

GEOTECHNICAL STUDY

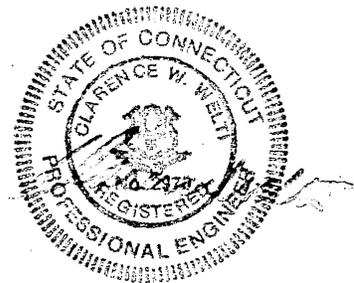
**CONSTRUCTION OF THE
NEW BRITAIN - HARTFORD BUSWAY
ConnDOT Project 171-305**

**Proposed Retaining Wall #105
Busway Sta 126+55 to Sta 127+12 (Right)**

**Prepared for:
Close, Jensen & Miller, P.C.**

**Prepared by:
Dr. Clarence Welti, P. E., P. C.**

April, 2011



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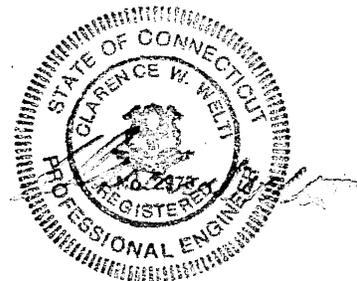
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1.0 Introduction and Background:

1.1 This study addresses the geotechnical requirements for the design of Retaining Wall #105 to be included in the construction for the New Britain to Hartford Busway. Wall #105 will be located along the right (easterly) shoulder of the Busway and will extend up to the Route 9 overpass (Bridge No. 05358). The wall will begin at Sta 126+55 and end at Sta 127+12. This wall will retain soils at the cut limits into the existing fills for Route 9. This study addresses geotechnical requirements pertaining to the wall construction, design parameters and temporary shoring.

1.2 Retaining Wall #105 will consist of a proprietary system to be approved by the Connecticut DOT. The face of the wall will be located horizontally 28 feet right of the Busway baseline and will end at the existing east abutment face. The wall will retain up to 8± feet of the embankment for Route 9, which slopes at approximately 2H:1V inclination up to that roadway. From the original bridge design plans the east abutment foundation is a spread footing supported atop embankment fill with the footing bottom shown at Elev. 102. The geometry of Wall #105 with foundation at Elev. 102± will not require underpinning of the existing abutment footing. However, temporary sheet piling will be required along the cut limits in the slope to support the embankment. The proposed jersey barrier wall that will be located beneath the overpass structure will be located laterally about 8 feet off the abutment and at footing subgrade of about Elev. 97±. This jersey barrier geometry should avoid special requirements for temporary shoring or underpinning. The new foundations will bear on the existing fills or natural soil. There do not appear to be any usual construction issues with Wall #105 based on the topographic and test boring information.

1.3 Temporary shoring will be required for construction of the proprietary wall #105 as cited above. It should be anticipated that the design and construction for such shoring would generally fall within the scope of the Standard Specifications of Form 816. The groundwater is not anticipated to affect the construction. Temporary Sheet Piling is a contractor provided item.

1.4 The design of the wall will be completed in U.S. Customary Units and in accordance with the LRFD method. It is presumed that the designs for temporary shoring can be completed with other methods such as Allowable Stress Design (ASD) or Load Factor Design (LFD).

1.5 Field exploration for the final design of the wall included two test borings, RW-102-2, RW-102-3 and RW-102-4, drilled by Associated Borings Company, Inc. in August, 2007. A supplemental boring RW=105-X-1 was drilled in March 2011 by the same drilling contractor. The borings were drilled with a 2.5" dia. hollow stem auger to auger refusal on probable bedrock at depths 27 feet and 28.1 feet below grade, respectively. Standard penetration tests and soil sampling were performed with a standard 2" dia. split spoon sampler using a 140 pound hammer and a hammer fall of 30 inches.

1.5.1 The two pilot borings SB-32A and SB-34 that were drilled by Seaboard Drilling, Inc. in March of 2003 near the subject wall location are included herein. They are referenced with regard to the bedrock properties only, since no rock cores were taken under the final subsurface investigation program. Those borings were cored 10 feet into the bedrock with 2 1/8" internal diameter NX core barrels. Standard 5 foot rock cores were retrieved and recovery data were recorded. The boring logs

are included in the appendices.

2.0 Geology and Soils Cross Section + Soil Properties:

2.1 The Geologic Origin of the natural soils (beneath the fills) at the site and environs consists of glacial lake deposits atop the bedrock or overlying glacial moraine deposits to the rock. The lake deposits consist generally of medium compact fine sand and silt with trace gravel. The glacial moraine consists generally of very dense fine to medium sand and gravel, some silt. The bedrock from geologic mapping is Portland Arkose (Sandstone or Siltstone).

2.2 The Soils/Rock Cross Sections from the 2007 borings are generally as follows:

Boring RW-102-2 (Sta 127+0; Elev. 92.6) and RW-102-3 (Sta 127+80; Elev. 92.4):

FILL; fine to coarse SAND, GRAVEL and COBBLES to 2 to 6± feet medium compact

FILL; fine to medium SAND, some Silt and Gravel to 18 to 18.5 feet, medium compact, locally loose

At RW-102-3; SILT to 21 feet, medium compact

Glacial Moraine; Fine to medium SAND, some Silt and Gravel to 25 feet at RW-102-2 and to 27 feet at RW-102-3 at auger refusal on probable bedrock

Boring RW-102-4 (Sta 128+50; Elev. 91.8):

FILL; fine to coarse SAND, GRAVEL and COBBLES to 5± feet, medium compact

FILL; Fine SAND, some Silt, trace Gravel to 16 feet, medium compact

Fine SAND, some Silt, trace Gravel to 28.1 feet at auger refusal on probable bedrock

Boring RW-105-X-1 (Sta 126+55; Elev.92.6):

FILL; fine to coarse SAND, little to and GRAVEL to 3 feet, medium compact

FILL; Fine to coarse SAND, some Silt, trace Gravel, little to some Silt, little Cobbles and Boulders to 20 feet, medium compact to dense

Fine SAND, some Gravel, little Silt to 25+ feet, dense

2.2.1 The Groundwater was observed at 17.5 to 20 feet below grade at the completion of the bore

holes; about Elev. 73 to Elev. 74

2.2.2 The Bedrock as encountered and described on the 2003 pilot borings SB-32A from Elev. 92.9 and SB-34 from Elev. 91.4:

Top of Bedrock at Elev. 64 to Elev. 64.4

Medium Hard to Hard Siltstone, moderately to highly weathered

Recoveries; 12" to 52"

RQD values 0% to 44%

2.3 Regarding the Soil Properties the following will apply:

New Backfill (Material of Section 3.3 below):

Unit Weight (moist)	125 pcf
Water Content	6 to 8%
Angle of Internal Friction	34°

Existing Fills:

Unit Weight	125 pcf
Submerged Unit Weight:	65 pcf
Angle of Internal Friction	31° to 32°
Stiffness Modulus	400+ Tons/sf

Glacial Lake Soils (Sand and Gravel):

Unit Weight	120 to 125 pcf
Submerged Unit Weight	66 pcf
Angle of Internal Friction	33+°
Stiffness Modulus	500 to 700+ Tons/sf

Glacial Moraine, Till:

Unit Weight	130 pcf
Submerged Unit Weight	70 pcf
Angle of Internal Friction	36° to 38°
Typical Stiffness Modulus	>1,000 tons/sf

Bedrock:

Typical Rock Compressive Values:	6,000 to 8,000 psi
Typical Stiffness Modulus:	100,000 to 150,000 Tons/sf
Poisson's Ratio:	0.2 to 0.25
Estimated Bond Strength, Rock to Grout (Ultimate)	100 psi

Notes:

The above soil parameters can be used for the design of temporary shoring.

