2'-4'	Sampled from: Provided by client , Job No. 27-107	

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1726 fax: (860) 829-1748
www.jgieastern.com

Remarks: Natural moisture content = 20.5%

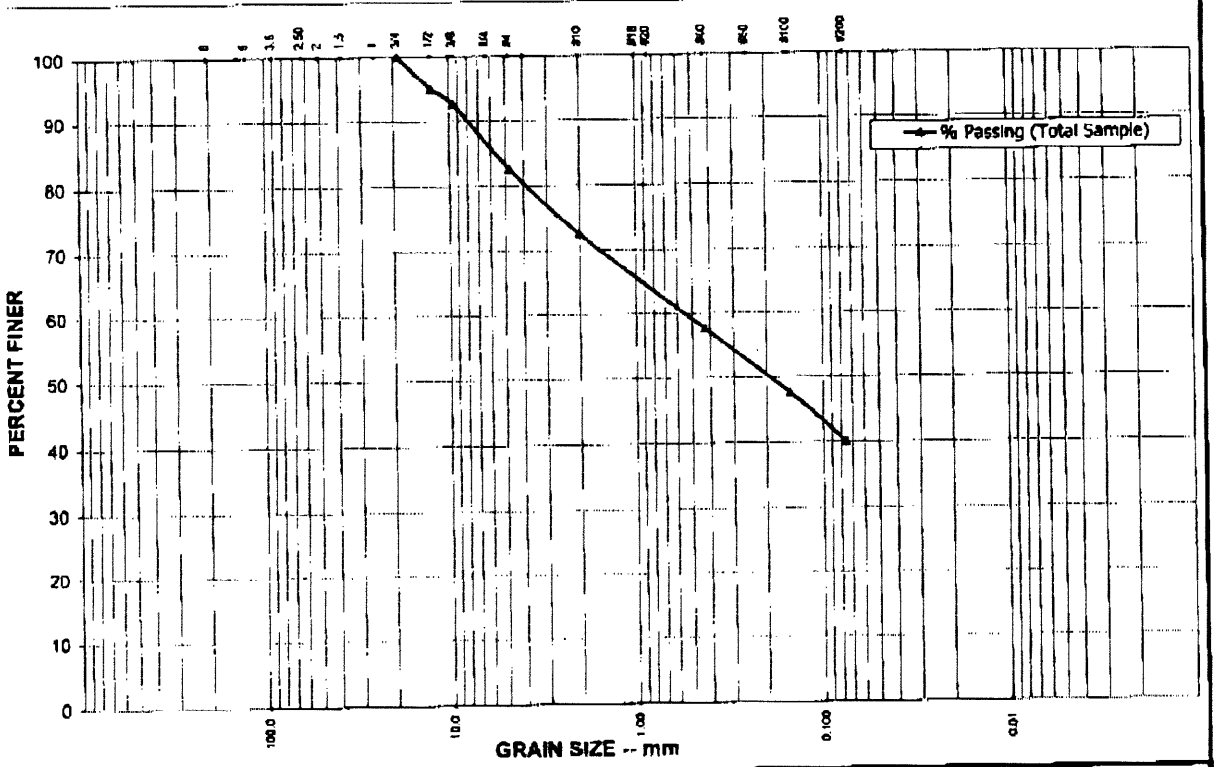
Tested By: M.F. Date: 7/16/2007

Reviewed By: Date:

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		23.5	35.3	41.2	Silt (>0.002mm)	Clay (<0.002mm)
0.0	17.5	% Sand		42.5	40.0	

Classification: RED BROWN C-F SAND and Silt, little Fine Gravel

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.02	95.0			
9.5	3/8"	0.03	92.5			
6.3	1/4"					
4.75	#4	0.07	82.5			
2.00	#10	0.11	72.5			
1.00	#18					
0.425	#40	0.17	57.5			
0.250	#60					
0.150	#100	0.21	47.5			
0.075	#200	0.24	40.0			
	Total Dry Wt.	0.4				
	Split Wt.					

Project:	VN Engineers,Inc.	Project No.: J2031487C	Date: 7/10/2007
City:	North Haven,CT	Specification: Not Provided	Lab No: C1737-07
Source:	B127, S-3, 4'-6'	Sampled from: Provided by client , Job No. 27-107	

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1746
www.jgieastern.com

Remarks: Natural moisture content = 7.5%

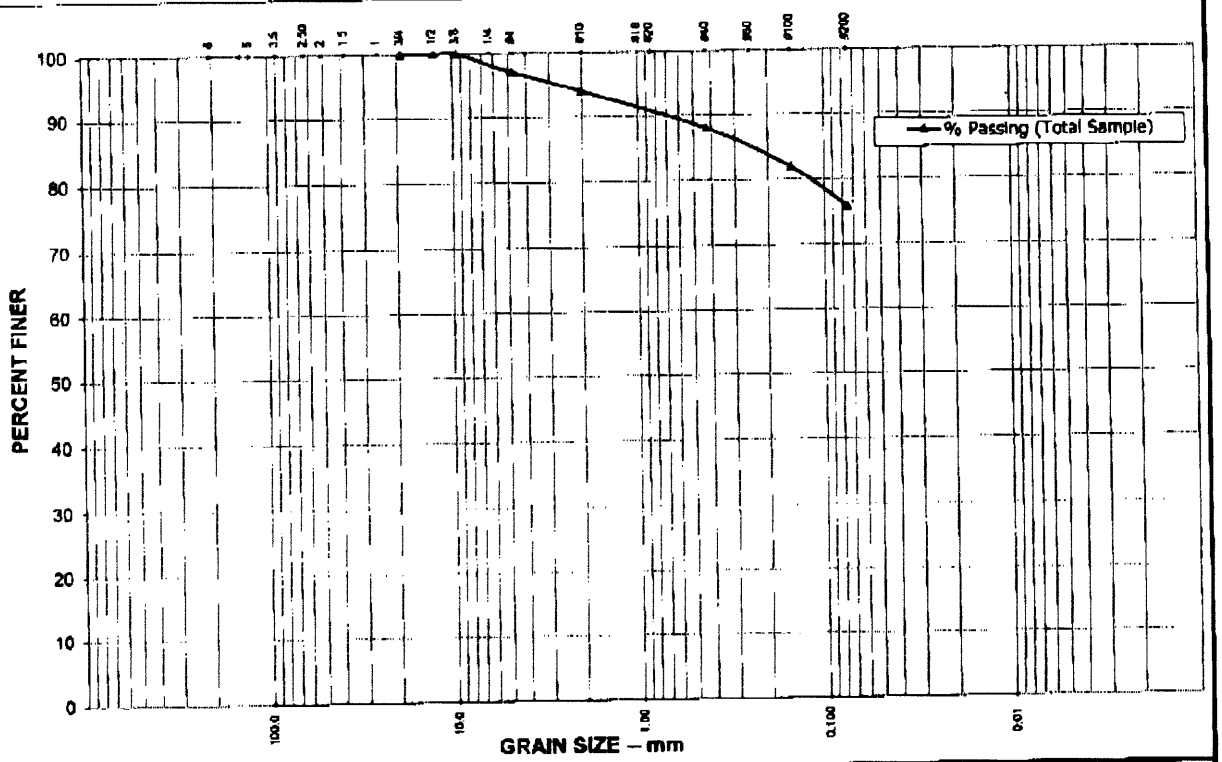
Tested By: M.F. Date: 7/21/2007

Reviewed By: Date:

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		14.3	28.6	57.1	Silt (>0.002mm)	Clay (<0.002mm)
0.0	3.0		% Sand	21.2	75.8	

Classification: RED BROWN SILT, some C-F Sand, little Fine Gravel

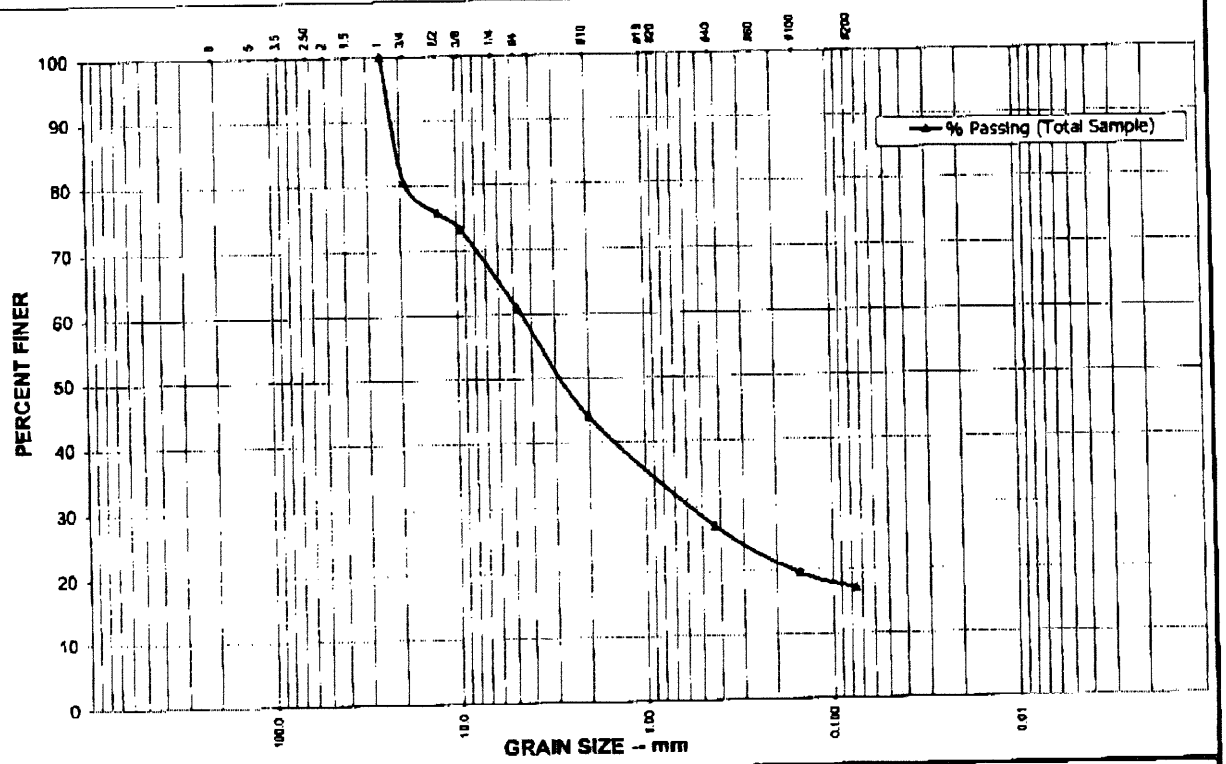
Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.00	100.0			
9.5	3/8"	0.00	100.0			
6.3	1/4"					
4.75	#4	0.01	97.0			
2.00	#10	0.02	93.9			
1.00	#18					
0.425	#40	0.04	87.9			
0.250	#60					
0.150	#100	0.06	81.8			
0.075	#200	0.08	75.8			
	Total Dry Wt.	0.33				
	Split Wt.					

Project:	VN Engineers, Inc.	Project No.: J2031487C	Date: 7/10/2007
City:	North Haven, CT	Specification: Not Provided	Lab No: C1765-07
Source:	B129, S-2, 5'-7'	Sampled from: Provided by client, Job No. 27-107	
JGI EASTERN, Inc.	114 Woodlawn Road Berlin, CT 06037 (860) 829-1728 fax: (860) 829-1746 www.jgieastern.com	Remarks: Natural moisture content = 21.2%	
		Tested By: M.F.	Date: 7/26/2007
		Reviewed By:	Date:

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		38.9	38.9	22.2	Silt (>0.002mm)	Clay (<0.002mm)
0.0	39.0	% Sand		43.9	17.1	

Classification: RED BROWN C-F SAND and Fine Gravel, little Silt

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"	0.00	100.0			
19.0	3/4"	0.08	80.5			
12.5	1/2"	0.10	75.6			
9.5	3/8"	0.11	73.2			
6.3	1/4"					
4.75	#4	0.16	61.0			
2.00	#10	0.23	43.9			
1.00	#18					
0.425	#40	0.30	26.8			
0.250	#60					
0.150	#100	0.33	19.5			
0.075	#200	0.34	17.1			
	Total Dry Wt.	0.41				
	Split Wt.					

Project:	VN Engineers,Inc.	Project No.: J2031487C	Date: 7/10/2007
City:	North Haven,CT	Specification: Not Provided	Lab No: C1766-07
Source:	~~B429, S-2, 5'-7'~~ B-131, S-1, 0'-2'	Sampled from: Provided by client , Job No. 27-107	
		Remarks: Natural moisture content = 9.8%	

JGI EASTERN, Inc.
114 Woodlawn Road
Berlin, CT 06037
(860) 829-1725 fax: (860) 829-1745
www.jgieastern.com

Tested By: M.F. Date: 7/26/2007
Reviewed By: Date:

PLASTICITY TEST REPORT

Report Number: J2031487C.0045
Service Date: 12/23/09
Report Date: 12/29/09

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

VN Engineers, Inc.
Attn: Sofia Nirshberg, P.E.
116 Washington Avenue
North Haven, CT 06473

Project

VN Engineering Testing Services
Laboratory Testing Services
Various Locations, CT

Project Number J2031487C

Material Information

Source of Material: New Britain HTFD Busway
Proposed Use: Not provided
Soil Description: Not performed

Classification: Not performed

Sample Information

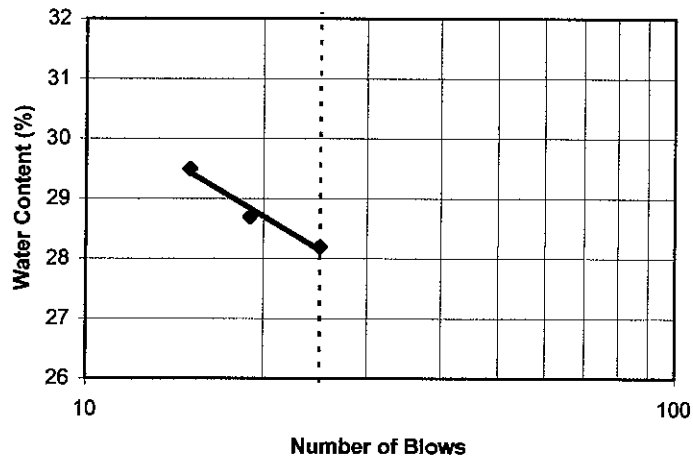
Sample Location: B-132, SS-2, 5 - 7 feet
Sampled By: Made by Client
Sample Date: 12/23/09

Laboratory Test Data

	Result	Requirements
Liquid Limit:	28	
Plastic Limit:	22	
Plasticity Index:	6	
In-Place Moist. (%):		

Liquid Limit Method: Method A
Sample Preparation: Dry

Liquid Limit Determination



Terracon Rep: Made by Client
Reported To:
Contractor:
Report Distribution:

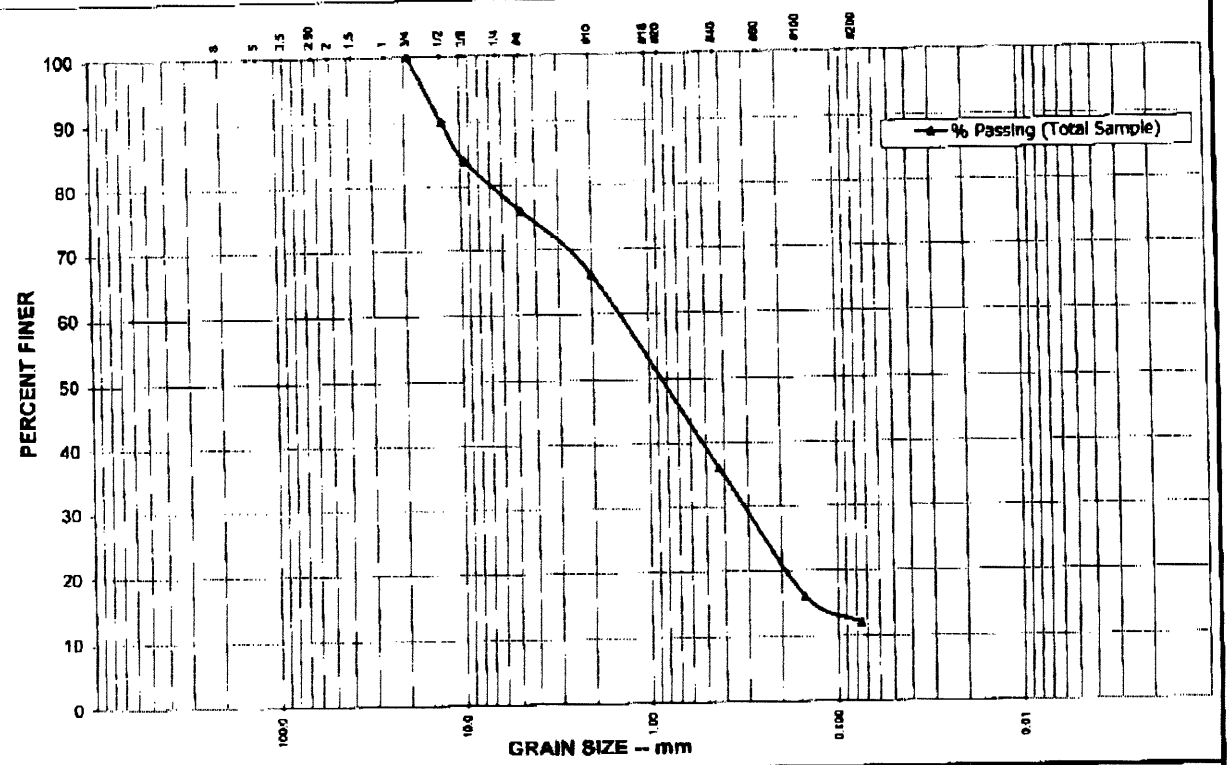
Reviewed By: for Kevin J. Brigandi
Principal, Department Manager

Test Methods: ASTM D4318

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		15.6	48.9	37.5	Silt (>0.002mm)	Clay (<0.002mm)
0.0	24.0	% Sand		64.0	12.0	

Classification: BROWN C-F SAND, some Fine Gravel, little Silt

Sieve Size (mm)	U.S. Sieve Size (In.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.05	90.0			
9.5	3/8"	0.08	84.0			
6.3	1/4"					
4.75	#4	0.12	76.0			
2.00	#10	0.17	66.0			
1.00	#18					
0.425	#40	0.32	36.0			
0.250	#60					
0.150	#100	0.42	16.0			
0.075	#200	0.44	12.0			

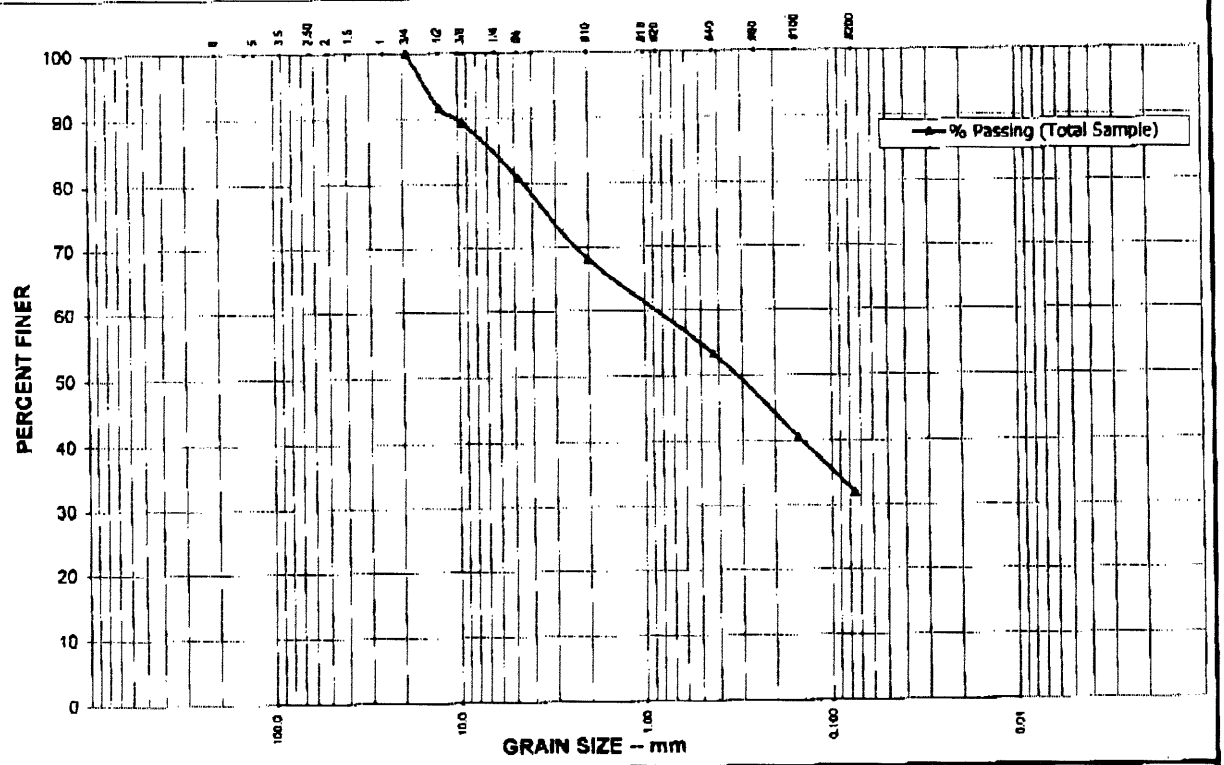
Total Dry Wt. 0.5
Split Wt.

Project: VN Engineers,Inc.	Project No.: J2031487C	Date: 7/10/2007	
City: North Haven,CT	Specification: Not Provided	Lab No: C1719-07	
Source: B133, S-1, 0'-2'	Sampled from: Provided by client , Job No. 27-107		
JGI EASTERN, Inc.	Remarks: Natural moisture content = 4.0%		
114 Woodlawn Road Berlin, CT 06037 (860) 829-1725 fax: (860) 829-1745 www.jgieastern.com	Tested By: M.F.	Date: 7/18/2007	
	Reviewed By:	Date:	

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		26.1	30.4	43.5	Silt (>0.002mm)	Clay (<0.002mm)
0.0	19.1		% Sand	48.9	31.9	

Classification: RED BROWN C-F Sand, some Silt, little Fine Gravel

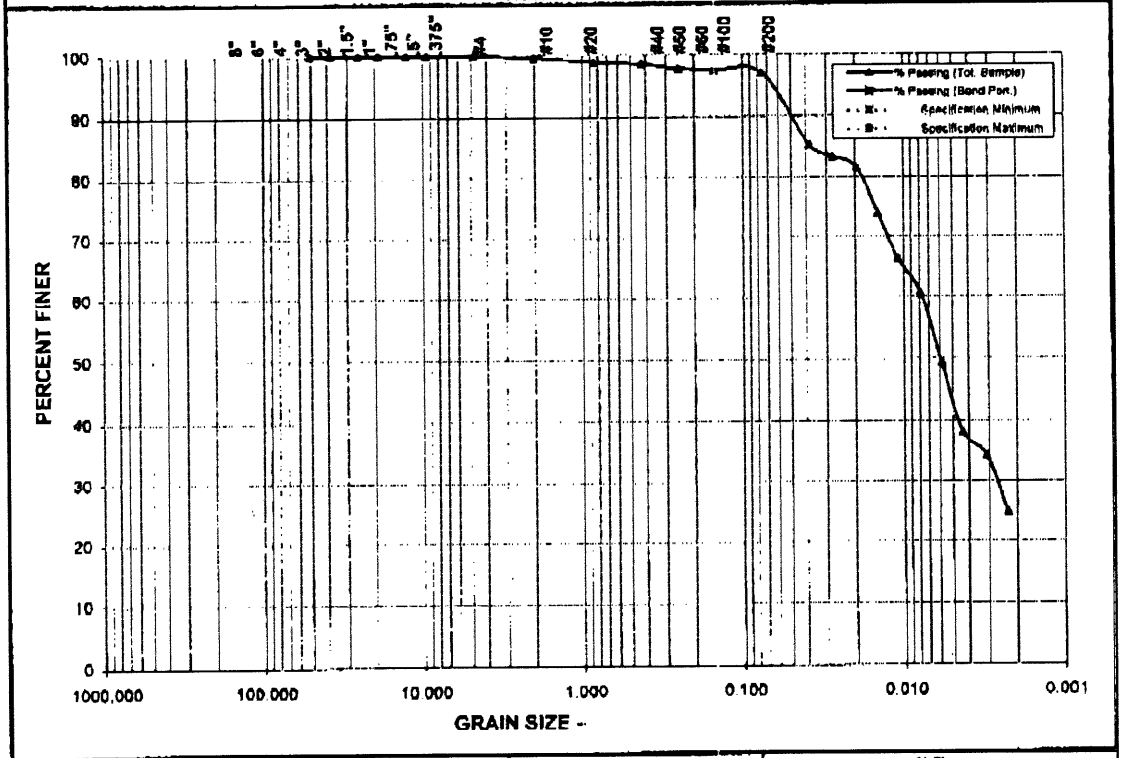
Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100.0			
12.5	1/2"	0.04	91.5			
9.5	3/8"	0.05	89.4			
6.3	1/4"					
4.75	#4	0.09	80.9			
2.00	#10	0.15	68.1			
1.00	#18					
0.425	#40	0.22	53.2			
0.250	#60					
0.150	#100	0.28	40.4			
0.075	#200	0.32	31.9			
	Total Dry Wt.	0.47				
	Split Wt.					

Project: VN Engineers,Inc.	Project No.: J2031487C	Date: 7/10/2007	
City: North Haven,CT	Specification: Not Provided	Lab No: C1731-07	
Source: B134, S-3, 10'-12'	Sampled from: Provided by client , Job No. 27-107		
JGI EASTERN, Inc.	114 Woodlawn Road Berlin, CT 06037 (860) 829-1735 fax: (860) 829-1746 www.jgieastern.com	Remarks: Natural moisture content = 12.8%	
		Tested By: M.F.	Date: 7/19/2007
		Reviewed By:	Date:

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM D-422



% Cobbles	% Gravel	Crs	Med	Fine	% Fines	
		11.5	37.2	51.3	Silt	Clay
0.0	0.1	% Sand		2.9	72.13	24.83

Classification: RED BROWN SILT, some Clay, trace C-F Sand

Sieve Size (mm.)	Sieve Size (in./no.)	Cumulative Wt. Retnd	% Passing (Tot. Sample)	% Passing (Sand Port.)	Specification Minimum	Specification Maximum
50.800	2"	0.00	100.0			
38.100	1.5"	0.00	100.0			
25.400	1"	0.00	100.0			
19.050	3/4"	0.00	100.0			
12.700	1/2"	0.00	100.0			
9.525	3/8"	0.00	100.0			
4.750	#4	0.15	99.9			
2.000	#10	0.18	99.5			
0.850	#20	0.58	99.8			
0.425	#40	0.78	98.5			
0.300	#50	----				
0.250	#60	1.13	97.8			
0.150	#100	1.29	97.5			
0.075	#200	1.50	97.0			
0.038			85.2			
0.027			83.4			
0.019			81.5			
0.014			73.9			
0.011			66.4			
0.008			60.7			
0.006			49.4			
0.004			39.0			
0.003			34.3			
0.002			24.8			

Total Dry Wt. 133.18
Split Wt. 53.25

Project: VN Engineers,INC.	Project No.: J2031478C	Date: 7/10/07	
North Haven,CT	Specification: ASTM D-422	Lab No: C1830-07	
Source: B-137,S-3,10'-12'	Sampled from: Provided by client		

JGI EASTERN, Inc.
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1980 (p) 860-721-1639 (f)
www.jgieastern.com

Remarks:
Natural moisture content = 25.4%

Reviewed By: [illegible] Date: 8/8/07

JGI EASTERN, Inc.

ASTM D 422 Hydrometer Analysis

Project Name	VN Enginners	Lab Technician	M.F.
Project #	J2031487C	Date:	8/6/2007
Lab #	C1830-07	Soil Description	RED BROWN

LABORATORY TEST DATA

Wet Sample Wt.: 166.98 Gms.
Dry Sample Wt. : 133.18 Gms

Hygroscopic Moisture
Wet Wt. + Tare: 37.19
Dry Wt. + Tare : 37.09
Tare #____Wt. : 20.05
Moisture Content (%): 0.59

Begin Soak: 8/6/2007 6:00
End Soak: 8/7/2007 6:00
Total Soak Time: 24.0 Hrs.

G_s 2.647
Dry Weight of Soil, W_s 53.25
Meniscus Correction, F_m 1
Temperature correction, F_T 0.15

Hydrometer Type: ASTM 152-H
Temperature of test, T 20 (°C)
Zero correction, F_z 7
152-H Hydrometer Correction $_e$: 1.01

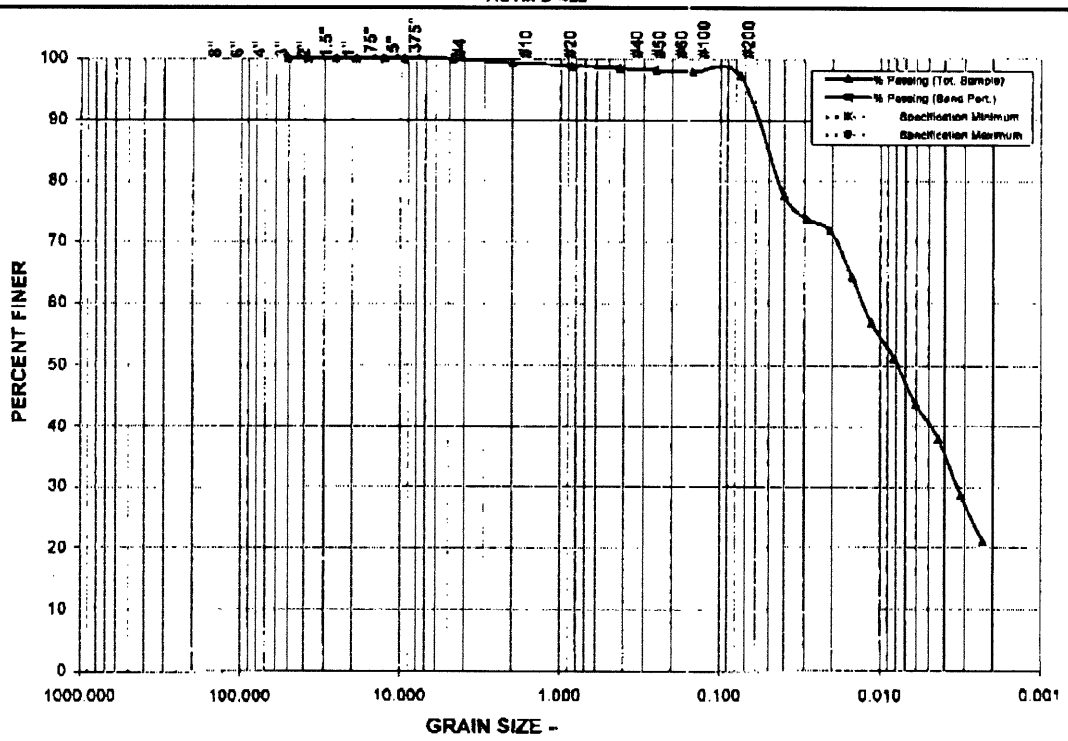
Actual Time 00:00	Elapsed Time, (min)	Acual Hydrometer Reading *R*	R_{cp}	Percent Finer, Split Sample 100	From Table 2, Use R to determine L		From Table 3	Particle Diameter D (mm)
					R_{cL}	L (cm)	A or K	
6:04	0	------	-------	------	------	------	------	-------
6:05	1	52	45.15	85.64	53	7.6	0.0139	0.0382
6:06	2	51	44.15	83.74	52	7.8	0.0139	0.0274
6:09	4	50	43.15	81.84	51	7.9	0.0139	0.0195
6:13	8	46	39.15	74.26	47	8.6	0.0139	0.0144
6:20	15	42	35.15	66.67	43	9.2	0.0139	0.0109
6:35	30	39	32.15	60.98	40	9.7	0.0139	0.0079
7:05	60	33	26.15	49.60	34	10.7	0.0139	0.0059
8:05	120	27	20.15	38.21877934	28	11.7	0.0139	0.0043
10:05	240	25	18.15	34.42535211	26	12	0.0139	0.0031
2:05	480	20	13.15	24.94178404	21	12.9	0.0139	0.0023
6:05	1440	15	8.15	15.45821596	16	13.7	0.0139	0.0014
6:05	2880	15	8.15	15.45821596	16	13.7	0.0139	0.0010

Reviewed By: KMS Date: 8/8/07

NVLAP # 100315-0

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM D-422



% Cobbles	% Gravel	Crs	Med	Fine	% Fines	
		20.7	32.6	48.7	Silt	Clay
0.0	0.1	% Sand		2.7	76.18	21.00

Classification; RED BROWN SILT , some Clay, trace C-F Sand

Sieve Size (mm.)	Sieve Size (in./no.)	Cumulative Wt. Retnd	% Passing (Tot. Sample)	% Passing (Sand Port.)	Specification Minimum	Maximum
50.800	2"	0.00	100.0			
38.100	1.5"	0.00	100.0			
25.400	1"	0.00	100.0			
19.050	3/4"	0.00	100.0			
12.700	1/2"	0.00	100.0			
9.525	3/8"	0.00	100.0			
4.750	#4	0.23	99.9			
2.000	#10	0.28	99.3			
0.850	#20	0.53	98.8			
0.425	#40	0.72	98.4			
0.300	#50	---				
0.250	#60	0.89	98.1			
0.150	#100	1.04	97.8			
0.075	#200	1.35	97.2			
0.040			77.5			
0.029			73.7			
0.021			71.9			
0.015			64.3			
0.011			56.8			
0.008			51.1			
0.006			43.6			
0.004			36.0			
0.003			28.5			
0.002			21.0			

Total Dry Wt. 155.28
Split Wt. 50.42

Project: VN Engineers,INC.	Project No.: J2031478C	Date: 7/10/07	
North Haven,CT	Specification: ASTM D-422	Lab No: C1831-07	
Source: B-138,S-3,10'-12'	Sampled from: Provided by client		

JGI EASTERN, Inc.
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900 (p) 860-721-1939 (f)
www.jgieastern.com

Remarks:
Natural moisture content = 22.8%

Reviewed By: KGB Date: 8/8/07

ASTM D422 - Rev. 3

JGI EASTERN, Inc.

