DELAWARE DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH SECTION

F.A. Project:
Contract: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
Boring Loc.: 51+84 28' Rt. BASELINE - BRIDGE G3

Boring No.: B # 1B

Boring Surface Elev: + 218.0' Reference:

Wt. of Casing Hammer:		Lbs.	Average Fall:		IN.
Wt. of Sample Hammer:	140	Lbs.	Average Fall:	30	IN.
Type of: D-Sampler:	SPLIT-BARREL	O.D.	O.D. of SAMPLER:	2	IN.
S-Sampler:		O.D.	O.D.of SAMP.TUBE:		IN.
U-Sampler:		O.D.	O.D.of SAMP.TUBE:		IN.
Core Bit :		O.D.	O.D.of ROCK CORE:		IN.

Casing Size: 3 1/4" Inches; From Depth of: 0.0' To: 5.5'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
01/24/05	0 HOUR	53.5'	5.5'	24.0'	
01/25/05	24 HOUR			28.0'	
/ /					
/ /					

Pay Quantities:

2 1/2 in. Dia.Dry Sample Boring:	16.0	Ft.;	Dia. U-Sample Boring:		Ft.
No. of 2 in. Dia. Shelby Tubes:		;	No.of:	U-Samples:	
2 1/2 in. Dia.Contin.Sample Boring:		Ft.;	Core Drilling in Rock:	35.0	Ft.

Boring Contractor: SITE-BLAUVELT
Driller: ROBERT MOYER
Helpers: DAMON SMITH

Remarks: INSPECTOR - K. GIBNEY

Reviewed By: RANDY FERGUSON Soils Supervisor: MAUREEN KELLEY

NOTES:

1. Make a separate log of each boring&each unsuccessful attempt. Keep a copy of all logs in the field.
2. In daily progress column indicate depth at beginning and end of work day, calendar date, time at beginning and end of work day and weather conditions.
3. All samples shall be numbered in consecutive order regardless of type; dry samples D, wash samples W, shelby tube samples S, undisturbed samples U. Do not assign numbers to lost samples but record blows and reasons for lack of recovery.
4. Mark each U-sample with boring number, sample number, depth, recovery and job number.
5. Record blows on sample per six inches of penetration. Note all blows and penetrations when taken at less than six inch intervals. Indicate method by which penetration of tube sampler was obtained.
6. Indicate changes of material in strata column and list generalized strata classifications.
7. List under remarks the manner by which changes in material were detected, all obstructions, any loss or gain of wash water including amount, the recovery of rock cores in feet and inches and percent of run, and any unusual occurences.

BORING NO. B # 1B

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 51+84 28' Rt. BASELINE - BRIDGE G3

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/24/05	1	3.5'	50/0.0"	No Sample Recovery	----------	
		5.0'				
	Run # 1	6.0' 8.5'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				8" Recovery = 26.7% RQD = 16.7% (very poor)		
	2	8.5'	8	No Sample Recovery	----------	
		10.0'	12 15			
				1" Recovery		
	Run # 2	10.0' 13.5'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				18" Recovery = 42.9% RQD = 11.9% (very poor)		
	3	13.5'	8 10	No Sieve Analysis	----------	
		15.0'	13			
				1" Recovery		
	4	18.5'	3 2	Saturated firm grayish brown silt w/some fine to coarse sand and clay, trace of	A-4 (3)	
		20.0'	3	gravel.		
				7" Recovery		
	Run # 3	20.0' 23.5'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				12" Recovery = 28.6% RQD = 0% (very poor)		
	5	23.5'	4 7	Saturated stiff grayish brown silty clay w/some fine to coarse sand, trace of	A-6 (7)	
		25.0'	7	gravel.		
				12" Recovery		

BORING NO. B # 1B

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 51+84 28' Rt. BASELINE - BRIDGE G3

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/21/05	Run # 4	25.0' 28.5'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				12" Recovery = 28.6% RQD = 0% (very poor)		
	6	28.5'	5 4	Saturated stiff gray silty clay w/trace of fine to coarse sand and gravel.	A-6 (7)	
		30.0'	5			
				13" Recovery		
	Run # 5	30.0' 33.5'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				4" Recovery = 9.5% RQD = 0% (very poor)		
	7	33.5'	6 7	No Sample Recovery	----------	
		35.0'	10			
	Run # 6	35.0' 38.5'	Core Drilling	Gneiss, blueish gray, medium hard, moderately to highly weathered, no apparent banding, extremely to very closely spaced fractures. 13" Recovery = 30.9% RQD = 0% (very poor)	----------	RQD = Rock Quality Designation
	Run # 7	38.5' 43.5'	Core Drilling	Gneiss, blueish gray, medium hard to hard, moderately to slightly weathered, no apparent banding, very closely spaced fractures. 30" Recovery = 50.0% RQD = 30% (poor)	----------	RQD = Rock Quality Designation
	Run # 8	43.5' 48.5'	Core Drilling	Gneiss, blueish gray, hard to very hard, slightly weathered to fresh, very thinly banded, closely to medium spaced fractures. 49" Recovery = 81.7% RQD = 50% (fair)	----------	RQD = Rock Quality Designation

BORING NO. B # 1B

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 51+84 28' Rt. BASELINE - BRIDGE G3

DAILY PROGRESS	SAMPLE NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/21/05	Run # 9	48.5' 53.5'	Core Drilling	Gneiss, blueish gray, hard to very hard, slightly weathered to fresh, very thinly banded, closely to medium spaced fractures. 60" Recovery = 100.0% RQD = 92.0% (excellent)	----------	RQD = Rock Quality Designation
			(END)			

BORING NO. B # 1B
SURFACE ELEV. + 218.0'

MATERIALS AND RESEARCH DIVISION
SUMMARY OF SOIL ANALYSIS TESTS PAGE 1
AASHTO TESTS:T-89,T-90, & T-265

CONTRACT- 23-106-05 NAME--- S.R. 141 - U.S. 202
DATE----- JULY 25, 2005 EAST SIDE IMPROVEMENTS

						********** PERCENT PASSING **********									
LOCATION	DEPTH	2.5	2	1	3/8	4	10	40	200	LL	PL	MO	OR	PI	CLASS	GI
B # 1B	S#1															
STA.	3.5- 3.5 NO SAMPLE RECOVERY															
51+84																
28' Rt.																
BASELINE																
RAMP "5"																
BRIDGE																
G3																
	STOP SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
CORE DRILLING																
RUN # 1	6.0' - 8.5' 8" RECOVERY = 26.7%															
	STOP CORE DRILLING															
	START SPLIT-BARREL SAMPLER															
	S#2															
	8.5-10.0 NO SIEVE ANALYSIS									--	--	3	--	--	-----	--
	STOP SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
RUN # 2	10.0' - 13.5' 18" RECOVERY = 42.9%															
	STOP CORE DRILLING															
	START SPLIT-BARREL SAMPLER															
	S#3															
	13.5-15.0 NO SIEVE ANALYSIS									34	23	32	--	11	-----	--
	S#4															
	18.5-20.0	100	100	100	99	98	96	82	68	30	23	29	--	7	A-4	3
	STOP SPLIT-BARREL SAMPLER															

CONTRACT- 23-106-05 NAME--- S.R. 141 - U.S. 202
DATE----- JULY 25, 2005 EAST SIDE IMPROVEMENTS

LOCATION	DEPTH	********** PERCENT PASSING ********** 2.5	2	1	3/8	4	10	40	200	LL	PL	MO	OR	PI	CLASS	GI
	START CORE DRILLING															
RUN # 3	20.0' - 23.5' 12" RECOVERY = 28.6%															
	STOP CORE DRILLING															
	START SPLIT-BARREL SAMPLER															
	S#5															
	23.5-25.0	100	100	100	100	99	96	84	70	33	21	23	--	12	A-6	7
	STOP SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
RUN # 4	25.0' - 28.5' 12" RECOVERY = 28.6%															
	STOP CORE DRILLING															
	START SPLIT-BARREL SAMPLER															
	S#6															
	28.5-30.0	100	100	100	100	100	98	97	92	34	22	25	--	12	A-6	11
	STOP SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
RUN # 5	30.0' - 33.5' 4" RECOVERY = 9.5%															
	STOP CORE DRILLING															
	START SPLIT-BARREL SAMPLER															
	S#7															
	33.5-35.0 NO SAMPLE RECOVERY															
	END SPLIT-BARREL SAMPLER															

CONTRACT- 23-106-05 NAME--- S.R. 141 - U.S. 202
DATE----- JULY 25, 2005 EAST SIDE IMPROVEMENTS

LOCATION	DEPTH	********** PERCENT PASSING ********** 2.5	2	1	3/8	4	10	40	200	LL	PL	MO	OR	PI	CLASS	GI
	START CORE DRILLING															
RUN # 6	35.0' - 38.5' 13" RECOVERY = 30.9%															
RUN # 7	38.5' - 43.5' 30" RECOVERY = 50.0%															
RUN # 8	43.5' - 48.5' 49" RECOVERY = 81.7%															
RUN # 9	48.5' - 53.5' 60" RECOVERY = 100.0%															
	END CORE DRILLING															
	END OF BORING															

DELAWARE DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH SECTION

F.A. Project:
Contract: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
Boring Loc.: 53+70 4' Lt. BASELINE - BRIDGE G3

Boring No.: B # 4

Boring Surface Elev: + 222.2' Reference:

Wt. of Casing Hammer:		Lbs.	Average Fall:	IN.
Wt. of Sample Hammer:	140	Lbs.	Average Fall: 30	IN.
Type of: D-Sampler:	SPLIT-BARREL	O.D.	O.D. of SAMPLER: 2	IN.
S-Sampler:		O.D.	O.D.of SAMP.TUBE:	IN.
U-Sampler:		O.D.	O.D.of SAMP.TUBE:	IN.
Core Bit :		O.D.	O.D.of ROCK CORE:	IN.

Casing Size: 3 1/4" Inches; From Depth of: 0.0' To: 8.5'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
01/27/05	0 HOUR	48.5'	48.5'	28.6'	
01/28/05	24 HOUR			28.6'	
/ /					
/ /					

Pay Quantities:
2 1/2 in. Dia.Dry Sample Boring: 22.7 Ft.; Dia. U-Sample Boring: Ft.
No. of 2 in. Dia. Shelby Tubes: ; No.of: U-Samples:
2 1/2 in. Dia.Contin.Sample Boring: Ft.; Core Drilling in Rock: 25.8 Ft.

Boring Contractor: SITE-BLAUVELT
Driller: ROBERT MOYER
Helpers: DAMON SMITH

Remarks: INSPECTOR - K. GIBNEY

Reviewed By: RANDY FERGUSON Soils Supervisor: MAUREEN KELLEY

NOTES:

1. Make a separate log of each boring&each unsuccessful attempt. Keep a copy of all logs in the field.
2. In daily progress column indicate depth at beginning and end of work day, calendar date, time at beginning and end of work day and weather conditions.
3. All samples shall be numbered in consecutive order regardless of type; dry samples D, wash samples W, shelby tube samples S, undisturbed samples U. Do not assign numbers to lost samples but record blows and reasons for lack of recovery.
4. Mark each U-sample with boring number, sample number, depth, recovery and job number.
5. Record blows on sample per six inches of penetration. Note all blows and penetrations when taken at less than six inch intervals. Indicate method by which penetration of tube sampler was obtained.
6. Indicate changes of material in strata column and list generalized strata classifications.
7. List under remarks the manner by which changes in material were detected, all obstructions, any loss or gain of wash water including amount, the recovery of rock cores in feet and inches and percent of run, and any unusual occurences.