The values of internal friction angles cited above are estimated from SPT data

The rock properties cited above are estimated from previous work by this firm within similar rock formations in proximity to the subject site and environs.

2.4 Some of the natural soils and potentially the existing fills will be susceptible to remolding under equipment when wet from stormwater onto the exposed subgrades.

3.0 Foundations and Design Considerations:

3.1 Regarding **Design of the Wall**, soil bearing, overturning and sliding must be addressed in the foundation design. The **criteria for Foundation Type and Loading** have been assumed by the writer as follows:

1. The maximum total settlement for the proposed wall shall not exceed 1" and the maximum differential settlement shall not exceed 1/2" in 10 feet of length.
2. The total lateral deflection at any point on the face of Wall 105 shall not exceed 1/2".

3.2 The recommended **Foundation Type** will be with spread footings. The existing fills extend to 20± feet deep and are probably present along the entire wall alignment. The footings will probably fall on the existing granular fills. Regarding establishment of an ultimate bearing capacity, the ultimate loading is based on the internal friction angle, which is related to the soil density and overburden weight. Based on the sample blow counts in the natural soils and existing fills the angle of internal friction is at least 31°, which indicates an ultimate capacity of at least 18+ ksf. The AASHTO LRFD resistance factor based on friction angle estimated from SPT data would be $\phi_R = 0.35$. This indicates a design bearing resistance of at least 6 ksf. Based on review of LRFD programs, particularly as relates to reduction for inclined loading, a significant reduction from ultimate bearing capacity is indicated, based on the ratio of lateral loading to vertical loading. This reduction is almost double the reduction for the ASD procedure. **To address this reduction it is suggested that the more appropriate LRFD value for ϕ be 0.50.** Based on the estimated minimum stiffness modulus of 400 Tons/sf the recommended design bearing resistance is 4 ksf to maintain settlements within the design criteria.

3.2.1 There shall be at least 12" of compacted granular fill conforming to Form 816, section M.02.01, as underlay beneath the wall footings. The granular fill shall be compacted to at least 95% of modified optimum density. The compacted underlay will provide a uniformly stiff surface to receive the footings. If the subgrades are wet, the initial 6" layer shall be with No. 8 crushed stone.

3.3 The required backfill for retaining walls will be with Pervious Structure Backfill conforming to ConnDOT Form 816, M.02.05. This material will have a unit weight of 125 pcf and internal friction angle of 34°.

3.4 The ultimate friction angle between the concrete and soil at the footing base is 30°. This would result in ultimate sliding factor of **0.60**, based on AASHTO criteria. The applicable resistance factor for sliding of cast in place concrete on the soil will be $\phi_R = 0.80$.

3.5 Regarding **Lateral Earth Pressure**, the design of the permanent wall #105 can be based on active pressure. The active pressure coefficient (to be multiplied by the unit weight of backfill) is $K_A = 0.28$. The unit weight will be as cited for pervious structure backfill in section 3.3 above.

3.5.1 The design of temporary sheet pilings can be based on the soil parameters given in section 2.3 above.

3.6 Groundwater Mitigation can be addressed with structure under drains.

3.7 Summary of Preliminary Foundation Design Parameters for Wall #105:

PARAMETER	LRFD DESIGN VALUE	ULTIMATE RESISTANCE	COMMENTS
Design Bearing Resistance	4 ksf (based on settlement)	18+ ksf	Resistance factor $\phi_R = 0.35$
Backfill Unit Weight *	125 pcf	–	ConnDOT Form 816 M.02.05
Angle of Internal Friction ϕ_1 (Backfill) *	34°	–	Compacted Pervious Backfill 95% of MOD
Sliding Factor, cast in place concrete on soil	0.48	0.60	Resistance factor $\phi_R = 0.80$
Interface Friction Angle Concrete to Backfill, δ	21°	30°	Value from AASHTO LRFD Manual
Active Pressure Coefficient, K_A	0.28	–	
Frost Protection Depth	4 feet	–	ConnDOT Bridge Design Guide

* For Backfill conforming to Pervious Structure Backfill (Section M.02.05)

4.0 Report Conditions: This report has been prepared for specific a application to the subject project in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. In the event that any changes in the nature, design and location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

Dr. Clarence Welti, P.E., P.C., should perform a general review of the final design and specifications in order that geotechnical design recommendations may be properly interpreted and implemented as they were intended.