ASTM D 422 Hydrometer Analysis

Project Name	VN Enginners	Lab Technician	M.F.
Project #	J2031487C	Date:	8/6/2007
Lab #	C1831-07	Soil Description	RED BROWN

LABORATORY TEST DATA

Wet Sample Wt.: 187.06 Gms.
Dry Sample Wt. : 152.28 Gms

Hygroscopic Moisture
Wet Wt. + Tare: 36.74
Dry Wt. + Tare : 36.64
Tare #____Wt. : 20.13
Moisture Content (%): 0.61

Begin Soak: 8/6/2007 5:45
End Soak: 8/7/2007 5:45
Total Soak Time: 24.0 Hrs.

G_s 2.647
Dry Weight of Soil, W_s 53.25
Meniscus Correction, F_m 1
Temperature correction, F_T 0.15

Hydrometer Type: ASTM 152-H
Temperature of test, T 20 (°C)
Zero correction, F_z 7
152-H Hydrometer Correction $_a$: 1.01

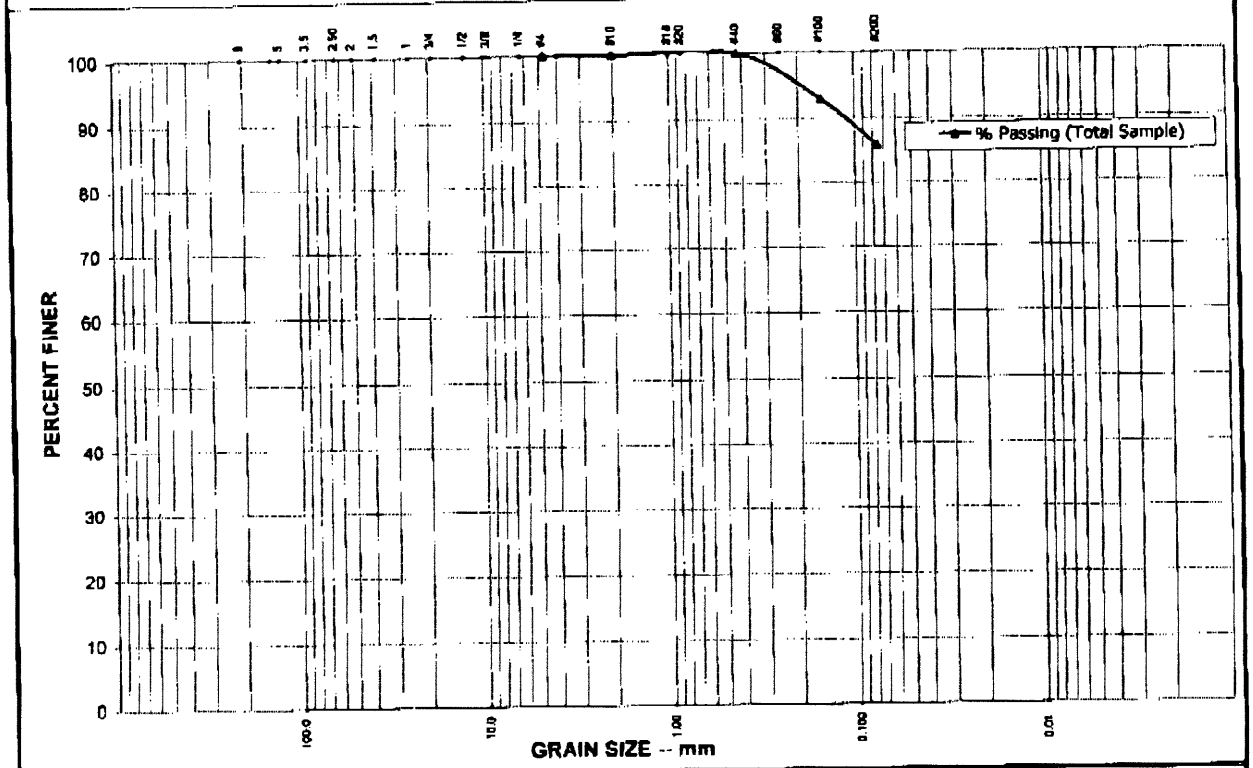
Actual Time 00:00	Elapsed Time, (min)	Acual Hydrometer Reading *R*	R_{cp}	Percent Finer, Split Sample 100	From Table 2, Use R to determine L		From Table 3	Particle Diameter D (mm)
					R_{cL}	L (cm)	A or K	
5:59	0	----	------	-------	------	------	------	-------
6:00	1	48	41.15	78.05	49	8.3	0.0139	0.0399
6:02	2	46	39.15	74.26	47	8.6	0.0139	0.0287
6:04	4	45	38.15	72.36	46	8.8	0.0139	0.0206
6:08	8	41	34.15	64.77	42	9.4	0.0139	0.0150
6:15	15	37	30.15	57.19	38	10.1	0.0139	0.0114
6:30	30	34	27.15	51.50	35	10.6	0.0139	0.0082
7:00	60	30	23.15	43.91	31	11.2	0.0139	0.0060
8:00	120	27	20.15	38.21877934	28	11.7	0.0139	0.0043
10:00	240	22	15.15	28.73521127	23	12.5	0.0139	0.0032
2:00	480	18	11.15	21.14835681	19	13.2	0.0139	0.0023
6:00	1440	18	11.15	21.14835681	19	13.2	0.0139	0.0013
6:00	2880	18	11.15	21.14835681	19	13.2	0.0139	0.0009

Reviewed By: KDS Date: 8/8/07

NVLAP # 100315-0

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		0.0	0.0	100.0	Silt (>0.002mm)	Clay (<0.002mm)
0.0	0.0	% Sand		14.3	85.7	

Classification: RED BROWN SILT, little Fine Sand

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Retained	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
90.0	3.5"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"					
12.5	1/2"					
9.5	3/8"					
6.3	1/4"					
4.75	#4	0.00	100.0			
2.00	#10	0.00	100.0			
1.00	#18					
0.425	#40	0.00	100.0			
0.250	#60					
0.150	#100	0.01	92.9			
0.075	#200	0.02	85.7			
	Total Dry Wt.	0.14				
	Split Wt.					

Project: VN Engineers,Inc.	Project No.: J2031487C	Date: 7/10/2007	
City: North Haven,CT	Specification: Not Provided	Lab No: C1718-07	
Source: B139, S-2, 5'-7'	Sampled from: Provided by client, Job No. 27-107		
JGI EASTERN, Inc.	114 Woodlawn Road Berlin, CT 06037 (860) 829-1725 fax: (860) 829-1745 www.jgieastern.com	Remarks: Natural moisture content = 7.1%	
		Tested By: M.F.	Date: 7/16/2007
		Reviewed By:	Date:

ASTM C136GSP1, Rev. 5

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117

% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		5.7	20.1	74.1	Silt (>0.002mm)	Clay (<0.002mm)
	4		% Sand	64	32	

USCS Classification: SILTY SAND: tan, (SM)

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Ret. (g)	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
75.0	3"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100			
12.5	1/2"					
9.5	3/8"	7.00	97			
6.3	1/4"					
4.75	#4	12.00	96			
2.00	#10	22.00	92			
1.00	#18					
0.425	#40	57.00	79			
0.250	#60					
0.150	#100	154.00	44			
0.075	#200	186.00	32			
	Total Dry Wt.	274				
	Split Wt.					

Project:	**VN Engineering, Inc.**	Project No.:	**J2031487C**	Date:	**4/9/2010**
City:	North Haven, CT	Specification:	Not Provided	Report No:	**J2031487C.0046**
Source:	B143, S-2	Sampled from:	Provided by client		

Terracon

201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900 (p) 860-721-1939 (f)
http://www.terracon.com/

Remarks: Job No. 27-107.01

Tested By: M.F. Date: 4/20/2010

Reviewed By: [signature] Date: 4/20/10

J2-C136CR, 1-1-09, Rev. 8

PLASTICITY TEST REPORT

Report Number: J2031487C.0046
Service Date: 04/09/10
Report Date: 04/19/10

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900

Client

VN Engineers, Inc.
Attn: Sofia Nirshberg, P.E.
116 Washington Avenue
North Haven, CT 06473

Project

VN Engineering Testing Services
Laboratory Testing Services
Various Locations, CT

Project Number J2031487C

Material Information

Source of Material: B-143, S-2
Proposed Use: Not Provided
Soil Description: SILTY SAND: tan, (SM)

Classification: SILTY SAND: tan, (SM)

Sample Information

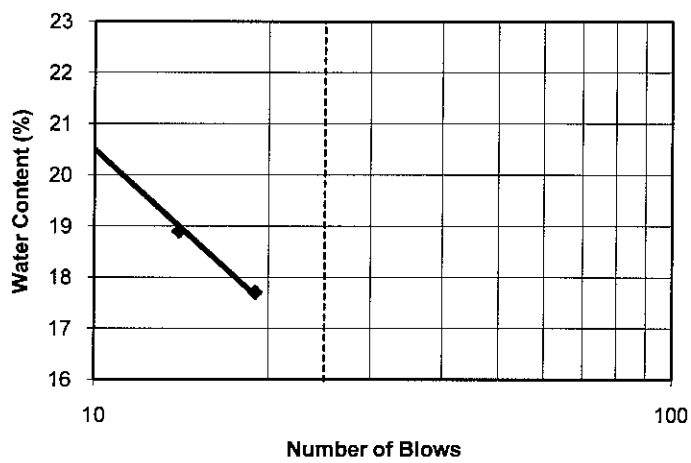
Sample Location: Provided by client
Sampled By: Made by Client
Sample Date: 04/09/10

Laboratory Test Data

	Result	Requirements
Liquid Limit:	16	
Plastic Limit:	Non-plastic	
Plasticity Index:	Non-plastic	
In-Place Moist. (%):		

Liquid Limit Method: Method A
Sample Preparation: Dry

Liquid Limit Determination



Comments:
Soil is Non-Plastic could not roll out for Plastic Limit

Services:

Terracon Rep: Made by Client
Reported To:
Contractor: VN Engineers
Report Distribution:

Reviewed By:
Kevin J. Brigandi
Principal, Department Manager

Test Methods:

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

Terracon

ASTM D 2216 Standard Test Method for Water (Moisture) Content of Soil and Aggregate

TEST DATA REPORT

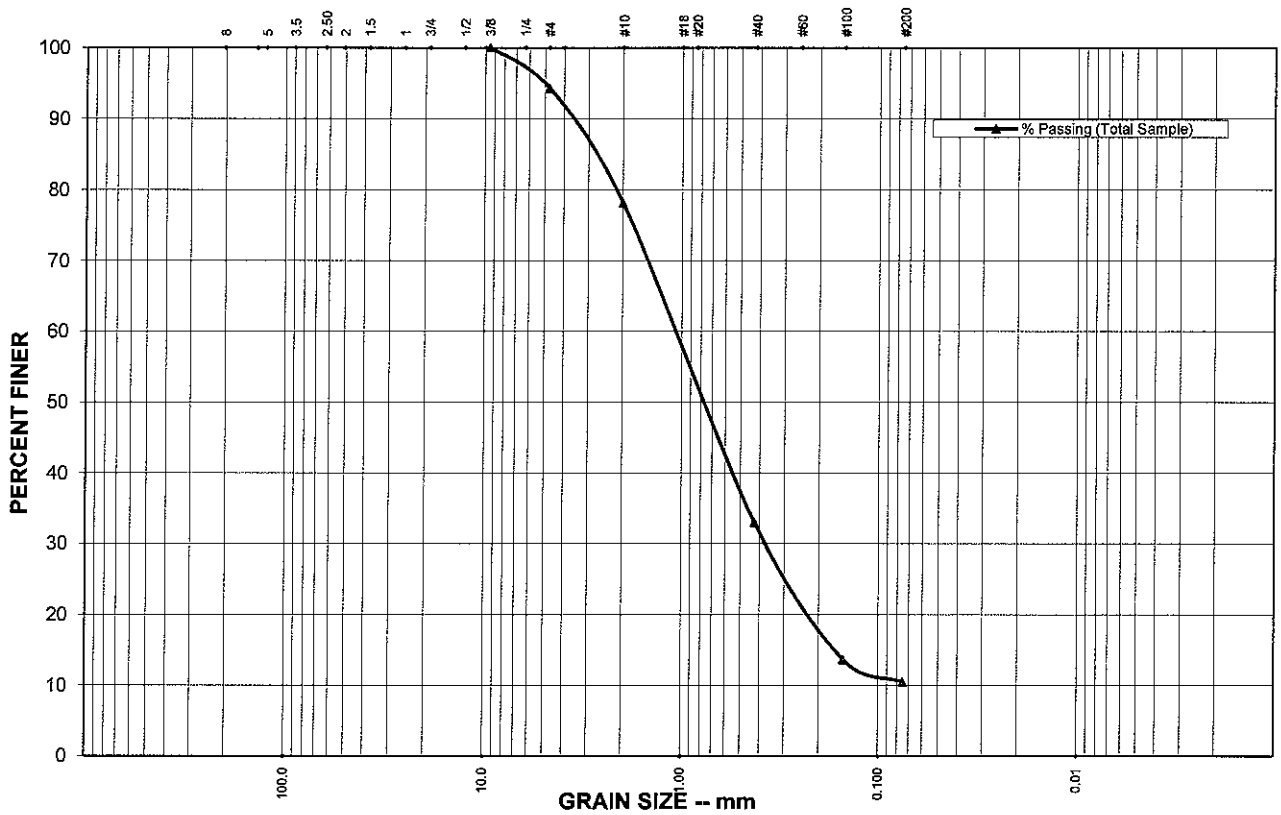
Project Name	VN Engineers, Inc.	Lab #	J2031487C.0046
Project #	J2031487C	Lab Technician:	M.Fongemie
Sampling Date	4/9/2010	Date of Test:	4/16/2010
Sampling Technician	Client		
Sample Source:	B-143, S-2		

Original Weight:	569	g	% Moisture	17.4%
Oven Dry Weight	520	g		
Tare Weight:	238	g		

Reviewed By: _____ Date: 4/20/10

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		19.3	53.8	26.9	Silt (>0.002mm)	Clay (<0.002mm)
	6		% Sand	84	10	

USCS Classification: WELL GRADED SAND: with silt, brown, (SW)

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Ret. (g)	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
75.0	3"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"					
12.5	1/2"					
9.5	3/8"	0.00	100			
6.3	1/4"					
4.75	#4	18.00	94			
2.00	#10	69.00	78			
1.00	#18					
0.425	#40	211.00	33			
0.250	#60					
0.150	#100	272.00	14			
0.075	#200	282.00	10			
	Total Dry Wt.	315				
	Split Wt.					

Project:	**VN Engineers, Inc.**	Project No.:	**J2031487C**	Date:	**4/9/2010**
City:	North Haven, CT	Specification:	Not Provided	Report No:	**J2031487C.0049**
Source:	B143, S-3	Sampled from:	Provided by client		

Terracon

201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900 (p) 860-721-1939 (f)
http://www.terracon.com/

Remarks: Job No. 27-107.1

Tested By: M.F. Date: 4/16/2010

Reviewed By: Date: 4/20/10

J2-C136CR, 1-1-09, Rev. 8

Terracon

ASTM D 2216 Standard Test Method for Water (Moisture) Content of Soil and Aggregate

TEST DATA REPORT

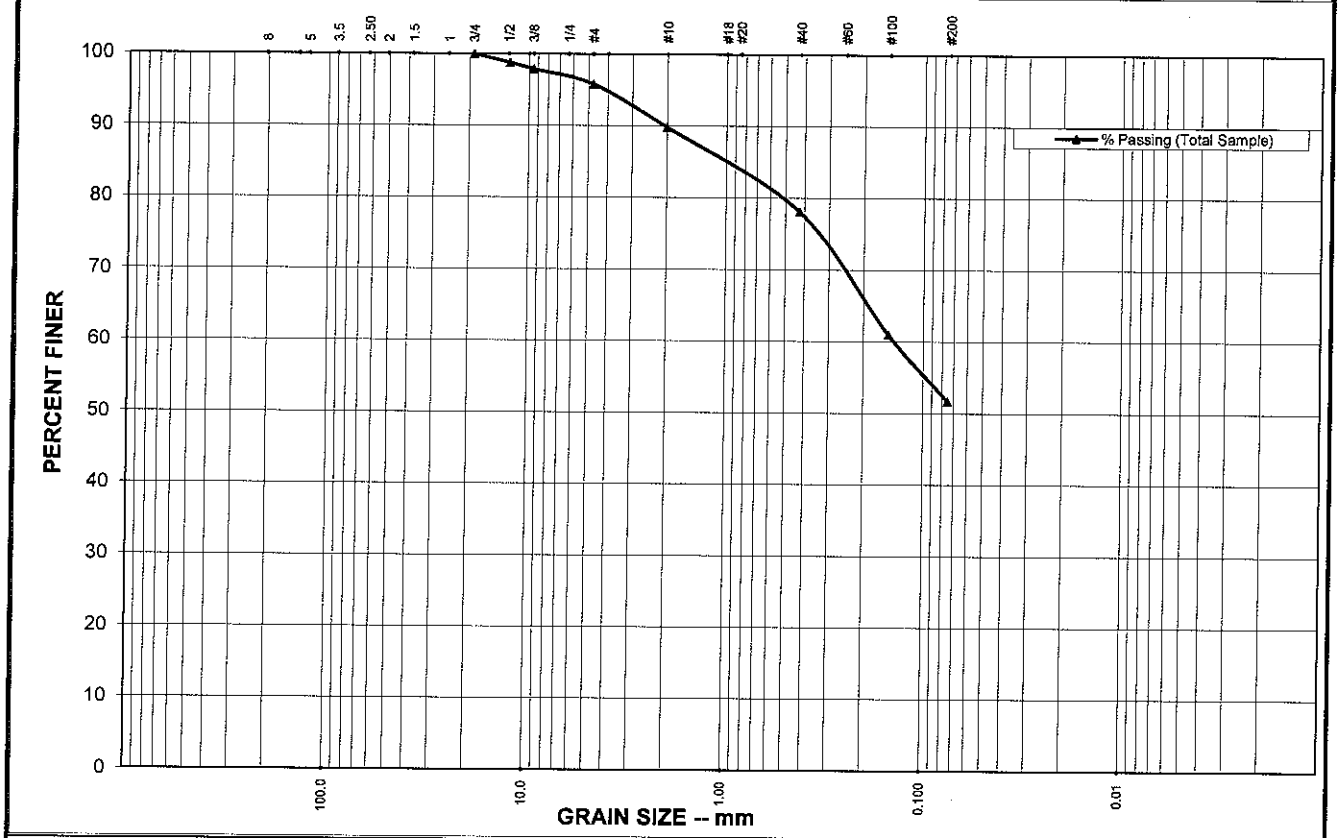
Project Name	VN Engineers, Inc.	Lab #	J2031487C.0049
Project #	J2031487C	Lab Technician:	M.Fongemie
Sampling Date	4/9/2010	Date of Test:	4/16/2010
Sampling Technician	Client		
Sample Source:	B-143, S-3		

Original Weight:	641	g	% Moisture	8.3%
Oven Dry Weight	615	g		
Tare Weight:	300	g		

Reviewed By: _____ Date: 4/20/10

GRAIN SIZE DISTRIBUTION TEST REPORT

ASTM TEST METHODS: C136, C117



% Cobbles	% Gravel	Coarse	Medium	Fine	% Fines	
		13.6	26.5	59.9	Silt (>0.002mm)	Clay (<0.002mm)
	4		% Sand	44	52	

USCS Classification: SILT: with sand, red brown, (ML)

Sieve Size (mm)	U.S. Sieve Size (in.)	Cumulative Wt. Ret. (g)	% Passing (Total Sample)	% Passing (Sand Portion)	Specification Minimum	Specification Maximum
200.0	8"					
125.0	5"					
75.0	3"					
57.0	2.25"					
50.0	2"					
37.5	1.5"					
25.0	1"					
19.0	3/4"	0.00	100			
12.5	1/2"	4.00	99			
9.5	3/8"	7.00	98			
6.3	1/4"					
4.75	#4	14.00	96			
2.00	#10	34.00	90			
1.00	#18					
0.425	#40	73.00	78			
0.250	#60					
0.150	#100	130.00	61			
0.075	#200	161.00	52			
	Total Dry Wt.	333				
	Split Wt.					

Project:	VN Engineers, Inc.	Project No.:	J2031487C	Date:	4/9/2010
City:	North Haven, CT	Specification:	Not Provided	Report No:	J2031487C.0050
Source:	B143, S-4	Sampled from:	Provided by client		

Terracon
201 Hammer Mill Road
Rocky Hill, CT 06067
860-721-1900 (p) 860-721-1939 (f)
http://www.terracon.com/

Remarks: Job No. 27-107.1

Tested By: M.F. Date: 4/16/2010

Reviewed By: [signature] Date: 4/20/10

J2-C136CR, 1-1-09, Rev. 8

Terracon

ASTM D 2216 Standard Test Method for Water (Moisture) Content of Soil and Aggregate

TEST DATA REPORT

Project Name	VN Engineers, Inc.	Lab #	J2031487C.0050
Project #	J2031487C	Lab Technician:	M.Fongemie
Sampling Date	4/9/2010	Date of Test:	4/16/2010
Sampling Technician	Client		
Sample Source:	B-143, S-4		

Original Weight:	593	g	% Moisture	17.7%
Oven Dry Weight	534	g		
Tare Weight:	201	g		

Reviewed By: _____ Date: 4/20/10

MT Group
New England Regional Office
21 North Plains Industrial Road, Wallingford, CT 06492
(203) 949-7733 FAX (203) 949-7735
www.materials-testing.com

Client: V.N. Engineers
116 Washington Ave
North Haven, CT 06473

Report #: 001
Date: 09/17/07
Lab Technician: Juan Zacharini

Project: New Britain Hartford Busway
Sample: Cores
Test: Compressive Strength
Method: ASTM C42
Sampled By: Client **On:** N/A **Delivered By:** Client

Core #	Client ID	Dia.	Original Height (inches)	Height Capped (inches)	L/D Ratio	Area (sq. in)	Max Load (Lbs.)	PSI	L/D Factor	Comp. Strength
1	27-107 B-112 24.5' – 25.0'	1.98	5.50	3.85	1.94	3.08	25420	8256	0.99	8198
2	27-107 B-115 36.5' – 36.8'	1.98	5.50	2.76	1.39	3.08	10220	3319	0.94	3130
3	27-107 B134 34.4' – 34.7'	1.98	4.50	3.51	1.77	3.08	10890	3537	0.98	3463
4	27-107 B-113 28.5' – 29.0'	1.98	4.00	3.05	1.54	3.08	11430	3713	0.96	3575
5 **	27-107 B-110 44.5' – 44.8'	1.98	5.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	27-107 B-111 28.5' – 29.0'	1.98	6.00	3.92	1.98	3.08	28960	9405	0.99	9340
**	Core #5 no compressive									
	strength - crack running									
	full length of core									

Reported To: V.N. Engineers

Submitted By: MT Group, LLC
Mohammad S. Keshawarz, P.E.

STATE OF CONNECTICUT
MOHAMMAD S. KESHAWARZ
No. 16793
LICENSED
PROFESSIONAL ENGINEER

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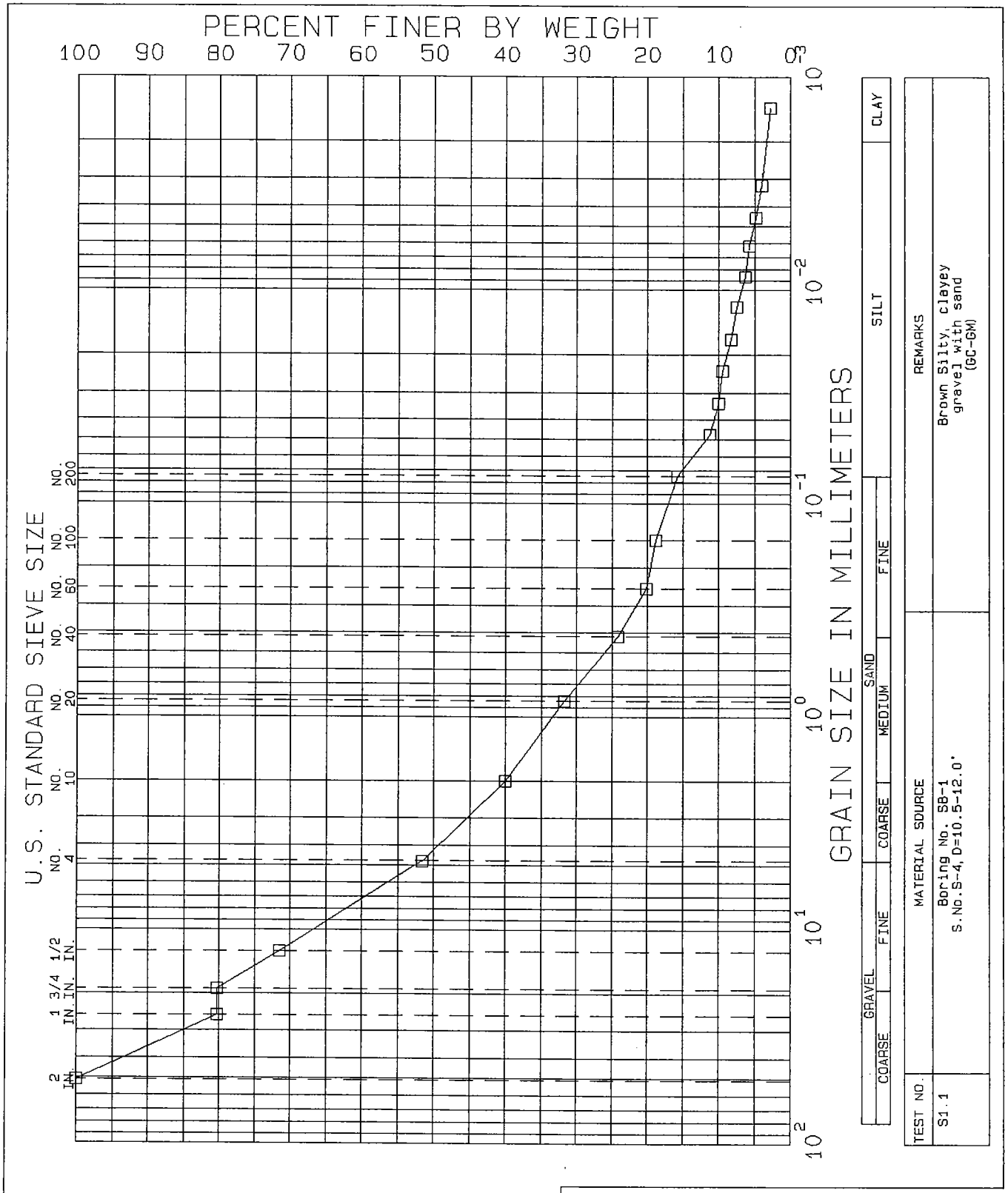
LABORATORY TESTING DATA SHEET

Project Name: NEW BRITAIN-HARTFORD BUSWAY CONNECTICUT
Project No.: L17828
Project Engineer: D. SCHULZE
Assigned By: D. GAFFNEY
Date: AUG.03
Reviewed By: [signature]
Date Reviewed: 9/3/03

Boring/ Test Pit No.	Sample No.	Depth ft.	Lab No.	Identification Tests: Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	Density: γ_d MAX (pcf) / W_{opt} (%)	Perme-ability cm/sec	Strength Tests: Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	Consol.: $C_c / (1 + e_0)$	Laboratory Log and Soil Description
SB-1	S-4	10.5-12.0	1	13.9	20	16	16	3												Brown Silty, clayey gravel with sand (GC-GM)
SB-2	S-2	4.5-6.0	2	20.3	21	21	26	6												Brown Silty sand with gravel (SM)
SB-2	S-4	10.5-12.0	3	10.3	NP	NP	14	3												Brown Silty sand with gravel (SM)
SB-4	S-5	13.5-15.0	4	24.4	21	20	84	9												Brown Silt (ML)
SB-5	S-2 S-3	4.5-9.0	5	6.3	24	23	23	4												Brown Silty sand with gravel (SM)
SB-5	S-9	25.5-27.0	6	2.8	16	14	44	9												Brown Silty sand with gravel (SM)
SB-6	S-7	19.5-21.0	7	7.9	NP	NP	10	2												Brown Well graded sand with silt and gravel (SW-SM)
SB-7	S-7	19.5 20.0	8	17.8																
SB-7	S-8	22.5-24.0	9	25.1	20	21	76	5												Brown Silt with sand (ML)
SB-8	S-5	13.5-15.0	10	9.5	16	16	11	2												Brown Well graded sand with silt and gravel (SW-SM)
SB-8	S-9	25.5-27.0	11	18.4																
SB-8	S-10 S-11	28.5-31.5	12	18.7	NP	NP	4	1												Brown Poorly graded sand with gravel (SP)
SB-10	S-8	22.5-24.0	13	16.4	NP	NP	15	1												Brown Silty sand (SM)
SB-11	S-5	13.5-15.0	14	14.1	20	17	18	3												Brown Silty sand with gravel (SM)