BORING NO. B # 4

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 53+70 4' Lt. BASELINE - BRIDGE G3

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/27/05	1	3.5'	7 7	Saturated very stiff reddish brown silty clay w/some gravel and fine sand, trace of	A-6 (7)	
		5.0'	14	coarse sand.		
				15" Recovery		
Run # 1	8.5' 13.5'	Core Drilling		Cobbles	----------	RQD = Rock Quality Designation
				5" Recovery = 8.3% RQD = 0% (very poor)		
2	13.5' 14.7'	12 14 50/0.2"		Saturated very dense brown gravel w/some silt and fine sand, trace of coarse sand.	A-1-b (0)	
				2" Recovery		
Run # 2	14.7' 18.5'	Core Drilling		Cobbles	----------	RQD = Rock Quality Designation
				3" Recovery = 6.8% RQD = 0% (very poor)		
Run # 3	18.5' 23.5'	Core Drilling		Cobbles	----------	RQD = Rock Quality Designation
				16" Recovery = 26.7% RQD = 0% (very poor)		
3	23.5' 25.0'	7 12 14		No Sample Recovery	----------	
4	28.5' 30.0'	12 12 11		No Sample Recovery	----------	
Run # 4	30.0' 33.5'	Core Drilling		Cobbles	----------	RQD = Rock Quality Designation
				3" Recovery = 7.1% RQD = 0% (very poor)		

BORING NO. B # 4

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 53+70 4' Lt. BASELINE - BRIDGE G3

DAILY PROGRESS	SAMPLE NO.	DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/27/05	5	33.5'	9 12	No Sample Recovery	----------	
		35.0'	14			
	6	38.5'	13 14	No Sieve Analysis	----------	
		40.0'	23			
				2" Recovery		
Run # 5		40.0' 43.5'	Core Drilling	Gneiss, brownish gray, medium hard to hard, highly to slightly weathered, very thinly to thinly banded, very closely fractured. 42" Recovery = 100.0% RQD = 20% (very poor)	----------	RQD = Rock Quality Designation
Run # 6		43.5' 48.5'	Core Drilling	Gneiss, blueish gray, hard to very hard, slightly weathered to fresh, very thinly to thinly banded, very closely spaced fractures. 58" Recovery = 96.7% RQD = 62% (fair)	----------	RQD = Rock Quality Designation

(END)

BORING NO. B # 4
SURFACE ELEV. + 222.2'

MATERIALS AND RESEARCH DIVISION
SUMMARY OF SOIL ANALYSIS TESTS
AASHTO TESTS:T-89,T-90, & T-265

CONTRACT- 23-106-05
DATE----- JULY 25, 2005

NAME--- S.R. 141 - U.S. 202
EAST SIDE IMPROVEMENTS

LOCATION	DEPTH	********** PERCENT PASSING ********** 2.5	2	1	3/8	4	10	40	200	LL	PL	MO	OR	PI	CLASS	GI
B # 4	S#1															
STA. 53+70 4' Lt. BASELINE RAMP "5" BRIDGE G3	3.5- 5.0	100	100	94	93	92	87	80	69	33	21	21	--	12	A-6	7
	STOP SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
CORE DRILLING RUN # 1	8.5' - 13.5' 5" RECOVERY = 8.3%															
	STOP CORE DRILLING															
	START SPLIT-BARREL SAMPLER															
	S#2															
	13.5-14.7	100	100	51	46	43	39	30	19	--	--	12	--	NP	A-1-b	0
	STOP SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
RUN # 2	14.7' - 18.5' 3" RECOVERY = 6.8%															
RUN # 3	18.5' - 23.5' 16" RECOVERY = 26.7%															
	STOP CORE DRILLING															

CONTRACT- 23-106-05 NAME--- S.R. 141 - U.S. 202
DATE----- JULY 25, 2005 EAST SIDE IMPROVEMENTS

LOCATION	DEPTH	********** PERCENT PASSING ********** 2.5	2	1	3/8	4	10	40	200	LL	PL	MO	OR	PI	CLASS	GI
	START SPLIT-BARREL SAMPLER															
	S#3															
	23.5-25.0 NO SAMPLE RECOVERY															
	S#4															
	28.5-30.0 NO SAMPLE RECOVERY															
	STOP SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
RUN # 4	30.0' - 33.5' 3" RECOVERY = 7.1%															
	STOP CORE DRILLING															
	START SPLIT-BARREL SAMPLER															
	S#5															
	33.5-35.0 NO SAMPLE RECOVERY															
	S#6															
	38.5-40.0 NO SIEVE ANALYSIS															
	END SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
RUN # 5	40.0' - 43.5' 42" RECOVERY = 100.0%															
RUN # 6	43.5' - 48.5' 58" RECOVERY = 96.7%															
	END CORE DRILLING															
	END OF BORING															

DELAWARE DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH SECTION

F.A. Project:
Contract: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
Boring Loc.: 53+30 BASELINE - BRIDGE G3

Boring No.: B # 5

Boring Surface Elev: + 218.9'

Reference:

Wt. of Casing Hammer:		Lbs.	Average Fall:		IN.
Wt. of Sample Hammer:	140	Lbs.	Average Fall:	30	IN.
Type of: D-Sampler:	SPLIT-BARREL	O.D.	O.D. of SAMPLER:	2	IN.
S-Sampler:		O.D.	O.D.of SAMP.TUBE:		IN.
U-Sampler:		O.D.	O.D.of SAMP.TUBE:		IN.
Core Bit :		O.D.	O.D.of ROCK CORE:		IN.

Casing Size: 3 1/4" Inches; From Depth of: 0.0' To: 46.0'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
01/27/05	0 HOUR	46.0'	46.0'	16.2'	
01/28/05	24 HR	46.0	46.0	Caved @ 3.0	
/ /					
/ /					

Pay Quantities:

2 1/2 in. Dia.Dry Sample Boring:	3.2	Ft.;	Dia. U-Sample Boring:		Ft.
No. of 2 in. Dia. Shelby Tubes:		;	No.of:	U-Samples:	
2 1/2 in. Dia.Contin.Sample Boring:		Ft.;	Core Drilling in Rock: 39.8		Ft.

Boring Contractor: SITE-BLAUVELT
Driller: ROBERT MOYER
Helpers: DAMON SMITH

Remarks: INSPECTOR - K. GIBNEY

Reviewed By: RANDY FERGUSON

Soils Supervisor: MAUREEN KELLEY

NOTES:

1. Make a separate log of each boring&each unsuccessful attempt. Keep a copy of all logs in the field.
2. In daily progress column indicate depth at beginning and end of work day, calendar date, time at beginning and end of work day and weather conditions.
3. All samples shall be numbered in consecutive order regardless of type; dry samples D, wash samples W, shelby tube samples S, undisturbed samples U. Do not assign numbers to lost samples but record blows and reasons for lack of recovery.
4. Mark each U-sample with boring number, sample number, depth, recovery and job number.
5. Record blows on sample per six inches of penetration. Note all blows and penetrations when taken at less than six inch intervals. Indicate method by which penetration of tube sampler was obtained.
6. Indicate changes of material in strata column and list generalized strata classifications.
7. List under remarks the manner by which changes in material were detected, all obstructions, any loss or gain of wash water including amount, the recovery of rock cores in feet and inches and percent of run, and any unusual occurences.

BORING NO. B # 5

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 53+30 BASELINE - BRIDGE G3

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/26/05	Run # 1	3.0' 6.0'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				3" Recovery = 8.3% RQD = 0% (very poor)		
	Run # 2	6.0' 9.5'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				8" Recovery = 19.0% RQD = 0% (very poor)		
	1	9.5' 9.7'	50/0.3"	No Sieve Analysis	----------	
				2" Recovery		
	Run # 3	9.7' 14.7'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				36" Recovery = 60.0% RQD = 45% (poor)		
	Run # 4	14.7' 19.7'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				17" Recovery = 28.3% RQD = 0% (very poor)		
	Run # 5	19.7' 23.5'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				10" Recovery = 21.7% RQD = 0% (very poor)		
	2	23.5' 25.0'	5 7 8	No Sample Recovery	----------	
	Run # 6	25.0' 28.5'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				6" Recovery = 14.3% RQD = 0% (very poor)		

BORING NO. B # 5

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 53+30 BASELINE - BRIDGE G3

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/26/05	3	28.5'	11 17	Saturated medium dense reddish brown silty fine to coarse sand and gravel.	A-2-5 (0)	
		30.0'	13			
				15" Recovery		
	Run # 7	33.0' 36.0'	Core Drilling	Gneiss, blueish gray, soft to hard, completely to moderately weathered, no apparent banding, very closely fractured. 20" Recovery = 55.6% RQD = 13.9% (very poor)	----------	RQD = Rock Quality Designation
	Run # 8	36.0' 41.0'	Core Drilling	Gneiss, blueish gray, medium to very hard, highly weathered to fresh, very thinly banded, widely spaced fractures. 60" Recovery = 100.0% RQD = 70% (fair)	----------	RQD = Rock Quality Designation
	Run # 9	41.0' 46.0'	Core Drilling	Gneiss, blueish gray, very hard, fresh, very thinly banded, medium to widely spaced fractures. 60" Recovery = 100.0% RQD = 100% (excellent)	----------	RQD = Rock Quality Designation
			(END)			

BORING NO. B # 5
SURFACE ELEV. + 218.9'

MATERIALS AND RESEARCH DIVISION
SUMMARY OF SOIL ANALYSIS TESTS
AASHTO TESTS:T-89,T-90, & T-265

CONTRACT- 23-106-05
DATE----- JULY 25, 2005

NAME--- S.R. 141 & U.S. 202
EAST SIDE IMPROVEMENTS

LOCATION	DEPTH	********** PERCENT PASSING ********** 2.5	2	1	3/8	4	10	40	200	LL	PL	MO	OR	PI	CLASS	GI
B # 5 STA. 53+30 BASELINE RAMP "5" BRIDGE G3																

CORE DRILLING

RUN # 1 3.0' - 6.0' 3" RECOVERY = 8.3%

RUN # 2 6.0' - 9.5' 8" RECOVERY = 19.0%
STOP CORE DRILLING

START SPLIT-BARREL SAMPLER
S#1
9.5- 9.7 NO SIEVE ANALYSIS
STOP SPLIT-BARREL SAMPLER

START CORE DRILLING

RUN # 3 9.7' - 14.7' 36" RECOVERY = 60.0%

RUN # 4 14.7' - 19.7' 17" RECOVERY = 28.3%

RUN # 5 19.7' - 23.5' 10" RECOVERY = 21.7%
STOP CORE DRILLING

CONTRACT- 23-106-05 NAME--- S.R. 141 & U.S. 202
DATE----- JULY 25, 2005 EAST SIDE IMPROVEMENTS

LOCATION	DEPTH	********** PERCENT PASSING ********** 2.5	2	1	3/8	4	10	40	200	LL	PL	MO	OR	PI	CLASS	GI
	START SPLIT-BARREL SAMPLER															
	S#2															
	23.5-25.0 NO SAMPLE RECOVERY															
	STOP SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
RUN # 6	25.0' - 28.5' 6" RECOVERY = 14.3%															
	STOP CORE DRILLING															
	START SPLIT-BARREL SAMPLER															
	S#3															
	28.5-30.0	100	100	100	87	83	74	51	26	42	--	28	--	NP	A-2-5	0
	END SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
RUN # 7	33.0' - 36.0' 20" RECOVERY = 55.6%															
RUN # 8	36.0' - 41.0' 60" RECOVERY = 100.0%															
RUN # 9	41.0' - 46.0' 60" RECOVERY = 100.0%															
	END CORE DRILLING															
	END OF BORING															

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 1

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 2.0

Elevation: Source: BRG3B-10

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:			263.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			249.42	
WT. OF WATER LOST:			13.78	POST-IGNITION
WT. OF BOTTLE:			86.60	DISH & SOIL:
WT. OF DRY SOIL:			162.82	
PERCENT OF WATER:			8.50	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:				LOSS %:

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE: WT. OF WASH SAMPLE:

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	
PLASTIC LIMIT:	
PLASTICITY INDEX:	
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 1A

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 3.0

Elevation: Source: BRG3B-10

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	36.18	31.25	516.90	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.80	29.73	456.82	
WT. OF WATER LOST:	4.38	1.52	60.08	POST-IGNITION
WT. OF BOTTLE:	19.08	22.27	86.80	DISH & SOIL:
WT. OF DRY SOIL:	12.72	7.46	370.02	
PERCENT OF WATER:	34.40	20.40	16.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	34.4			LOSS %:

WT PASSING #10 SIEVE: 238

WT. OF TOTAL SAMPLE: 370.0 WT. OF WASH SAMPLE: 103.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	25.6	25.6	6.9	93.1
#4	66.9	41.3	11.2	81.9
#10	132.3	65.4	17.7	64.2
#40	26.3	26.3	16.3	48.0
#200	54.3	28.0	17.3	30.7
PASS #200		49.6	30.7	

SUMMARY

LIQUID LIMIT:	34.4
PLASTIC LIMIT:	20.4
PLASTICITY INDEX:	14.0
% SAND AND GRAVEL:	69.3
% SILT:	
% CLAY:	
CLASSIFICATION:	A-2-6(1)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 2

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 4.0

Elevation: Source: BRG3B-10

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	33.54	27.76	793.10	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.09	26.16	661.45	
WT. OF WATER LOST:	4.45	1.60	131.65	POST-IGNITION
WT. OF BOTTLE:	18.79	19.35	86.90	DISH & SOIL:
WT. OF DRY SOIL:	10.30	6.81	574.55	
PERCENT OF WATER:	43.20	23.50	22.90	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	43.2			LOSS %:

WT PASSING #10 SIEVE: 482

WT. OF TOTAL SAMPLE: 574.5 WT. OF WASH SAMPLE: 104.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	12.0	12.0	2.1	97.9
#4	25.9	13.9	2.4	95.5
#10	92.9	67.0	11.7	83.8
#40	22.9	22.9	18.5	65.4
#200	49.7	26.8	21.6	43.8
PASS #200		54.3	43.8	

SUMMARY

LIQUID LIMIT:	43.2
PLASTIC LIMIT:	23.5
PLASTICITY INDEX:	19.7
% SAND AND GRAVEL:	56.2
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-6(5)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 3

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 6.0

Elevation: Source: BRG3B-10

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	37.37	29.88	835.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.76	28.32	713.25	
WT. OF WATER LOST:	4.61	1.56	121.75	POST-IGNITION
WT. OF BOTTLE:	21.12	21.26	86.81	DISH & SOIL:
WT. OF DRY SOIL:	11.64	7.06	626.44	
PERCENT OF WATER:	39.60	22.10	19.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	39.6			LOSS %:

WT PASSING #10 SIEVE: 531

WT. OF TOTAL SAMPLE: 626.4 WT. OF WASH SAMPLE: 105.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	27.3	27.3	4.4	95.6
#4	43.5	16.2	2.6	93.1
#10	95.8	52.3	8.3	84.7
#40	20.2	20.2	16.2	68.5
#200	46.1	25.9	20.8	47.7
PASS #200		59.5	47.7	

SUMMARY

LIQUID LIMIT:	39.6
PLASTIC LIMIT:	22.1
PLASTICITY INDEX:	17.5
% SAND AND GRAVEL:	52.3
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(5)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 4

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 8.0

Elevation: _____ Source: BRG3B-10

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	40.86	21.22	809.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	36.00	19.75	701.43	
WT. OF WATER LOST:	4.86	1.47	107.97	POST-IGNITION
WT. OF BOTTLE:	22.11	13.08	78.01	DISH & SOIL:
WT. OF DRY SOIL:	13.89	6.67	623.42	
PERCENT OF WATER:	35.00	22.00	17.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	35.0			LOSS %: _____

WT PASSING #10 SIEVE: 484

WT. OF TOTAL SAMPLE: 623.4 WT. OF WASH SAMPLE: 108.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	76.7	76.7	12.3	87.7
#4	99.2	22.5	3.6	84.1
#10	139.2	40.0	6.4	77.7
#40	22.2	22.2	15.9	61.8
#200	47.6	25.4	18.2	43.5
PASS #200		60.7	43.5	

SUMMARY

LIQUID LIMIT:	35.0
PLASTIC LIMIT:	22.0
PLASTICITY INDEX:	13.0
% SAND AND GRAVEL:	56.5
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(2)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 5

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 10.0

Elevation: _____ Source: BRG3B-10

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	45.57	23.20	444.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	40.53	21.77	408.87	
WT. OF WATER LOST:	5.04	1.43	35.93	POST-IGNITION
WT. OF BOTTLE:	21.35	14.81	87.08	DISH & SOIL:
WT. OF DRY SOIL:	19.18	6.96	321.79	
PERCENT OF WATER:	26.30	20.50	11.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	26.3			LOSS %: _____

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE: WT. OF WASH SAMPLE:

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	26.3
PLASTIC LIMIT:	20.5
PLASTICITY INDEX:	5.8
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 6

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 12.0

Elevation: Source: BRG3B-10

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	41.15	23.86	389.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	36.03	22.25	339.87	
WT. OF WATER LOST:	5.12	1.61	49.53	POST-IGNITION
WT. OF BOTTLE:	19.19	15.09	88.40	DISH & SOIL:
WT. OF DRY SOIL:	16.84	7.16	251.47	
PERCENT OF WATER:	30.40	22.50	19.70	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	30.4			LOSS %:

WT PASSING #10 SIEVE: 171

WT. OF TOTAL SAMPLE: 251.5 WT. OF WASH SAMPLE: 54.2

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	12.4	12.4	4.9	95.1
#4	31.0	18.6	7.4	87.7
#10	80.3	49.3	19.6	68.1
#40	9.6	9.6	12.1	56.0
#200	23.7	14.1	17.7	38.3
PASS #200		30.5	38.3	

SUMMARY

LIQUID LIMIT:	30.4
PLASTIC LIMIT:	22.5
PLASTICITY INDEX:	7.9
% SAND AND GRAVEL:	61.7
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(0)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 7

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 14.0

Elevation: Source: BRG3B-10

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	35.89		303.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.96		273.15	
WT. OF WATER LOST:	2.93		30.65	POST-IGNITION
WT. OF BOTTLE:	21.71		78.14	DISH & SOIL:
WT. OF DRY SOIL:	11.25		195.01	
PERCENT OF WATER:	26.00		15.70	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	26.0			LOSS %:

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE: WT. OF WASH SAMPLE:

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	26.0
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 8

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 17.0

Elevation: Source: BRG3B-10

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	43.09		296.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	39.35		273.27	
WT. OF WATER LOST:	3.74		22.93	POST-IGNITION
WT. OF BOTTLE:	22.02		86.50	DISH & SOIL:
WT. OF DRY SOIL:	17.33		186.77	
PERCENT OF WATER:	21.60		12.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	21.6			LOSS %:

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE: WT. OF WASH SAMPLE:

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	21.6
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 10

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 27.0

Elevation: _____ Source: BRG3B-10

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:			159.30	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			142.06	
WT. OF WATER LOST:			17.24	POST-IGNITION
WT. OF BOTTLE:			77.29	DISH & SOIL:
WT. OF DRY SOIL:			64.77	
PERCENT OF WATER:			26.60	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:	NV			LOSS %: _____

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE: WT. OF WASH SAMPLE:

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	NV
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 11

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 32.0

Elevation: Source: BRG3B-10

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	32.62	20.51	694.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	28.70	18.54	554.92	
WT. OF WATER LOST:	3.92	1.97	139.28	POST-IGNITION
WT. OF BOTTLE:	19.54	12.90	86.80	DISH & SOIL:
WT. OF DRY SOIL:	9.16	5.64	468.12	
PERCENT OF WATER:	42.80	34.90	29.80	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	42.8			LOSS %:

WT PASSING #10 SIEVE: 380

WT. OF TOTAL SAMPLE: 468.1 WT. OF WASH SAMPLE: 106.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	58.4	58.4	12.5	87.5
#4	67.0	8.6	1.8	85.7
#10	87.8	20.8	4.4	81.2
#40	20.8	20.8	15.9	65.4
#200	59.6	38.8	29.6	35.8
PASS #200		47.0	35.8	

SUMMARY

LIQUID LIMIT:	42.8
PLASTIC LIMIT:	34.9
PLASTICITY INDEX:	7.9
% SAND AND GRAVEL:	64.2
% SILT:	
% CLAY:	
CLASSIFICATION:	A-5(0)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-10

Contract: 25-106-02

Boring Location: Sta. 53+95.05, 18' Lt. Ramp 5

Boring Surface Elev.: 229.60 **Reference:**

Wt. of Casing Hammer:		**Lbs.**	**Average Fall:**		**IN.**		
Wt. of Sample Hammer:	140	**Lbs.**	**Average Fall:**	30	**IN.**		
Type of: D-Sampler:	Split-Barrel	**O.D.**	**O.D. of Sampler:**	2	**IN.**		
S-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
U-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
Core Bit:	NQ2	**O.D.**	**O.D. of Rock Core:**	3	**IN.**		

Casing Size: 3 1/4" **Inches** **From Depth of:** 0.0' **To:** 18.5'

Hollow Stem Auger: **From Depth of:** **To:**

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
9/3/2009				Dry	
					229.6
					229.6
					229.6

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: 38.1 **Ft.;** **Dia. U-Sample Boring:** **Ft.**

No. of 2 in. Dia. Shelby Tubes: **;** **No. of: U-Samples:**

2 1/2 in. Dia. Contin. Sample Boring: **Ft.;** **Core Drilling in Rock:** 12.5 **Ft.**

Boring Contractor: Walton Corporation

Driller: Gary Truver

Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
			0.0'				Asphalt - 16".
			2.0'		0" RECOVERY		
2.53		1	2.0'	7 8	No Sieve Analysis - Indication of moist medium dense brown silty sand.		
			3.0'		7" RECOVERY		
		1A	3.0'	7 6	Moist medium dense orange clayey gravel w/ some fine to coarse sand.	A-2-6(1)	
			4.0'		9" RECOVERY		
		2	4.0'	2 3 6 10	Moist stiff orange fine sandy clay w/some coarse sand and gravel.	A-7-6(5)	
5.06							
			6.0'		24" RECOVERY		
		3	6.0'	16 39 16 22	Moist hard orange fine sandy clay w/some coarse sand and gravel.	A-6(5)	
7.59			8.0'		20" RECOVERY		
		4	8.0'	5 9 12 23	Moist very stiff orangish brown mottled gravelly clay w/some fine to coarse sand.	A-6(2)	
10.12			10.0'		24" RECOVERY		
		5	10.0'	29 33 31 50	No Sieve Analysis - Indication of moist very dense orangish brown silty sand, trace of rock fragments.		
			12.0'		10" RECOVERY		
12.65		6	12.0'	30 15 17 29	Moist hard brown clayey gravelly silt w/some fine to coarse sand.	A-4(0)	Rock Fragments
			14.0'		6" RECOVERY		

Remarks: GTA Inspector - D. Zmijewski

Reviewed By: Hany Fekry **Soils Supervisor:** Randy Ferguson

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange
Contract: 25-106-02

Boring No.: BRG3B-10

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		7	14.0'	26 39 50/4"	No Sieve Analysis - Indication of moist to wet very dense brown silty sand.		
15.18			15.5'		6" RECOVERY		
		8	17.0'	29 17 19	No Sieve Analysis - Indication of wet dense gray silty sand, trace of rock fragments.		
17.71			18.5'		8" RECOVERY		
		R-1	18.5'		Gniess, blue gray, coarse grained, unweathered, hard 26" Recovery = 61.90% RQD = 38.1% (poor)		RQD - Rock Quality Designation
20.24			22.0'		26" RECOVERY		
		9	22.0'	1 11 17	No Sample Recovery		
22.77			23.5'		0" RECOVERY		
25.3							
		10	27.0'	7 11 20	No Sieve Analysis - Indication of wet hard gray sandy silt.		
27.83			28.5'		2" RECOVERY		
30.36							
		11	32.0'	4 8 14	Wet very stiff brown clayey fine sandy silt w/ some gravel and coarse sand.	A-5(0)	
32.89			33.5'		18" RECOVERY		
35.42							
		12	37.0'	7 8 50/2"	No Sieve Analysis - Indication of wet blue, gray and orange mottled highly weathered rock.		
37.95			38.0'		5" RECOVERY		