APPENDIX 1

TEST BORING LOGS

BORING LOCATION PLAN

LEGEND

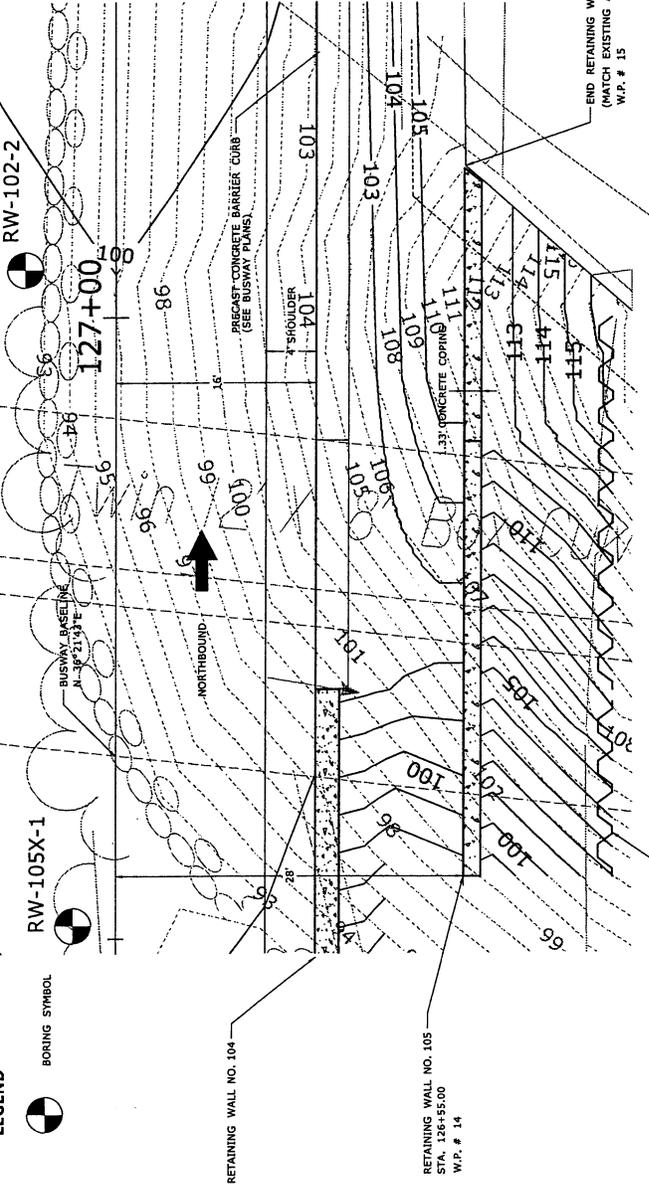


BORING SYMBOL

RW-105X-1

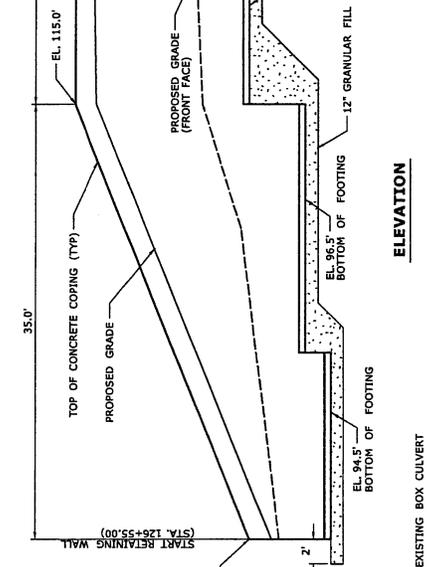


RW-102-2



TEMPORARY EARTH RETAINING SYSTEM

END RETAINING WALL #105
(MATCH EXISTING ABUTMENT)
W.P. # 15



ELEVATION

NOTE: TOP OF EXISTING BOX CULVERT
EL. 83.0' +/-

Jaime Lloret DRILLER		SM-001 REV. 10/92				BORING REPORT				SHEET 1 OF 1				
INSPECTOR Welti & Associates, P.C.		STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION				TOWN: New Britain/Newington, CT				Associated Borings Co., Inc.				
SOILS ENGINEER		PROJECT NAME: Hartford-New Britain Busway				PROJECT NUMBER: 171-305				BORING CONTRACTOR Close Jensen & Miller, P.C.				
Surface Elevation: 92.6		LOCATION:				DESIGN ENGINEER								
Date Started: 3/23/2011		Auger		Casing		Sampler		Core Bar		Hole No. RW-105X-1				
Date Finished: 3/23/2011		Type		HSA						Line & Station 126+51				
Groundwater Observations		Size I. D.		2 1/4 in		2 in				Offset 3' LT				
AT 20 ' AFTER 0 HRS		Hammer				140 lb		Bit		N Coordinate 811792.58				
AT ' AFTER HRS		Fall				30 in				E. Coordinate 998057.60				
DEPTH	Casing blows per foot	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)		
		DEPTH IN FEET FROM - TO	NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12	12-18	18-24				
5		1.0 - 3.0	1	24	12	D	1	1	12	15	3	Blk C-F Sand and Gravel (Fill)		
		3.0 - 5.0	2	24	12	D	15	17	26	30		Red Br. C-F Sand and C-F Gravel, Little Silt, Cobbles, Boulders		
		5.0 - 7.0	3	24	4	D	16	15	15	20	11	Red Br. M-F Sand, Some Silt Little C-F Gravel (Fill)		
		7.0 - 9.0	4	24	4	D	21	16	30	50				
10		10.0 - 12.0	5	24	12	D	21	16	16	18		20	Red Br. F. Sand, Some C-F Gravel, Little Silt	
		12.0 - 14.0	6	24	8	D	13	15	15	15				
15		15.0 - 17.0	7	24	4	D	21	26	31	19	25	End of Boring - 25.0		
		17.0 - 19.0	8	24	6	D	36	16	17	16				
20		20.0 - 22.0	9	24	12	D	17	15	15	17			25	End of Boring - 25.0
		23.0 - 25.0	10	24	7	D	14	15	15	15				
25											25	End of Boring - 25.0		
30											25	End of Boring - 25.0		
35											25	End of Boring - 25.0		
40											25	End of Boring - 25.0		
From Ground Surface to		Feet Used		Inch Casing Then		Inch Casing For		Feet						
Footage in Earth 25.0		Footage in Rock 0.0		No. of Samples 10		Hole No. RW-105X-1								
SAMPLE TYPE CODING: D = DRIVEN C = CORE A = AUGER UP = UNDISTURBED PISTON		TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%												

Jaime Lloret		SM-001 REV. 10/92 BORING REPORT								SHEET 1 OF 1		
DRILLER		STATE OF CONNECTICUT										
Don Moodie		DEPARTMENT OF TRANSPORTATION								Associated Borings Co., Inc.		
INSPECTOR		TOWN: New Britain/Newington, CT								BORING CONTRACTOR		
Welti & Associates, P.C.		PROJECT NAME: Hartford-New Britain Busway								Close Jensen & Miller, P.C.		
SOILS ENGINEER		PROJECT NUMBER: 171-305								DESIGN ENGINEER		
Surface Elevation: 92.62		LOCATION:										
Date Started: 8/31/2007		Auger		Casing		Sampler		Core Bar		Hole No. RW-102-2		
Date Finished: 8/31/2007		Type		HSA		SS				Line & Station 127+0		
Groundwater Observations		Size I. D.		2 1/4 in		2 in				Offset Appx CL		
AT 18 ' AFTER 0 HRS		Hammer				140 lb		Bit		N Coordinate 811837.36		
AT ' AFTER HRS		Fall				30 in				E. Coordinate 998085.87		
DEPTH	Casing blows per foot	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		DEPTH IN FEET FROM - TO	NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12	12-18	18-24		
5		0.0 - 2.0	1	24	8	D	13	17	21	40	2	Blk & Br. C-F Sand and C-F Gravel, Cobbles (Fill)
		2.0 - 4.0	2	24	8	D	17	31	36	40		
		4.0 - 6.0	3	24	10	D	7	11	9	12		
		6.0 - 8.0	4	24	7	D	10	14	16	30		
		8.0 - 10.0	5	24	12	D	11	15	17	14		
10		10.0 - 12.0	6	24	8	D	10	12	9	9	18	Red & Blk M-F Sand, Some Silt, Some C-F Gravel, (Fill)
		12.0 - 14.0	7	24	10	D	7	9	19	16		
		14.0 - 16.0	8	24	8	D	9	11	7	7		
15		16.0 - 18.0	9	24	7	D	9	7	11	12	25	Red Br. F. Silty Sand, Tr. C-F Gravel
		18.0 - 20.0	10	24	10	D	6	7	9	7		
20		20.0 - 22.0	11	24	6	D	7	7	8	10	25	End of Boring - 25.0
		23.0 - 25.0	12	24	12	D	22	36	22	25		
25											25	End of Boring - 25.0
30											25	End of Boring - 25.0
35											25	End of Boring - 25.0
40											25	End of Boring - 25.0
From Ground Surface to		Feet Used		Inch Casing Then		Inch Casing For		Feet				
Footage in Earth 25.0		Footage in Rock 0.0		No. of Samples 12		Hole No. RW-102-2						
SAMPLE TYPE CODING: D = DRIVEN		C = CORE		A = AUGER		UP = UNDISTURBED PISTON						
PROPORTIONS USED: TRACE = 1-10%		LITTLE = 10-20%		SOME = 20-35%		AND = 35-50%						