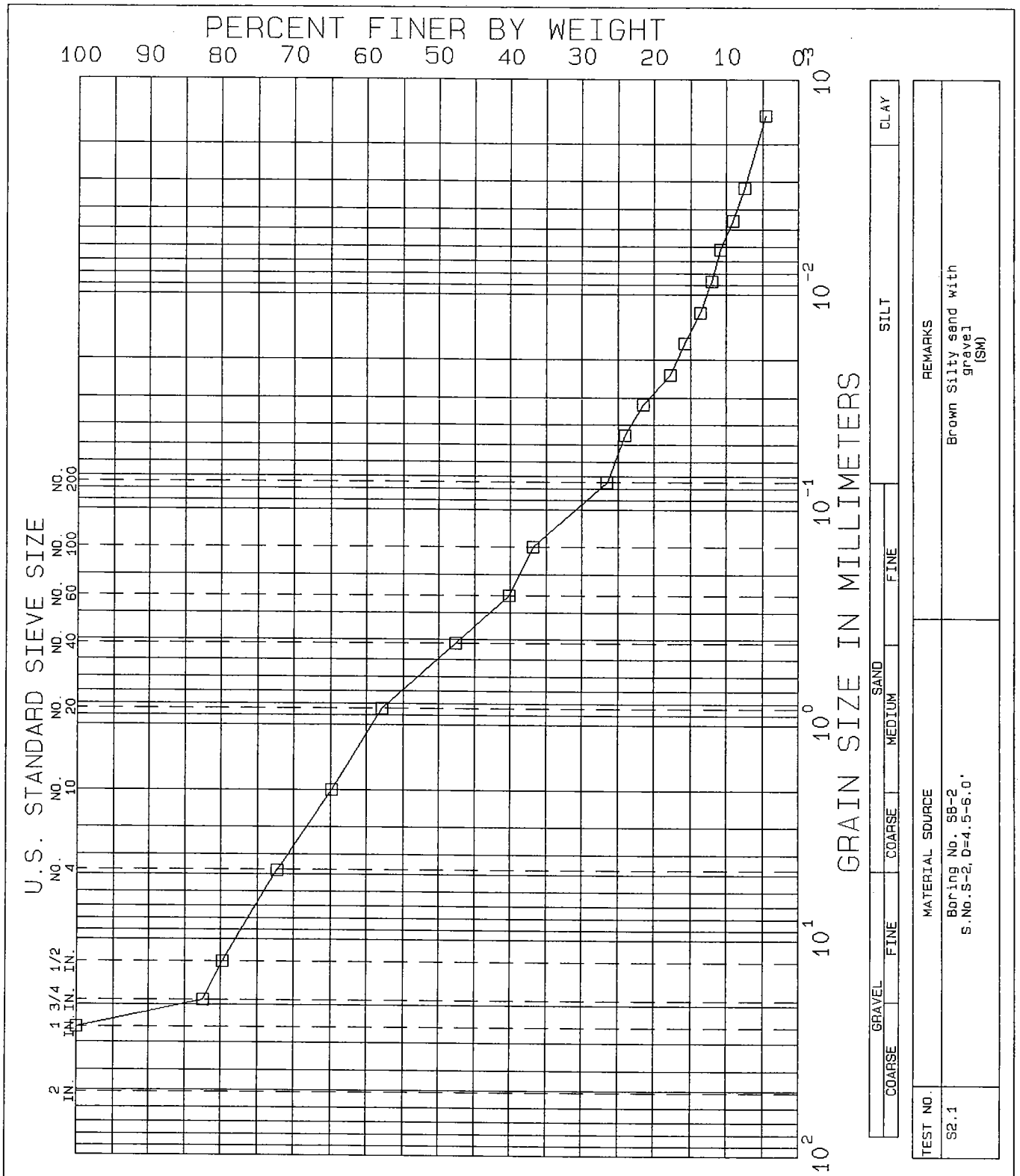


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-1	TEST SERIES	
SAMPLE	S-4	NO.	1
DEPTH	10.5-12.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

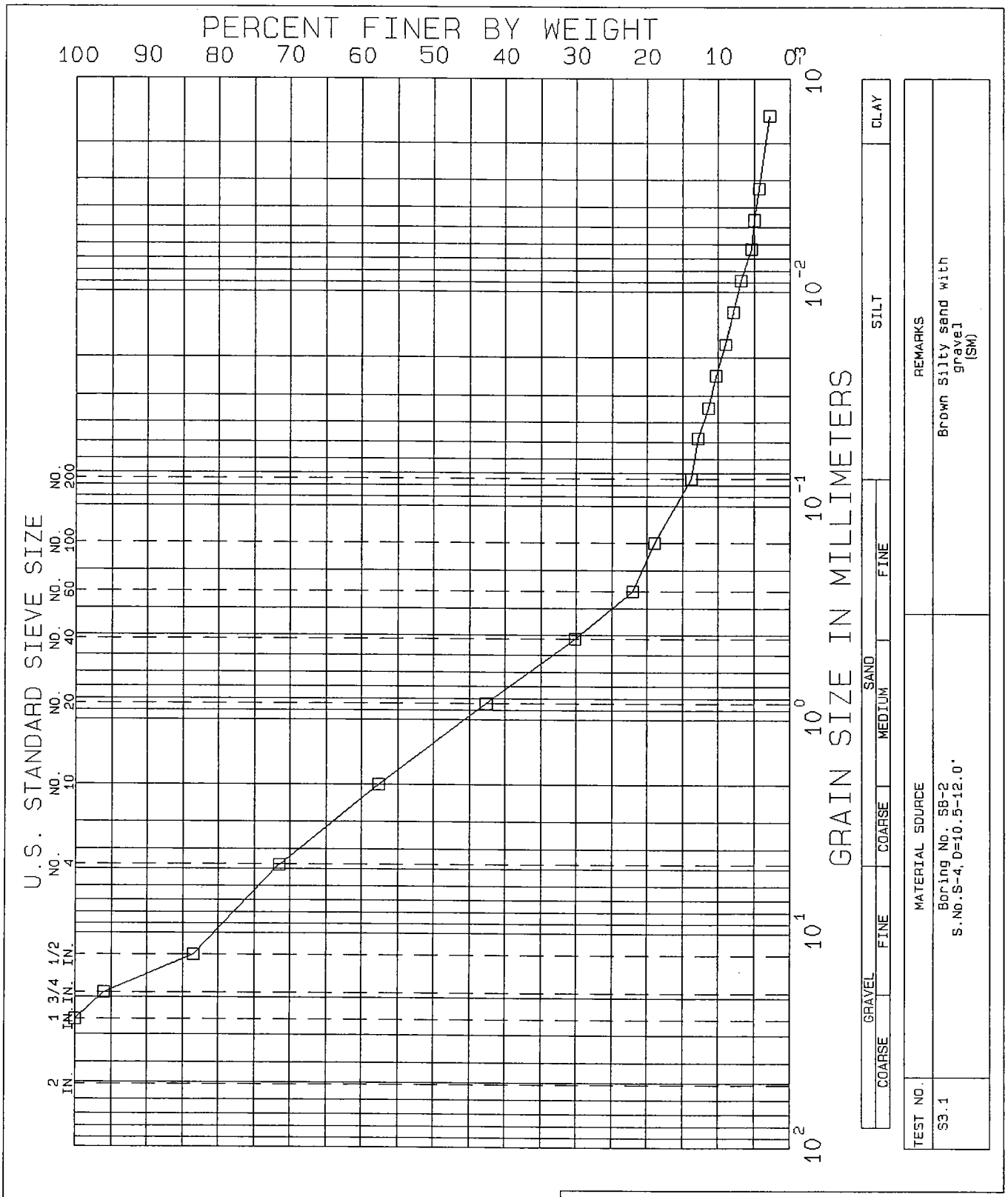


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-2	TEST SERIES	
SAMPLE	S-2	NO.	2
DEPTH	4.5-6.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

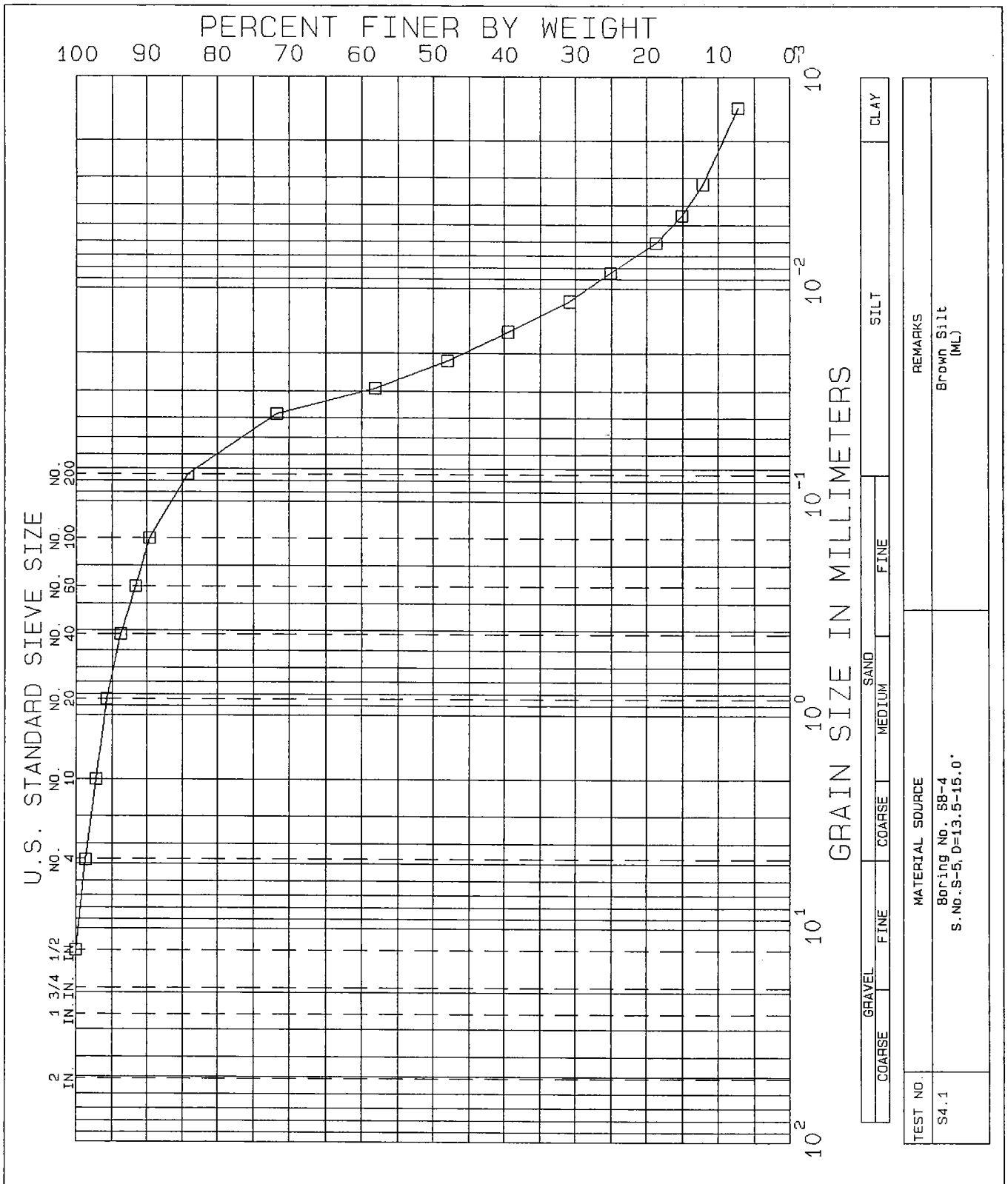


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-2	TEST SERIES	
SAMPLE	S-4	NO.	3
DEPTH	10.5-12.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

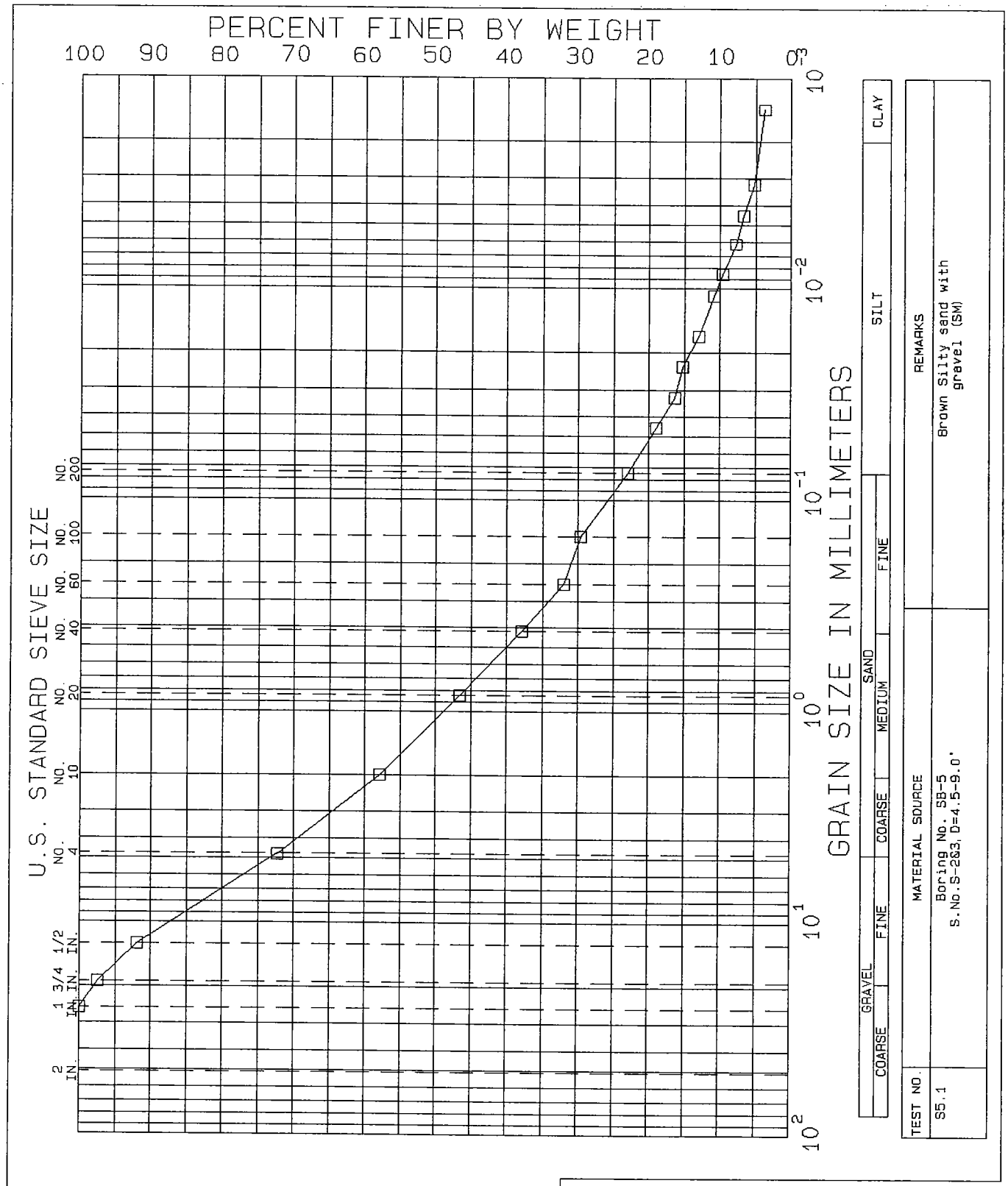


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-4	TEST SERIES	
SAMPLE	S-5	NO.	4
DEPTH	13.5-15.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17628

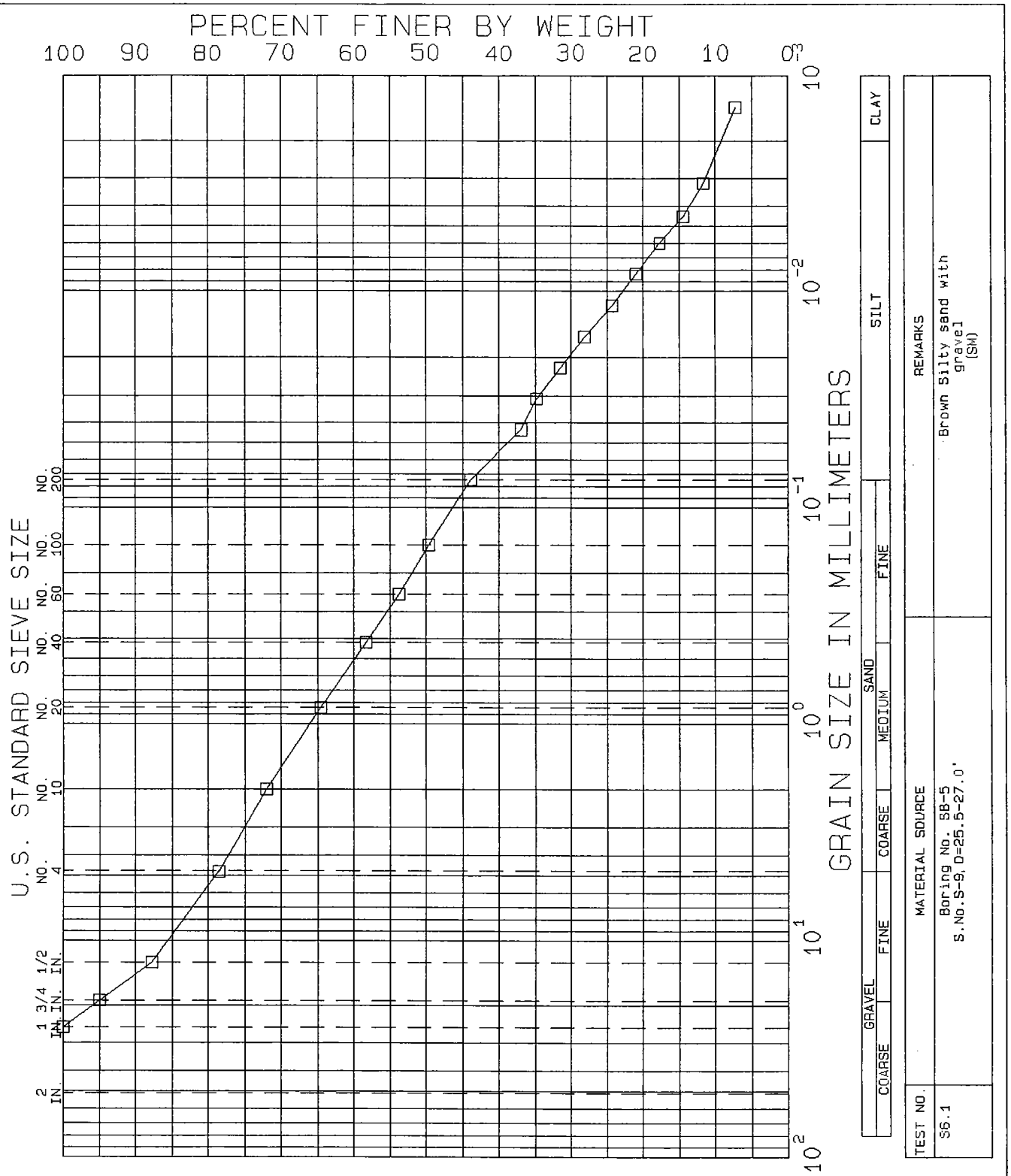


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-5	TEST SERIES	
SAMPLE	S-2&3	NO.	5
DEPTH	4.5-9.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

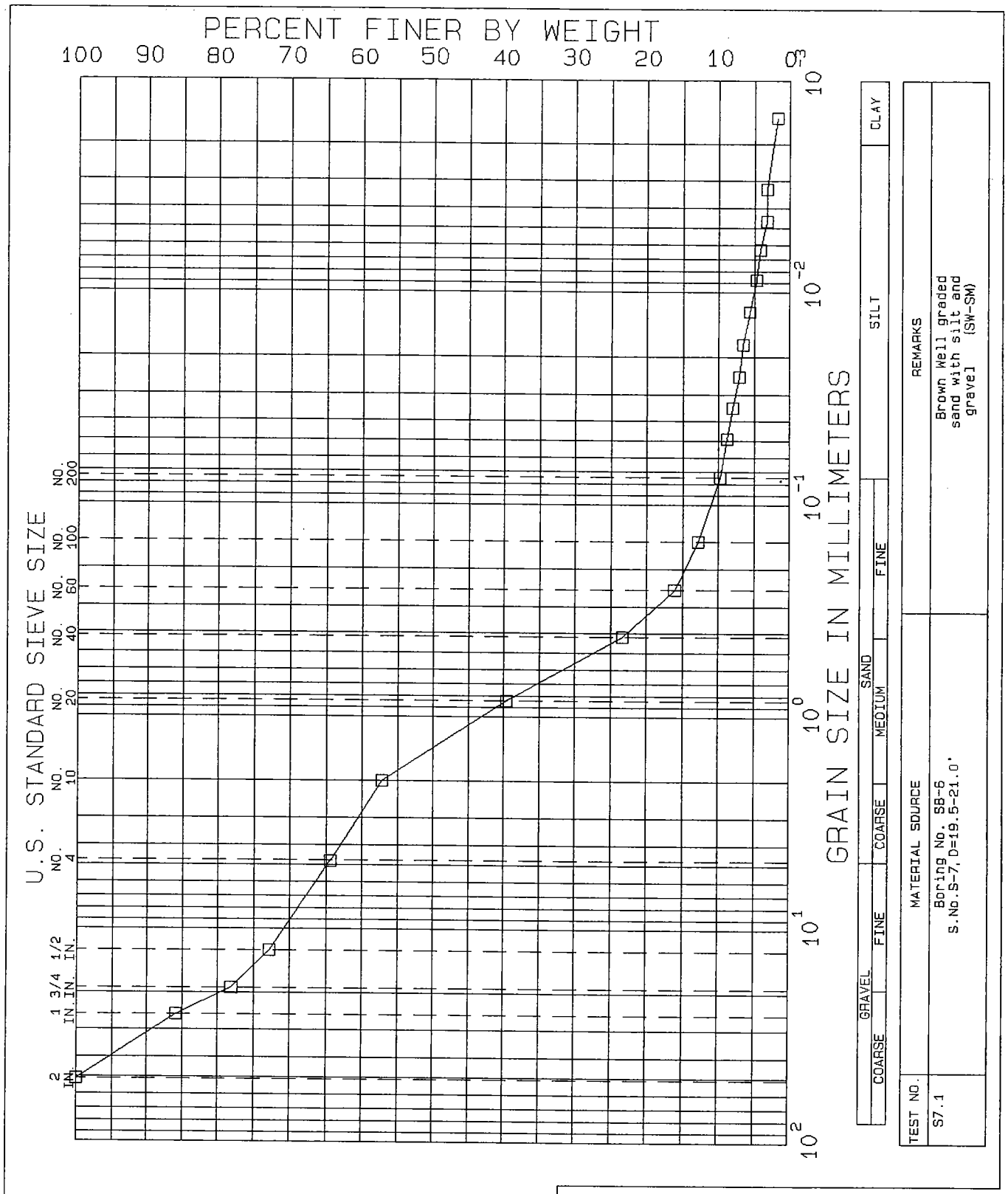


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-5	TEST SERIES	
SAMPLE	S-9	NO.	6
DEPTH	25.5-27.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

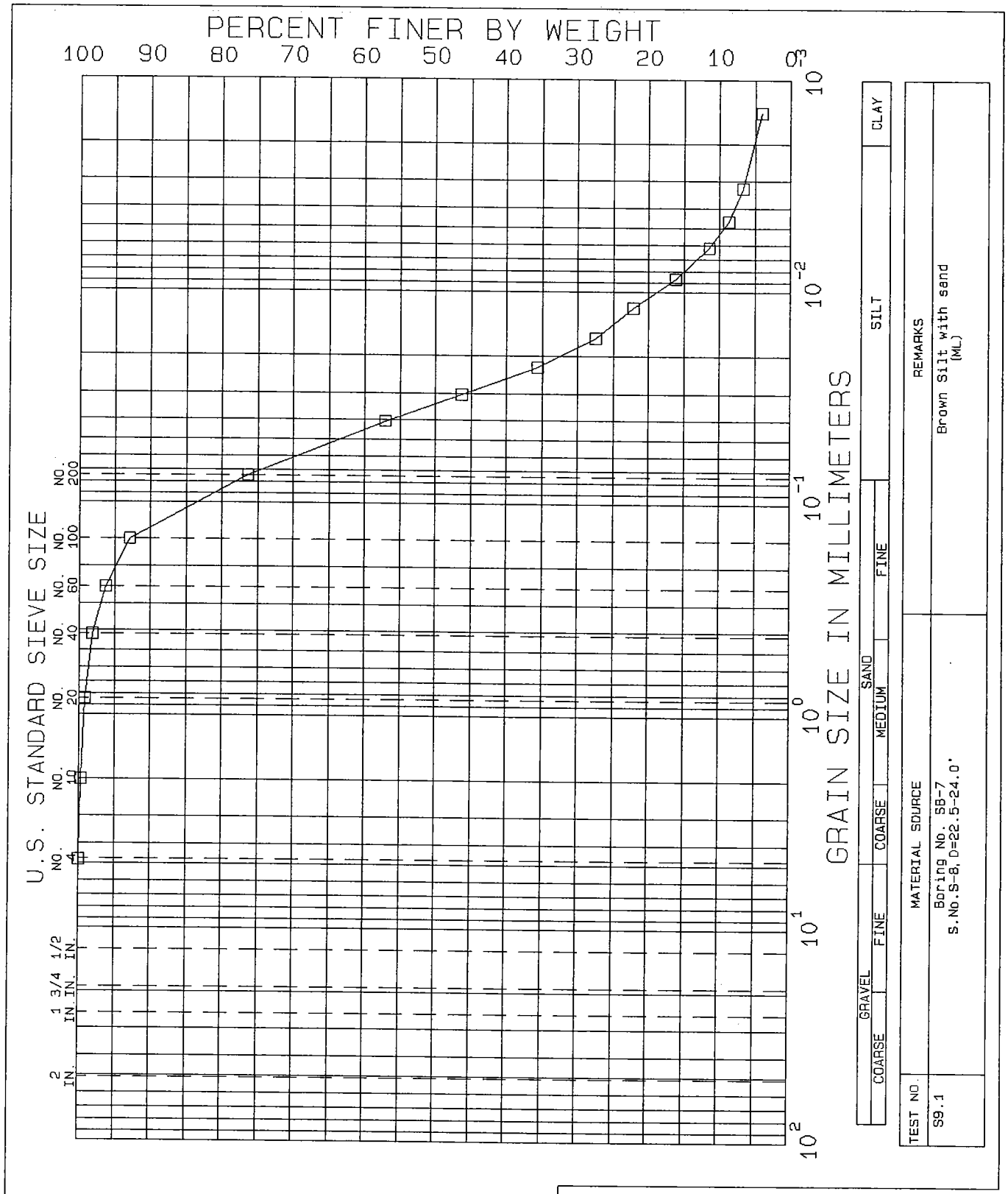


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-6	TEST SERIES	
SAMPLE	S-7	NO.	7
DEPTH	19.5-21.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828



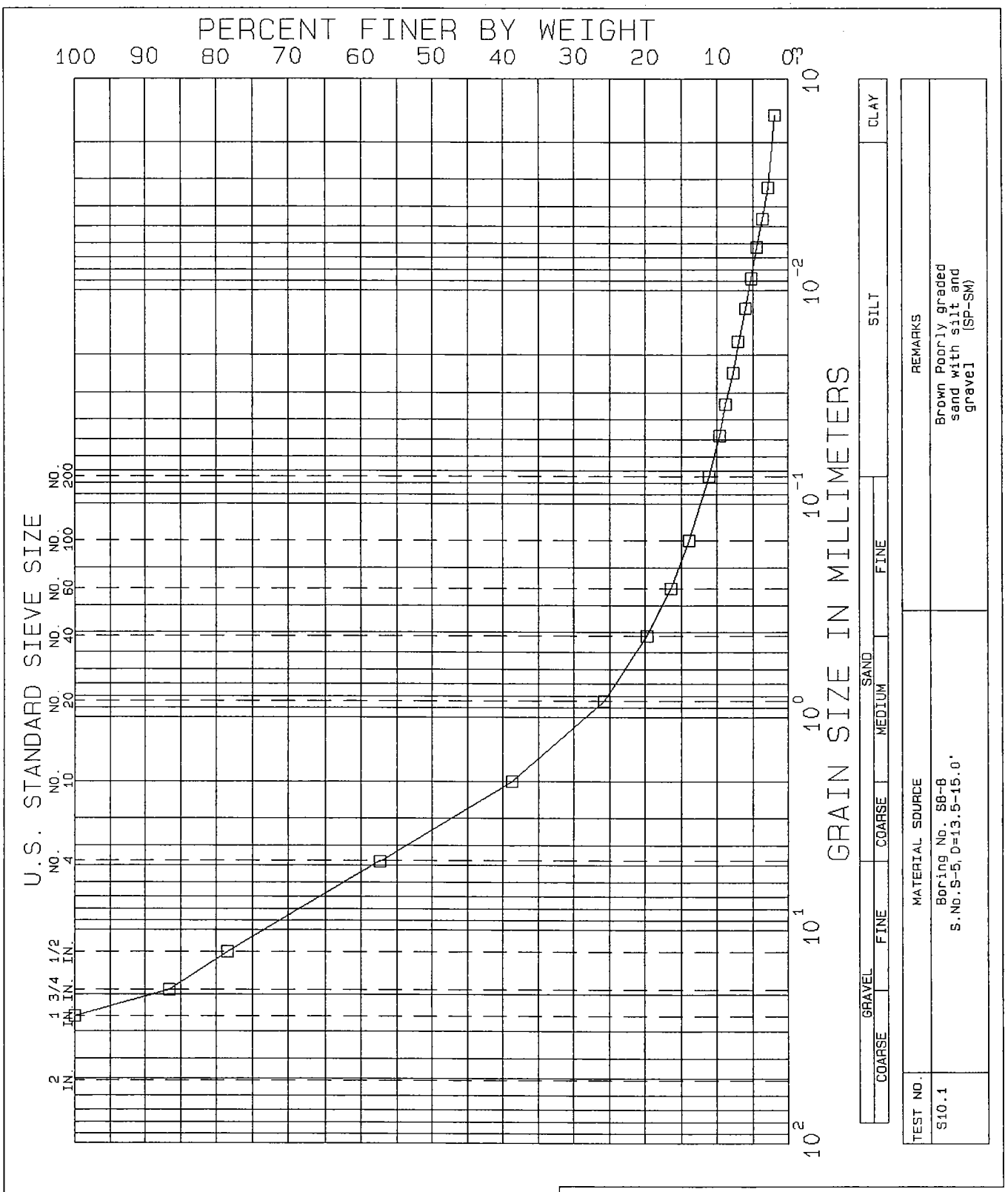
NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-7	TEST SERIES	
SAMPLE	S-B	NO.	9
DEPTH	22.5-24.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