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange
Contract: 25-106-02

Boring No.: BRG3B-10

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		R-2	38.1'		Gniess, gray and white, coarsed grained, unweathered, hard 33" Recovery = 70.51% RQD = 0.0% (very poor)		RQD - Rock Quality Designation
40.48							
			42.0'		33" RECOVERY		
		R-3	42.0'		Gniess, gray and white, coarse grained, unweathered, hard 59" Recovery = 98.33% RQD = 81.6% (good)		RQD - Rock Quality Designation
43.01							
45.54							
			47.0'		59" RECOVERY		
					End of Boring		
48.07							
50.6							
53.13							
55.66							
58.19							
60.72							

KEY TO SYMBOLS

Symbol Description

Strata symbols

 **Clayey sand**

 **Frac rock**

 **Silty sand**

Notes:

1. **Exploratory borings were drilled on 9-3-2009 using a 3 1/4 - inch diameter hollow stem auger. Rig is a ATV CME 55.**

2. **No free water was encountered at the time of drilling or when re-checked the following day, unless recorded on 1st page.**

3. **Boring locations were taped from existing features and elevations extrapolated from survey unless otherwise reported.**

4. **These logs are subject to the limitations, conclusions, and recommendations in this report.**

5. **Results of tests conducted on samples recovered are reported on the logs.**

6. **All blow counts are uncorrected.**

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 1

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 0.0

Elevation: Source: BRG3B-11

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	31.39	26.42	736.30	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	28.73	25.30	660.87	
WT. OF WATER LOST:	2.66	1.12	75.43	POST-IGNITION
WT. OF BOTTLE:	19.36	19.42	87.20	DISH & SOIL:
WT. OF DRY SOIL:	9.37	5.88	573.67	
PERCENT OF WATER:	28.40	19.00	13.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	28.4			LOSS %:

WT PASSING #10 SIEVE: 447

WT. OF TOTAL SAMPLE: 573.7 WT. OF WASH SAMPLE: 110.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	37.2	37.2	6.5	93.5
#4	61.3	24.1	4.2	89.3
#10	126.6	65.3	11.4	77.9
#40	23.9	23.9	16.8	61.1
#200	55.0	31.1	21.9	39.2
PASS #200		55.6	39.2	

SUMMARY

LIQUID LIMIT:	28.4
PLASTIC LIMIT:	19.0
PLASTICITY INDEX:	9.4
% SAND AND GRAVEL:	60.8
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(0)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 2

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 2.0

Elevation: Source: BRG3B-11

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	35.12	31.97	575.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.70	30.38	501.63	
WT. OF WATER LOST:	3.42	1.59	73.57	POST-IGNITION
WT. OF BOTTLE:	21.01	22.76	77.59	DISH & SOIL:
WT. OF DRY SOIL:	10.69	7.62	424.04	
PERCENT OF WATER:	32.00	20.90	17.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	32.0			LOSS %:

WT PASSING #10 SIEVE: 391

WT. OF TOTAL SAMPLE: 424.0 WT. OF WASH SAMPLE: 103.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	6.7	6.7	1.6	98.4
#10	33.4	26.7	6.3	92.1
#40	13.8	13.8	12.3	79.8
#200	33.6	19.8	17.6	62.2
PASS #200		69.8	62.2	

SUMMARY

LIQUID LIMIT:	32.0
PLASTIC LIMIT:	20.9
PLASTICITY INDEX:	11.1
% SAND AND GRAVEL:	37.8
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(5)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 3

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 27.6

Elevation: _____ Source: BRG3B-11

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	32.06	30.28	522.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	28.92	28.76	446.39	
WT. OF WATER LOST:	3.14	1.52	75.61	POST-IGNITION
WT. OF BOTTLE:	19.44	22.08	87.30	DISH & SOIL:
WT. OF DRY SOIL:	9.48	6.68	359.09	
PERCENT OF WATER:	33.10	22.80	21.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	33.1			LOSS %: _____

WT PASSING #10 SIEVE: 314

WT. OF TOTAL SAMPLE: 359.1 WT. OF WASH SAMPLE: 113.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	30.6	30.6	8.5	91.5
#4	34.3	3.7	1.0	90.4
#10	45.3	11.0	3.1	87.4
#40	12.9	12.9	9.9	77.4
#200	34.3	21.4	16.5	61.0
PASS #200		79.1	61.0	

SUMMARY

LIQUID LIMIT:	33.1
PLASTIC LIMIT:	22.8
PLASTICITY INDEX:	10.3
% SAND AND GRAVEL:	39.0
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(4)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 4

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 33.3

Elevation: _____ Source: BRG3B-11

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	35.44		232.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.57		213.87	
WT. OF WATER LOST:	2.87		18.13	POST-IGNITION
WT. OF BOTTLE:	22.14		86.41	DISH & SOIL:
WT. OF DRY SOIL:	10.43		127.46	
PERCENT OF WATER:	27.50		14.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	27.5			LOSS %: _____

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE:		WT. OF WASH SAMPLE:		
SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	27.5
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 5

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 39.8

Elevation: Source: BRG3B-11

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	33.36		465.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.84		380.54	
WT. OF WATER LOST:	3.52		84.86	POST-IGNITION
WT. OF BOTTLE:	21.17		86.46	DISH & SOIL:
WT. OF DRY SOIL:	8.67		294.08	
PERCENT OF WATER:	40.60		28.90	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	40.6			LOSS %:

WT PASSING #10 SIEVE: 198

WT. OF TOTAL SAMPLE: 294.1 WT. OF WASH SAMPLE: 100.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	47.2	47.2	16.1	83.9
#4	74.2	27.0	9.2	74.8
#10	95.8	21.6	7.3	67.4
#40	17.8	17.8	12.0	55.5
#200	66.4	48.6	32.7	22.8
PASS #200		33.9	22.8	

SUMMARY

LIQUID LIMIT:	40.6
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	77.2
% SILT:	
% CLAY:	
CLASSIFICATION:	A-2-5(0)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-11

Contract: 25-106-02

Boring Location: Sta. 53+50.00, Ramp 5

Boring Surface Elev.: 225.07 **Reference:**

Wt. of Casing Hammer:		**Lbs.**	**Average Fall:**		**IN.**		
Wt. of Sample Hammer:	140	**Lbs.**	**Average Fall:**	30	**IN.**		
Type of: D-Sampler:	Split-Barrel	**O.D.**	**O.D. of Sampler:**	2	**IN.**		
S-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
U-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
Core Bit:	NQ2	**O.D.**	**O.D. of Rock Core:**	3	**IN.**		

Casing Size: 3 1/4" **Inches** **From Depth of:** 0.0' **To:** 3.1'

Hollow Stem Auger: **From Depth of:** **To:**

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
9/2/2009				Dry	
					225.1
					225.1
					225.1

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring:	40.6	**Ft.;**	**Dia. U-Sample Boring:**		**Ft.**
No. of 2 in. Dia. Shelby Tubes:		**;**	**No. of:**	**U-Samples:**	
2 1/2 in. Dia. Contin. Sample Boring:		**Ft.;**	**Core Drilling in Rock:**	34.0	**Ft.**

Boring Contractor: Walton Corporation
Driller: Gary Truver
Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1	0.0'	10 9 7 7	Moist very stiff brown clayey fine sandy gravelly silt w/some coarse sand.	A-4(0)	
			2.0'		18" RECOVERY		
		2	2.0'	13 14 50/1"	Moist hard orangish brown clay w/some fine to coarse sand, trace of gravel.	A-6(5)	
3.15			3.1'		13" RECOVERY		
		R-1	3.1'		Gniess, blue gray, unweathered, coarse grained, hard 39" Recovery = 72.22% RQD = 64.8% (fair)		RQD = Rock Quality Designation
6.3							
			7.6'		39" RECOVERY		
		R-2	7.6'		Gniess, blue gray, coarse grained, unweathered, hard 20" Recovery = 33.33% RQD = 29.2% (poor)		RQD = Rock Quality Designation
9.45							
12.6			12.6'		20" RECOVERY		
		R-3	12.6'		Gniess, blue gray, coarse grained, unweathered, hard 21" Recovery = 35.0% RQD = 11.0% (very poor)		RQD = Rock Quality Designation
15.75							
			17.6'		21" RECOVERY		

Remarks: GTA Inspector - D. Zmijewski

Reviewed By: Hany Fekry **Soils Supervisor:** Randy Ferguson

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-11
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		R-4	17.6'		Gniess, blue gray, coarse grained, unweathered, hard		RQD = Rock Quality Designation
18.9					18" Recovery = 30.0%		
					RQD = 8.3% (very poor)		
22.05			22.6'		18" RECOVERY		
		R_5	22.6'		Gniess, blue gray, coarse grained, unweathered, hard		RQD = Rock Quality Designation
25.2					19" Recovery = 31.67%		
					RQD = 9.0% (very poor)		
			27.6'		19" RECOVERY		
28.35		3	27.6'	4 10 50/4"	Wet hard grayish brown mottled clayey silt w/ some fine sand and gravel, trace of coarse sand.	A-4(4)	Rock Fragments
			28.7'		12" RECOVERY		
		R-6	28.7'		No Sample Recovery		
31.5							
			33.3'		0" RECOVERY		
		4	33.3'	5 20 20	No Sieve Analysis - Indication of wet dense brown silty sand.		
34.65			34.8'		6" RECOVERY		
		R-7	34.8'		Gniess, blue gray, coarse grained, some weathering, hard		RQD = Rock Quality Designation
					28" Recovery = 46.67%		
37.8					RQD = 9.0% (very poor)		
			39.8'		28" RECOVERY		
		5	39.8'	8 50/4"	Wet very dense orangish brown silty fine sand and gravel w/some coarse sand.	A-2-5(0)	Weathered Rock
40.95			40.6'		6" RECOVERY		
					End of Boring		
44.1							
47.25							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Clayey sand

Poorly graded, silty or clayey sands and gravel

Frac rock

Silty sand

Notes:

1. **Exploratory borings were drilled on 9-2-2009 using a 3 1/4 - inch diameter hollow stem auger. Rig is a ATV CME 55.**

2. **No free water was encountered at the time of drilling or when re-checked the following day, unless recorded on 1st page.**

3. **Boring locations were taped from existing features and elevations extrapolated from survey unless otherwise reported.**

4. **These logs are subject to the limitations, conclusions, and recommendations in this report.**

5. **Results of tests conducted on samples recovered are reported on the logs.**

6. **All blow counts are uncorrected.**

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 1

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 0.5

Elevation: Source: BRG3B-12

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	35.73	23.12	419.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.47	21.63	368.76	
WT. OF WATER LOST:	3.26	1.49	50.24	POST-IGNITION
WT. OF BOTTLE:	21.19	14.81	78.36	DISH & SOIL:
WT. OF DRY SOIL:	11.28	6.82	290.40	
PERCENT OF WATER:	28.90	21.80	17.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	28.9			LOSS %:

WT PASSING #10 SIEVE: 265

WT. OF TOTAL SAMPLE: 290.4 WT. OF WASH SAMPLE: 104.5

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	1.5	1.5	0.5	99.5
#4	5.9	4.4	1.5	98.0
#10	25.7	19.8	6.8	91.2
#40	16.4	16.4	14.3	76.8
#200	43.0	26.6	23.2	53.6
PASS #200		61.5	53.6	

SUMMARY

LIQUID LIMIT:	28.9
PLASTIC LIMIT:	21.8
PLASTICITY INDEX:	7.1
% SAND AND GRAVEL:	46.4
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(2)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 2

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 2.0

Elevation: Source: BRG3B-12

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	29.95	20.56	452.60	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	26.77	19.07	397.88	
WT. OF WATER LOST:	3.18	1.49	54.72	POST-IGNITION
WT. OF BOTTLE:	18.74	12.89	77.29	DISH & SOIL:
WT. OF DRY SOIL:	8.03	6.18	320.59	
PERCENT OF WATER:	39.60	24.10	17.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	39.6			LOSS %:

WT PASSING #10 SIEVE: 205

WT. OF TOTAL SAMPLE: 320.6 WT. OF WASH SAMPLE: 103.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	66.5	66.5	20.7	79.3
#4	79.7	13.2	4.1	75.1
#10	115.3	35.6	11.1	64.0
#40	20.9	20.9	12.9	51.2
#200	50.3	29.4	18.1	33.0
PASS #200		53.6	33.0	