Thomas Lloret		SM-001 REV. 10/92 BORING REPORT								SHEET 1 OF 1		
DRILLER Don Moodie		STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION								Associated Borings Co., Inc.		
INSPECTOR Wolti & Associates, P.C.		TOWN: New Britain/Newington, CT								BORING CONTRACTOR Close Jensen & Miller, P.C.		
SOILS ENGINEER		PROJECT NAME: Hartford-New Britain Busway								DESIGN ENGINEER		
Surface Elevation: 92.44		LOCATION:										
Date Started: 8/31/2007		Auger		Casing		Sampler		Core Bar		Hole No. RW-102-3		
Date Finished: 8/31/2007		Type		HSA		SS				Line & Station 127+80		
Groundwater Observations		Size I. D.		2 1/4 in		2 in				Offset CL		
AT 18.5 'AFTER 0 HRS		Hammer				140 lb		Bit		N Coordinate 811898.06		
AT 'AFTER HRS		Fall				30 in				E. Coordinate 998134.82		
DEPTH	Casing blows per foot	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		DEPTH IN FEET FROM - TO	NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12	12-18	18-24		
5		0.0 - 1.0	1	12	3	D	25	50	X	X	6	Blk & Br. C-F Sand and C-F Gravel, Cobbles (Fill)
		2.0 - 4.0	2	24	10	D	9	9	10	11		
		4.0 - 6.0	3	24	9	D	5	7	7	10		
		6.0 - 8.0	4	24	10	D	9	5	7	7		
		8.0 - 10.0	5	24	13	D	7	7	9	7		
10		10.0 - 12.0	6	24	9	D	1	1	7	7	18.5	Red & Blk M-F Sand, Some Silt, Some C-F Gravel, (Fill)
		12.0 - 14.0	7	24	14	D	5	5	7	5		
		14.0 - 16.0	8	24	11	D	3	5	5	5		
15		16.0 - 18.0	9	24	6	D	1	1	4	2	21	Red Br. Silt
		18.0 - 20.0	10	24	10	D	1	1	4	5		
		20.0 - 22.0	11	24	10	D	14	14	19	17		
20											27	Red Br. M-F Silty Sand, Some C-F Gravel (Till)
		25.0 - 26.5	12	18	11	D	37	36	50	X		
25											30	Refusal - 27.0
30											35	NOTE: BORING ELEVATION 10' LOWER DUE TO OFFSET
35											40	
From Ground Surface to		Feet Used		Inch Casing Then		Inch Casing For		Feet				
Footage in Earth 27.0		Footage in Rock 0.0		No. of Samples 12		Hole No. RW-102-3						
SAMPLE TYPE CODING: D = DRIVEN C = CORE		A = AUGER		UP = UNDISTURBED PISTON								
PROPORTIONS USED: TRACE = 1-10%		LITTLE = 10-20%		SOME = 20-35%		AND = 35-50%						

Mark Lloret		SM-001 REV. 10/92		BORING REPORT		SHEET 1 OF 1						
DRILLER		STATE OF CONNECTICUT										
Don Moodie		DEPARTMENT OF TRANSPORTATION				Associated Borings Co., Inc.						
INSPECTOR		TOWN:		New Britain/Newington, CT		BORING CONTRACTOR						
Welti & Associates, P.C.		PROJECT NAME:		Hartford-New Britain Busway		Close Jensen & Miller, P.C.						
SOILS ENGINEER		PROJECT NUMBER:		171-305		DESIGN ENGINEER						
Surface Elevation: 91.8		LOCATION:										
Date Started: 8/24/2007		Auger		Casing		Sampler		Core Bar		Hole No. RW-102-4		
Date Finished: 8/24/2007		Type		HSA		SS				Line & Station 128+50		
Groundwater Observations		Size I. D.		2 1/4 in		2 in				Offset 16' RT		
AT 18 'AFTER 0 HRS		Hammer				140 lb		Bit		N Coordinate 811962.92		
AT 17.5 'AFTER 24 HRS		Fall				30 in				E. Coordinate 998163.18		
DEPTH	Casing blows per foot	SAMPLE				BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)	
		DEPTH IN FEET FROM - TO	NO.	PEN. INCH	REC. INCH	TYPE	0-6	6-12	12-18			18-24
5		0.0 - 2.0	1	8	8	D	30	90/2"	X	X	5	Br. C-F Sand and C-F Gravel, Cobbles (Fill)
		2.0 - 4.0	2	24	10	D	18	22	24	28		
		4.0 - 6.0	3	24	12	D	6	7	7	6	18	Red Br. F. Silty Sand, Tr. F. Gravel (Fill)
		6.0 - 8.0	4	24	10	D	8	7	12	10		
10		10.0 - 12.0	5	24	8	D	6	6	7	8	18	Red Br. F. Silty Sand, Tr. F. Gravel
15		15.0 - 17.0	6	24	10	D	5	5	6	7	28.1	Refusal - 28.1
20		20.0 - 22.0	7	24	12	D	10	14	21	18	28.1	Refusal - 28.1
25		25.0 - 27.0	8	14	14	D	20	48	90/2"	X	28.1	Refusal - 28.1
		28.0 - 28.1	9	1	1	D	50/1"	X	X	X		
30											28.1	Refusal - 28.1
35											28.1	Refusal - 28.1
40											28.1	Refusal - 28.1

From Ground Surface to Feet Used - Inch Casing Then Inch Casing For - Feet

Footage in Earth 28.1 Footage in Rock 0.0 No. of Samples 9 Hole No. **RW-102-4**

SAMPLE TYPE CODING: D = DRIVEN C = CORE A = AUGER UP = UNDISTURBED PISTON
 PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