GZA GEOENVIRONMENTAL, INC.
ENGINEERS AND SCIENTISTS

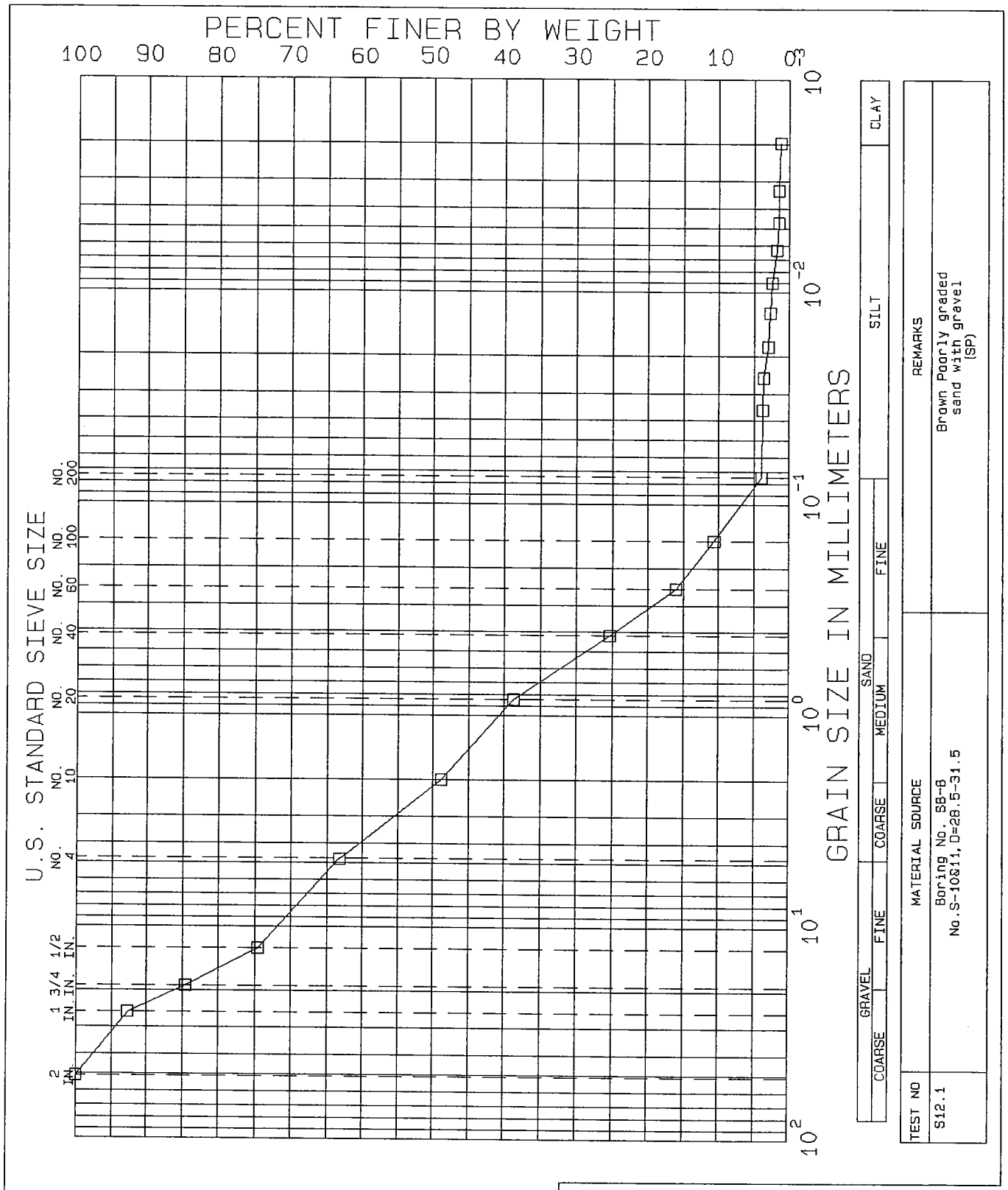


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-8	TEST SERIES	
SAMPLE	S-5	NO.	10
DEPTH	13.5-15.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

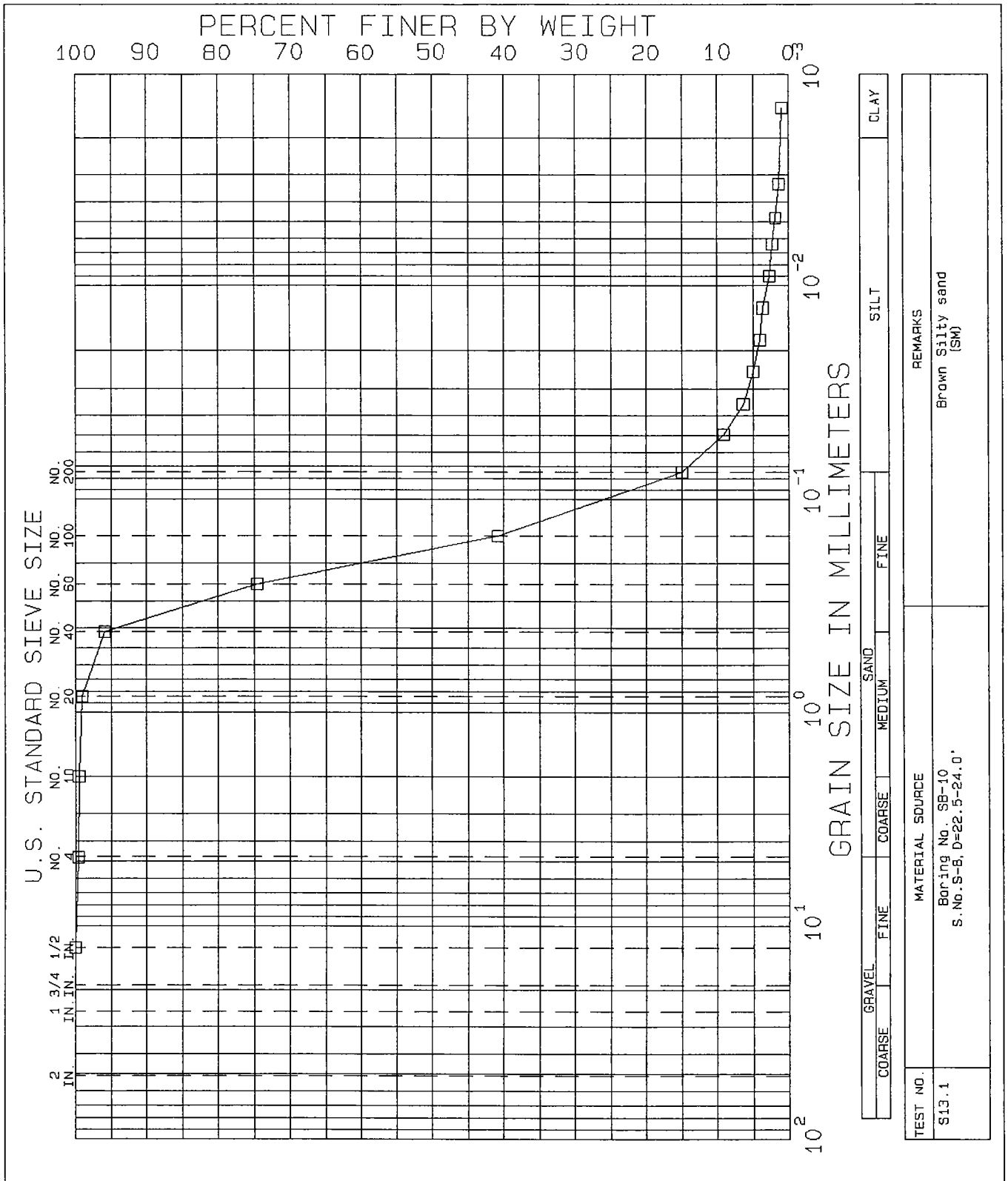


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-8	TEST SERIES	
SAMPLE	S10&11	NO.	12
DEPTH	28.5-31.5'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

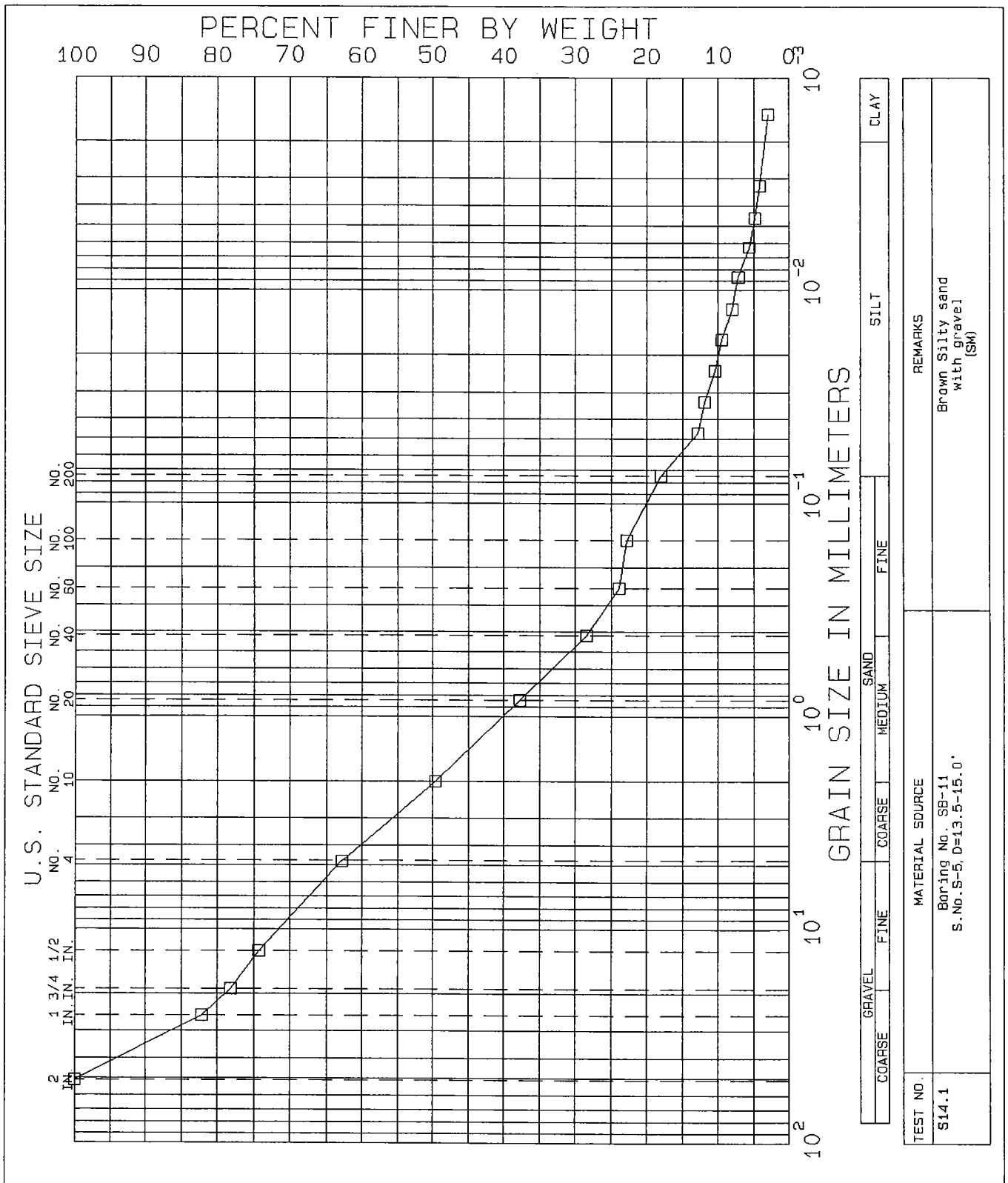


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-10	TEST SERIES	
SAMPLE	S-B	NO.	13
DEPTH	22.5-24.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828



NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-11	TEST SERIES	
SAMPLE	S-5	NO.	14
DEPTH	13.5-15.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

RECEIVED

SEP 19 2003

BAKER ENGINEERING NY INC.
ROCKY HILL, CT

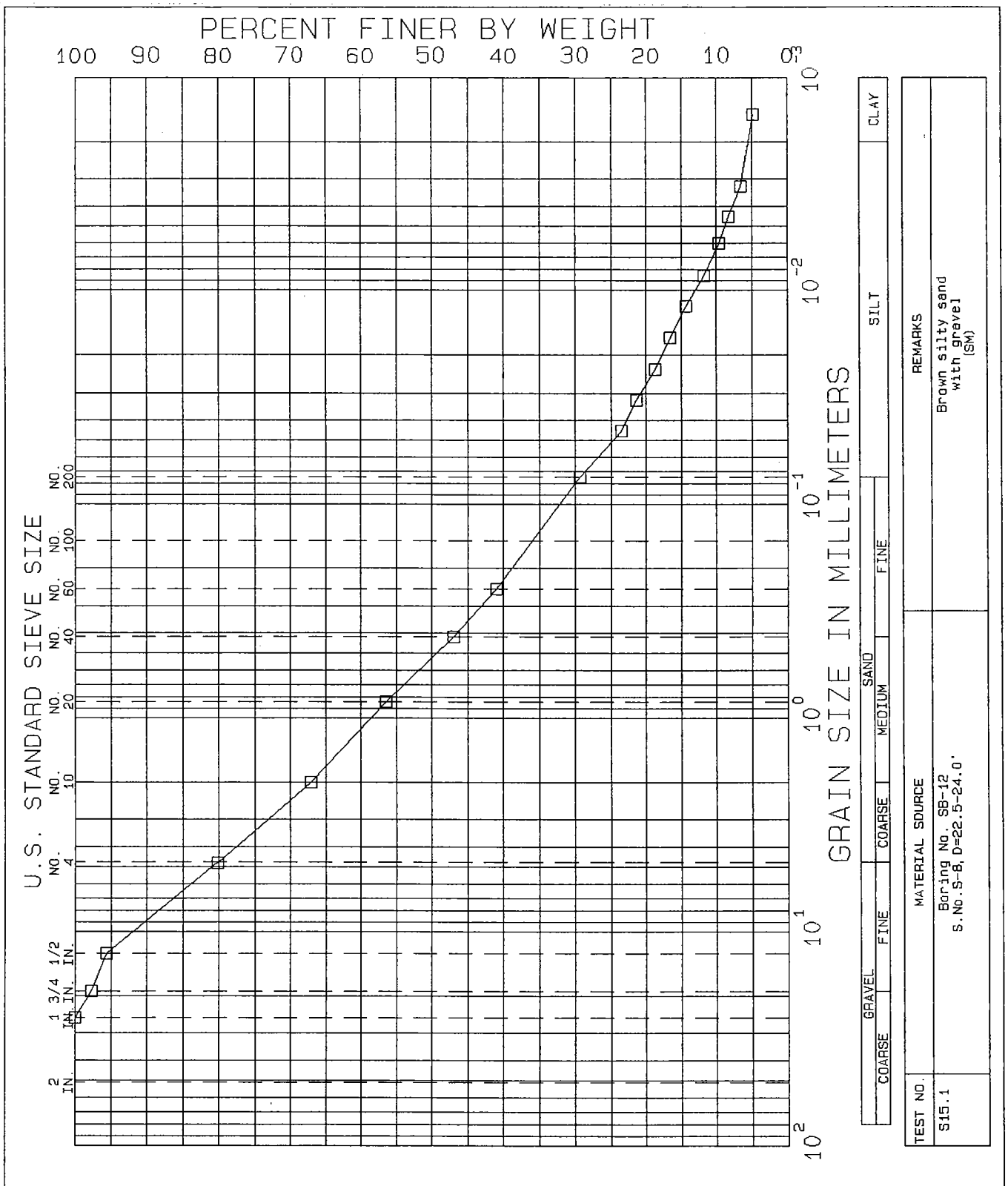
LABORATORY TESTING DATA SHEET

Project Name: NEW BRITAIN-HARTFORD BUSWAY
CONNECTICUT

Project No.: L17828 | Assigned By: D. GAFFNEY | Reviewed By: Don Schulze

Project Engineer: D. SCHULZE | Date: AUG.03 | Date Reviewed: 9/15/03

Boring/ Test Pit No.	Sample No.	Depth ft.	Lab No.	Identification Tests: Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	Density: γ_d MAX (pcf) / W_{opt} (%)	Perme-ability cm/sec	Strength Tests: Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	Consol.: $\frac{C_c}{1+e_0}$	Laboratory Log and Soil Description
SB-12	S-8	22.5-24.0	15	12.4	16	14	29	5												Brown silty sand with gravel (SM)
SB-13	S-7	19.5-21.0	16	15.2	NP	NP	7	2												Red-brown, well graded sand w/ silt & gravel (SW-SM)
SB-14	S-4	10.5-12.0	17	10.4	16	13	20	5												Brown silty sand with gravel (SM)
SB-15	S-3	4.5-6.0	18	16.3	20	17	30	4												Brown silty gravel with sand (GM)
SB-16	S-5	12.0-13.5	19	20.8	NP	NP	64	4												Brown gravelly silt with sand (ML)
SB-16	S-9	24.0-25.2	20	10.2	14	12	44	12												Red-brown silty sand (SM)
SB-17	S-8	22.5-24.0	21	22.4	21	20	68	11												Red-brown gravelly silt with sand (ML)
SB-18	S-5	13.5-15.0	22	30.1	30	19	68	18												Red-brown sandy lean clay (CL)
SB-19	S-3	7.5-9.0	23	21.7	21	21	91	8												Red-brown silt (ML)
SB-21	S-2	4.5-6.0	24	15.4	NP	NP	18	4												Dark brown silty sand (SM)
SB-21	S-8	22.5-24.0	25	14.6	19	16	21	6												Red-brown silty sand with gravel (SM)
SB-22	S-1	1.5-3.0	26	9.8	NP	NP	10	3												Dk brown well graded sand with silt & gravel (SW-SM)
SB-22	S-3	7.5-9.0	27	18.0	24	16	16	5												Red-brown clayey gravel with sand (GC)
SB-23	S-4	10.5-11.5	28	14.7	18	14	27	6												Red-brown, silty, clayey sand with gravel (SC-SM)
SB-24	S-3	4.5-5.3	29	19.3	25	18	21	6												Red-brown, silty, clayey sand with gravel (SC-SM)
SB-25	S-2	4.5-6.0	30	33.2	27	19	44	6												Red-brown, clayey sand (SC)

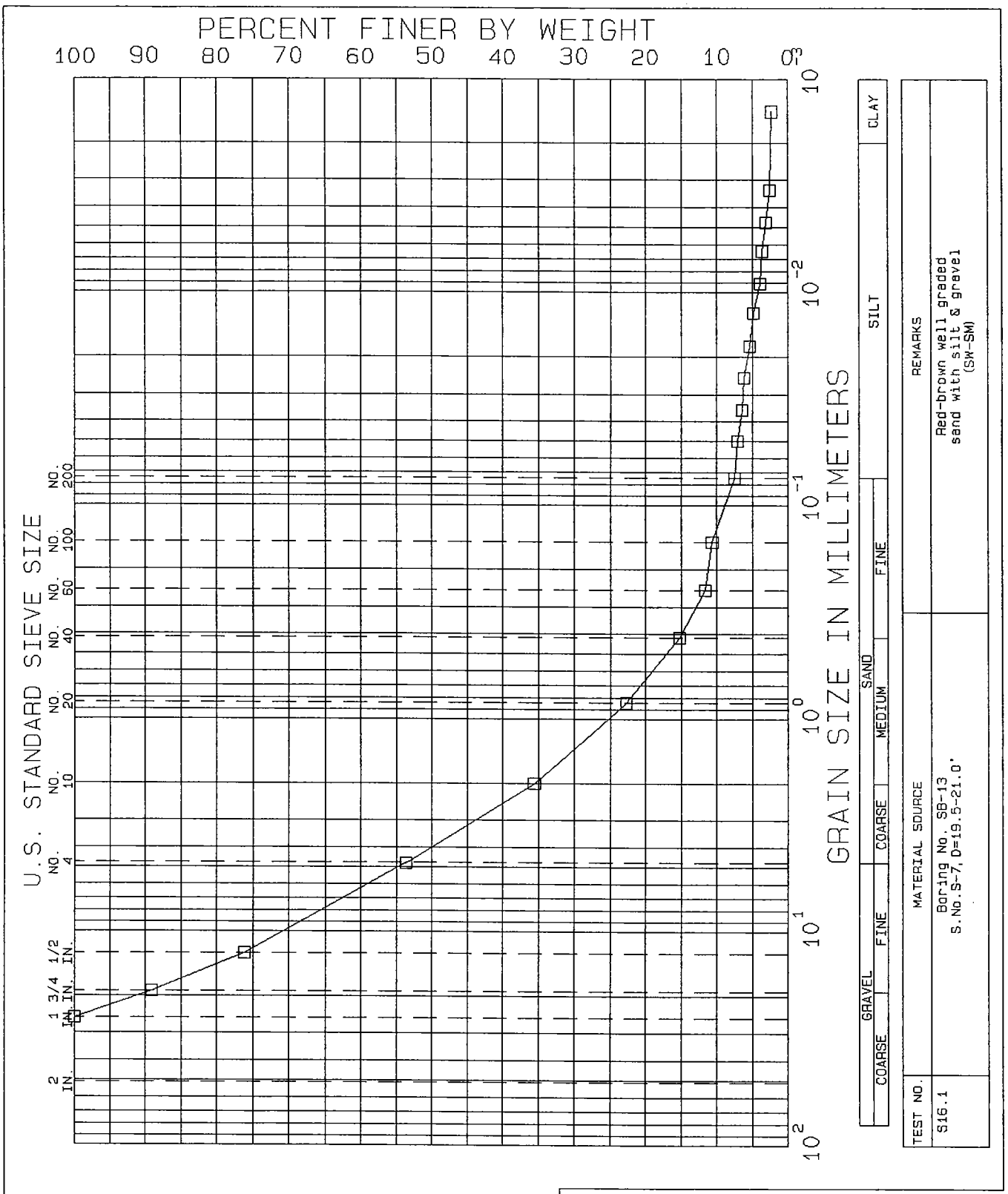


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-12	TEST SERIES	
SAMPLE	S-8	NO.	15
DEPTH	22.5-24.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

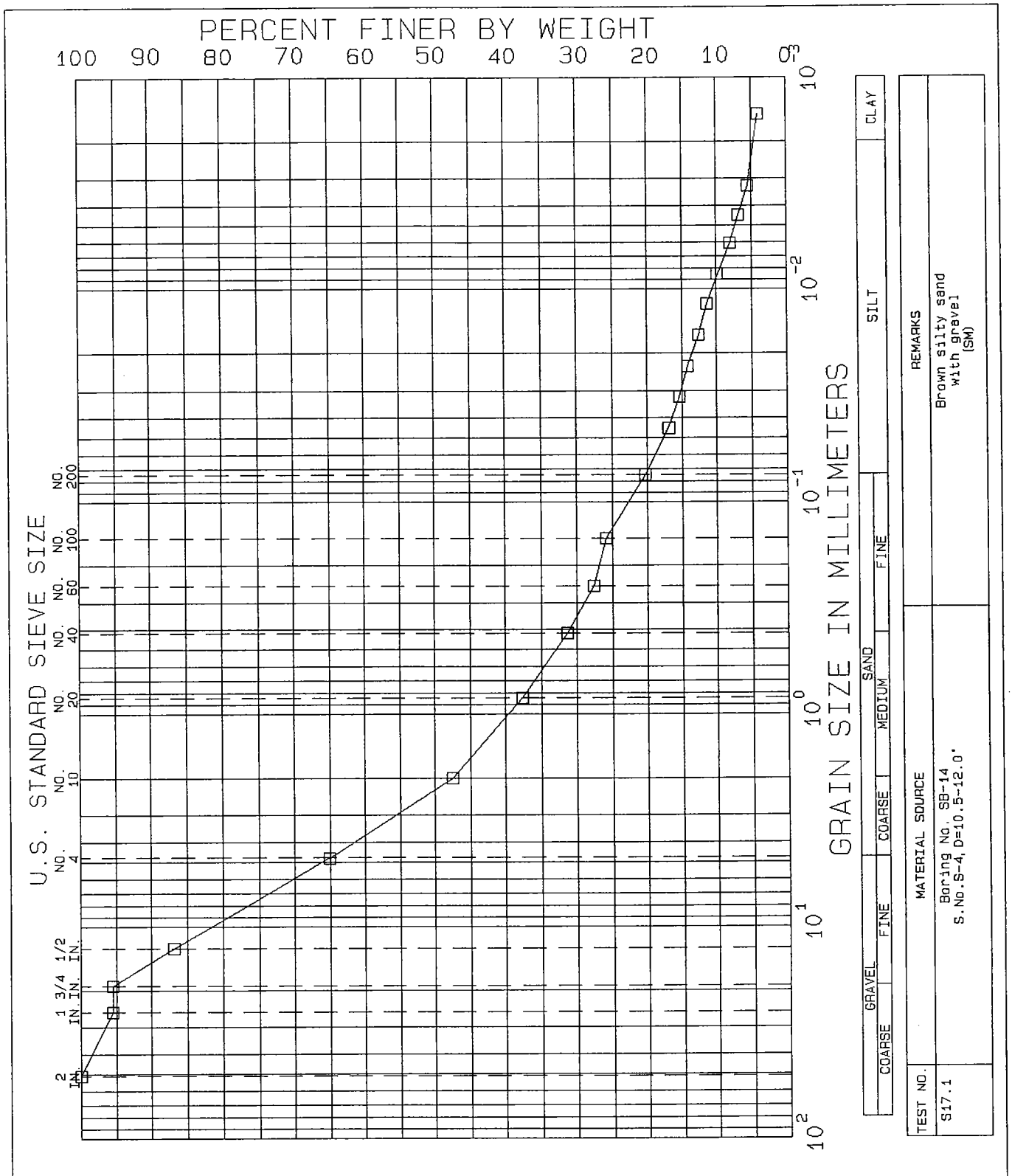


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-13	TEST SERIES	
SAMPLE	S-7	NO.	16
DEPTH	19.5-21.0'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

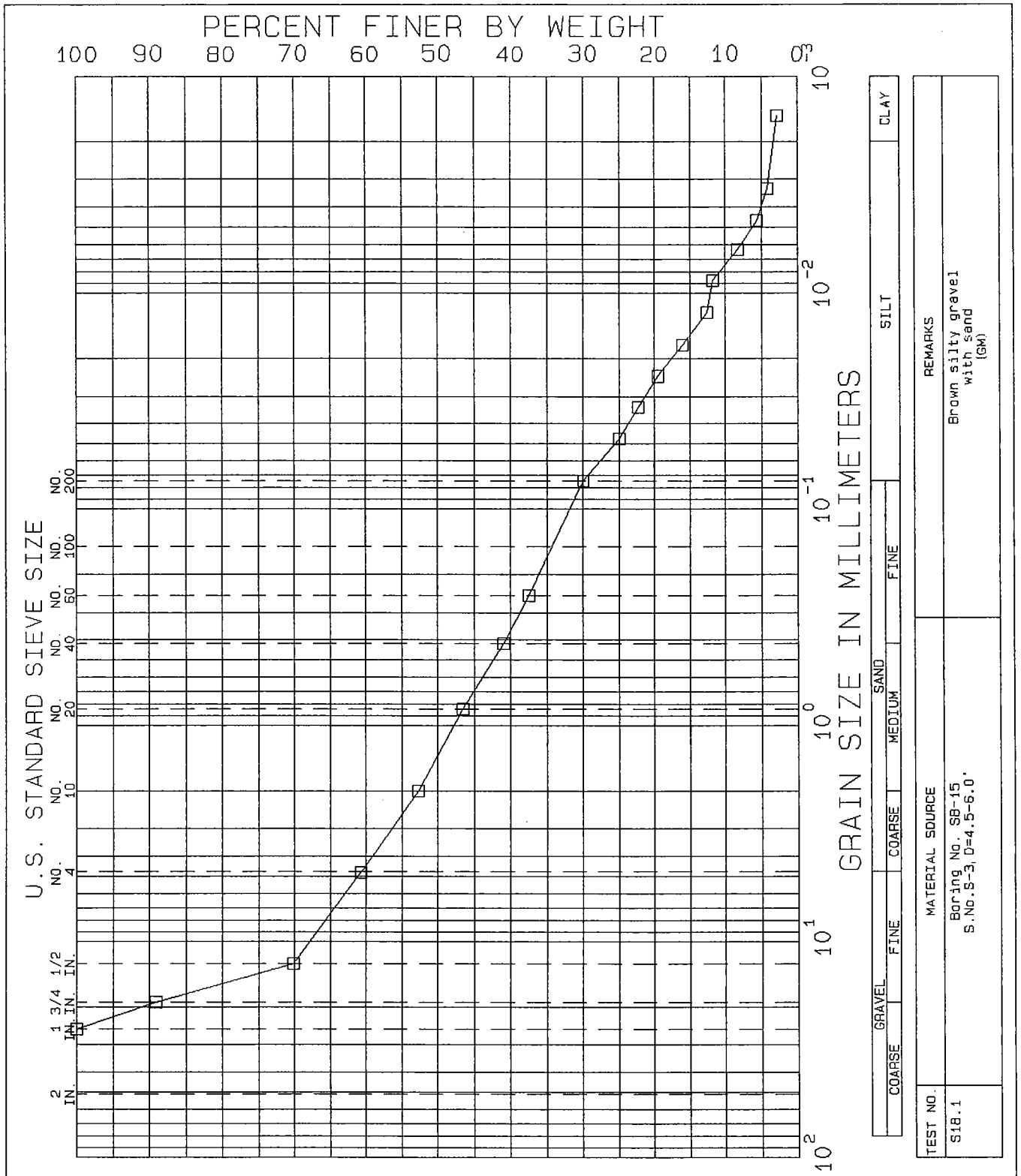


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-14	TEST SERIES	
SAMPLE	S-4	NO.	17
DEPTH	10.5-12.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

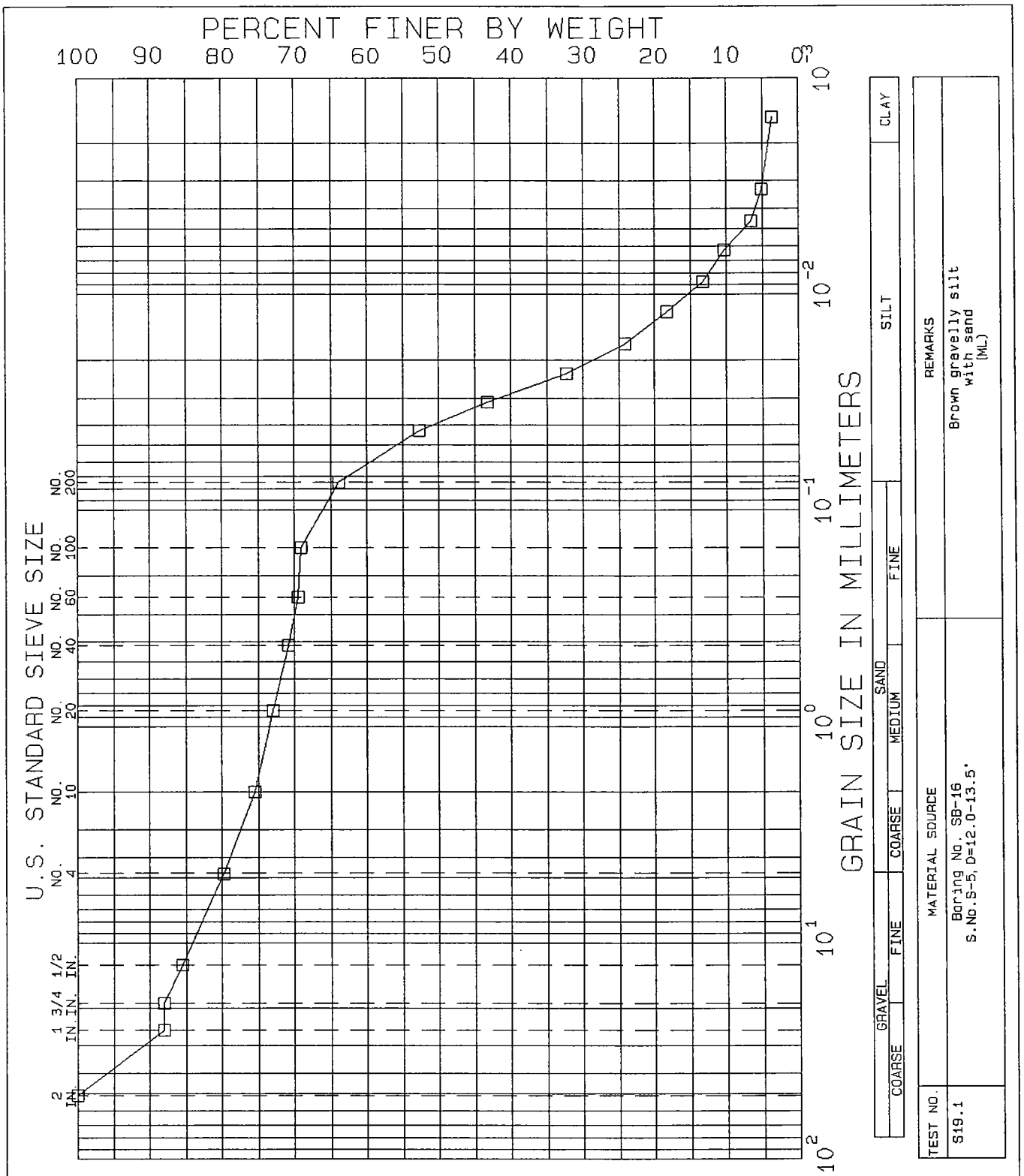


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-15	TEST SERIES	
SAMPLE	S-3	NO.	18
DEPTH	4.5-6.0'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