SUMMARY

LIQUID LIMIT:	39.6
PLASTIC LIMIT:	24.1
PLASTICITY INDEX:	15.5
% SAND AND GRAVEL:	67.0
% SILT:	
% CLAY:	
CLASSIFICATION:	A-2-6(1)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 3

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 6.8

Elevation: _____ Source: BRG3B-12

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:			163.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			161.38	
WT. OF WATER LOST:			1.62	POST-IGNITION
WT. OF BOTTLE:			78.52	DISH & SOIL:
WT. OF DRY SOIL:			82.86	
PERCENT OF WATER:			2.00	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:	NV			LOSS %: _____

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE: WT. OF WASH SAMPLE:

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	NV
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 4

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 11.8

Elevation: _____ Source: BRG3B-12

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	24.40	26.54	207.90	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	23.20	25.21	195.35	
WT. OF WATER LOST:	1.20	1.33	12.55	POST-IGNITION
WT. OF BOTTLE:	19.42	19.15	87.23	DISH & SOIL:
WT. OF DRY SOIL:	3.78	6.06	108.12	
PERCENT OF WATER:	31.70	21.90	11.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	31.7			LOSS %: _____

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE: WT. OF WASH SAMPLE:

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	31.7
PLASTIC LIMIT:	21.9
PLASTICITY INDEX:	9.8
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 5

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 16.8

Elevation: _____ Source: BRG3B-12

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	32.48	26.76	469.50	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.17	25.42	369.86	
WT. OF WATER LOST:	3.31	1.34	99.64	POST-IGNITION
WT. OF BOTTLE:	22.36	20.89	79.30	DISH & SOIL:
WT. OF DRY SOIL:	6.81	4.53	290.56	
PERCENT OF WATER:	48.60	29.60	34.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	48.6			LOSS %: _____

WT PASSING #10 SIEVE: 244

WT. OF TOTAL SAMPLE: 290.6 WT. OF WASH SAMPLE: 102.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	10.3	10.3	3.5	96.5
#4	18.1	7.8	2.7	93.8
#10	46.1	28.0	9.6	84.1
#40	16.4	16.4	13.4	70.7
#200	34.4	18.0	14.7	56.0
PASS #200		68.5	56.0	

SUMMARY

LIQUID LIMIT:	48.6
PLASTIC LIMIT:	29.6
PLASTICITY INDEX:	19.0
% SAND AND GRAVEL:	44.0
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(9)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 6

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 21.8

Elevation: _____ Source: BRG3B-12

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	31.15	26.84	706.10	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	28.49	25.80	579.89	
WT. OF WATER LOST:	2.66	1.04	126.21	POST-IGNITION
WT. OF BOTTLE:	20.96	21.37	80.23	DISH & SOIL:
WT. OF DRY SOIL:	7.53	4.43	499.66	
PERCENT OF WATER:	35.30	23.50	25.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	35.3			LOSS %: _____

WT PASSING #10 SIEVE: 448

WT. OF TOTAL SAMPLE: 499.7 WT. OF WASH SAMPLE: 110.5

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	25.9	25.9	5.2	94.8
#4	29.2	3.3	0.7	94.2
#10	51.2	22.0	4.4	89.8
#40	4.4	4.4	3.6	86.2
#200	10.3	5.9	4.8	81.4
PASS #200		100.2	81.4	

SUMMARY

LIQUID LIMIT:	35.3
PLASTIC LIMIT:	23.5
PLASTICITY INDEX:	11.8
% SAND AND GRAVEL:	18.6
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(9)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 7

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 26.8

Elevation: Source: BRG3B-12

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	32.02	20.86	782.10	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.88	19.55	650.15	
WT. OF WATER LOST:	2.14	1.31	131.95	POST-IGNITION
WT. OF BOTTLE:	22.39	12.73	73.25	DISH & SOIL:
WT. OF DRY SOIL:	7.49	6.82	576.90	
PERCENT OF WATER:	28.60	19.20	22.90	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	28.6			LOSS %:

WT PASSING #10 SIEVE: 521

WT. OF TOTAL SAMPLE: 576.9 WT. OF WASH SAMPLE: 107.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	21.1	21.1	3.7	96.3
#4	25.6	4.5	0.8	95.6
#10	55.7	30.1	5.2	90.3
#40	6.2	6.2	5.2	85.1
#200	19.2	13.0	10.9	74.2
PASS #200		88.2	74.2	

SUMMARY

LIQUID LIMIT:	28.6
PLASTIC LIMIT:	19.2
PLASTICITY INDEX:	9.4
% SAND AND GRAVEL:	25.8
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(6)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 8

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 31.8

Elevation: Source: BRG3B-12

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	40.20		577.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	34.84		446.17	
WT. OF WATER LOST:	5.36		131.23	POST-IGNITION
WT. OF BOTTLE:	23.47		77.49	DISH & SOIL:
WT. OF DRY SOIL:	11.37		368.68	
PERCENT OF WATER:	47.10		35.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	47.1			LOSS %:

WT PASSING #10 SIEVE: 288

WT. OF TOTAL SAMPLE: 368.7 WT. OF WASH SAMPLE: 103.7

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
2"	0.0	0.0	0.0	100.0
1"	27.8	27.8	7.5	92.5
3/8"	45.1	17.3	4.7	87.8
# 4	49.6	4.5	1.2	86.5
#10	81.0	31.4	8.5	78.0
#40	29.0	29.0	21.8	56.2
#200	71.7	42.7	32.1	24.1
PASS #200		32.0	24.1	

SUMMARY

LIQUID LIMIT:	47.1
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	75.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-2-5(0)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-12

Contract: 25-106-02

Boring Location: Sta. 53+47.12, 19' Rt. Ramp 5

Boring Surface Elev.: 223.97 **Reference:**

Wt. of Casing Hammer:		**Lbs.**	**Average Fall:**		**IN.**		
Wt. of Sample Hammer:	140	**Lbs.**	**Average Fall:**	30	**IN.**		
Type of: D-Sampler:	Split-Barrel	**O.D.**	**O.D. of Sampler:**	2	**IN.**		
S-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
U-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
Core Bit:	NQ2	**O.D.**	**O.D. of Rock Core:**	3	**IN.**		

Casing Size: 3 1/4" **Inches** **From Depth of:** 0.0' **To:** 2.3'

Hollow Stem Auger: **From Depth of:** **To:**

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
9/1/2009				Dry	
					224.0
					224.0
					224.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring:	33.3	**Ft.;**	**Dia. U-Sample Boring:**		**Ft.**
No. of 2 in. Dia. Shelby Tubes:		**;**	**No. of:**	**U-Samples:**	
2 1/2 in. Dia. Contin. Sample Boring:		**Ft.;**	**Core Drilling in Rock:**	30.5	**Ft.**

Boring Contractor: Walton Corporation
Driller: Gary Truver
Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1	0.5'	7 10 50/1"	Moist hard brown clayey fine sandy silt w/some coarse sand, trace of gravel.	A-4(2)	Topsoil - 4".
			2.0'		10" RECOVERY		
		2	2.0'	50/3"	Moist very dense brown clayey gravel w/some fine to coarse sand.	A-2-6(1)	
2.93		R-1	2.3'		3.6" RECOVERY		RQD - Rock Quality Designation
			2.3'		Gniess, blue gray, coarse grained, unweathered, hard 16" Recovery = 29.63% RQD = 15.7% (very poor)		
5.86							
			6.8'		16" RECOVERY		
		3	6.8'	7 20 16	No Sieve Analysis - Indication of moist dense blue gniess.		Rock Fragment stuck in spoon.
			8.3'		2" RECOVERY		
8.79		R-2	8.3'		Rock Fragments 4.5" Recovery = 10.71% RQD = 0.0% (very poor)		RQD - Rock Quality Designation
11.72			11.8'		4.5" RECOVERY		
		4	11.8'	3 3 3	No Sieve Analysis - Indication of wet firm orangish brown sandy lean clay, trace of rock fragments		
			13.3'		8" RECOVERY		
		R-3	13.3'		Rock Fragments 0" Recovery = 0.0% RQD = 0.0% (very poor)		RQD - Rock Quality Designation
14.65							
			16.8'		0" RECOVERY		

Remarks: GTA Inspector - D. Zmijewski

Reviewed By: Hany Fekry **Soils Supervisor:** Randy Ferguson

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-12
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
17.58		5	16.8'	3 4 4	Wet firm orange clay w/some gravel and fine to coarse sand.	A-7-5(9)	
			18.3'		12" RECOVERY		
		R-4	18.3'		Rock Fragments 0" Recovery = 0.0% RQD = 0.0% (very poor)		RQD - Rock Quality Designation
20.51			21.8'		0" RECOVERY		
		6	21.8'	3 4 4	Wet firm brownish gray mottled clay w/trace of gravel and fine to coarse sand.	A-6(9)	
23.44			23.3'		18" RECOVERY		
		R-5	23.3'		Rock Fragments 0" Recovery = 0.0% RQD = 0.0% (very poor)		RQD - Rock Quality Designation
26.37			26.8'		0" RECOVERY		
		7	26.8'	3 4 5	Wet stiff brownish gray mottled clayey silt w/ some fine sand, trace of gravel and coarse sand.	A-4(6)	
			28.3'		18" RECOVERY		
29.3		R-6	28.3'		Rock Fragments 0" Recovery = 0.0% RQD = 0.0% (very poor)		RQD - Rock Quality Designation
			31.8'		0" RECOVERY		
32.23		8	31.8'	6 11 19	Wet medium dense orangish brown silty fine to coarse sand and gravel.	A-2-5(0)	
			33.3'		13" RECOVERY		
		R-7	33.3'		Gniess, blue gray, coarse grained, slightly weathered 26" Recovery = 61.90% RQD = 15.0% (very poor)		RQD - Rock Quality Designation
35.16			36.8'		26" RECOVERY		
		R-8	36.8'		Gniess, blue gray, coarse grained, unweathered, hard 57" Recovery = 95.0% RQD = 86.7% (good)		RQD - Rock Quality Designation
41.02			41.8'		57" RECOVERY		
					End of Boring		
43.95							

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Silty low plasticity clay
	Clayey sand
	Frac rock
	Well graded gravels and sands
	Poorly graded, silty or clayey sands and gravel
	Silty sand

Notes:

1. Exploratory borings were drilled on 9-1-2009 using a 3 1/4 - inch diameter hollow stem auger. Rig is a ATV CME 55.

2. No free water was encountered at the time of drilling or when re-checked the following day, unless recorded on 1st page.