Driller: R. Ingram/Seaboard	Connecticut DOT Boring Report		Hole No.: SB-32
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT		Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305		Northing: 811809.1
Start Date: 02/27/03	Route No.:		Easting: 998051.4
Finish Date: 02/27/03	Bridge No.:		Surface Elevation: 92.9
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: NA
Hammer Wt.: 300 Fall: 24"		Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ NA		after: hours, @	after: hours, @
Baker Info: S.O. Number: B25624LPDSOIL41802/42002		File: southern	Template: CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES						Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)				
0	A-N		1.5					92	
1								SILT WITH GRAVEL (ML) - reddish brown silt, little fine to coarse gravel; dry, very dense, NP; (FILL).	91
2	S-1	21 28 46	1.5	1.0					90
3									
4	A-N		1.5						89
5	S-2	7 14 22	1.5	0.0					88
6								SILT WITH GRAVEL (ML) - reddish brown silt, little fine to coarse gravel; dry, very dense, NP; (FILL).	87
7	S-3	13 25 40	1.5	0.8					86
8	S-4	21 48 27	1.5	0.7				GRAVELLY SILT WITH SAND (ML) - reddish brown silt, and fine to coarse gravel, some fine to coarse sand; dry, very dense, NP; (FILL). Switch to 4" casing at 9.0'.	85
9									84
10	W-N		1.5						83
11	S-5	12 12 12	1.5	0.8				SANDY SILT WITH GRAVEL (ML) - reddish brown silt, some fine to coarse sand, little fine to medium gravel; dry, medium dense, NP; (FILL).	82
12									81
13	W-N		1.5						80
14	S-6	34 21 25	1.5	0.4				13.5' ———— ELEV. 79.4 POORLY GRADED GRAVEL WITH SILT (GP-GM) - reddish brown fine to coarse gravel, some silt, trace fine to coarse sand; wet, dense, NP; (FILL).	79
15									78
16	W-N		1.5						77
17	S-7	17 11 12	1.5	0.5				16.5' ———— ELEV. 76.4 SILTY SAND WITH GRAVEL (SM) - reddish brown fine to coarse sand, and silt, little fine to coarse gravel; wet, medium dense, NP.	76
18									75
19	W-N		1.5					74	
		11						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: 22.0' Rock: 0.0'

NOTES: Boring terminated at 22.0' due to bent casing.

Sheet 1 of 2

Driller: R. Ingram/Seaboard	Connecticut DOT Boring Report	Hole No.: SB-32
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 811809.1
Start Date: 02/27/03	Route No.:	Easting: 998051.4
Finish Date: 02/27/03	Bridge No.:	Surface Elevation: 92.9
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: NA
Hammer Wt.: 300 Fall: 24"	Hammer Wt.: 140 Fall: 30"	
Groundwater Obs. @ NA	after: hours, @	after: hours, @
Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)		

Depth (ft.)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)			
20	S-8	12	1.5	0.0		[Patterned Strata]	Boring terminated at 22.0'	
21		16						
22	W-N		1.0				ELEV. 70.9	71
23								70
24								69
25								68
26								67
27								66
28								65
29								64
30								63
31								62
32								61
33								60
34								59
35								58
36								57
37								56
38								55
39								54
								53

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: 22.0' Rock: 0.0'

NOTES: Boring terminated at 22.0' due to bent casing.

Sheet 2 of 2

Driller: R. Ingrams/Seaboard	Connecticut DOT Boring Report	Hole No.: SB-32A
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing:
Start Date: 02/28/03	Route No.:	Easting:
Finish Date:	Bridge No.:	Surface Elevation: 92
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. @ 16.8' after: 0 hours, @16.7' after: 24 hours, @16.4' after: 48 hours		
Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)		

Depth (ft.)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)			
0								
1								91
2								90
3								89
4								88
5								87
6								86
7								85
8								84
9								83
10								82
11	W-N		22.5					81
12								80
13								79
14								78
15								77
16								76
17								75
18								74
19								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: 35.0' Rock: 10.0'	NOTES: Boring SB-32A was drilled one foot ahead station from borina SB-32.	Sheet 1 of 3
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Driller: R. Ingrams/Seaboard	Connecticut DOT Boring Report	Hole No.: SB-32A
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing:
Start Date: 02/28/03	Route No.:	Easting:
Finish Date:	Bridge No.:	Surface Elevation: 92
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. @ 16.8' after: 0 hours, @16.7' after: 24 hours, @16.4' after: 48 hours		
Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)		

Depth (ft.)	SAMPLES						Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)				
20								72	
21								71	
22								70	
23	S-1	100/0.0	0.0	0.0				69	
24	W-N		2.9					68	
25								67	
26	S-2	24 25 26	1.5	0.5		25.5'	POORLY GRADED GRAVEL WITH SAND (GP-GM) - reddish brown to black fine to coarse gravel, some fine to coarse sand, little silt; wet, very dense, NP.	ELEV. 66.5	
27									66
28	W-N		1.5			28.0'		ELEV. 64.0	
29	S-3	100/0.1	0.1	0.0				65	
30	W-N		1.4					64	
31	S-4	100/0.1	0.1	0.0				63	
32								62	
33	W-N		4.9					61	
34								60	
35				1.0	0.0		SILTSTONE; reddish brown, medium hard to hard, moderately to highly weathered.	58	
36								57	
37	C-1		5.0					56	
38								55	
39								54	
								53	

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'	NOTES: Boring SB-32A was drilled one foot ahead station from boring SB-32.	Sheet 2 of 3
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Driller: R. Ingrams/Seaboard	Connecticut DOT Boring Report	Hole No.: SB-32A
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing:
Start Date: 02/28/03	Route No.:	Easting:
Finish Date:	Bridge No.:	Surface Elevation: 92
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. @ 16.8' after: 0 hours, @ 16.7' after: 24 hours, @ 16.4' after: 48 hours		
Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E (LD4 1/03)		

Depth (ft.)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)			
40	C-2		5.0	20%	0%		SILTSTONE; reddish brown, medium hard to hard, moderately to highly weathered.	52
41				4.3	2.0			51
42								50
43								49
44								48
45								86%
46						End of Boring at 45.0'	46	
47							45	
48							44	
49							43	
50							42	
51							41	
52							40	
53							39	
54							38	
55							37	
56							36	
57							35	
58							34	
59							33	

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%

Driller: Rob Ingram/Seaboard	Connecticut DOT Boring Report	Hole No.: SB-34
Inspector: Josh Colella	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 811994.8
Start Date: 03/04/03	Route No.:	Easting: 998205.1
Finish Date: 03/04/03	Bridge No.:	Surface Elevation: 91.4