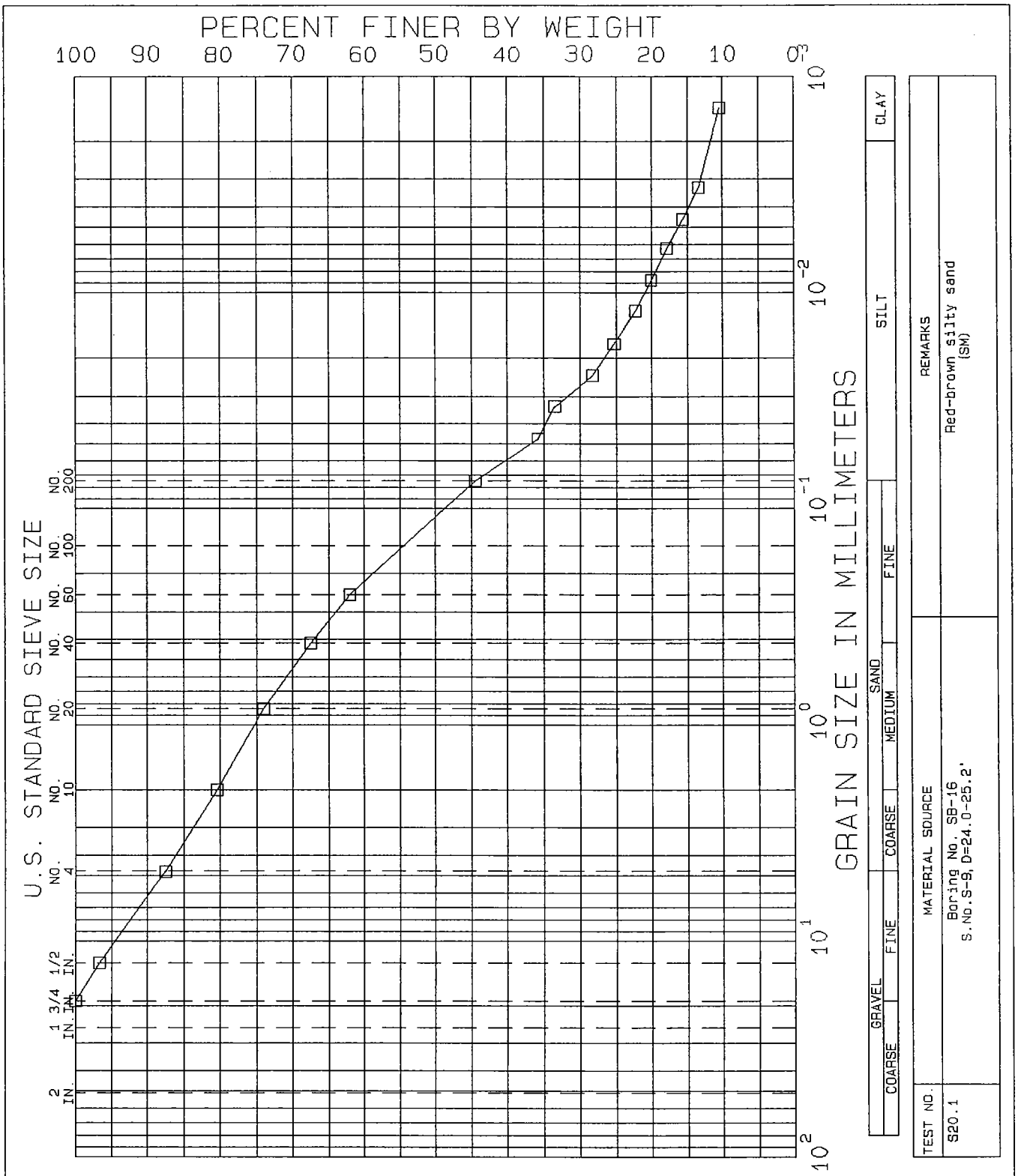


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-16	TEST SERIES	
SAMPLE	S-5	NO.	19
DEPTH	12.0-13.5'	DATE	Aug.03
TECH.	MST		
REVIEWER	DAS	FILE	L17828

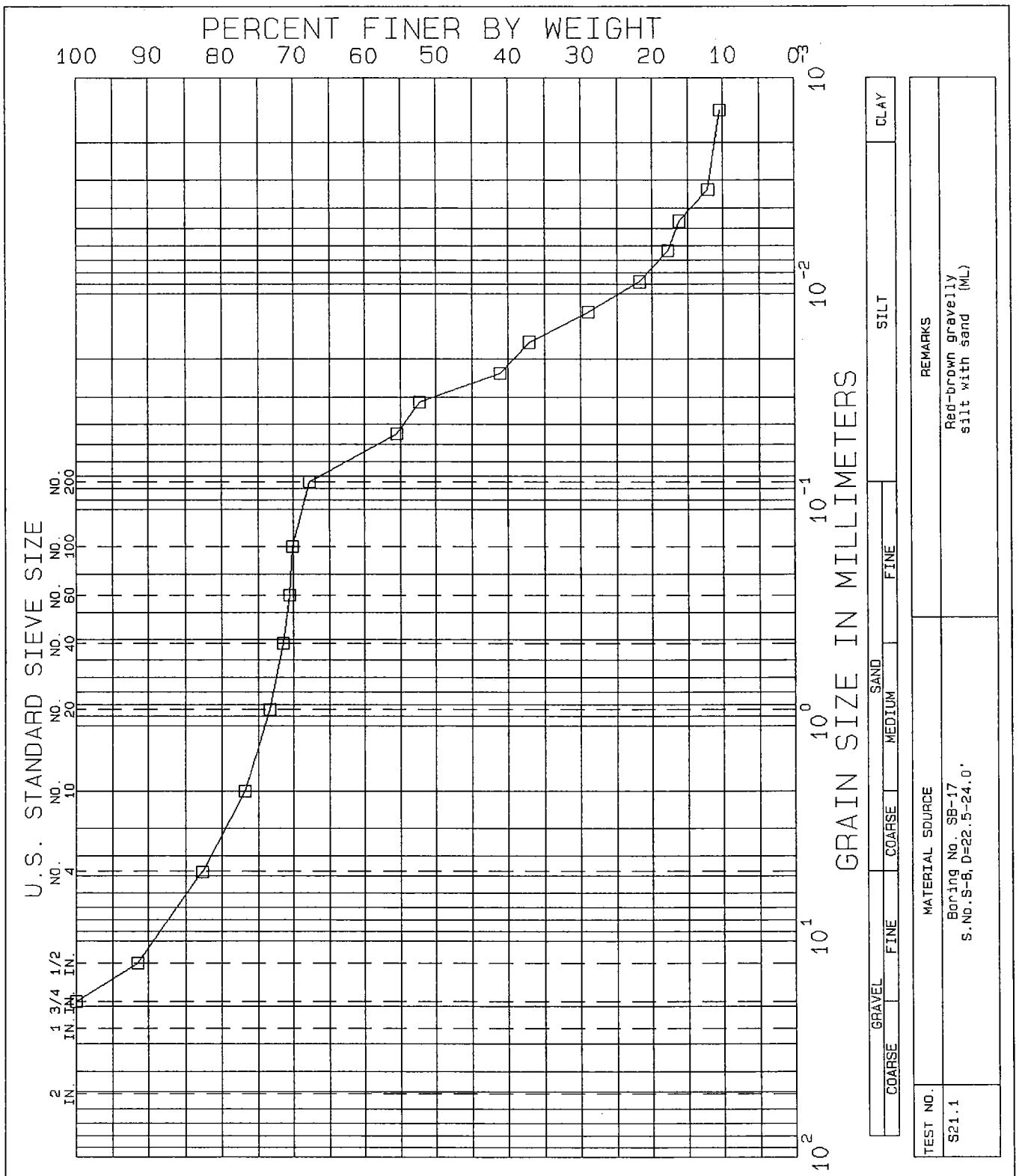


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-16	TEST SERIES	
SAMPLE	S-9	NO.	20
DEPTH	24.0-25.2'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

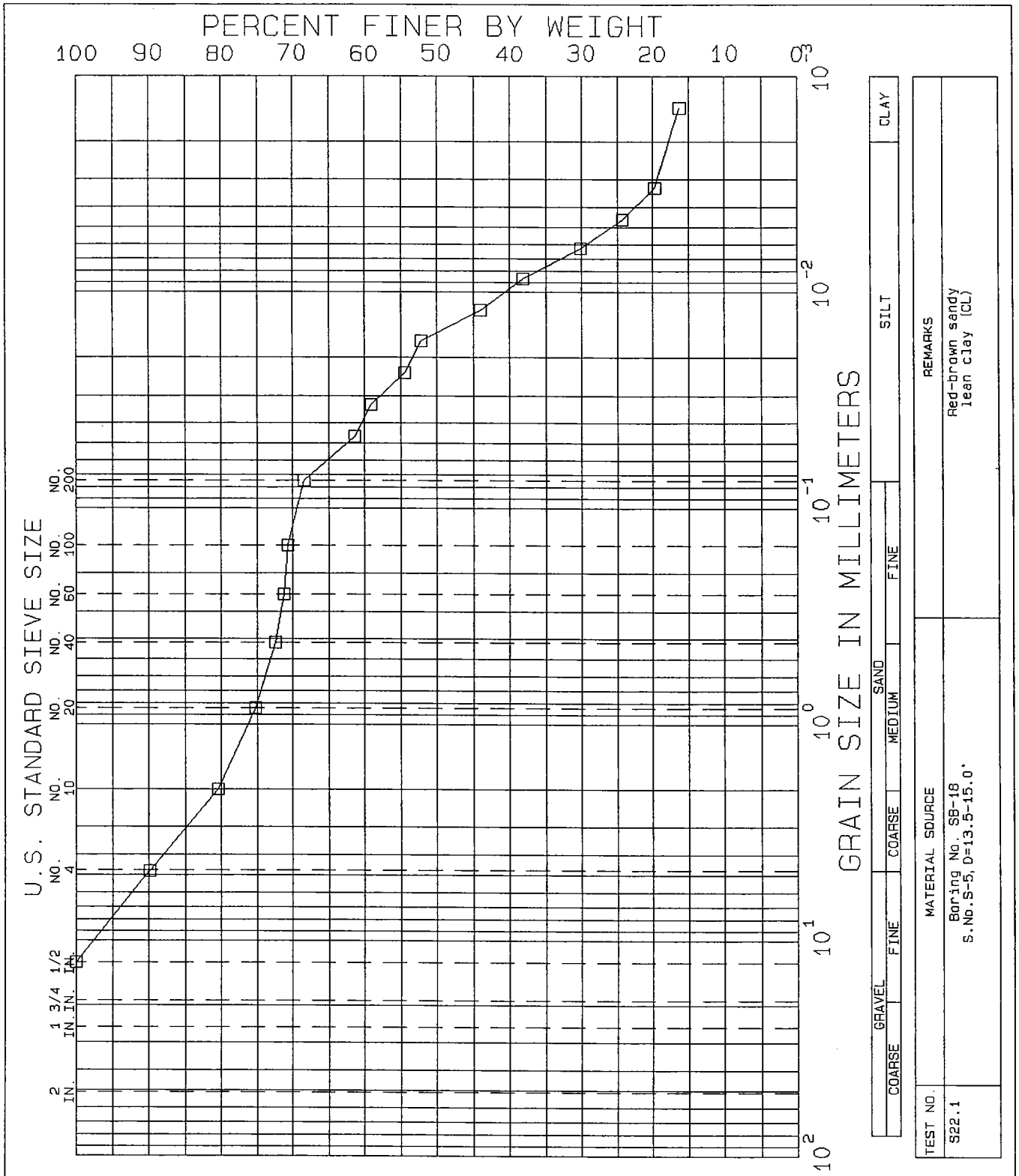


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-17	TEST SERIES	
SAMPLE	S-8	NO.	21
DEPTH	22.5-24.0'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

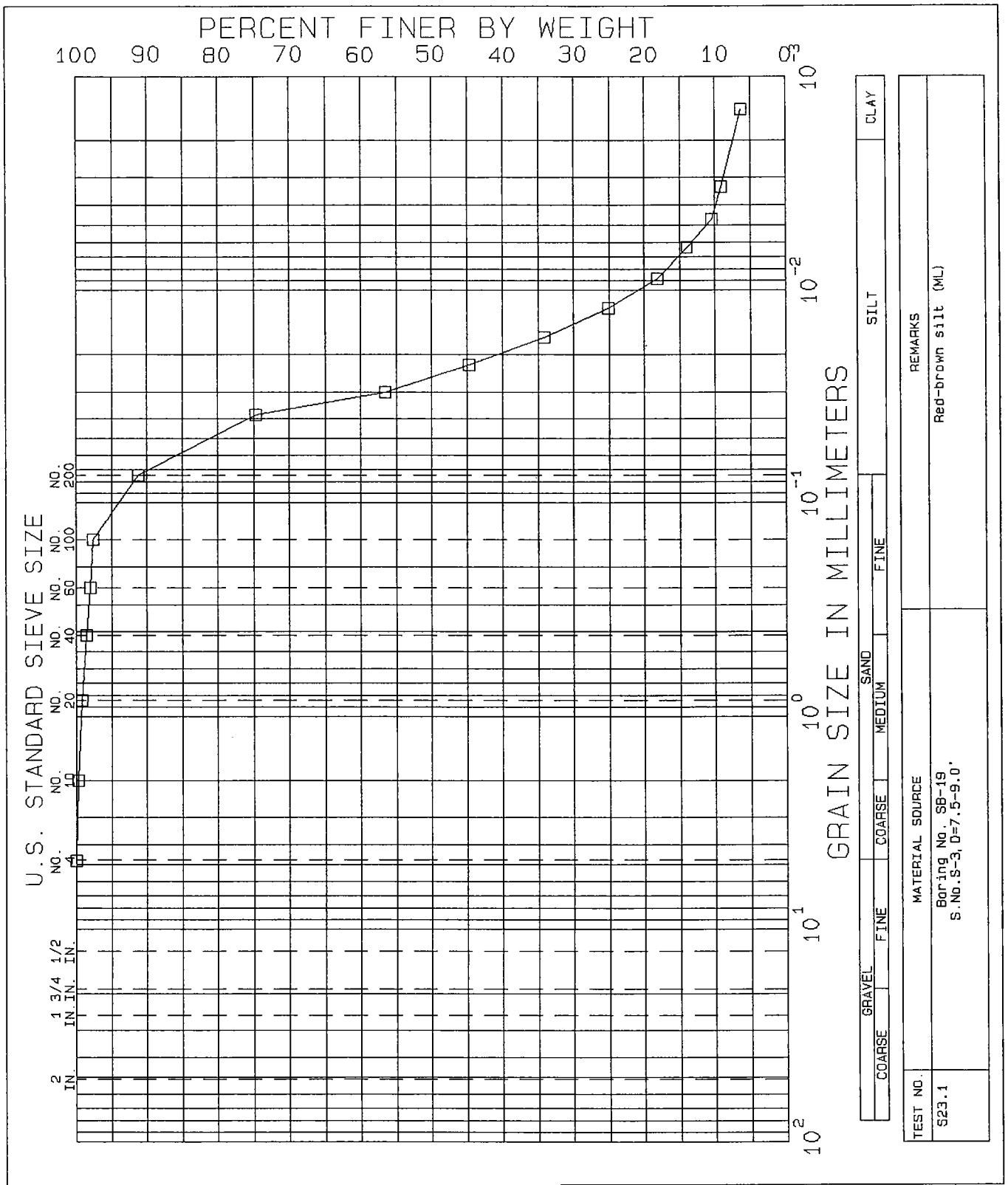


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-18	TEST SERIES	
SAMPLE	S-5	NO.	22
DEPTH	13.5-15.0'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

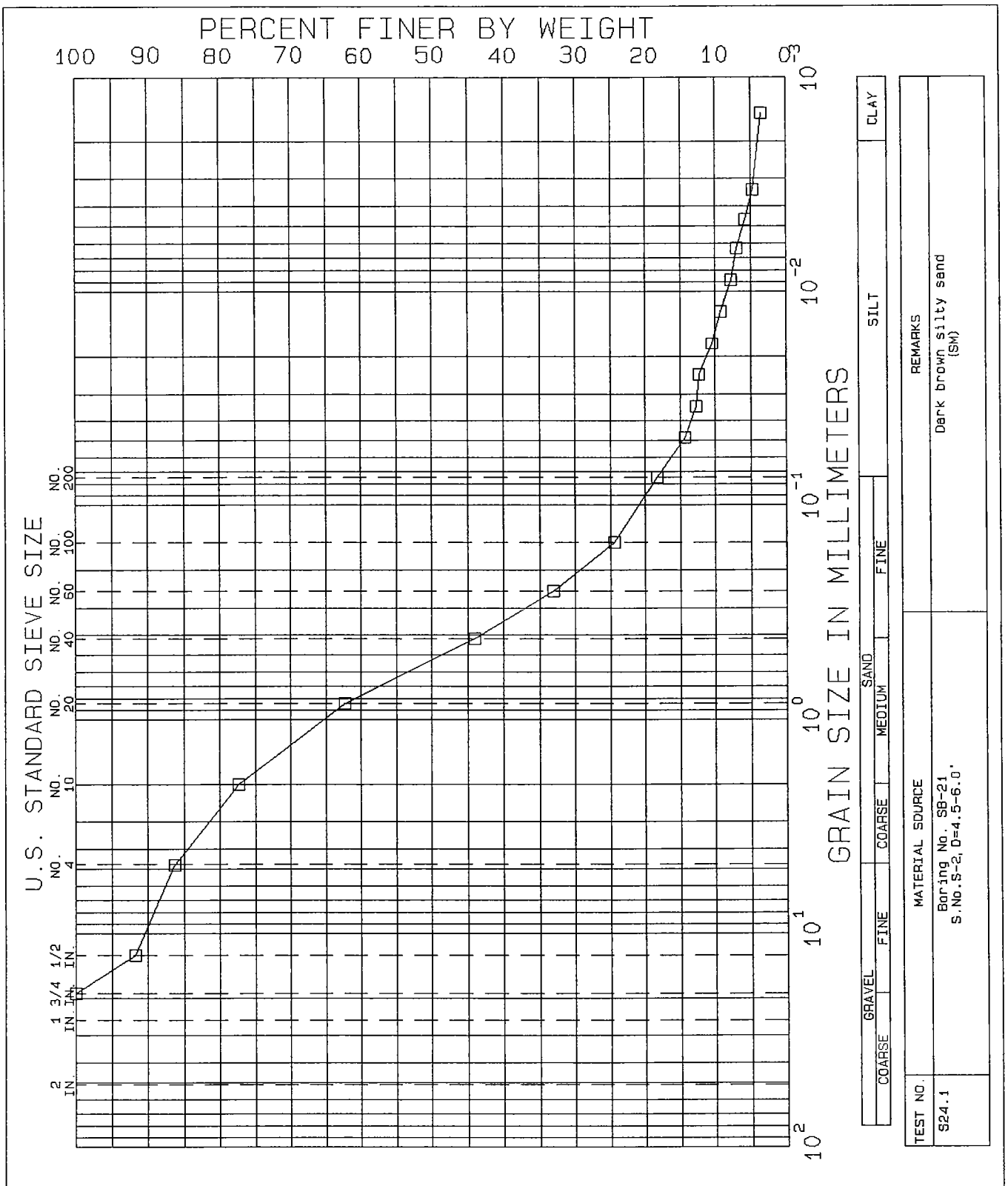


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-19	TEST SERIES	
SAMPLE	S-3	NO.	23
DEPTH	7.5-9.0'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

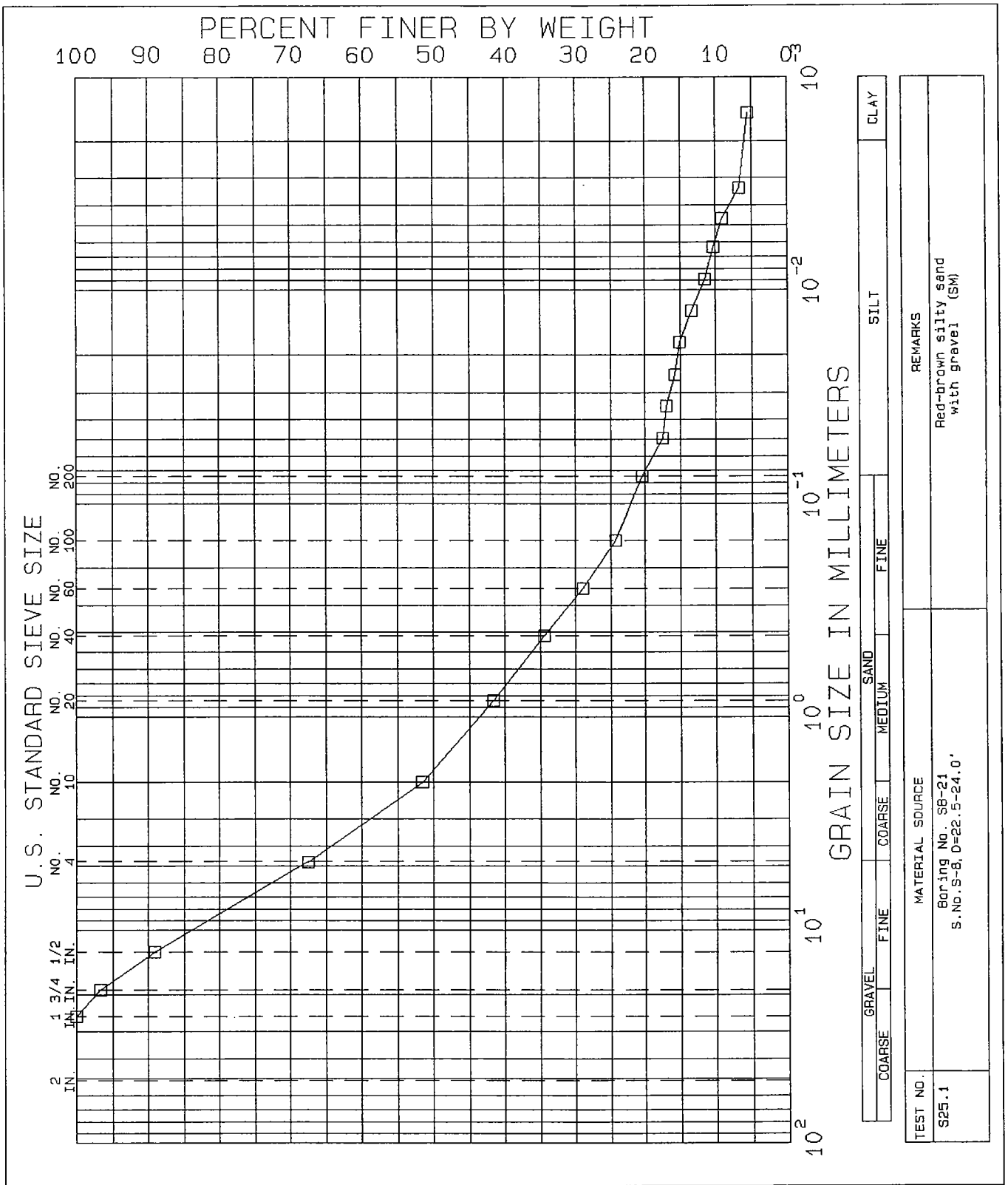


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-21	TEST SERIES	
SAMPLE	S-2	NO.	24
DEPTH	4.5-6.0'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

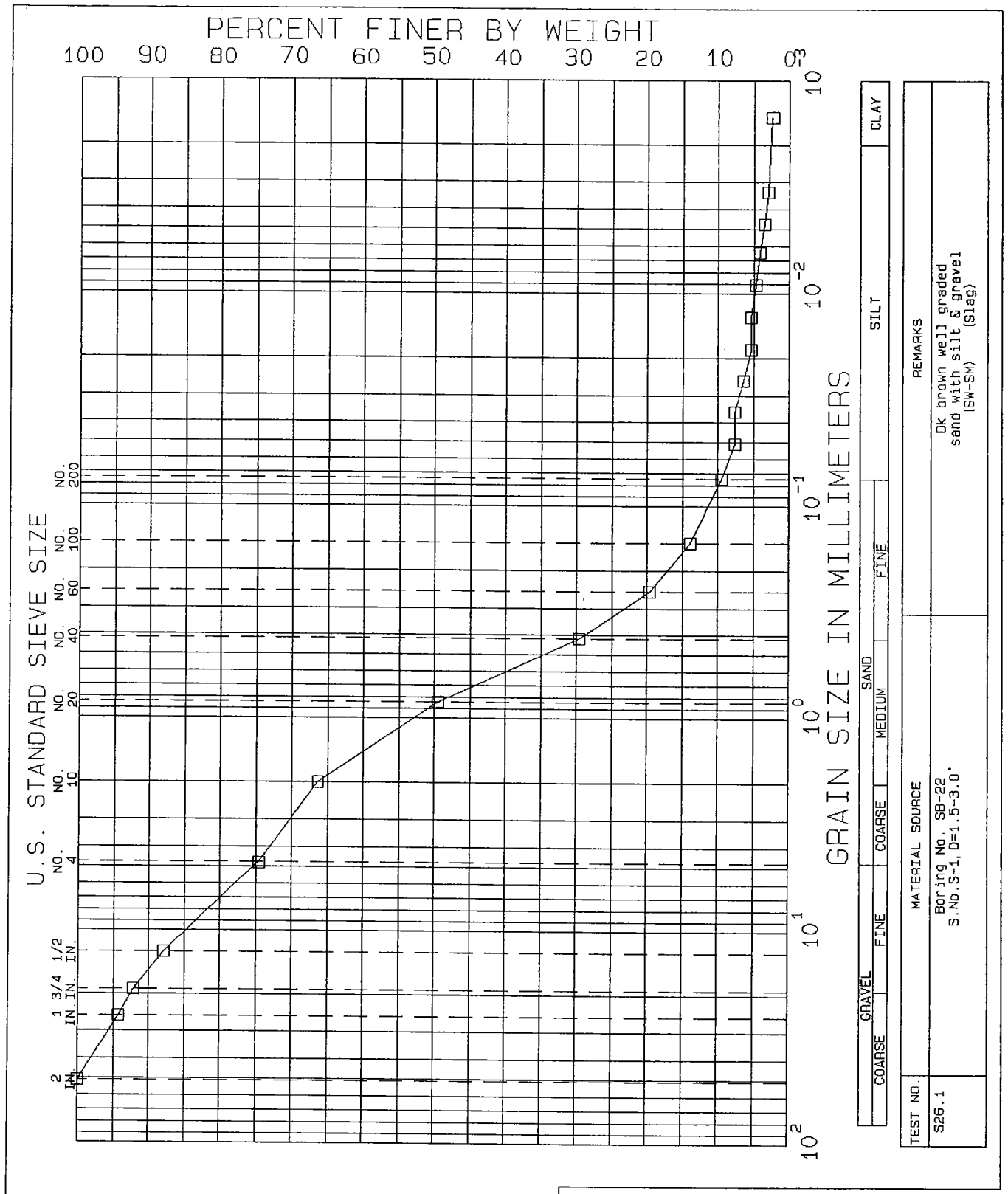


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-21	TEST SERIES	
SAMPLE	S-8	NO.	25
DEPTH	22.5-24.0'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

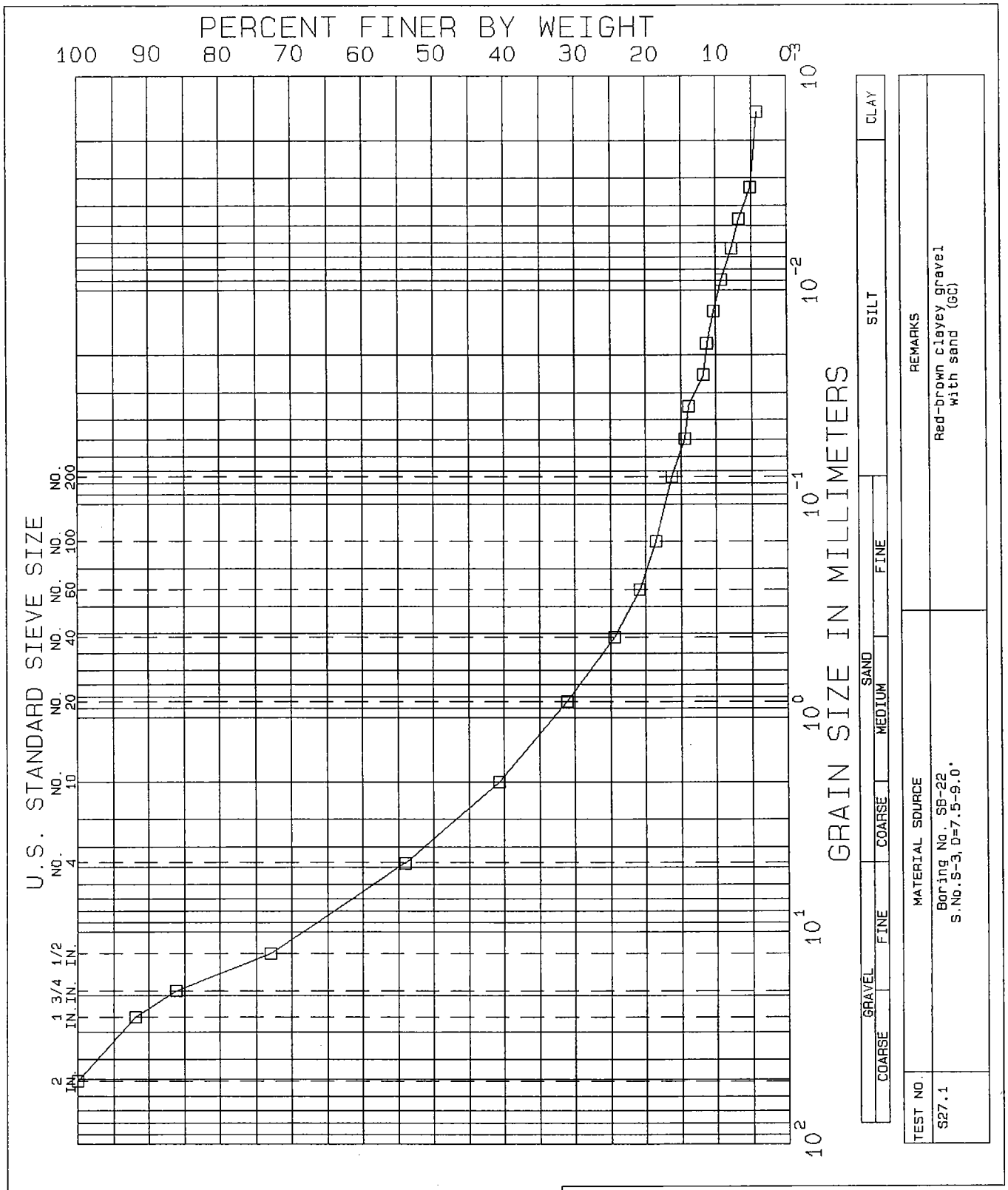


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-22	TEST SERIES	
SAMPLE	S-1	NO.	26
DEPTH	1.5-3.0'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