3. Boring locations were taped from existing features and elevations extrapolated from survey unless otherwise reported.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

5. Results of tests conducted on samples recovered are reported on the logs.

6. All blow counts are uncorrected.

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 1

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 0.0

Elevation: _____ Source: BRG3B-7

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	40.21	22.11	607.63	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	35.79	20.49	530.49	
WT. OF WATER LOST:	4.42	1.62	77.14	POST-IGNITION
WT. OF BOTTLE:	19.56	13.25	86.80	DISH & SOIL:
WT. OF DRY SOIL:	16.23	7.24	443.69	
PERCENT OF WATER:	27.20	22.40	17.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	27.2			LOSS %: _____

WT PASSING #10 SIEVE: 360

WT. OF TOTAL SAMPLE: 443.7 WT. OF WASH SAMPLE: 109.7

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	34.9	34.9	7.9	92.1
#4	42.6	7.7	1.7	90.4
#10	83.4	40.8	9.2	81.2
#40	10.4	10.4	7.7	73.5
#200	34.2	23.8	17.6	55.9
PASS #200		75.5	55.9	

SUMMARY

LIQUID LIMIT:	27.2
PLASTIC LIMIT:	22.4
PLASTICITY INDEX:	4.8
% SAND AND GRAVEL:	44.1
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(1)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 2

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 2.0

Elevation: Source: BRG3B-7

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	39.35	20.89	678.62	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	34.76	19.38	593.68	
WT. OF WATER LOST:	4.59	1.51	84.94	POST-IGNITION
WT. OF BOTTLE:	21.85	12.59	87.57	DISH & SOIL:
WT. OF DRY SOIL:	12.91	6.79	506.11	
PERCENT OF WATER:	35.60	22.20	16.80	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	35.6			LOSS %:

WT PASSING #10 SIEVE: 397

WT. OF TOTAL SAMPLE: 506.1 WT. OF WASH SAMPLE: 102.2

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	66.8	66.8	13.2	86.8
#4	74.9	8.1	1.6	85.2
#10	108.9	34.0	6.7	78.5
#40	16.8	16.8	12.9	65.6
#200	45.3	28.5	21.9	43.7
PASS #200		56.9	43.7	

SUMMARY

LIQUID LIMIT:	35.6
PLASTIC LIMIT:	22.2
PLASTICITY INDEX:	13.4
% SAND AND GRAVEL:	56.3
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(3)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-7

Contract: 25-106-02

Boring Location: Sta. 51+70.78, 15' Rt. Ramp 5

Boring Surface Elev.: 218.31 **Reference:**

Wt. of Casing Hammer:		**Lbs.**	**Average Fall:**		**IN.**		
Wt. of Sample Hammer:	140	**Lbs.**	**Average Fall:**	30	**IN.**		
Type of: D-Sampler:	Split-Barrel	**O.D.**	**O.D. of Sampler:**	2	**IN.**		
S-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
U-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
Core Bit:		**O.D.**	**O.D. of Rock Core:**		**IN.**		

Casing Size: 3 1/4" **Inches** **From Depth of:** 0.0' **To:** 5.4'

Hollow Stem Auger: **From Depth of:** **To:**

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
8/25/2009				Dry	
					218.3
					218.3
					218.3

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring:	5.4	**Ft.;**	**Dia. U-Sample Boring:**		**Ft.**
No. of 2 in. Dia. Shelby Tubes:		**;**	**No. of:**	**U-Samples:**	
2 1/2 in. Dia. Contin. Sample Boring:		**Ft.;**	**Core Drilling in Rock:**		**Ft.**

Boring Contractor: Walton Corporation
Driller: Gary Truver
Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1	0.0'	5 12 12	Moist very stiff brown silt w/some clay, gravel and fine sand, trace of coarse sand.	A-4(1)	Topsoil - 6".
			1.5'		12" RECOVERY		
2.53		2	2.0'	12 13 13 15	Moist very stiff brown fine sandy gravelly clay w/some coarse sand.	A-6(3)	
			4.0'		17" RECOVERY		
		3	4.0'	12 16 50/5"	No Sample Recovery		
5.06			5.5'		0" RECOVERY		
					End of Boring		
7.59							
10.12							
12.65							

Remarks: GTA Inspector - D. Zmijewski

Reviewed By: Hany Fekry **Soils Supervisor:** Randy Ferguson

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty low plasticity clay

Clayey sand

Notes:

1. **Exploratory borings were drilled on 8-25-2009 using a 3 1/4 - inch diameter hollow stem auger. Rig is a Truck CME 55.**

2. **No free water was encountered at the time of drilling or when re-checked the following day, unless recorded on 1st page.**

3. **Boring locations were taped from existing features and elevations extrapolated from survey unless otherwise reported.**

4. **These logs are subject to the limitations, conclusions, and recommendations in this report.**

5. **Results of tests conducted on samples recovered are reported on the logs.**

6. **All blow counts are uncorrected.**

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-7A

Contract: 25-106-02

Boring Location: Sta. 51+70.78, 15' Rt. Ramp 5

Boring Surface Elev.: 218.31 **Reference:**

Wt. of Casing Hammer:		**Lbs.**	**Average Fall:**		**IN.**
Wt. of Sample Hammer:		**Lbs.**	**Average Fall:**		**IN.**
Type of: D-Sampler:		**O.D.**	**O.D. of Sampler:**		**IN.**
S-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**
U-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**
Core Bit:	NQ2	**O.D.**	**O.D. of Rock Core:**	3	**IN.**

Casing Size: 3 1/4" **Inches** **From Depth of:** 0.0' **To:** 2.6'
Hollow Stem Auger: **From Depth of:** **To:**

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
8/26/2009				Dry	
					218.3
					218.3
					218.3

Pay Quantities:
2 1/2 in. Dia. Dry Sample Boring: 0.0 **Ft.;** **Dia. U-Sample Boring:** **Ft.**
No. of 2 in. Dia. Shelby Tubes: **;** **No. of:** **U-Samples:**
2 1/2 in. Dia. Contin. Sample Boring: **Ft.;** **Core Drilling in Rock:** 14.5 **Ft.**

Boring Contractor: Walton Corporation
Driller: Gary Truver
Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
			0.0'		Blank augered to 2.6'.		
2.18			2.6'		0" RECOVERY		
		R-1	2.6'		Gniess, blue gray, coarse grained, unweathered, hard 41" Recovery = 75.93% RQD = 44.9% (poor)		RQD = Rock Quality Designation
4.36							
6.54			7.1'		41" RECOVERY		
		R-2	7.1'		Gniess, blue gray, coarsed grained, unweathered, hard 26" Recovery = 43.33% RQD = 25.8% (poor)		RQD = Rock Quality Designation
8.72							
10.9							
			12.1'		26" RECOVERY		

Remarks: GTA Inspector - D. Zmijewski - Boring offset 5' to continue w/rock coring.

Reviewed By: Hany Fekry **Soils Supervisor:** Randy Ferguson

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange
Contract: 25-106-02

Boring No.: BRG3B-7A

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		R-3	12.1'		Gniess, blue gray, hard 27" Recovery = 45.0% RQD = 25.8% (poor)		RQD = Rock Quality Designation
13.08							
15.26							
			17.1'		27" RECOVERY		
17.44					End of Boring		
19.62							
21.8							
23.98							
26.16							
28.34							
30.52							
32.7							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Frac rock

Notes:

1. **Exploratory borings were drilled on 8-26-2009 using a 3 1/4 - inch diameter hollow stem auger. Rig is a Truck CME 55.**

2. **No free water was encountered at the time of drilling or when re-checked the following day, unless recorded on 1st page.**

3. **Boring locations were taped from existing features and elevations extrapolated from survey unless otherwise reported.**

4. **These logs are subject to the limitations, conclusions, and recommendations in this report.**

5. **Results of tests conducted on samples recovered are reported on the logs.**

6. **All blow counts are uncorrected.**

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 1B

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 17.7

Elevation: Source: BRG3B-7B

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:			185.42	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			181.00	
WT. OF WATER LOST:			4.42	POST-IGNITION
WT. OF BOTTLE:			98.20	DISH & SOIL:
WT. OF DRY SOIL:			82.80	
PERCENT OF WATER:			5.30	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:	NV			LOSS %:

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE: WT. OF WASH SAMPLE:

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	NV
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 2B

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 27.7

Elevation: _____ Source: BRG3B-7B

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	44.54	24.27	650.85	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	40.31	22.79	559.52	
WT. OF WATER LOST:	4.23	1.48	91.33	POST-IGNITION
WT. OF BOTTLE:	22.12	15.41	86.76	DISH & SOIL:
WT. OF DRY SOIL:	18.19	7.38	472.76	
PERCENT OF WATER:	23.30	20.10	19.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	23.3			LOSS %: _____

WT PASSING #10 SIEVE: 384

WT. OF TOTAL SAMPLE: 472.8 WT. OF WASH SAMPLE: 105.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
2"	0.0	0.0	0.0	100.0
1"	30.2	30.2	6.4	93.6
3/8"	40.3	10.1	2.1	91.5
# 4	51.2	10.9	2.3	89.2
#10	88.3	37.1	7.8	81.3
#40	9.7	9.7	7.5	73.8
#200	24.3	14.6	11.3	62.6
PASS #200		81.0	62.6	

SUMMARY

LIQUID LIMIT:	23.3
PLASTIC LIMIT:	20.1
PLASTICITY INDEX:	3.2
% SAND AND GRAVEL:	37.4
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(0)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 3B1

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 32.7

Elevation: Source: BRG3B-7B

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	40.61	29.73	252.48	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	36.16	28.16	214.70	
WT. OF WATER LOST:	4.45	1.57	37.78	POST-IGNITION
WT. OF BOTTLE:	19.12	21.04	78.95	DISH & SOIL:
WT. OF DRY SOIL:	17.04	7.12	135.75	
PERCENT OF WATER:	26.10	22.10	27.80	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	26.1			LOSS %:

WT PASSING #10 SIEVE: 136

WT. OF TOTAL SAMPLE: 135.8 WT. OF WASH SAMPLE: 50.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#10	0.0	0.0	0.0	100.0
#40	1.6	1.6	3.2	96.8
#200	8.5	6.9	13.7	83.1
PASS #200		41.8	83.1	

SUMMARY

LIQUID LIMIT:	26.1
PLASTIC LIMIT:	22.1
PLASTICITY INDEX:	4.0
% SAND AND GRAVEL:	16.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(2)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 3B2

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 33.7

Elevation: _____ Source: BRG3B-7B

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	33.08	29.35	474.57	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.88	28.29	404.41	
WT. OF WATER LOST:	3.20	1.06	70.16	POST-IGNITION
WT. OF BOTTLE:	19.45	22.61	86.22	DISH & SOIL:
WT. OF DRY SOIL:	10.43	5.68	318.19	
PERCENT OF WATER:	30.70	18.70	22.00	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	30.7			LOSS %: _____

WT PASSING #10 SIEVE: 262

WT. OF TOTAL SAMPLE: 318.2 WT. OF WASH SAMPLE: 104.5

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	14.6	14.6	4.6	95.4
#4	26.0	11.4	3.6	91.8
#10	56.2	30.2	9.5	82.3
#40	23.9	23.9	18.8	63.5
#200	58.6	34.7	27.3	36.2
PASS #200		45.9	36.2	

SUMMARY

LIQUID LIMIT:	30.7
PLASTIC LIMIT:	18.7
PLASTICITY INDEX:	12.0
% SAND AND GRAVEL:	63.8
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(1)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-7B

Contract: 25-106-02

Boring Location: Sta. 51+70.78, 15' Rt. Ramp 5

Boring Surface Elev.: 218.31 **Reference:**

Wt. of Casing Hammer:		**Lbs.**	**Average Fall:**		**IN.**		
Wt. of Sample Hammer:	140	**Lbs.**	**Average Fall:**	30	**IN.**		
Type of: D-Sampler:	Split-Barrel	**O.D.**	**O.D. of Sampler:**	2	**IN.**		
S-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
U-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
Core Bit:	NQ2	**O.D.**	**O.D. of Rock Core:**	3	**IN.**		

Casing Size: 3 1/4" **Inches** **From Depth of:** 0.0' **To:** 3.2'

Hollow Stem Auger: **From Depth of:** **To:**

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
8/27/2009				Dry	
					218.3
					218.3
					218.3

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring:	0.0	**Ft.;**	**Dia. U-Sample Boring:**		**Ft.**
No. of 2 in. Dia. Shelby Tubes:		**;**	**No. of:**	**U-Samples:**	
2 1/2 in. Dia. Contin. Sample Boring:		**Ft.;**	**Core Drilling in Rock:**	25.5	**Ft.**

Boring Contractor: Walton Corporation
Driller: Gary Truver
Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
			0.0'				Topsoil - 6". Blank Augered to 3.2' to begin Rock Coring.
3.2			3.2'		0" RECOVERY		
		R-1	3.2'		Gniess, blue gray, coarse grained, unweathered, hard. 34" Recovery = 62.96% RQD = 37.0% (poor)		RQD = Rock Quality Designation
6.4			7.7'		34" RECOVERY		
		R-2	7.7'		Gniess, blue gray, coarse grained, unweathered, hard. 18" Recovery = 30.0% RQD = 0.0% (very poor)		RQD = Rock Quality Designation
9.6							
12.8			12.7'		18" RECOVERY		
		R-3	12.7'		Gniess, blue gray, coarse grained, unweathered, hard. 2" Recovery = 3.33% RQD = 0.0% (very poor)		RQD = Rock Quality Designation
16							
			17.7'		2" RECOVERY		

Remarks: GTA Inspector - D. Zmijewski - Boring offset 5' from Boring 7A and restarted.