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. @ 0.0 after: 0 hours, @8.5 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						Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)				
0								91	
1	W-N		1.5					90	
2	S-1	9 7	1.5	1.0			POORLY GRADED SAND (SP) - black fine to coarse sand, little fine to medium gravel, trace silt; dry, medium dense, NP; (FILL)	89	
3		7						88	
4	W-N		1.5					87	
5	S-2	7 5	1.5	0.5		4.5'	SILT WITH GRAVEL (ML) - brown silt, little fine to medium gravel, trace fine to medium sand; dry, medium dense, NP; (FILL)	86	
6		6						85	
7	W-N		1.5					84	
8	S-3	5 4	1.5	0.3		7.5'	ELASTIC SILT (MH) - brown silt, trace fine sand, trace clay; moist, stiff, -PL	83	
9		5						82	
10	W-N		1.5					81	
11	S-4	6 7	1.5	1.3			ELASTIC SILT (MH) - brown silt, trace fine sand, trace clay, trace fine gravel; moist, very stiff, -PL	80	
12		10						79	
13	W-N		1.5					78	
14	S-5	6 6	1.5	0.8		13.5'	SILT (ML) - brown silt; moist, stiff, -PL	77	
15		7						76	
16	W-N		1.5					75	
17	S-6	7 9	1.5	0.75			SILT WITH GRAVEL (ML) - brown silt, little fine to medium gravel, trace clay; moist, medium dense, NP;	74	
18		15						73	
19	W-N		1.5					72	
		12				19.5'		ELEV. 71.9	

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: 28.0 Rock: 10.0

NOTES:

Driller: Rob Ingram/Seaboard	Connecticut DOT Boring Report		Hole No.: SB-34
Inspector: Josh Colella	Town: New Britain / Newington, CT		Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305		Northing: 811994.8
Start Date: 03/04/03	Route No.:		Easting: 998205.1
Finish Date: 03/04/03	Bridge No.:		Surface Elevation: 91.4
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. @ 0.0 after: 0 hours, @ 8.5 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						Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)				
20	S-7	19	1.5	1.0			ELASTIC SILT WITH GRAVEL (MH) - brown silt, little fine to medium gravel, trace fine sand, trace clay; moist, hard, + PL;	71	
21		29						70	
22	W-N		1.5				GRAVELLY ELASTIC SILT (MH) - brown silt, some fine to medium gravel, trace fine sand, trace clay; moist, hard, + PL.	69	
23	S-8	29	1.5	0.3				68	
24		50					SILTY GRAVEL (GM) - brown fine to coarse gravel, little silt, trace fine sand; moist, very dense, NP; (DECOMPOSED ROCK).	67	
25	W-N	100	1.5					66	
26	S-9	27	1.5	0.6			ELEV. 65.9	65	
27	W-N	300	1.0				ELEV. 64.4	64	
28				3.7	0.8		SILTSTONE; reddish brown, hard, moderately to slightly weathered	63	
29								62	
30	C-1		5.0				SILTSTONE; reddish brown, hard, moderately to slightly weathered	61	
31								60	
32				74%	16%		SILTSTONE; reddish brown, hard, moderately to slightly weathered	59	
33				3.7	2.2			58	
34	C-2		5.0				SILTSTONE; reddish brown, hard, moderately to slightly weathered	57	
35								56	
36							SILTSTONE; reddish brown, hard, moderately to slightly weathered	55	
37								54	
38				74%	44%		ELEV. 53.4	53	
39							End of boring at 38.0'	52	

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: 28.0 Rock: 10.0

NOTES:

Driller: R. Ingrams/Seaboard	Connecticut DOT Boring Report	Hole No.: SB-32A
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing:
Start Date: 02/28/03	Route No.:	Easting:
Finish Date:	Bridge No.:	Surface Elevation: 92

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. @ 16.8' after: 0 hours, @16.7' after: 24 hours, @16.4' after: 48 hours
 Baker Info: S.O. Number: B25624LPDSOIL41802/42002 File: southern Template: CDOT E(LD4 1/03)

Depth (ft.)	SAMPLES						Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)				
0									
1									91
2									90
3									89
4									88
5									87
6									86
7									85
8									84
9									83
10									82
11	W-N		22.5						81
12									80
13									79
14									78
15									77
16									76
17									75
18									74
19									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: 13.0' Rock: 10.0' No. of Samples: 4
 NOTES: Boring SB-32A was drilled one foot ahead station from boring SB-32.
 Sheet 1 of 3
 SM-001-M REV. 1/02

Driller: R. Ingrams/Seaboard	Connecticut DOT Boring Report	Hole No.: SB-32A
Inspector: Ryan Tinsley	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing:
Start Date: 02/28/03	Route No.:	Easting:
Finish Date:	Bridge No.:	Surface Elevation: 92

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. @ 16.8' after: 0 hours, @16.7' after: 24 hours, @16.4' after: 48 hours

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

Depth (ft.)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)			
20								72
21								71
22								70
23	S-1	100/0.0	0.0	0.0				69
24	W-N		2.9					68
25								67
26	S-2	24 25 26	1.5	0.5		25.5'	POORLY GRADED GRAVEL WITH SAND (GP-GM) - reddish brown to black fine to coarse gravel, some fine to coarse sand, little silt; wet, very dense, NP.	ELEV. 66.5
27	W-N		1.5					66
28						28.0'		ELEV. 64.0
29	S-3	100/0.1	0.1	0.0				65
30	W-N		1.4					64
31	S-4	100/0.1	0.1	0.0				63
32								62
33	W-N		4.9					61
34								60
35				1.0	0.0			59
36							SILTSTONE; reddish brown, medium hard to hard, moderately to highly weathered.	58
37	C-1		5.0					57
38								56
39								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%

NOTES: Boring SB-32A was drilled one foot ahead station from boring SB-32.

Total Penetration in Earth: 13.0' Rock: 10.0' No. of Samples: 4

Sheet 2 of 3
SM-001-M REV. 1/02

Driller: R. Ingrams/Seaboard **Connecticut DOT Boring Report** **Hole No.:** SB-32A
Inspector: Ryan Tinsley **Town:** New Britain / Newington, CT **Stat./Offset:**
Engineer: Baker Engineering **Project No.:** 171-0305 **Northing:**
Start Date: 02/28/03 **Route No.:** **Easting:**
Finish Date: **Bridge No.:** **Surface Elevation:** 92

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. @ 16.8' after: 0 hours, **@ 16.7'** after: 24 hours, **@ 16.4'** after: 48 hours
Baker Info: S.O. Number: B25624LPDSOIL41802/42002 **File:** southern **Template:** CDOT E (LD4 1/03)

Depth (ft.)	SAMPLES					Generalized Strata Description	Material Description and Notes	Elevation (ft.)	
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)				
40	C-2		5.0	20%	0%		SILTSTONE; reddish brown, medium hard to hard, moderately to highly weathered.	52	
41				4.3	2.0			51	
42									50
43									49
44									48
45								86%	40%
46						End of Boring at 45.0'.		46	
47								45	
48								44	
49								43	
50								42	
51								41	
52								40	
53								39	
54								38	
55								37	
56								36	
57								35	
58								34	
59								33	

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%
NOTES: Boring SB-32A was drilled one foot ahead station from boring SB-32.