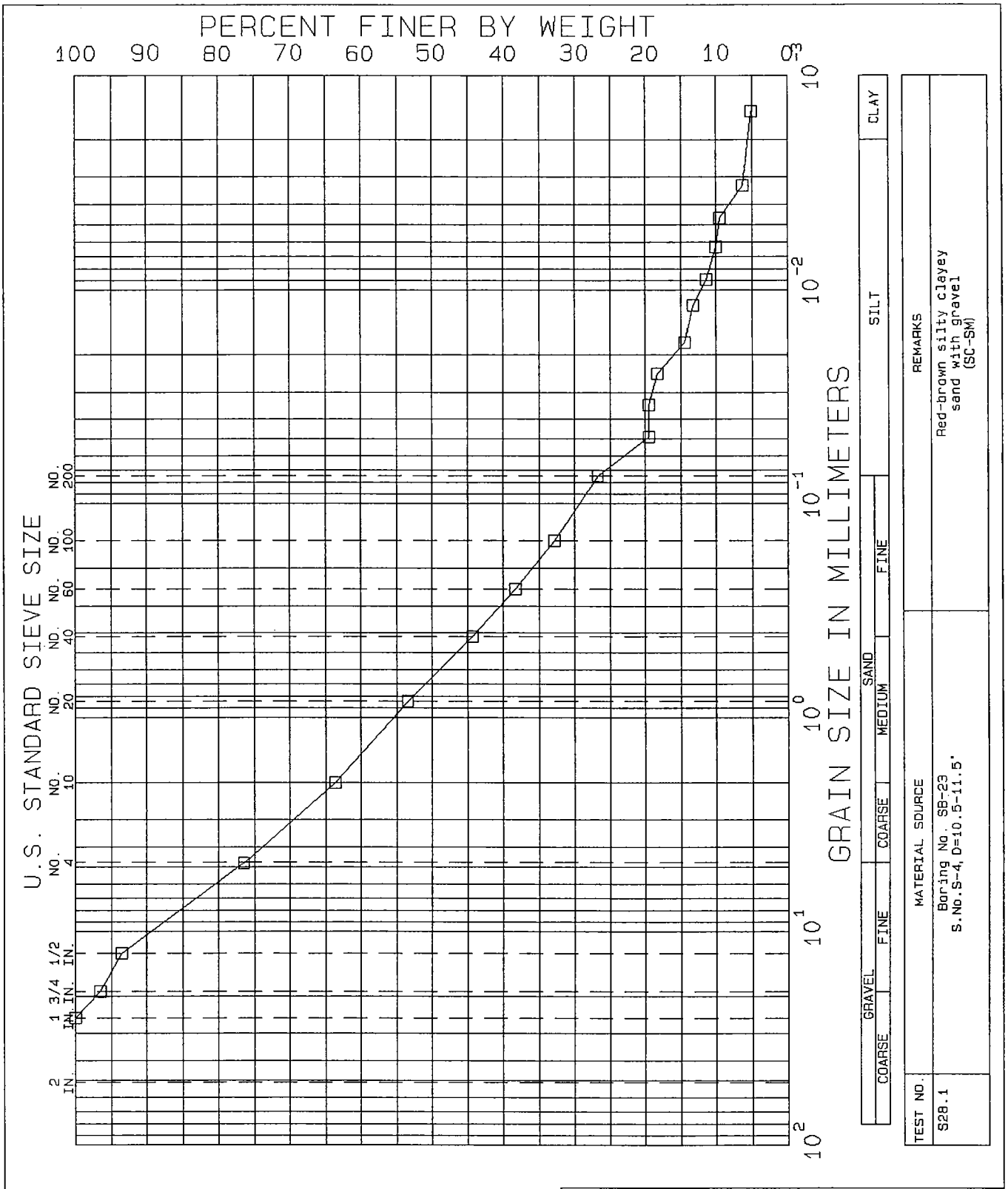


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-22	TEST SERIES	
SAMPLE	S-3	NO.	27
DEPTH	7.5-9.0'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

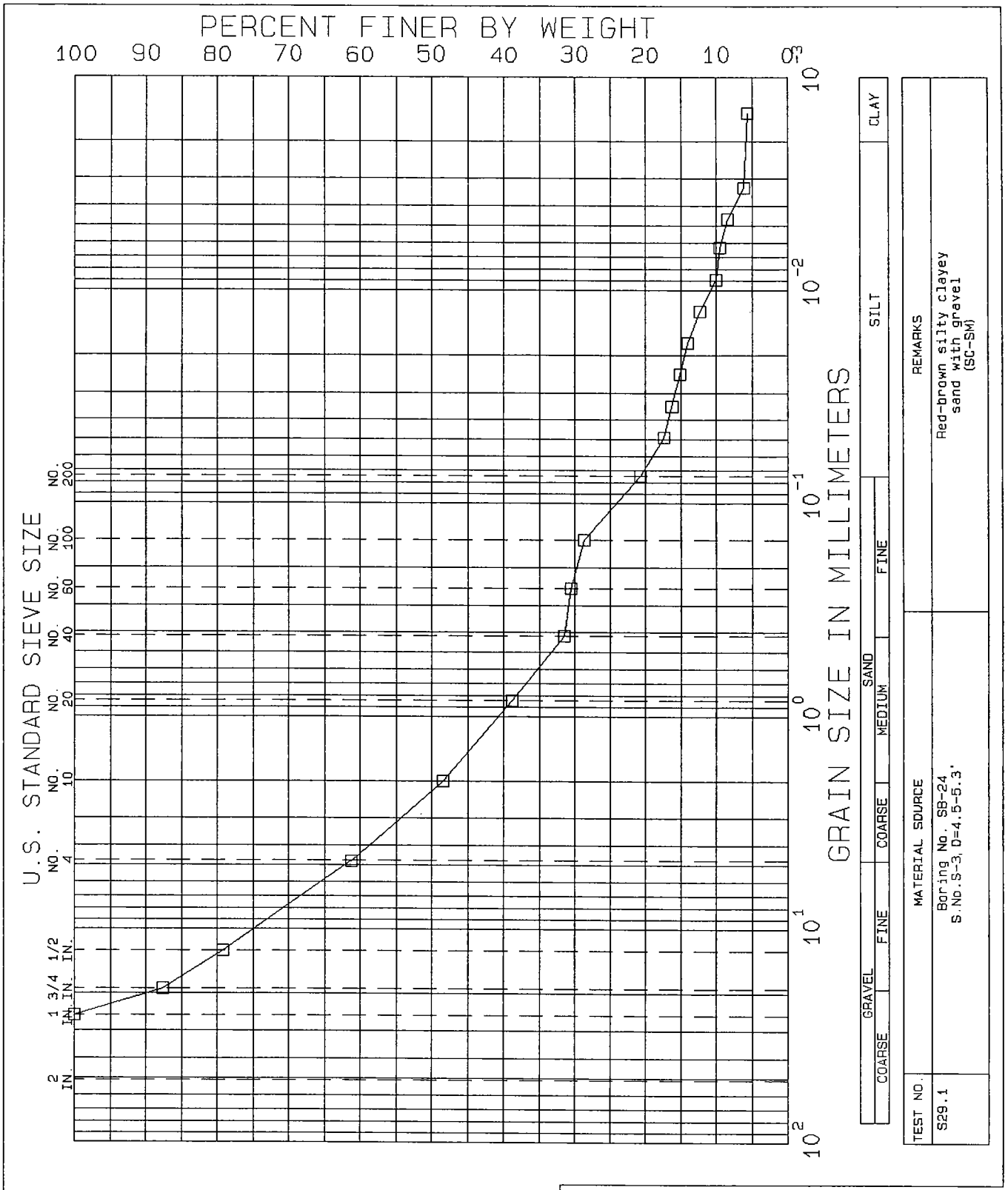


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-23	TEST SERIES	
SAMPLE	S-4	NO.	28
DEPTH	10.5-11.5'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

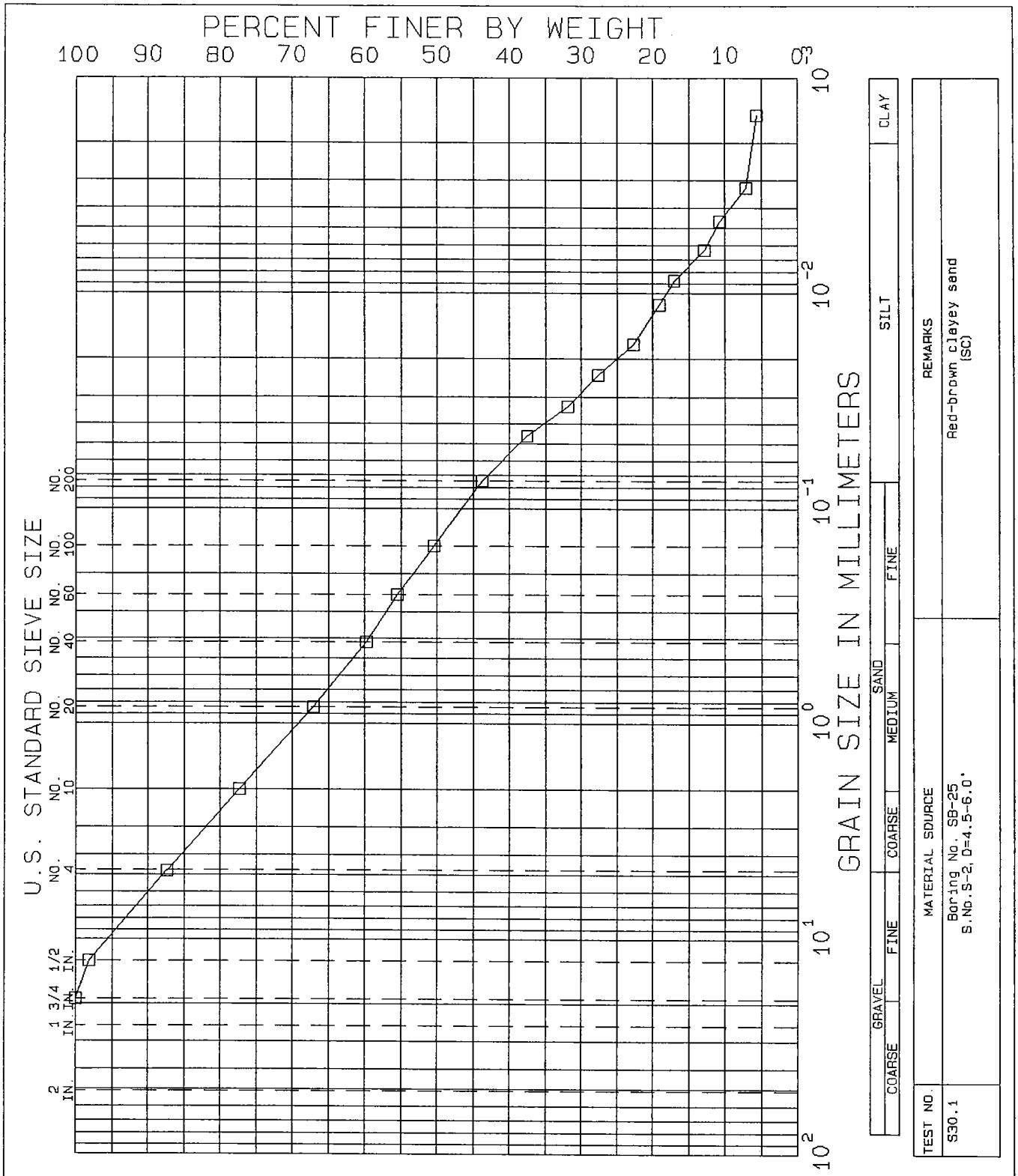


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-24	TEST SERIES	
SAMPLE	S-3	NO.	29
DEPTH	4.5-5.3'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828



NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

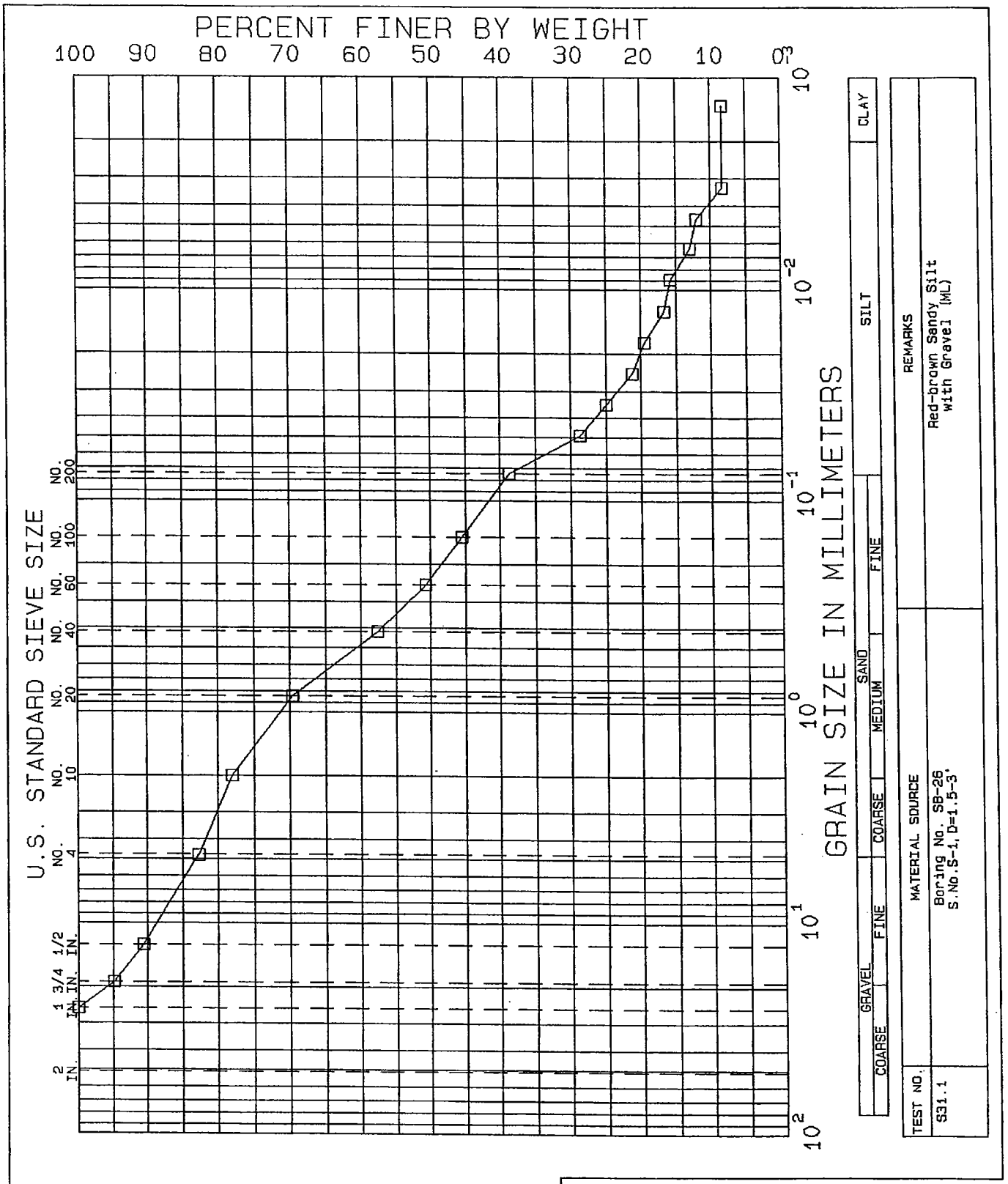
GRADATION TESTS

BORING NO.	SB-25	TEST SERIES	
SAMPLE	S-2	NO.	30
DEPTH	4.5-6.0'	DATE	Aug.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17B28

LABORATORY TESTING DATA SHEET

Project Name: NEW BRITAIN-HARTFORD BUSWAY CONNECTICUT
Project No.: L17823 | Assigned By: D. GAFFNEY | Reviewed By:
Project Engineer: D. SCHULZE | Date: SEP.03 | Date Reviewed:

Boring/ Test Pit No.	Sample No.	Depth ft.	Lab No.	Identification Tests: Water Content %	LL %	PL %	Sieve -200 %	Hyd -2μ %	ORG %	G_s	Dry unit wt. pcf	Density: γ_d MAX (pcf) / W_{opt} (%)	Perme-ability cm/sec	Strength Tests: Torvane or Type Test	$\bar{\sigma}_c$ psf	Failure Criteria	$\sigma_1 - \sigma_3$ or τ psf	Strain %	Consol.: $\frac{C_c}{1+e_0}$	Laboratory Log and Soil Description
SB-26	S-1	1.5-3.0	31	11.8	17	16	39	8												Red-brown Silty sand with gravel (SM)
SB-26	S-6	16.5-18.0	32	16.3	23	15	33	10												Red-brown Clayey sand with gravel (SC)
SB-27	S-10	30.0-30.8	33	9.8	15	12	33	10												Red-brown Silty sand with gravel (SM)
SB-28	S-3	7.5-9.0	34	38.2	34	24	60	9												Brown Sandy lean clay (CL)
SB-30	S-6	16.5-18.0	35	23.6	26	21	88	19												Red-brown Silty clay (CL-ML)
SB-31	S-9	25.5-27.0	36	19.0	20	18	81	9												Red-brown Silt with sand (ML)
SB-32	S-1	1.5-3.0	37	10.3	24	16	31	10												Red-brown clayey sand with gravel (SC)
SB-32	S-7	16.5-18.0	38	16.1	18	18	23	6												Red-brown Silty sand with gravel (SM)
SB-34	S-4	10.5-12.0	39	21.2	21	21	58	8												Red-brown Sandy silt (ML)
SB-35	S-6	16.5-18.0	40	24.2	22	19	90	15												Red-brown Silt (ML)
SB-35	S-8	22.5-24.0	41	29.2	21	20	95	15												Red-brown Silt (ML)
SB-36	S-2 S-3	4.5-9.0	42	18.5	27	18	30	8												Red-brown clayey gravel with sand (GC)
SB-36	S-7	19.5-21.0	43	28.0	24	20	92	22												Red-brown Silt (ML)
SB-37	S-4	10.5-12.0	44	17.1	27	17	30	9												Brown clayey gravel with sand (GC)
SB-38	S-8	22.5-24.0	45	23.4	23	15	23	7												Red-brown clayey gravel with sand (GC)

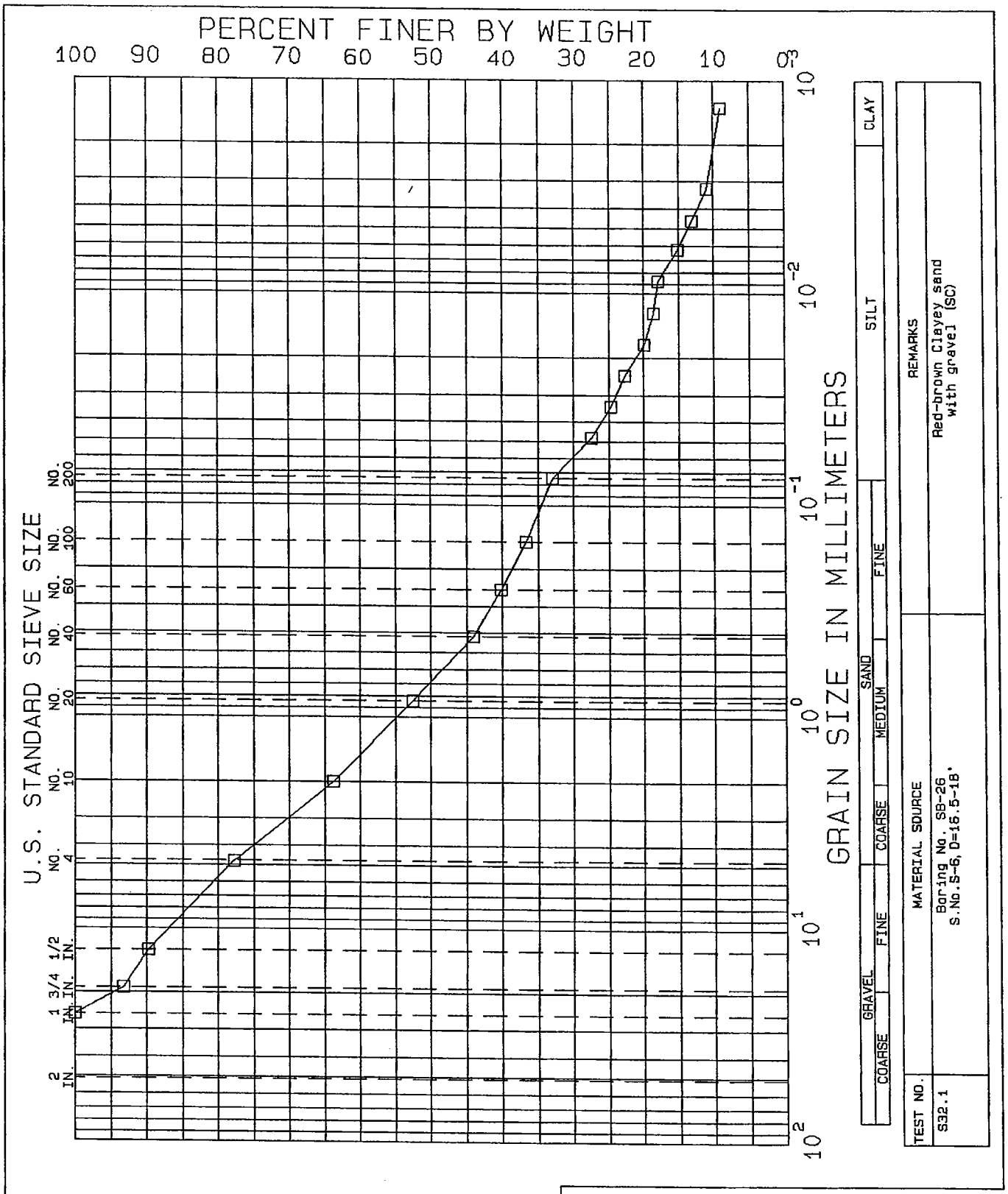


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-26	TEST SERIES	
SAMPLE	S-1	NO.	31
DEPTH	1.5-3'	DATE	Sep.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828



NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-26	TEST SERIES	
SAMPLE	S-6	NO.	32
DEPTH	16.5-18'	DATE	Sep.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

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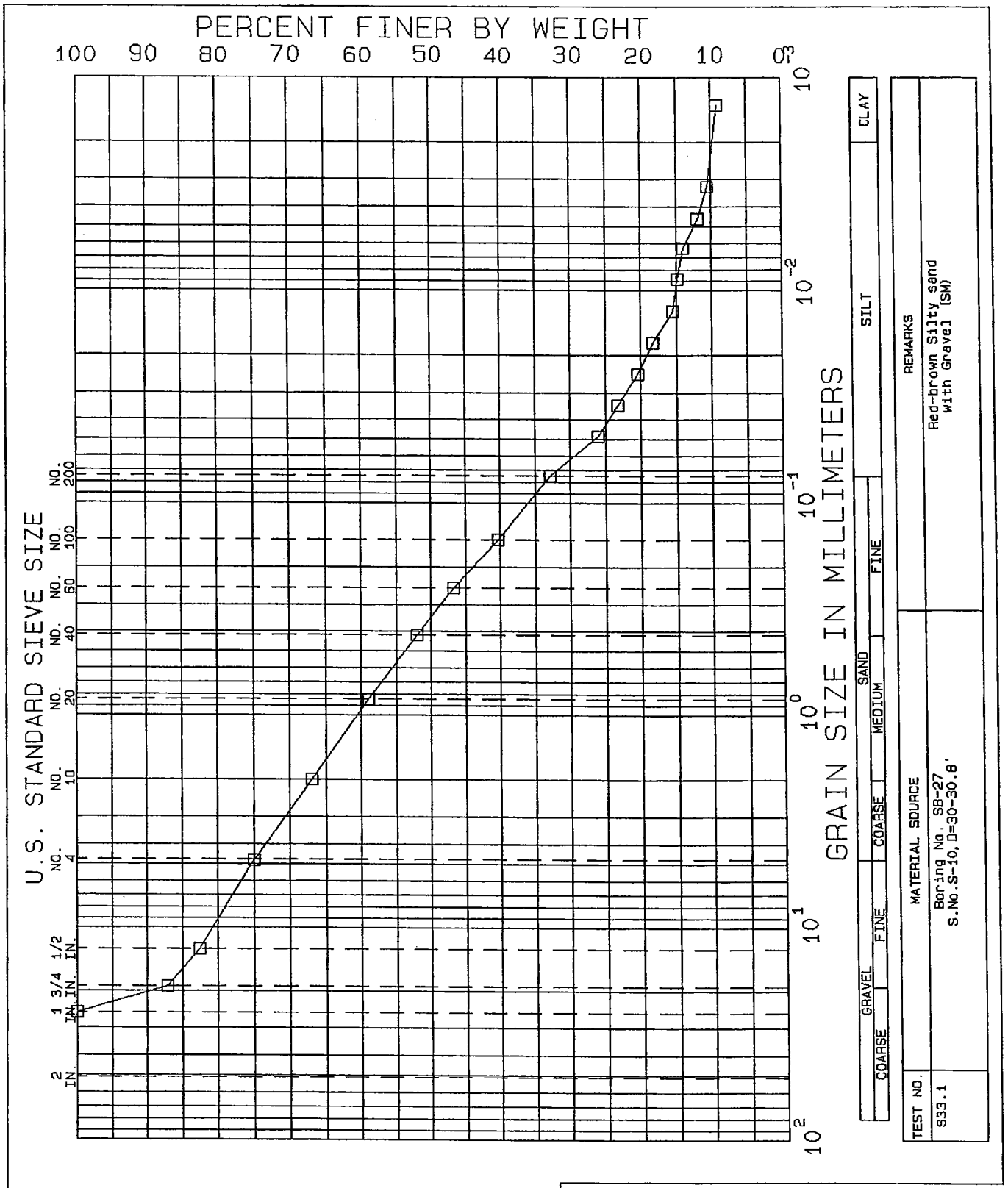
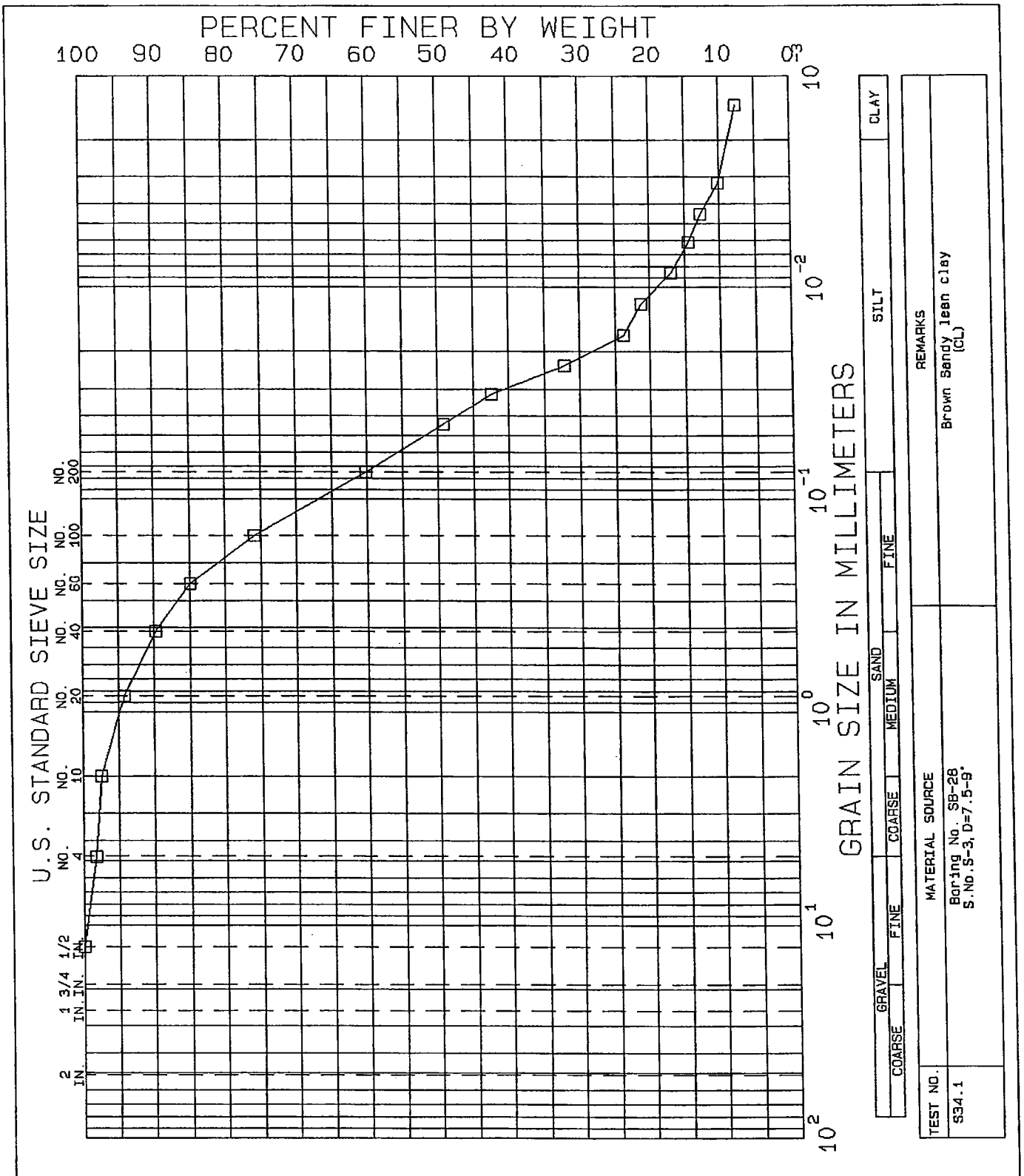


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-27	TEST SERIES	
SAMPLE	S-10	NO.	33
DEPTH	30-30.8'	DATE	Sep.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

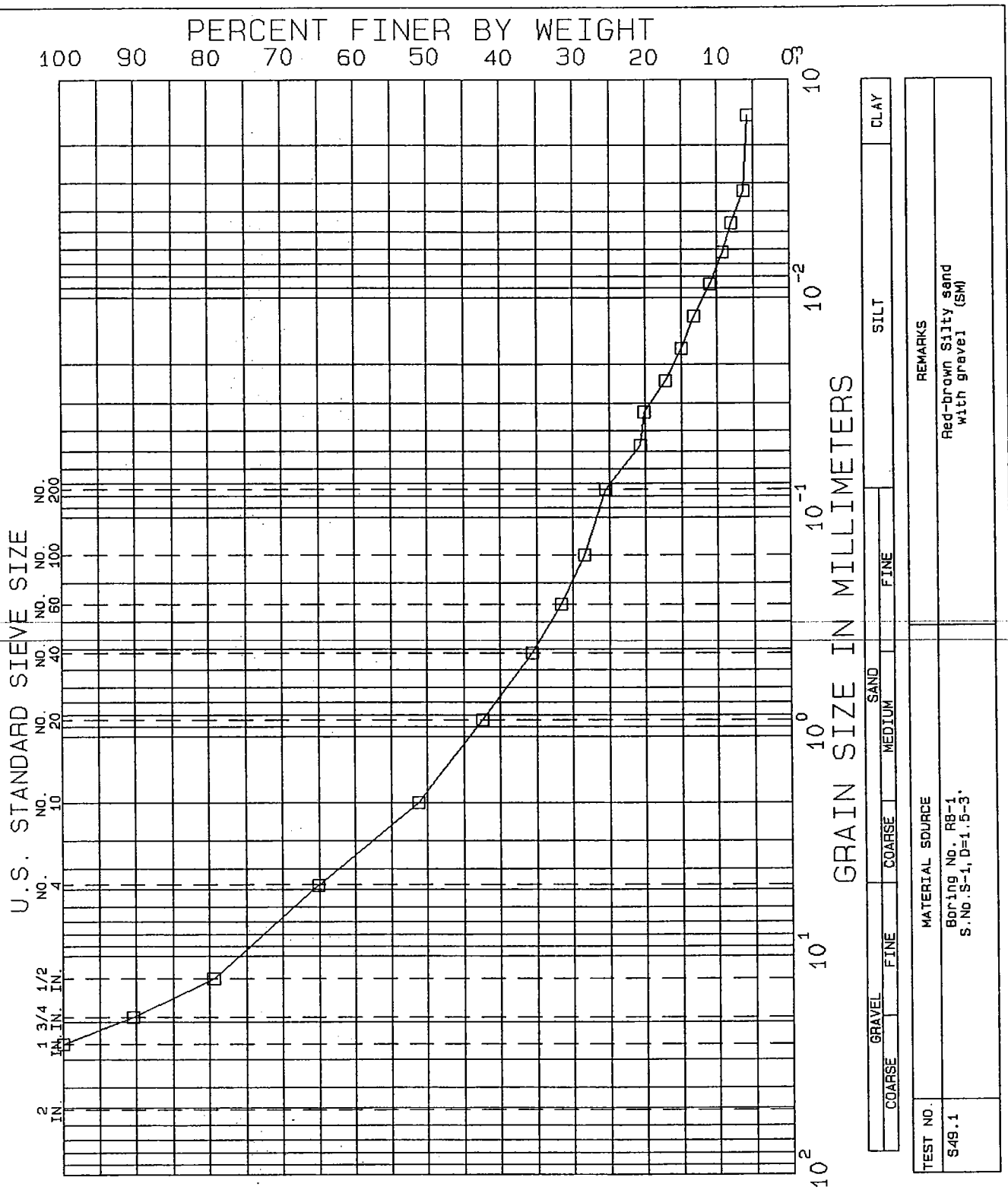


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	SB-28	TEST SERIES	
SAMPLE	S-3	NO.	34
DEPTH	7.5-9'	DATE	Sep.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