Reviewed By: Hany Fekry **Soils Supervisor:** Randy Ferguson

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-7B
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1B	17.7'	10 13 17 19	No Sieve Analysis - Indication of wet medium dense gray silty sand w/some rock fragments.		
19.2			19.7'		4" RECOVERY		
		R-4	19.7'		Gniess, blue gray, coarse grained, hard. 6" Recovery = 16.67% RQD = 0.0% (very poor)		RQD = Rock Quality Designation
22.4			22.7'		6" RECOVERY		
		R-5	22.7'		Gniess, blue gray, coarse grained, unweathered, hard. 5" Recovery = 8.33% RQD = 8.33% (very poor)		RQD = Rock Quality Designation
25.6			27.7'		5" RECOVERY		
		2B	27.7'	9 11 12 10	Wet very stiff gray silt w/some gravel (rock fragments) and fine sand, trace of coarse sand.	A-4(0)	
28.8			29.7'		9" RECOVERY		
		R-6	29.7'		No Sample Recovery		
32			32.7'		0" RECOVERY		
		3B1	32.7'	6 6	Wet stiff gray silt w/some clay and fine sand, trace of coarse sand.	A-4(2)	
			33.7'		5" RECOVERY		
		3B2	33.7'	9 9	Wet stiff brown fine sandy clay w/some coarse sand and gravel.	A-6(1)	
35.2			34.7'		9" RECOVERY		
					End of Boring		
38.4							
41.6							
44.8							
48							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Frac rock

Well graded gravels and sands

Silty low plasticity clay

Clayey sand

Notes:

1. **Exploratory borings were drilled on 8-27-2009 using a 3 1/4 - inch diameter hollow stem auger. Rig is a Truck CME 55.**

2. **No free water was encountered at the time of drilling or when re-checked the following day, unless recorded on 1st page.**

3. **Boring locations were taped from existing features and elevations extrapolated from survey unless otherwise reported.**

4. **These logs are subject to the limitations, conclusions, and recommendations in this report.**

5. **Results of tests conducted on samples recovered are reported on the logs.**

6. **All blow counts are uncorrected.**

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 1

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 0.5

Elevation: Source: BRG3B-8

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	34.88	26.19	390.71	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.86	24.84	347.75	
WT. OF WATER LOST:	3.02	1.35	42.96	POST-IGNITION
WT. OF BOTTLE:	22.36	19.09	87.51	DISH & SOIL:
WT. OF DRY SOIL:	9.50	5.75	260.24	
PERCENT OF WATER:	31.80	23.50	16.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	31.8			LOSS %:

WT PASSING #10 SIEVE: 179

WT. OF TOTAL SAMPLE: 260.2 WT. OF WASH SAMPLE: 72.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
2"	0.0	0.0	0.0	100.0
1"	55.1	55.1	21.2	78.8
3/8"	59.3	4.2	1.6	77.2
# 4	62.2	2.9	1.1	76.1
#10	81.0	18.8	7.2	68.9
#40	10.0	10.0	9.6	59.3
#200	28.4	18.4	17.6	41.7
PASS #200		43.6	41.7	

SUMMARY

LIQUID LIMIT:	31.8
PLASTIC LIMIT:	23.5
PLASTICITY INDEX:	8.3
% SAND AND GRAVEL:	58.3
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(1)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 2

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 2.0

Elevation: Source: BRG3B-8

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	24.78	20.15	699.19	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	21.81	18.74	604.27	
WT. OF WATER LOST:	2.97	1.41	94.92	POST-IGNITION
WT. OF BOTTLE:	13.24	12.64	77.49	DISH & SOIL:
WT. OF DRY SOIL:	8.57	6.10	526.78	
PERCENT OF WATER:	34.70	23.10	18.00	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	34.7			LOSS %:

WT PASSING #10 SIEVE: 427

WT. OF TOTAL SAMPLE: 526.8 WT. OF WASH SAMPLE: 107.5

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	44.6	44.6	8.5	91.5
#4	53.1	8.5	1.6	89.9
#10	99.5	46.4	8.8	81.1
#40	16.7	16.7	12.6	68.5
#200	43.3	26.6	20.1	48.4
PASS #200		64.2	48.4	

SUMMARY

LIQUID LIMIT:	34.7
PLASTIC LIMIT:	23.1
PLASTICITY INDEX:	11.6
% SAND AND GRAVEL:	51.6
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(3)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 3

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 4.0

Elevation: Source: BRG3B-8

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	23.65	22.36	566.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	20.94	21.07	488.88	
WT. OF WATER LOST:	2.71	1.29	77.32	POST-IGNITION
WT. OF BOTTLE:	13.11	15.47	77.28	DISH & SOIL:
WT. OF DRY SOIL:	7.83	5.60	411.60	
PERCENT OF WATER:	34.60	23.00	18.80	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	34.6			LOSS %:

WT PASSING #10 SIEVE: 333

WT. OF TOTAL SAMPLE: 411.6 WT. OF WASH SAMPLE: 106.2

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	36.7	36.7	8.9	91.1
#4	45.6	8.9	2.2	88.9
#10	78.8	33.2	8.1	80.9
#40	17.7	17.7	13.5	67.4
#200	47.8	30.1	22.9	44.5
PASS #200		58.4	44.5	

SUMMARY

LIQUID LIMIT:	34.6
PLASTIC LIMIT:	23.0
PLASTICITY INDEX:	11.6
% SAND AND GRAVEL:	55.5
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(2)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 4

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 14.7

Elevation: _____ Source: BRG3B-8

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	25.12	19.24	499.18	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	22.13	18.14	424.39	
WT. OF WATER LOST:	2.99	1.10	74.79	POST-IGNITION
WT. OF BOTTLE:	12.70	12.73	87.60	DISH & SOIL:
WT. OF DRY SOIL:	9.43	5.41	336.79	
PERCENT OF WATER:	31.70	20.30	22.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	31.7			LOSS %: _____

WT PASSING #10 SIEVE: 228

WT. OF TOTAL SAMPLE: 336.8 WT. OF WASH SAMPLE: 102.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
2"	0.0	0.0	0.0	100.0
1"	32.1	32.1	9.5	90.5
3/8"	44.3	12.2	3.6	86.8
# 4	65.2	20.9	6.2	80.6
#10	108.6	43.4	12.9	67.8
#40	16.3	16.3	10.8	56.9
#200	36.1	19.8	13.2	43.8
PASS #200		65.9	43.8	

SUMMARY

LIQUID LIMIT:	31.7
PLASTIC LIMIT:	20.3
PLASTICITY INDEX:	11.4
% SAND AND GRAVEL:	56.2
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(2)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 5

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 26.7

Elevation: Source: BRG3B-8

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	32.56	27.01	566.55	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.56	25.88	461.14	
WT. OF WATER LOST:	3.00	1.13	105.41	POST-IGNITION
WT. OF BOTTLE:	19.57	20.87	77.93	DISH & SOIL:
WT. OF DRY SOIL:	9.99	5.01	383.21	
PERCENT OF WATER:	30.00	22.60	27.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	30.0			LOSS %:

WT PASSING #10 SIEVE: 297

WT. OF TOTAL SAMPLE: 383.2 WT. OF WASH SAMPLE: 102.5

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	4.3	4.3	1.1	98.9
#4	25.4	21.1	5.5	93.4
#10	86.5	61.1	15.9	77.4
#40	10.4	10.4	7.9	69.6
#200	22.5	12.1	9.1	60.4
PASS #200		80.0	60.4	

SUMMARY

LIQUID LIMIT:	30.0
PLASTIC LIMIT:	22.6
PLASTICITY INDEX:	7.4
% SAND AND GRAVEL:	39.6
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(2)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 7

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 36.7

Elevation: _____ Source: BRG3B-8

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:			479.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			403.80	
WT. OF WATER LOST:			75.20	POST-IGNITION
WT. OF BOTTLE:			86.93	DISH & SOIL:
WT. OF DRY SOIL:			316.87	
PERCENT OF WATER:			23.70	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:	NV			LOSS %: _____

WT PASSING #10 SIEVE: 174

WT. OF TOTAL SAMPLE: 316.9 WT. OF WASH SAMPLE: 100.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	79.9	79.9	25.2	74.8
#4	106.5	26.6	8.4	66.4
#10	142.5	36.0	11.4	55.0
#40	39.0	39.0	21.3	33.8
#200	74.2	35.2	19.2	14.6
PASS #200		26.7	14.6	

SUMMARY

LIQUID LIMIT:	NV
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	85.4
% SILT:	
% CLAY:	
CLASSIFICATION:	A-1-b

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-8

Contract: 25-106-02

Boring Location: Sta. 52+05.14, Ramp 5

Boring Surface Elev.: 219.57 **Reference:**

Wt. of Casing Hammer:		**Lbs.**	**Average Fall:**		**IN.**		
Wt. of Sample Hammer:	140	**Lbs.**	**Average Fall:**	30	**IN.**		
Type of: D-Sampler:	Split-Barrel	**O.D.**	**O.D. of Sampler:**	2	**IN.**		
S-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
U-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
Core Bit:	NQ2	**O.D.**	**O.D. of Rock Core:**	3	**IN.**		

Casing Size: 3 1/4" **Inches** **From Depth of:** 0.0' **To:** 4.7'

Hollow Stem Auger: **From Depth of:** **To:**

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
8/31/2009				Dry	
					219.6
					219.6
					219.6

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: 38.7 **Ft.;** **Dia. U-Sample Boring:** **Ft.**

No. of 2 in. Dia. Shelby Tubes: **;** **No. of: U-Samples:**

2 1/2 in. Dia. Contin. Sample Boring: **Ft.;** **Core Drilling in Rock:** 24.0 **Ft.**

Boring Contractor: Walton Corporation

Driller: Gary Truver

Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1	0.5'	5 7 10	Moist very stiff gray clayey gravelly silt w/ some fine sand, trace of coarse sand.	A-4(1)	Topsoil - 6".
			2.0'		8" RECOVERY		
		2	2.0'	6 15 13 11	Moist very stiff grayish brown fine sandy clay w/some gravel and coarse sand.	A-6(3)	
2.9			4.0'		18" RECOVERY		
		3	4.0' 4.7'	5 7 50/5"	Moist hard brown fine sandy clay w/some gravel and coarse sand.	A-6(2)	
		R-1	4.7'		7" RECOVERY		RQD = Rock Quality Designation
5.8					Gniess, gray and white, coarse grained, unweathered, hard. 31" Recovery = 51.67% RQD = 43.3% (poor)		
8.7			9.7'		31" RECOVERY		
		R-2	9.7'		Gniess, gray and white, coarse grained, unweathered, hard. 5" Recovery = 8.33% RQD = 8.3% (very poor)		RQD = Rock Quality Designation
11.6							
14.5			14.7'		5" RECOVERY		
		4	14.7'	24 6 17 50/4"	Wet very stiff gray gravelly clay w/some fine to coarse sand.	A-6(2)	
			16.7'		12" RECOVERY		

Remarks: GTA Inspector - J. Williams

Reviewed By: Hany Fekry **Soils Supervisor:** Randy Ferguson

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-8
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
17.4		R-3	16.7'		Gniess, gray and white, coarse grained, unweathered, hard. 20" Recovery = 33.33% RQD = 8.3% (very poor)		RQD = Rock Quality Designation
20.3			21.7'		20" RECOVERY		
23.2		R-4	21.7'		Gniess, gray and white, coarse grained, unweathered, hard. 27" Recovery = 45.0% RQD = 21.6% (very poor)		RQD = Rock Quality Designation
26.1			26.7'		27" RECOVERY		
29		5	26.7'	8 11 9 11	Wet very stiff gray clayey gravelly silt w/trace of fine to coarse sand.	A-4(2)	
			28.7'		15" RECOVERY		
31.9		6	31.7'	8 50/2"	No Sample Recovery		
			32.7'		0" RECOVERY		
34.8		R-5	32.7'		Gniess, gray and white, coarse grained, unweathered, hard. 4" Recovery = 8.33% RQD = 0.0% (very poor)		RQD = Rock Quality Designation
			36.7'		4" RECOVERY		
37.7		7	36.7'	11 19 22 20	Wet dense brown gravel and coarse sand w/ some fine sand and silt.	A-1-b	
			38.7'		10" RECOVERY		
40.6					End of Boring		
43.5							

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Silty sand
	Clayey sand
	Frac rock
	Silty low plasticity clay

Notes:

1. Exploratory borings were drilled on 8-31-2009 using a 3 1/4 - inch diameter hollow stem auger. Rig is a ATV CME 55.

2. No free water was encountered at the time of drilling or when re-checked the following day, unless recorded on 1st page.