Total Penetration in Earth: 13.0' **Rock:** 10.0'
No. of Samples: 4

Driller: Rob Ingram/Seaboard	Connecticut DOT Boring Report	Hole No.: SB-34
Inspector: Josh Colella	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 811994.8
Start Date: 03/04/03	Route No.:	Easting: 998205.1
Finish Date: 03/04/03	Bridge No.:	Surface Elevation: 91.4

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. @ 0.0 after: 0 hours, @ 8.5 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					Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)			
0	W-N		1.5					91
1	S-1	9	1.5	1.0		POORLY GRADED SAND (SP) - black fine to coarse sand, little fine to medium gravel, trace silt; dry, medium dense, NP; (FILL)	90	
2		7					89	
3	W-N		1.5				88	
4	S-2	7	1.5	0.5		SILT WITH GRAVEL (ML) - brown silt, little fine to medium gravel, trace fine to medium sand; dry, medium dense, NP; (FILL)	87	
5		5					86	
6	W-N		1.5				85	
7	S-3	5	1.5	0.3		ELASTIC SILT (MH) - brown silt, trace fine sand, trace clay; moist, stiff, -PL	84	
8		4					83	
9	W-N		1.5				82	
10	S-4	6	1.5	1.3		ELASTIC SILT (MH) - brown silt, trace fine sand, trace clay, trace fine gravel; moist, very stiff, -PL	81	
11		7					80	
12	W-N		1.5				79	
13	S-5	6	1.5	0.8		SILT (ML) - brown silt; moist, stiff, -PL	78	
14		6					77	
15	W-N		1.5				76	
16	S-6	7	1.5	0.75		SILT WITH GRAVEL (ML) - brown silt, little fine to medium gravel, trace clay; moist, medium dense, NP;	75	
17		9					74	
18	W-N		1.5				73	
19		12					72	

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: 28.0 Rock: 10.0
 No. of Samples: 9

NOTES:

Driller: Rob Ingram/Seaboard	Connecticut DOT Boring Report	Hole No.: SB-34
Inspector: Josh Colella	Town: New Britain / Newington, CT	Stat./Offset:
Engineer: Baker Engineering	Project No.: 171-0305	Northing: 811994.8
Start Date: 03/04/03	Route No.:	Easting: 998205.1
Finish Date: 03/04/03	Bridge No.:	Surface Elevation: 91.4
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. @ 0.0 after: 0 hours, @8.5 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						Generalized Strata Description	Material Description and Notes	Elevation (ft.)
	Sample Type/No.	Blows on Sampler per 0.5 ft.	Pen. (ft.)	Rec. (ft./%)	RQD (ft./%)				
20	S-7	19	1.5	1.0			ELASTIC SILT WITH GRAVEL (MH) - brown silt, little fine to medium gravel, trace fine sand, trace clay; moist, hard, + PL;	71	
21		29					70		
22	W-N		1.5				69		
23	S-8	29 50	1.5	0.3			68		
24		100					67		
25	W-N		1.5				66		
26	S-9	27 50	1.5	0.6			25.5' SILTY GRAVEL (GM) - brown fine to coarse gravel, little silt, trace fine sand; moist, very dense, NP; (DECOMPOSED ROCK). ELEV. 65.9	65	
27		300					27.0' (DECOMPOSED ROCK). ELEV. 64.4	64	
28	W-N		1.0				SILTSTONE; reddish brown, hard, moderately to slightly weathered	63	
29				3.7	0.8			62	
30	C-1		5.0				61		
31							60		
32							59		
33				74% 3.7	16% 2.2		SILTSTONE; reddish brown, hard, moderately to slightly weathered	58	
34							57		
35	C-2		5.0				56		
36							55		
37							54		
38				74%	44%		End of boring at 38.0' ELEV. 53.4	53	
39								52	