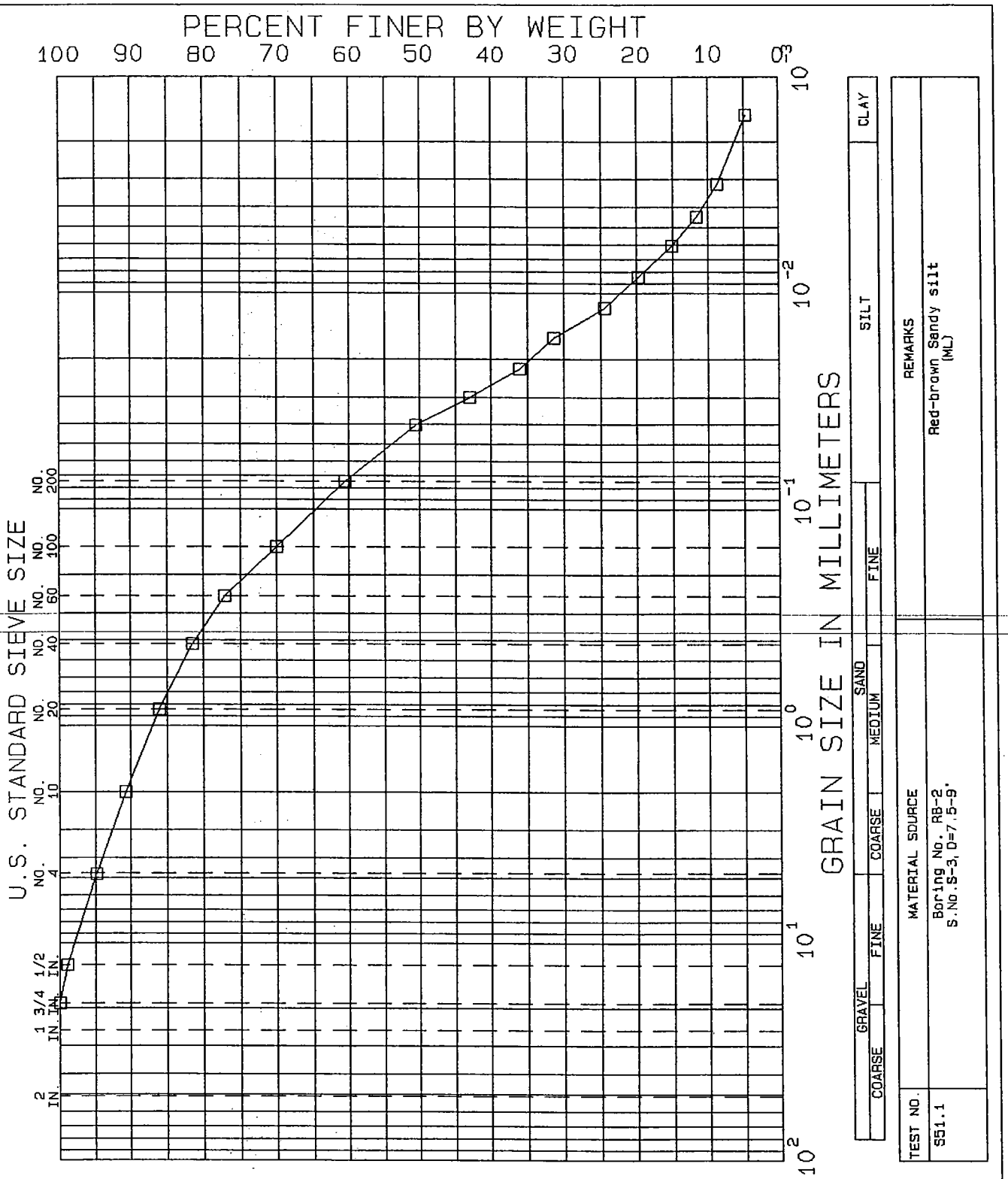


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	RB-1	TEST SERIES	
SAMPLE	S-1	NO.	49
DEPTH	1.5-3'	DATE	Oct.03
TECH.	CAG		
REVIEWER	MBP	FILE	L17028

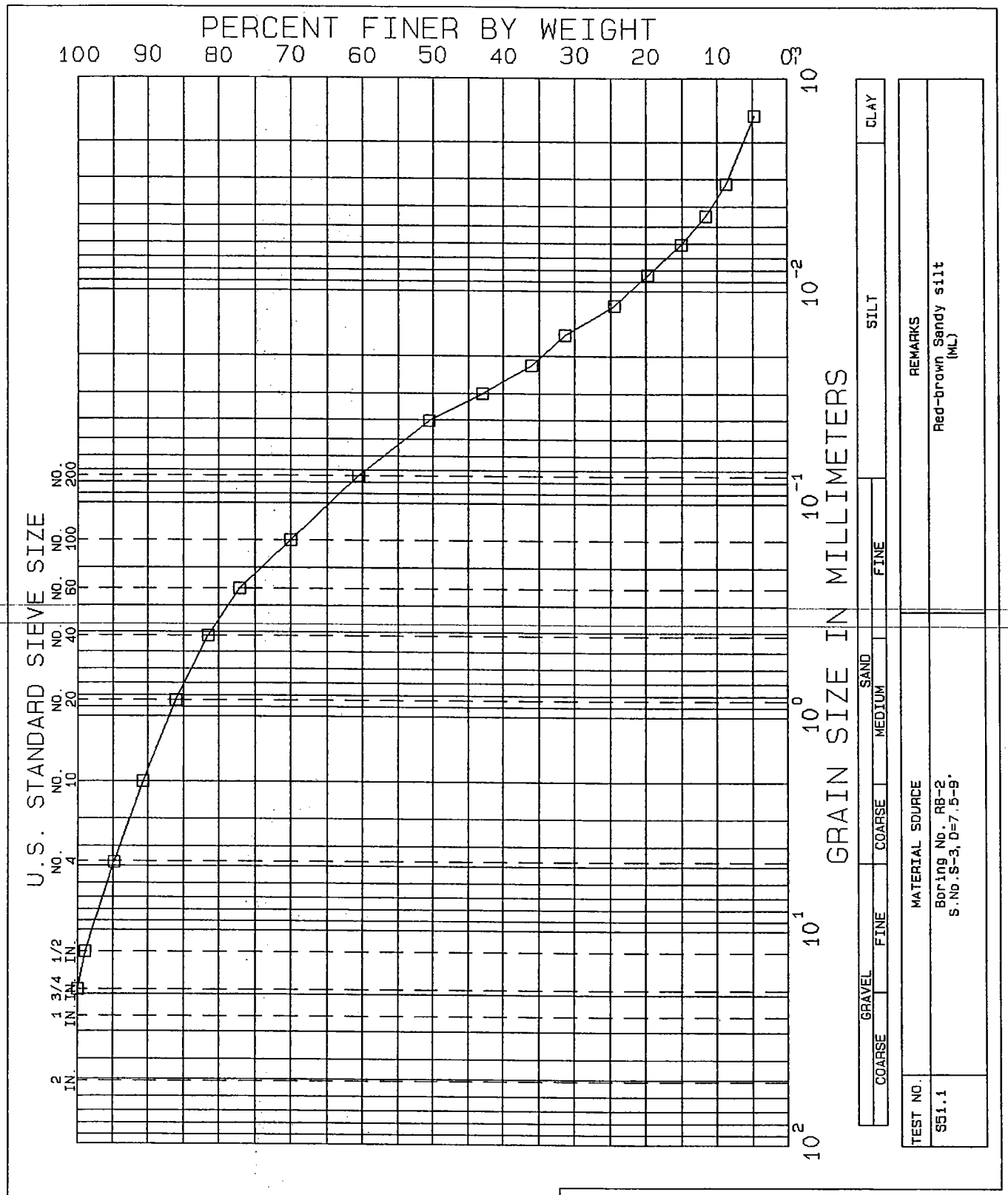


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	RB-2	TEST SERIES	
SAMPLE	S-3	NO.	51
DEPTH	7.5-9'	DATE	Oct.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

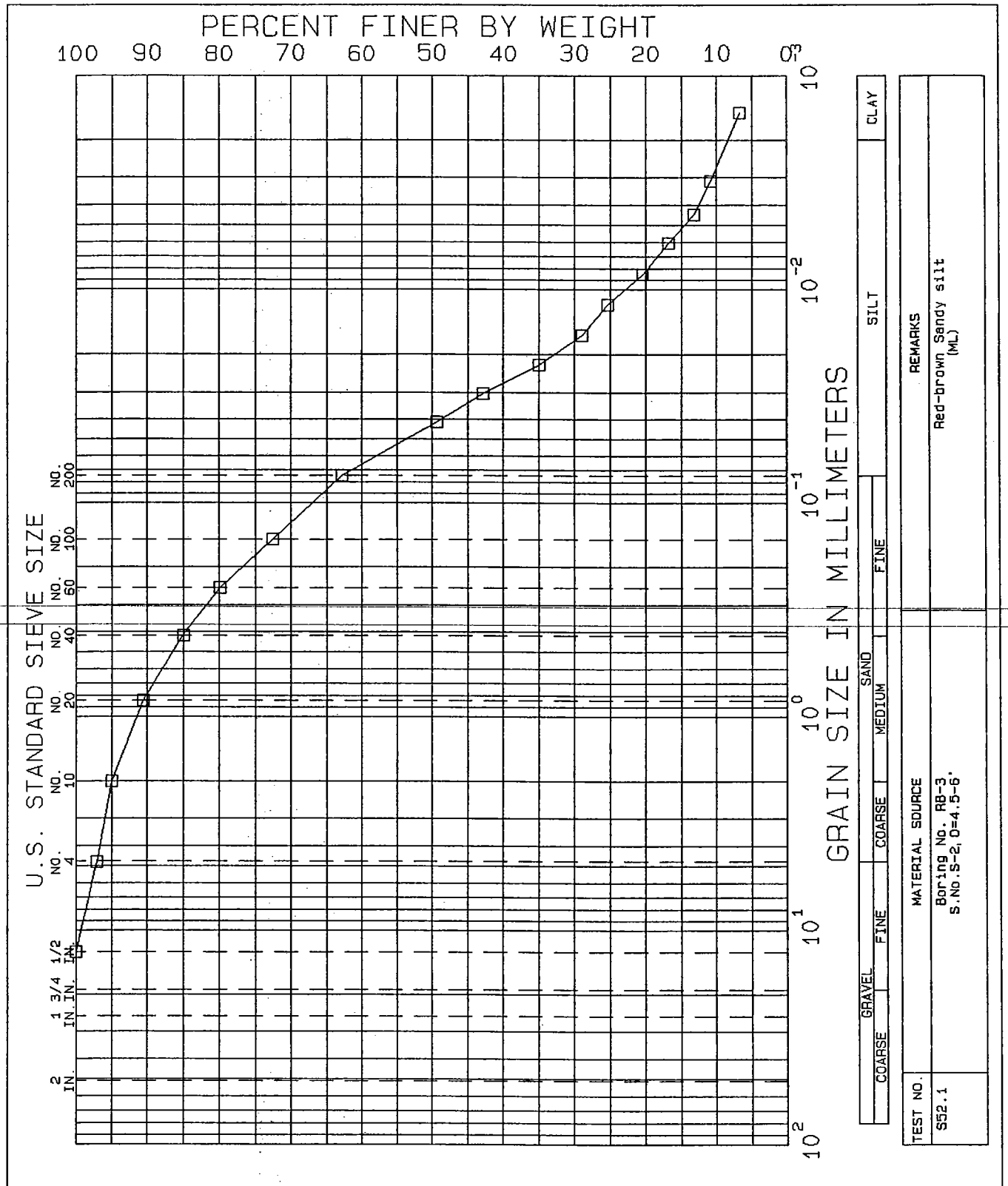


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	RB-2	TEST SERIES	
SAMPLE	S-3	NO.	51
DEPTH	7.5-9'	DATE	Oct.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

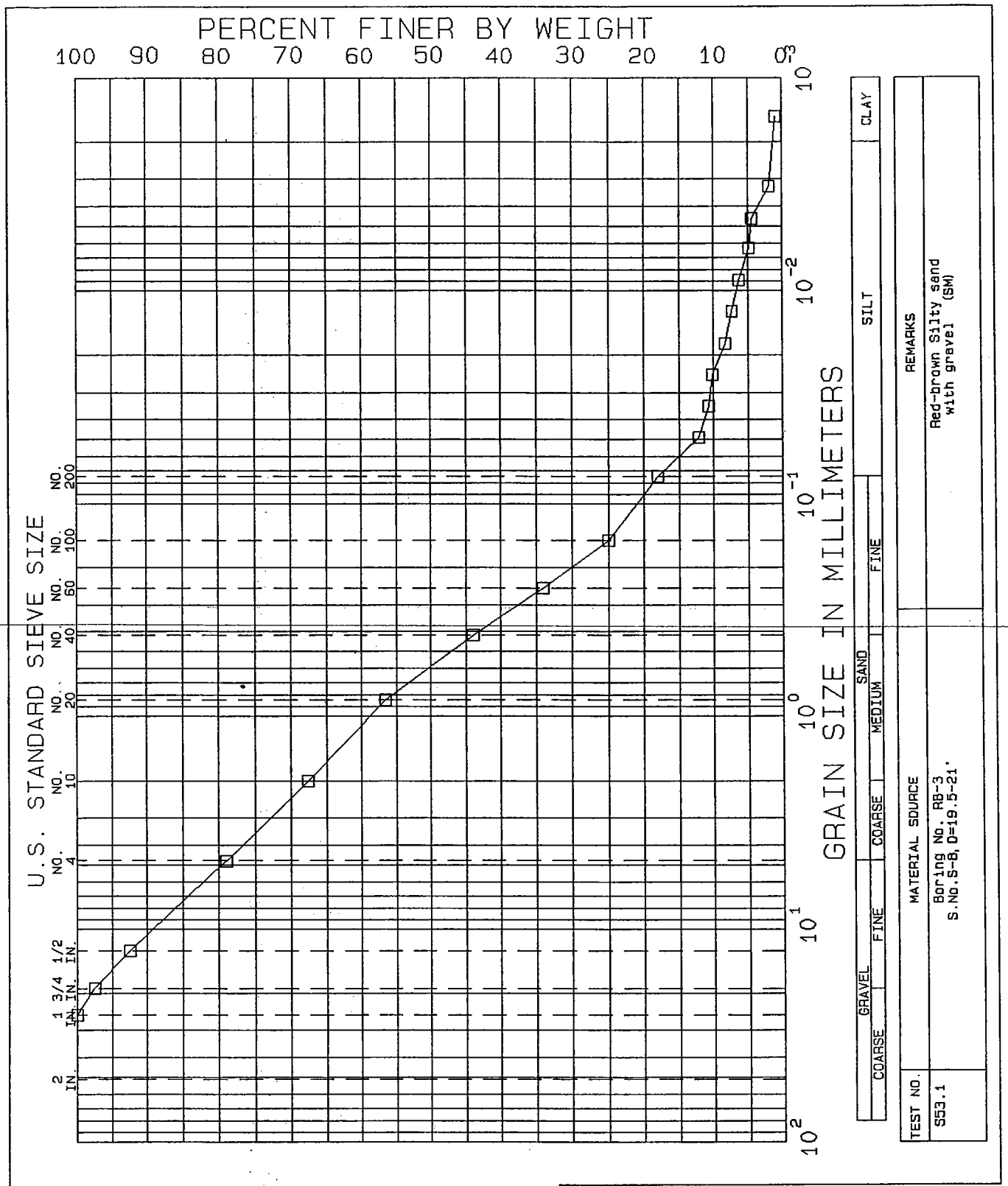


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	RB-3	TEST SERIES	
SAMPLE	S-2	NO.	52
DEPTH	4.5-6'	DATE	Oct.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

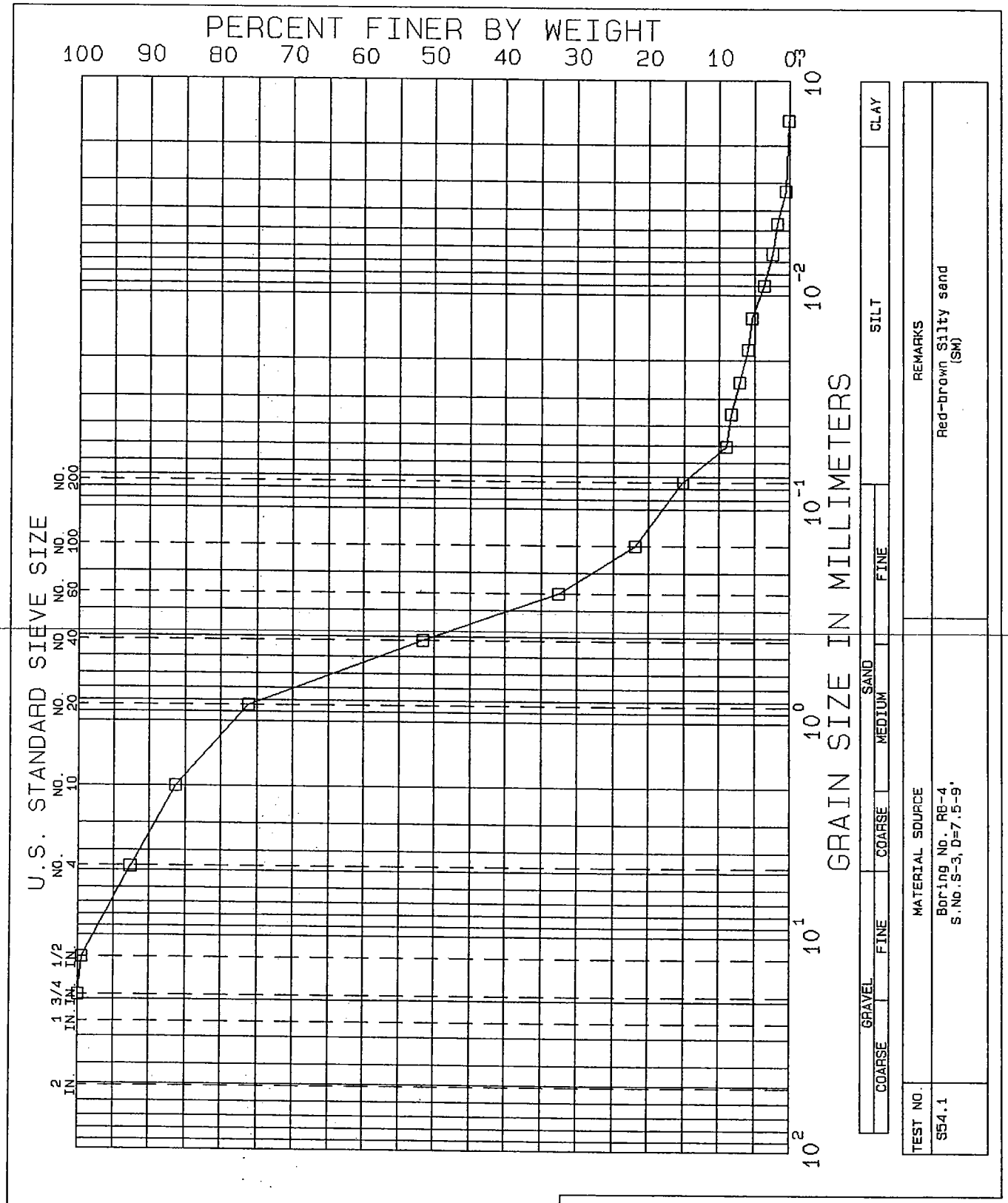


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	RB-3	TEST SERIES	
SAMPLE	S-8	NO.	53
DEPTH	19.5-21'	DATE	Oct.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

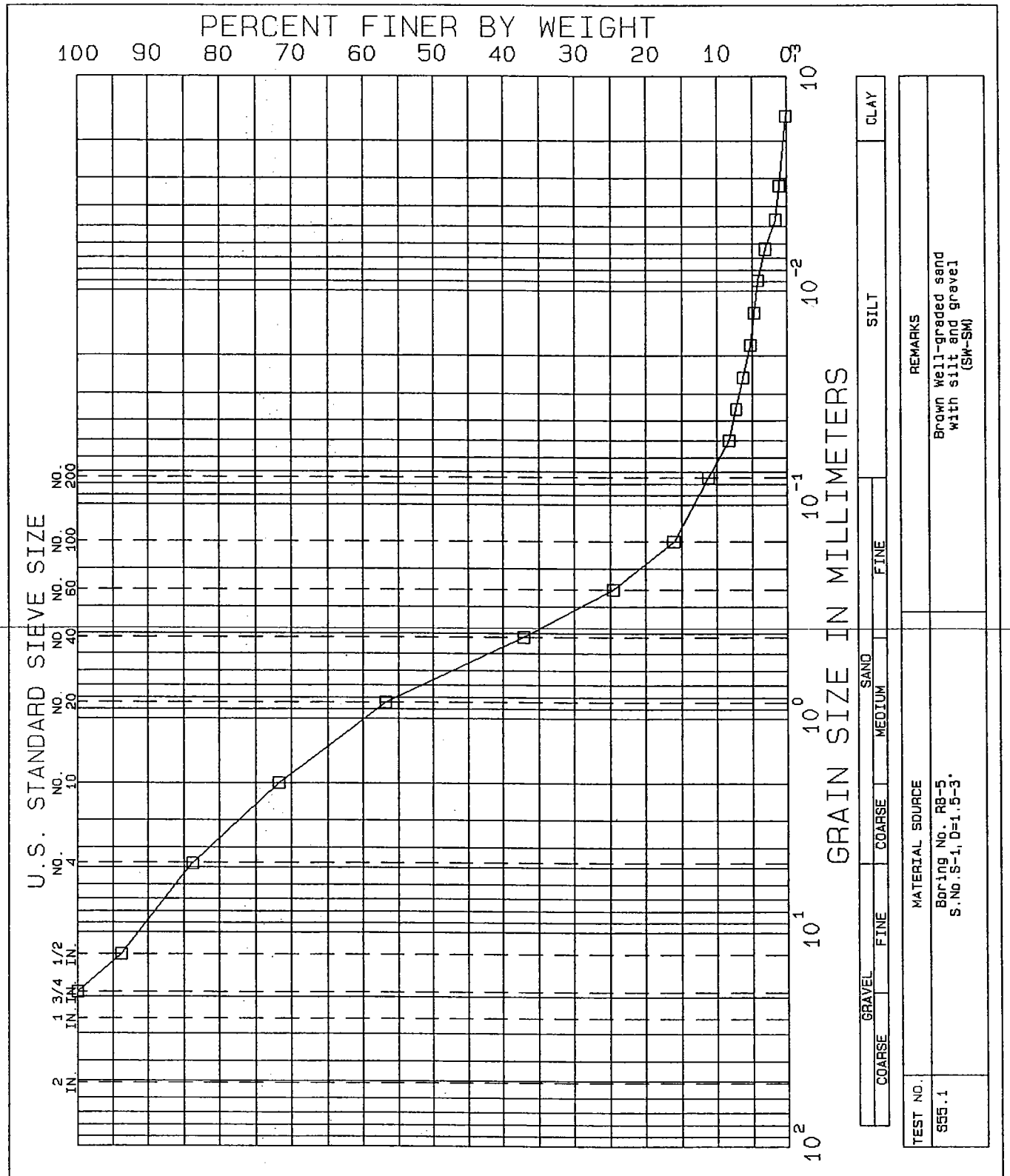


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	RB-4	TEST SERIES	
SAMPLE	S-3	NO.	54
DEPTH	7.5-9'	DATE	Oct.03
TECH.	CAG		
REVIEWER	MBP	FILE	L1782B

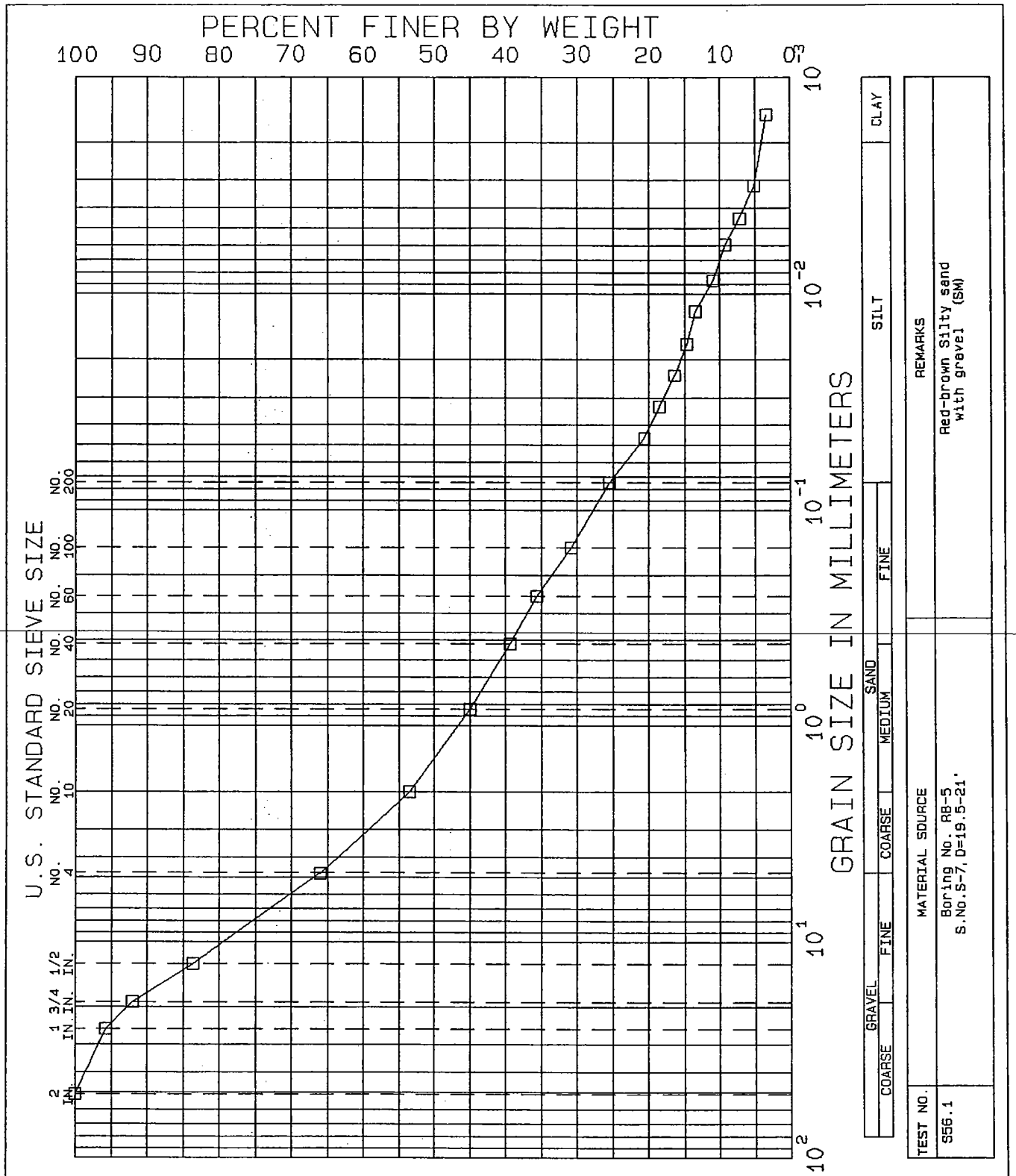


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	RB-5	TEST SERIES	
SAMPLE	S-1	NO.	55
DEPTH	1.5-3'	DATE	Oct.03
TECH.	PEC		
REVIEWER	MBP	FILE	L1782B

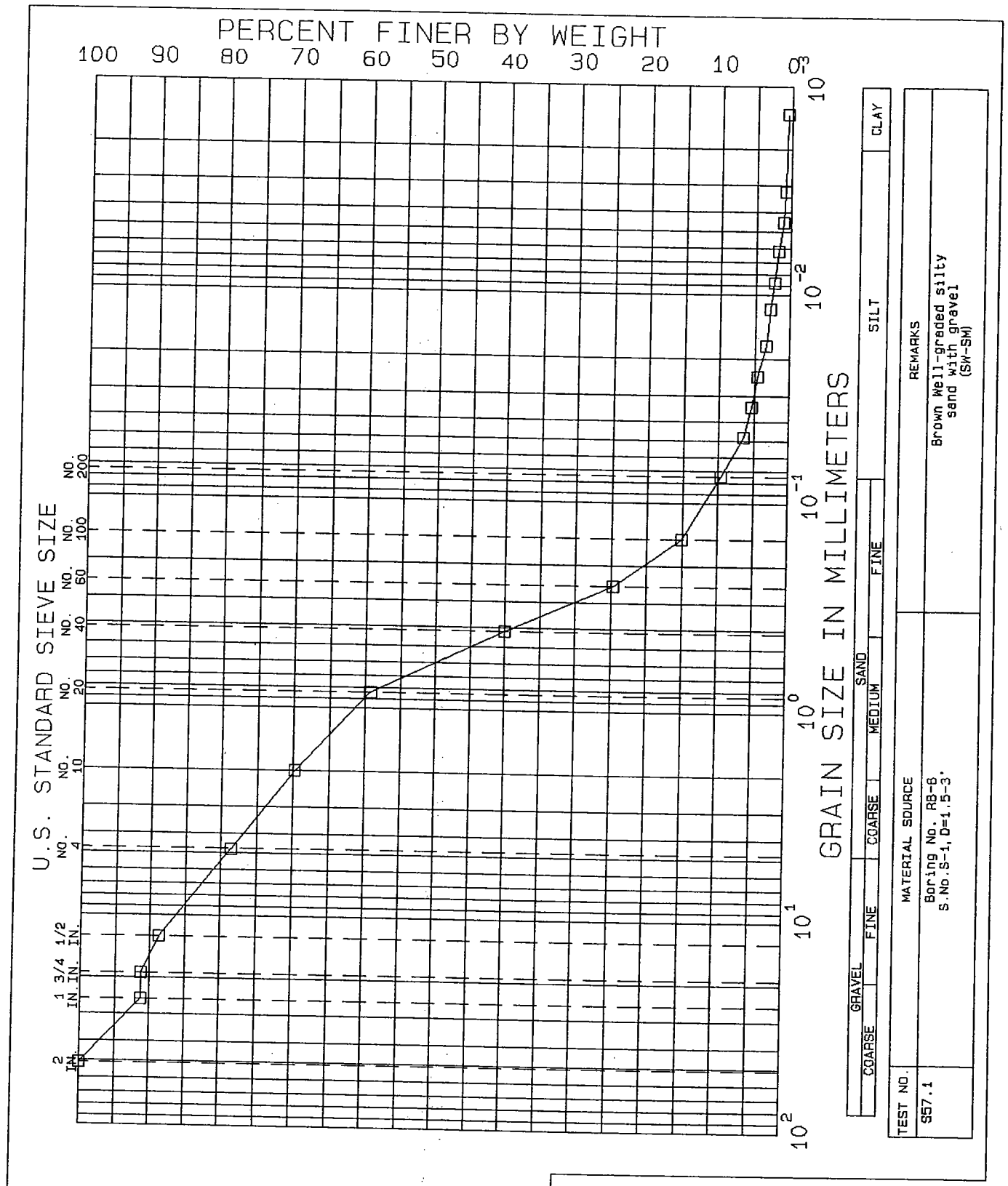


NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	RB-5	TEST SERIES	
SAMPLE	S-7	NO.	56
DEPTH	19.5-21'	DATE	Oct.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828



NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO. RB-8
SAMPLE S-1
DEPTH 1.5-3'
TECH. PEC
REVIEWER MBP

TEST SERIES
NO. 57
DATE Oct.03

FILE L17828

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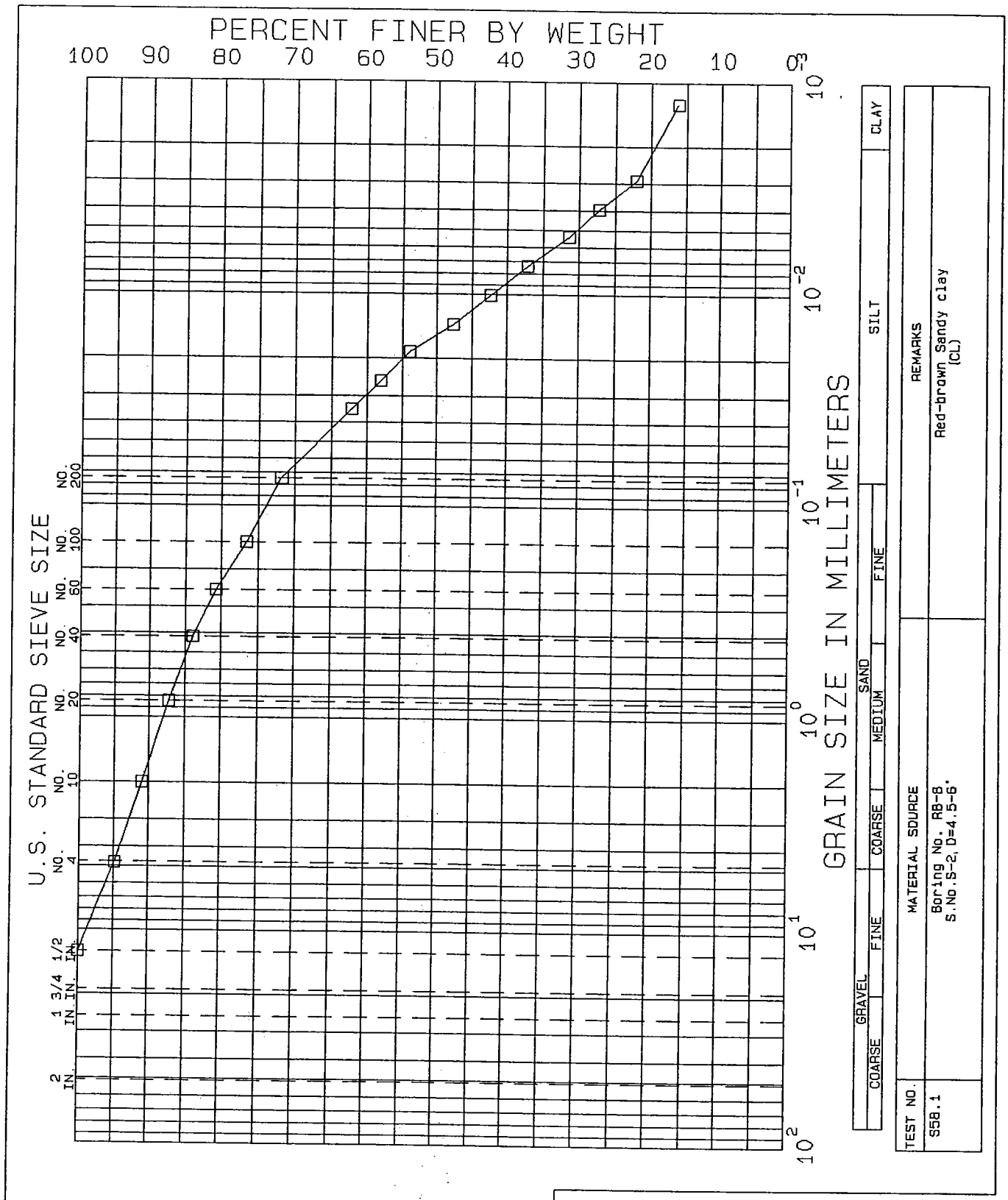

NEW BRITAIN-HARTFORD BUSWAY

CONNECTICUT

GRADATION TESTS

BORING NO.	RB-8	TEST SERIES	
SAMPLE	S-2	NO.	58
DEPTH	4.5-6'	DATE	Oct.03
TECH.	PEC		
REVIEWER	MBP	FILE	L17828

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ENGINEERS AND SCIENTISTS

APPENDIX 4

EXISTING GEOLOGY AND SOILS INFORMATION FROM PUBLISHED SOURCES

APPENDIX 4

EXISTING GEOLOGY AND SOILS
INFORMATION FROM PUBLISHED SOURCES

Geology and Existing Geotechnical Information: General Site Geology from Published Sources.