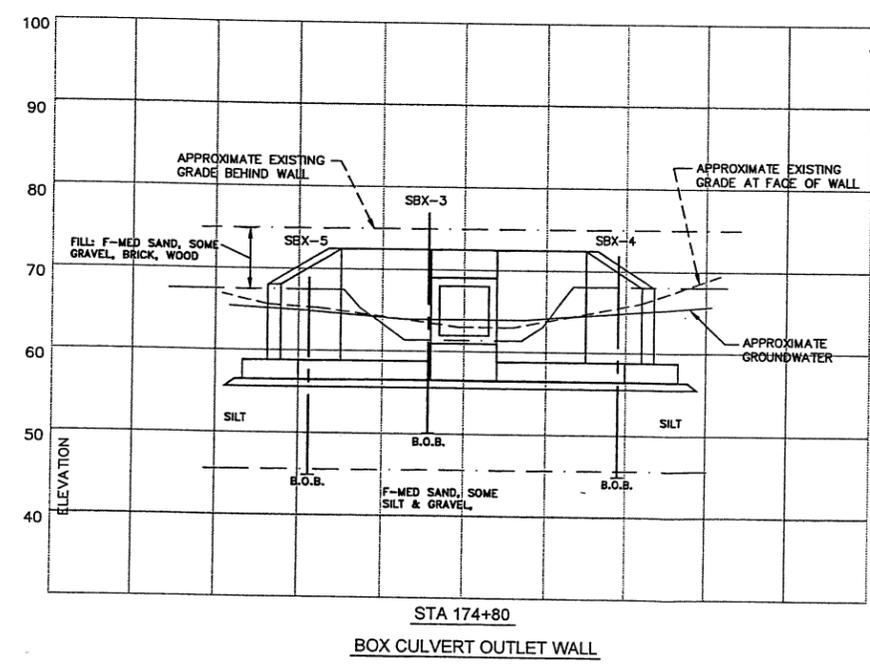
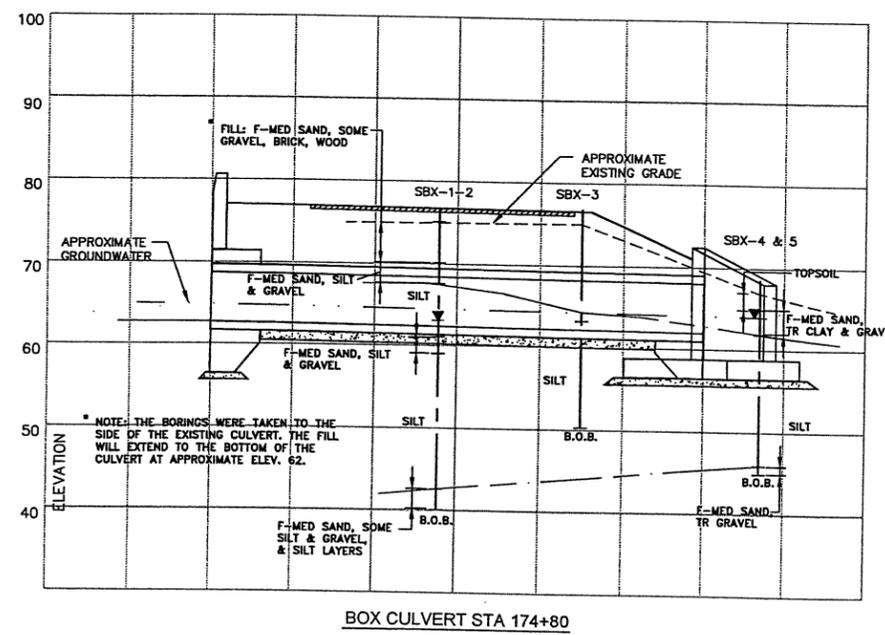
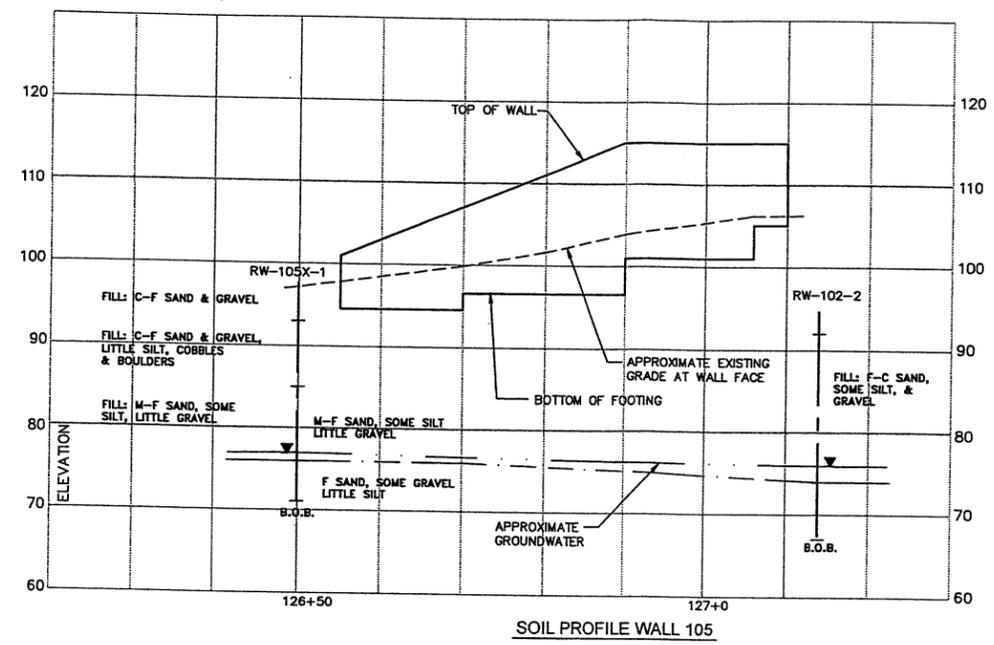
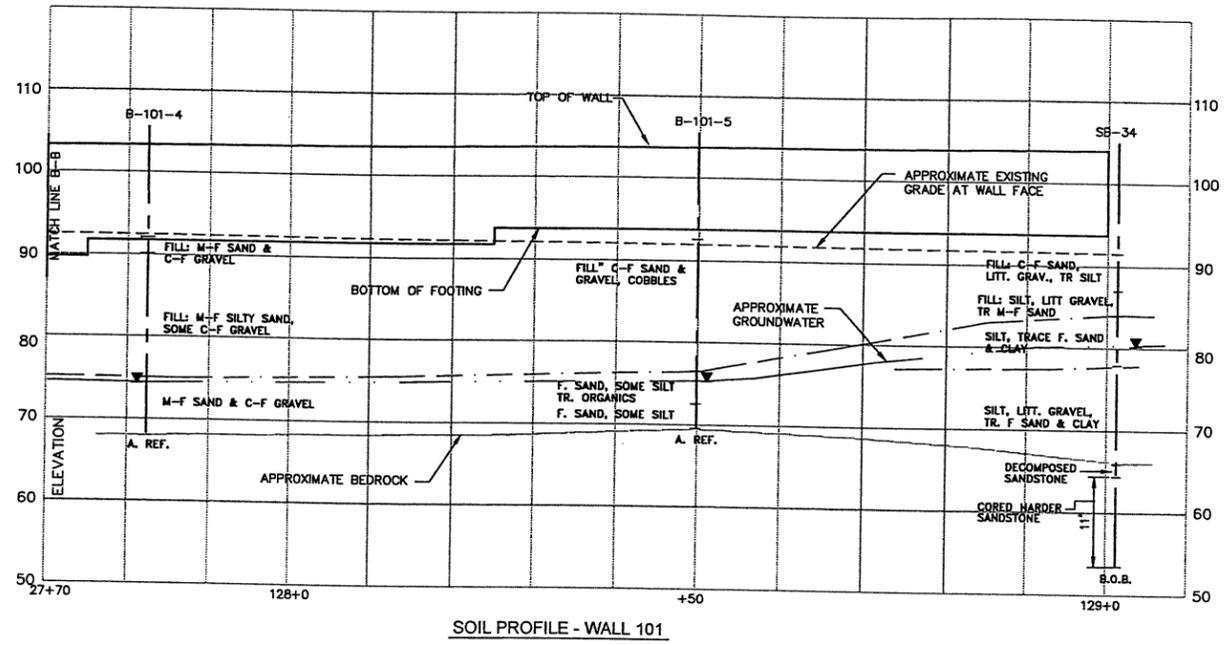
Sample Type: S=Split Spoon C=Core UP=Undisturbed Piston V=Vane Shear Test A=Auger
Proportions Used: Trace = 1 - 10%, Little = 10 - 20%, Some = 20 - 35%, And = 35 - 50%

Total Penetration in Earth: 28.0 Rock: 10.0
No. of Samples: 9

NOTES:

APPENDIX 2

Geologic Sections + Grain Size Gradations (if any)



- A. REF. = AUGER REFUSAL
- B.O.B. = BOTTOM OF BORING
- ▼ = OBSERVED GROUNDWATER LEVEL
- = ESTIMATED WATER TABLE
- = STRATUM CHANGE
- = GRADE LINE

REVISIONS		
DATE	NO.	DESCRIPTION

NEW BRITAIN - HARTFORD BUSWAY
NEWINGTON SECTIONS A & B

STRUCTURE GEOTECHNICAL SECTIONS

SCALE: 1" = 10' DATE: MARCH 30, 2011

DR. CLARENCE WELTI, P.E., P.C.
227 WILLIAMS STREET, P.O. BOX 497
GLASTONBURY, CONNECTICUT 06033

SHEET 2

APPENDIX 2

Geologic Sections + Grain Size Gradations (if any)