Soils

The project is located in the Central Lowlands of Connecticut, a north-south trending region between the Eastern and Western Highlands. The physiographic map (Figure 3) of the New Britain and South Hartford Quadrangles indicate the following soil types with the project limits: Artificial Fill (af), Ground-Moraine Deposits (Qgm), Valley Train Deposits (Qvt), Fine-grained Noncyclic Sediment (Qfs), Kame-delta Deposit (Qkd), Flood Plain Alluvium (Qfa), Alluvium (Qal), Swamp Deposits (Qs), and Terrace Alluvium (Qta).

The above surficial deposits are described below as the units occur along the proposed alignment of the Hartford Busway from southeast to northeast.

The Artificial Fills consist of railroad construction fills. The fill generally consists of sand, silt, and gravel obtained from deltaic, ground moraine, or flood plain deposits. Most of the fills were probably obtained from adjacent areas and share similar characteristics.

Ground-moraine deposits are a result of drifting and consist of mostly unstratified deposits with variable thicknesses and undulatory surfaces with low relief. The deposit is made up of till, which is a nonsorted, nonstratified, reddish-brown sediment composed of clay size particles to large boulders. The upper portion of the till is generally compact and firm. East of New Britain, the matrix of the till consists of a high percentage of clay. The average thickness of the till is approximately 20 feet.

A Valley-Train deposit is an outwash deposit by a melt water stream in a valley beyond a glacier. This deposit consists of a light colored, micaceous, medium-grained sand to medium gravel, which is often well sorted, well stratified, and cross-bedded. Typically, there is a 1 to 3 foot thick layer of gravel and gravelly sand, which is underlain by 2.5 foot thick eolian sand. However, the total thickness can be upwards of 20 feet.

Fine-grained noncyclic sediment consists of reddish-brown clayey silt that is characterized by convolute bedding. The deformed unit is distinguished by its silt content and thin bedding. The finer layers within the unit range from 0.5 to 1.5 inches thick and the coarser grained laminae are 2 to several times thicker. Random occurrences of pebbles and cobbles are common. The thickness of this sediment ranges from 5-12 feet thick.

The Kame-delta Deposit is composed of stratified drift. This delta deposit consists of reddish-brown, well sorted, well stratified sands with moderate amounts of silt, clay, and gravel. There are typically three distinct layers within this deposit, which are distinguished by grain size. The uppermost layer consists of cross bedded gravel and is generally 2 to 5 feet thick. The middle layer consists of coarse sands, which tend to be 10 to 20 feet thick. The bottom layer consists of finer sands that tend to be at least 18 feet thick.

The Flood Plain Alluvium refers to alluvium, which underlies the surface of a modern flood plain. This alluvium is a result of deposits ranging from silt to cobble sized gravel from various streams as well as the Farmington River. It consists of a well-sorted silt with interbedded find to very fine-grained sands or poorly to well sorted and well stratified gravels. The thickness of this alluvium ranges from 12 to 33 feet.

The Alluvium in the area is comprised of two facies, an upper and lower. The lower facies consists of reddish-brown, medium-grained sand to fine gravel. There are occurrences within this facies of a light colored material of same size that is both intermixed and separated. There are few pebbles present and the size of these pebbles can be up to 2 inches. This lower Alluvium facies is well to moderately well sorted, well stratified, and cross-bedded to the south. The upper Alluvium facies is characterized as a finer, massive, well sorted, poorly stratified, light gray to yellow clayey sandy silt.

The Swamp Deposits are characterized by muck and peat deposits. The muck consists of silt, clay, and very find sand intermixed with decomposed humus. The muck is generally 1.5 to 2.5 feet thick. The peat consists of only partially decomposed humus, which is generally greater than 5 feet thick. Many of the artificial fills in the New Britain area are believed to be underlain by swamp deposits. Depressions and ponds can occur in artificial fills where underlying swamp deposits are thick.

The Terrace Alluvium is present on the northeast section of the project limits. It consists of light colored reddish brown, coarse-grained sand and cobbles. These capping terraces are relatively thin (10 feet or less) and are a result of the Mattabesset and Connecticut rivers.

Rock

The following bedrock information was obtained from the Bedrock Geologic Map of the New Britain Quadrangle and the Bedrock Geologic Map of Connecticut (Figure 4).

The bedrock units within the project limits are members of the Newark Group, which is Jurassic in age (approximately 210 to 230 mya). This area is characterized by sedimentary rock (brownstone), which has been intruded by basaltic sills (trap rock), with a series of normal faults trending northeast and southwest. There is little to no exposure of bedrock throughout the project area. The geologic maps indicate the following rock types, which underlay the surficial deposits within the project location: East Berlin Formation (Jke), Hampton Basalt (Jrh). And Portland Arkose (Jrp). The above bedrock

units are described below as the units occur along the proposed alignment of the Hartford Busway from southwest to northeast.

The East Berlin Formation consists of a dark reddish brown to grayish-red, micaceous, feldspathic to arkosic interbedded medium to fine-grained sandstone, siltstone, and shale. The East Berlin Formation also may locally consist of medium gray, thin bedded, micaceous shale. The thickness of this unit is unknown, but may exceed 600 feet.

The intruding Hampden Basalt (traprock) underlies a small section of the alignment as it enters New Britain from the east. This basalt consists of a dark to very dark gray or greenish gray, hard, fine-grained basalt. The thickness is approximately 150 feet. There are local occurrences of two or more lava flows that constitute a single stratigraphic unit within the Hampden Basalt.

The Portland Arkose (brownstone) underlies a majority of the proposed alignment. This arkose consists of a reddish-brown to grayish-red, micaceous, feldspathic, interbedded, medium to fine-grained sandstone, siltstone, and shale. The thickness of this unit is highly variable and may exceed 1000 feet.

Groundwater and Drainage

The regional data on groundwater and drainage conditions are based on The Hartford South Quadrangle Report No. 20.

Most of the water bearing deposits within the proposed roadway are gravelly sand deposits surrounding streams and river flood plains. The aquifers in the area are relatively thin and generally do not exceed a thickness of 35 feet, but are relatively high yielding. The sands are generally underlain by less permeable clayey silts.

Groundwater is also typically found in depressions in the bedrock, which are filled with sand and gravel. Groundwater in bedrock is typically limited to areas of secondary porosity; however, discontinuities can be sufficient water bearing sources as long as recharge areas are not sealed by clays.

The regional drainage is controlled by the Connecticut River to the east and its main tributaries, the Mattabessett, South Branch of the Park, and Farmington Rivers. The local drainage flows toward the swamps, lakes/ponds, and small streams.

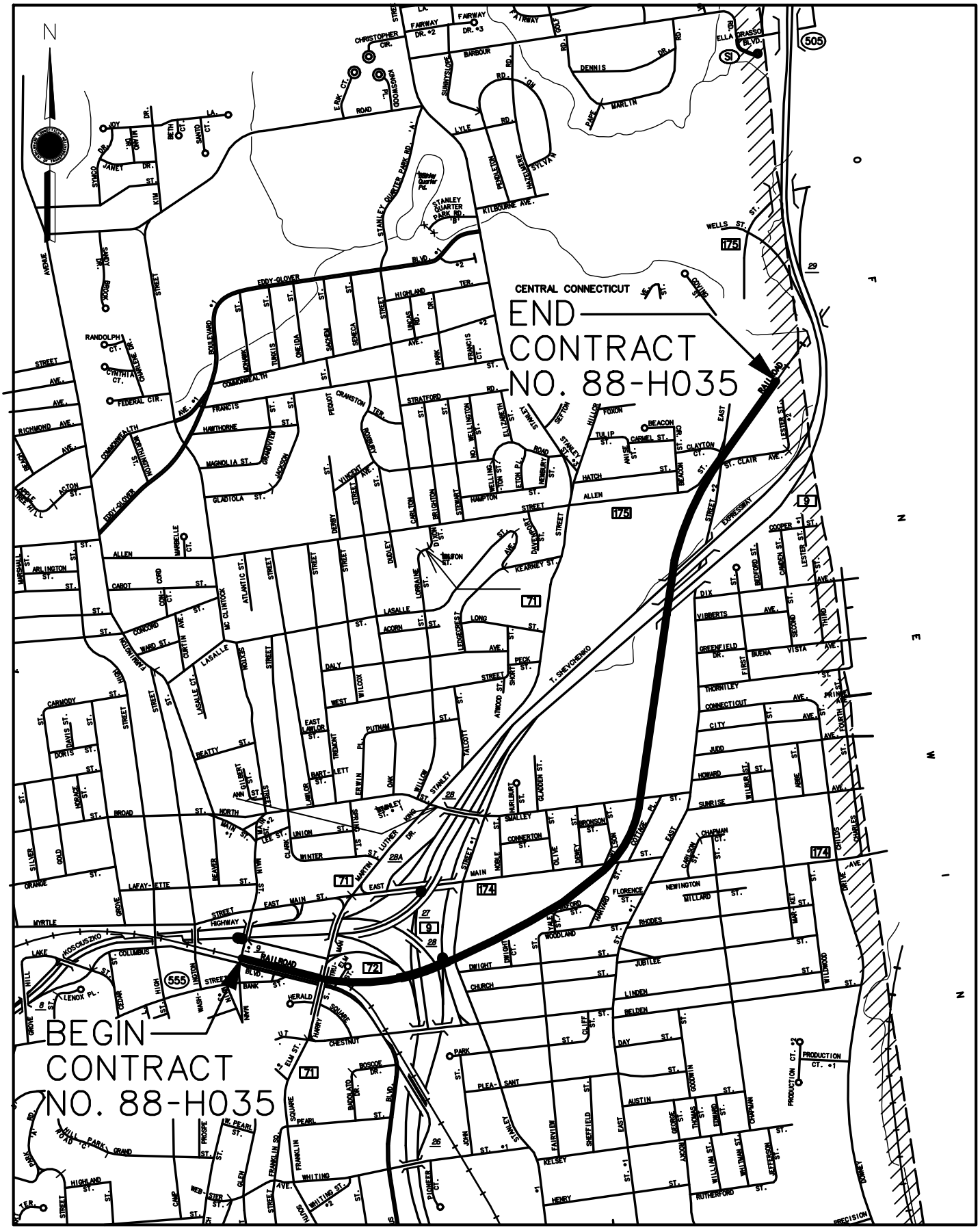

FIGURE 1
PROJECT LOCATION MAP

N.T.S.

VN ENGINEERS, Inc.
TRAFFIC • INFRASTRUCTURE • GEOTECHNICAL

New Britain-Hartford Busway
New Britain, CT

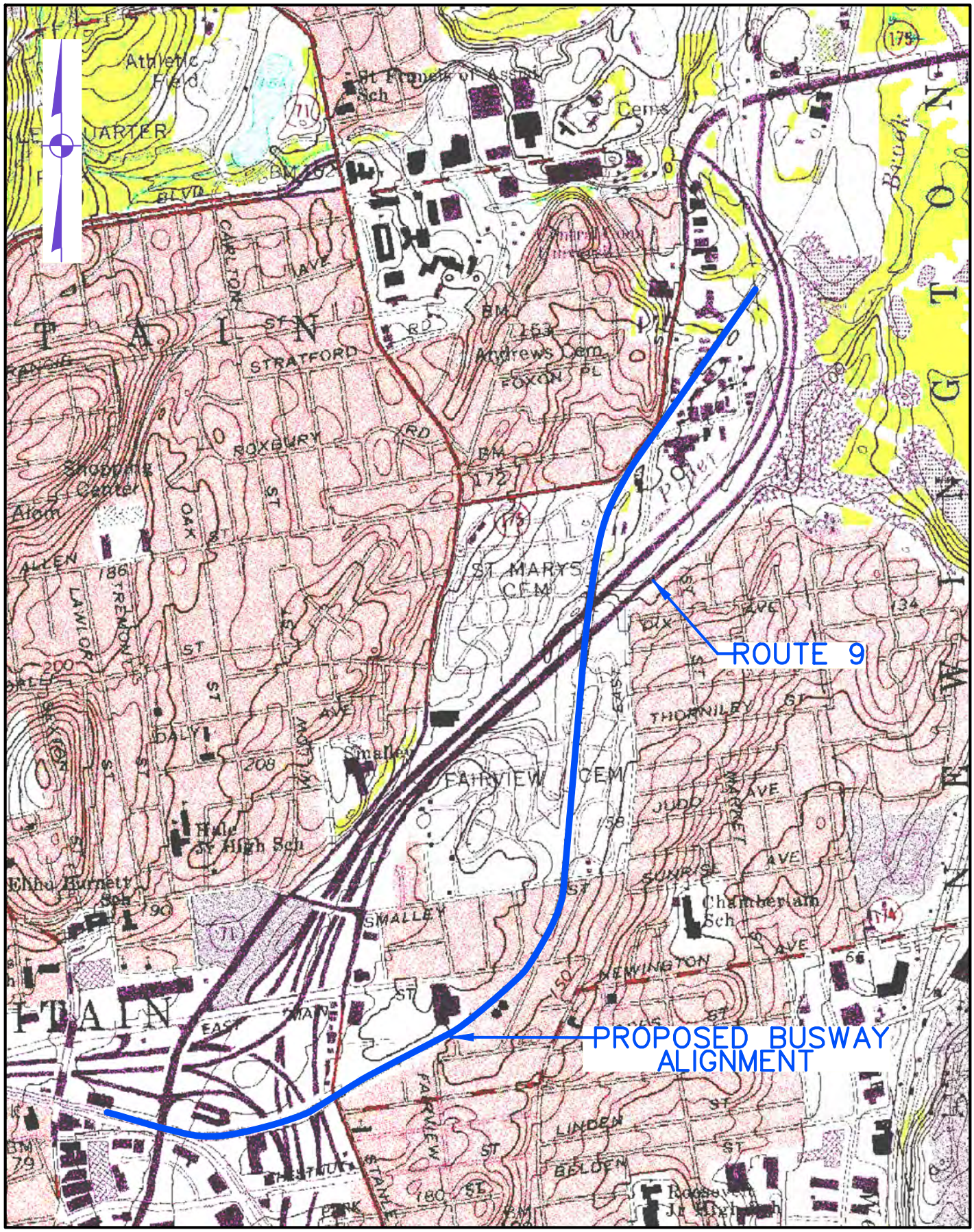

FIGURE 2
TOPOGRAPHIC LOCATION MAP

N.T.S.

VN ENGINEERS, Inc.
TRAFFIC•INFRASTRUCTURE•GEOTECHNICAL

New Britain-Hartford Busway
New Britain, CT

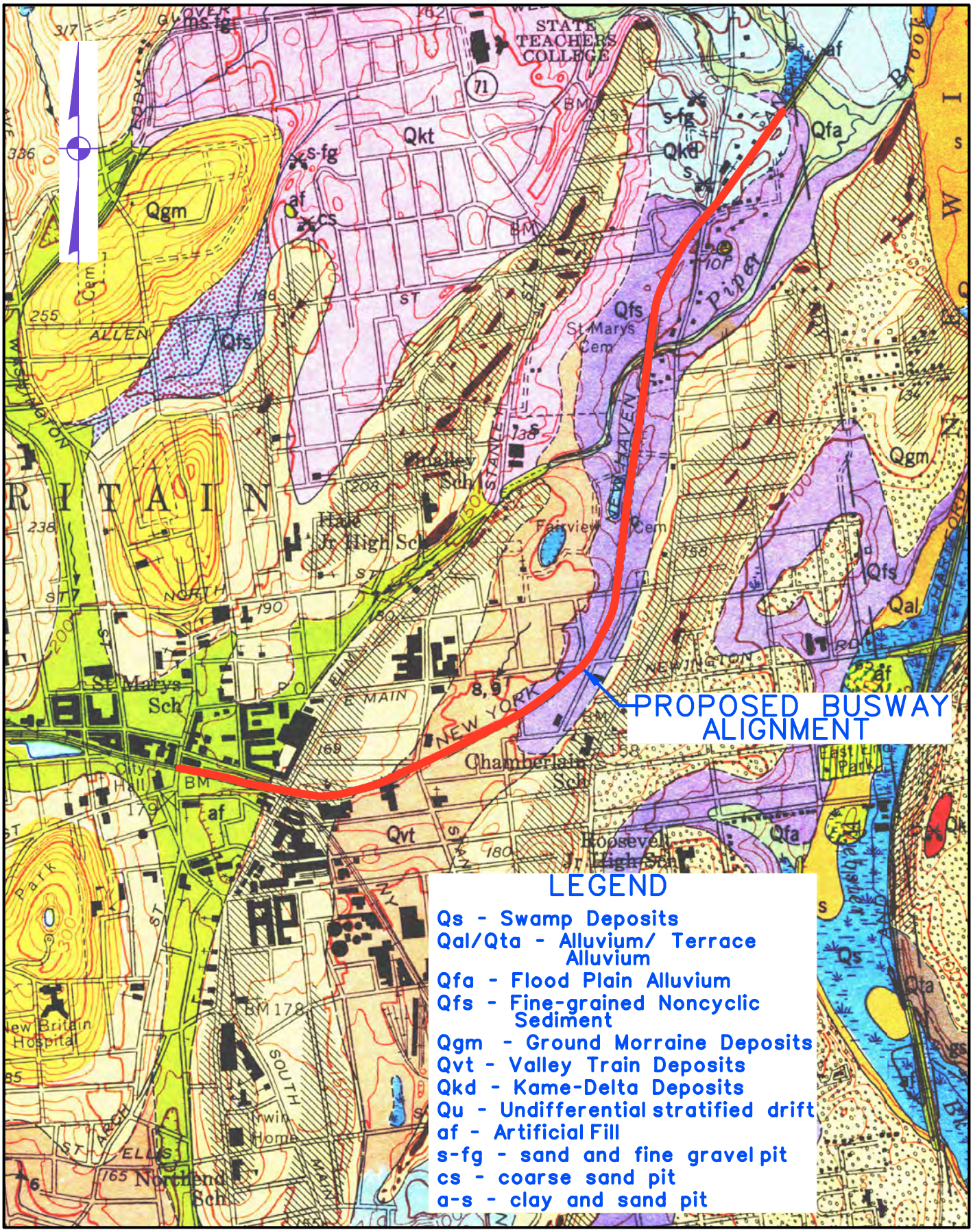

FIGURE 3
SURFICIAL GEOLOGY MAP

N.T.S.

VN ENGINEERS, Inc.
TRAFFIC•INFRASTRUCTURE•GEOTECHNICAL

New Britain-Hartford Busway
New Britain, CT

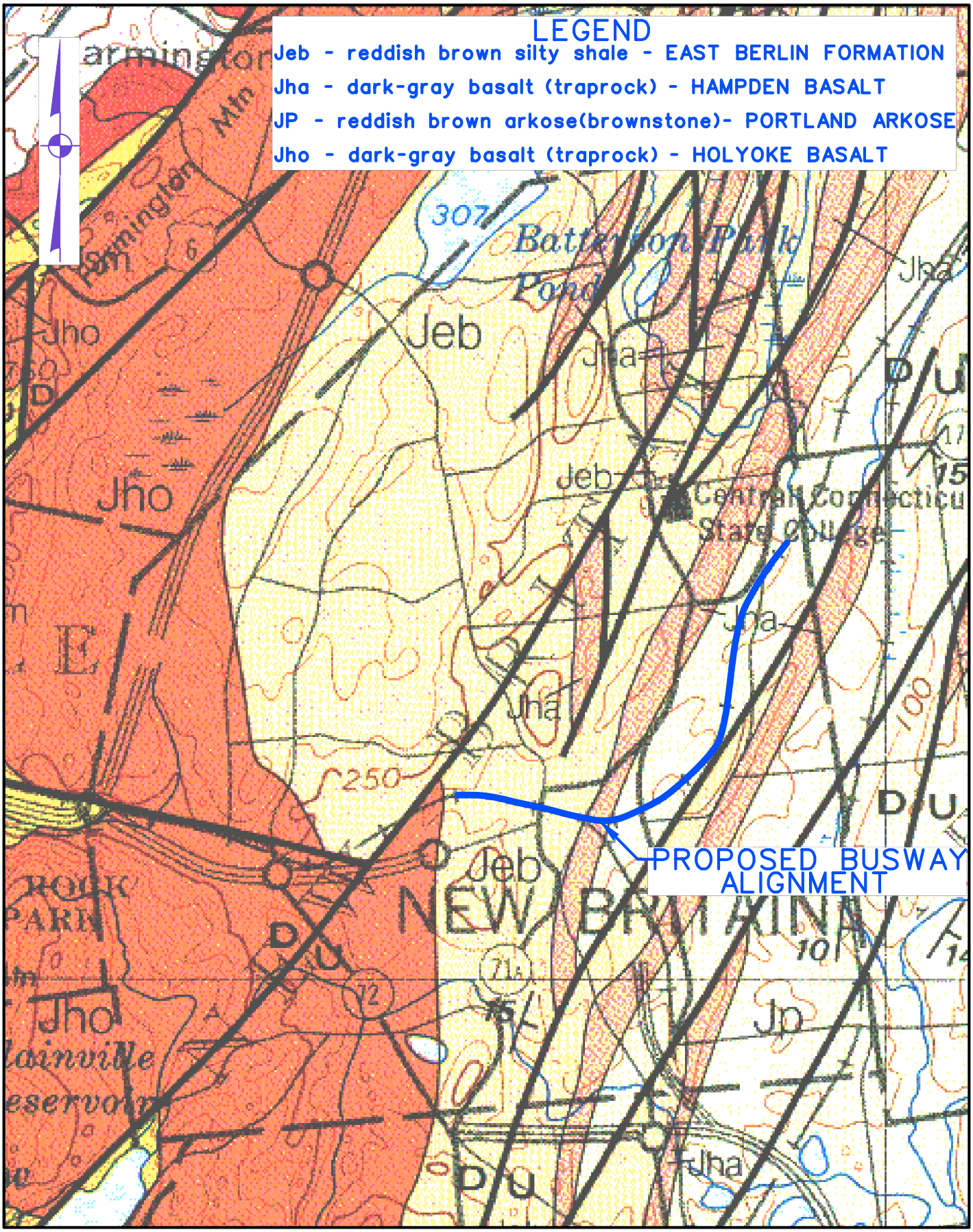

FIGURE 4
BEDROCK GEOLOGIC MAP
N.T.S.

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TRAFFIC•INFRASTRUCTURE•GEOTECHNICAL

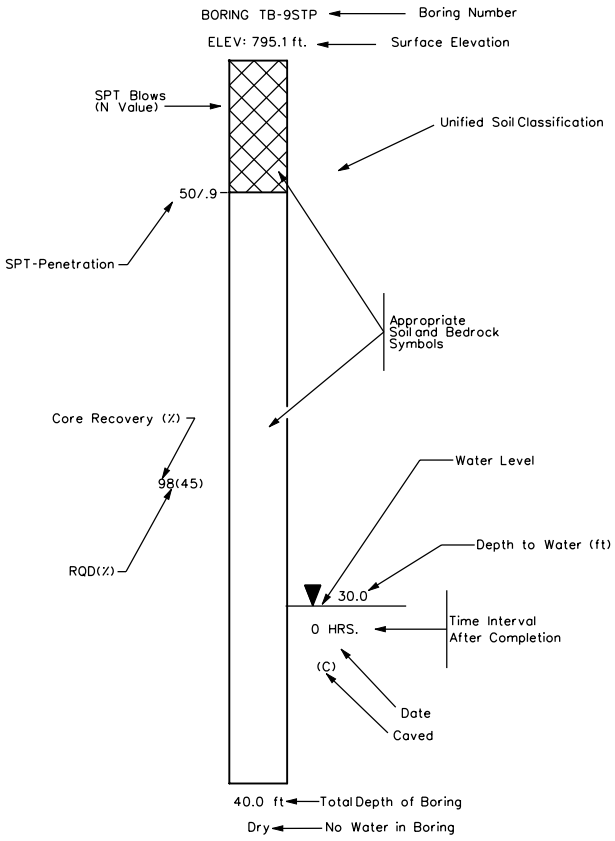
New Britain-Hartford Busway
New Britain, CT

SOIL LEGEND AND CHARACTERISTICS

Well graded gravel (GW)	Well graded Sand (SW)
Well graded Gravel and Sand (GW-SW)	Well graded Sand with Silt (SW-SM)
Well graded Gravel with Silt (GW-GM)	Well graded Sand with Clay (SW-SC)
Well graded Gravel with Clay (GW-GC)	Poorly graded Sand (SP)
Poorly graded Gravel (GP)	Poorly graded Sand with Silt (SP-SM)
Poorly graded Gravel and Well graded Sand (GP-SW)	Poorly graded Sand with Clay (SP-SC)
Poorly graded Gravel with Silt (GP-GM)	Silt (ML)
Poorly graded Gravel with Clay(GP-GC)	Clay (CL)
TopSoil	Organic Silt (DL)
Fill Soil, Debris	Organic Clay (DL)

ROCK SYMBOLS AND NAMES

Sandstone	Traprock
Shale	Basalt
Concrete	Asphalt



VN ENGINEERS, Inc.
TRAFFIC•INFRASTRUCTURE•GEOTECHNICAL

FIGURE 5: SOIL AND ROCK LEGEND
New Britain - Hartford Busway
New Britain, CT

APPENDIX 5

LIMITATIONS

APPENDIX
LIMITATIONS

A. SUBSURFACE INFORMATION

Locations: The locations of the explorations were in accordance with the plans provided by URS. The elevations of the explorations were later surveyed by the CDOT.

Interface of Strata: The stratification lines shown on the individual logs of the subsurface explorations represent the approximate boundary between soil types, and the transition may be gradual.

Field Logs/Final Logs: A field log was prepared for each exploration by a member of our staff. The field log contains factual information and interpretation of the soil conditions between samples.

We must emphasize that our recommendations are based on the final logs and the information contained therein, and not on the field logs.

The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and tests of the field samples. The final logs are included in the engineering report.

Water Levels: Water level readings have been made in the explorations at times and under conditions stated on the individual logs. This data has been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, regrading, temperature, and other factors at the time measurements were made.

Pollution/Contamination: Unless specifically indicated to the contrary in this report, the scope of our services was limited only to investigation and evaluation of the geotechnical engineering aspects of the site conditions, and did not include any consideration of potential site pollution or contamination resulting from the presence of chemicals, metals, radioactive elements, etc. This report offers no facts or opinions related to potential pollution/contamination of the site.

Environmental Considerations: Unless specifically indicated to the contrary in this report, this report does not address environmental considerations which may affect the site development, e.g., wetlands determinations, flora and fauna, wildlife, etc. The conclusions and recommendations of this report are not intended to supersede any environmental conditions which should be reflected in the site planning.

B. APPLICABILITY OF REPORT

This report has been prepared in accordance with generally accepted soils and foundation engineering practices for the exclusive use of URS for specific application to design of the proposed Busway Project. No other warranty, expressed or implied, is made.

C. REINTERPRETATION OF RECOMMENDATIONS

Change in Location or Nature of Facilities: In the event that any changes in the nature, design or location of the redesign are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

Changed Conditions During Construction: The analyses and recommendations submitted in this report are based in part upon the data obtained from forty (40) widely-spaced test borings performed for this study. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

Changes in State-of-the-Art: The conclusions and recommendations contained in this report are based upon the applicable standards of our profession at the time this report was prepared.

Use of Report by Prospective Bidders: This soil and foundation engineering report was prepared for the project by VN Engineers, Inc. for design purposes only, and may not be sufficient to prepare an accurate bid. Contractors utilizing the information in the report should do so with the expressed understanding that its scope is limited to design considerations. Prospective bidders should obtain the owner's permission to perform whatever additional explorations or data gathering they deem necessary to prepare their bid accurately.