3. Boring locations were taped from existing features and elevations extrapolated from survey unless otherwise reported.

4. These logs are subject to the limitations, conclusions, and recommendations in this report.

5. Results of tests conducted on samples recovered are reported on the logs.

6. All blow counts are uncorrected.

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 1

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 2.0

Elevation: Source: BRG3B-9

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	37.05	23.42	689.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.80	21.52	544.64	
WT. OF WATER LOST:	5.25	1.90	145.16	POST-IGNITION
WT. OF BOTTLE:	20.86	12.99	97.16	DISH & SOIL:
WT. OF DRY SOIL:	10.94	8.53	447.48	
PERCENT OF WATER:	48.00	22.30	32.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	48.0			LOSS %:

WT PASSING #10 SIEVE: 367

WT. OF TOTAL SAMPLE: 447.5 WT. OF WASH SAMPLE: 111.7

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	24.6	24.6	5.5	94.5
#4	35.5	10.9	2.4	92.1
#10	80.8	45.3	10.1	81.9
#40	21.1	21.1	15.5	66.5
#200	47.5	26.4	19.4	47.1
PASS #200		64.2	47.1	

SUMMARY

LIQUID LIMIT:	48.0
PLASTIC LIMIT:	22.3
PLASTICITY INDEX:	25.7
% SAND AND GRAVEL:	52.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-6(8)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 2

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 4.0

Elevation: _____ Source: BRG3B-9

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	39.86	25.28	738.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	35.67	23.23	598.62	
WT. OF WATER LOST:	4.19	2.05	139.78	POST-IGNITION
WT. OF BOTTLE:	21.73	12.96	80.84	DISH & SOIL:
WT. OF DRY SOIL:	13.94	10.27	517.78	
PERCENT OF WATER:	30.10	20.00	27.00	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	30.1			LOSS %: _____

WT PASSING #10 SIEVE: 424

WT. OF TOTAL SAMPLE: 517.8 WT. OF WASH SAMPLE: 101.8

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	54.3	54.3	10.5	89.5
#4	62.7	8.4	1.6	87.9
#10	93.9	31.2	6.0	81.9
#40	10.5	10.5	8.4	73.4
#200	23.4	12.9	10.4	63.0
PASS #200		78.4	63.0	

SUMMARY

LIQUID LIMIT:	30.1
PLASTIC LIMIT:	20.0
PLASTICITY INDEX:	10.1
% SAND AND GRAVEL:	37.0
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(4)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 4

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 9.6

Elevation: _____ Source: BRG3B-9

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	37.38	32.62	565.10	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.61	30.56	468.41	
WT. OF WATER LOST:	4.77	2.06	96.69	POST-IGNITION
WT. OF BOTTLE:	21.17	22.26	86.42	DISH & SOIL:
WT. OF DRY SOIL:	11.44	8.30	381.99	
PERCENT OF WATER:	41.70	24.80	25.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	41.7			LOSS %: _____

WT PASSING #10 SIEVE: 316

WT. OF TOTAL SAMPLE: 382.0 WT. OF WASH SAMPLE: 105.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	30.9	30.9	8.1	91.9
#4	38.4	7.5	2.0	89.9
#10	66.1	27.7	7.3	82.7
#40	18.6	18.6	14.6	68.1
#200	39.2	20.6	16.2	51.9
PASS #200		65.9	51.9	

SUMMARY

LIQUID LIMIT:	41.7
PLASTIC LIMIT:	24.8
PLASTICITY INDEX:	16.9
% SAND AND GRAVEL:	48.1
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-6(6)

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 5

REPORTED BY: _____

REVIEWED BY: _____

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: _____ Road: _____

Location: _____ Depth: 14.6

Elevation: _____ Source: BRG3B-9

Type and Use of Material: _____

Method Placed: _____ Type of Sample: _____

Remarks: _____

_____ Date Sampled: _____

Sampled By: _____

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: _____ Date Tested: _____ Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	38.16	29.17	274.60	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	33.85	27.54	234.91	
WT. OF WATER LOST:	4.31	1.63	39.69	POST-IGNITION
WT. OF BOTTLE:	22.09	21.57	88.16	DISH & SOIL:
WT. OF DRY SOIL:	11.76	5.97	146.75	
PERCENT OF WATER:	36.60	27.30	27.00	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	36.6			LOSS %: _____

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE:		WT. OF WASH SAMPLE:		
SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	36.6
PLASTIC LIMIT:	27.3
PLASTICITY INDEX:	9.3
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample _____ conform with the requirements of the specifications. Material represented by this sample has been _____ for use.

REMARKS:

COMPARISON: _____

INDEPENDENT ASSURANCE SUPERVISOR: _____

QUALITY ASSURANCE SUPERVISOR: _____

(FOR INDEPENDENT ASSURANCE EVALUATION)

_____
SOILS SUPERVISOR

_____
GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 7

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 24.6

Elevation: Source: BRG3B-9

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	37.80	26.98	580.50	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	33.26	25.47	482.10	
WT. OF WATER LOST:	4.54	1.51	98.40	POST-IGNITION
WT. OF BOTTLE:	19.26	18.82	97.48	DISH & SOIL:
WT. OF DRY SOIL:	14.00	6.65	384.62	
PERCENT OF WATER:	32.40	22.70	25.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	32.4			LOSS %:

WT PASSING #10 SIEVE: 359

WT. OF TOTAL SAMPLE: 384.6 WT. OF WASH SAMPLE: 109.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	5.5	5.5	1.4	98.6
#10	25.8	20.3	5.3	93.3
#40	13.2	13.2	11.3	82.0
#200	29.0	15.8	13.5	68.5
PASS #200		80.1	68.5	

SUMMARY

LIQUID LIMIT:	32.4
PLASTIC LIMIT:	22.7
PLASTICITY INDEX:	9.7
% SAND AND GRAVEL:	31.5
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(5)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 8

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 29.6

Elevation: Source: BRG3B-9

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:	39.19	29.56	397.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	35.16	28.05	339.32	
WT. OF WATER LOST:	4.03	1.51	58.08	POST-IGNITION
WT. OF BOTTLE:	22.39	21.21	78.40	DISH & SOIL:
WT. OF DRY SOIL:	12.77	6.84	260.92	
PERCENT OF WATER:	31.60	22.10	22.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	31.6			LOSS %:

WT PASSING #10 SIEVE: 191

WT. OF TOTAL SAMPLE: 260.9 WT. OF WASH SAMPLE: 52.2

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	48.2	48.2	18.5	81.5
#4	49.3	1.1	0.4	81.1
#10	70.0	20.7	7.9	73.2
#40	5.7	5.7	8.0	65.2
#200	13.3	7.6	10.7	54.5
PASS #200		38.9	54.5	

SUMMARY

LIQUID LIMIT:	31.6
PLASTIC LIMIT:	22.1
PLASTICITY INDEX:	9.5
% SAND AND GRAVEL:	45.5
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(3)

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 9

REPORTED BY:

REVIEWED BY:

DELAWARE DEPARTMENT OF TRANSPORTATION

DOVER, DELAWARE (302) 760-2400

Contract: 25-106-02 F.A. Project: I-95 & U.S. 202 Interchange

Contractor: Road:

Location: Depth: 34.6

Elevation: Source: BRG3B-9

Type and Use of Material:

Method Placed: Type of Sample:

Remarks:

Date Sampled:

Sampled By:

FOR LABORATORY USE ONLY

Location of Lab: DOVER

Date Received: Date Tested: Date Reported: 11/5/2009

PHYSICAL TEST CONSTANTS	LIQUID LIMIT T-89	PLASTIC LIMIT T-90	MOISTURE T-265	ORGANIC T-267
BOTTLE NO.:				PRE-IGNITION
WT. WET SOIL & BOTTLE:			244.90	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			228.59	
WT. OF WATER LOST:			16.31	POST-IGNITION
WT. OF BOTTLE:			98.20	DISH & SOIL:
WT. OF DRY SOIL:			130.39	
PERCENT OF WATER:			12.50	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:	NV			LOSS %:

WT PASSING SIEVE:

WT. OF TOTAL SAMPLE: WT. OF WASH SAMPLE:

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING

SUMMARY

LIQUID LIMIT:	NV
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	
% SILT:	
% CLAY:	
CLASSIFICATION:	

This sample conform with the requirements of the specifications. Material represented by this sample has been for use.

REMARKS:

COMPARISON:

INDEPENDENT ASSURANCE SUPERVISOR:

QUALITY ASSURANCE SUPERVISOR:

(FOR INDEPENDENT ASSURANCE EVALUATION)

SOILS SUPERVISOR

GEOTECHNICAL ENGINEER

LB-44 (Rev 5/2003)
Doc # 55-08/04/07/20

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-9

Contract: 25-106-02

Boring Location: Sta. 52+16.58, 20' Lt. Ramp 5

Boring Surface Elev.: 220.99 **Reference:**

Wt. of Casing Hammer:		**Lbs.**	**Average Fall:**		**IN.**		
Wt. of Sample Hammer:	140	**Lbs.**	**Average Fall:**	30	**IN.**		
Type of: D-Sampler:	Split-Barrel	**O.D.**	**O.D. of Sampler:**	2	**IN.**		
S-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
U-Sampler:		**O.D.**	**O.D. of Samp. Tube:**		**IN.**		
Core Bit:	NQ2	**O.D.**	**O.D. of Rock Core:**	3	**IN.**		

Casing Size: 3 1/4" **Inches** **From Depth of:** 0.0' **To:** 6.1'

Hollow Stem Auger: **From Depth of:** **To:**

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
9/8/2009				Dry	
					221.0
					221.0
					221.0

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: 36.1 **Ft.;** **Dia. U-Sample Boring:** **Ft.**

No. of 2 in. Dia. Shelby Tubes: **;** **No. of: U-Samples:**

2 1/2 in. Dia. Contin. Sample Boring: **Ft.;** **Core Drilling in Rock:** 3.5 **Ft.**

Boring Contractor: Walton Corporation

Driller: Gary Truver

Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
			0.0'				Asphalt - 16".
			2.0'		0" RECOVERY		
2.9		1	2.0'	16 8 8 11	Wet very stiff orange clay w/some fine to coarse sand and gravel.	A-7-6(8)	
			4.0'		12" RECOVERY		
5.8		2	4.0'	3 7 28 11	Wet hard brown clayey silt w/some gravel, trace of fine to coarse sand.	A-4(4)	
			6.0'		17" RECOVERY		
		3	6.0'	50/1"	No Sample Recovery		RQD - Rock Quality Designation
		R-1	6.1'		0" RECOVERY		
8.7			6.1'		No Sample Recovery 0" Recovery = 0.0% RQD = 0.0% (very poor)		
			9.6'		0" RECOVERY		
11.6		4	9.6'	10 7 15	Wet very stiff orange clay w/some gravel and fine to coarse sand.	A-7-6(6)	
			11.1'		14" RECOVERY		
14.5		5	14.6'	9 11 11	No Sieve Analysis - Indication of wet very stiff orange sandy lean clay, trace of rock fragments.		
			16.1'		6" RECOVERY		

Remarks: GTA Inspector - D. Zmijewski

Reviewed By: Hany Fekry **Soils Supervisor:** Randy Ferguson

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG3B-9
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
17.4							
20.3		6	19.6' 21.1'	11 13 21	No Sample Recovery 0" RECOVERY		
23.2							
26.1		7	24.6' 26.1'	7 9 10	Wet very stiff orangish gray mottled clayey silt w/some fine to coarse sand, trace of gravel. 16" RECOVERY	A-4(5)	
29							
31.9		8	29.6' 31.1'	8 9 12	Wet very stiff gray clayey gravellsy silt w/trace of fine to coarse sand. 12" RECOVERY	A-4(3)	
34.8		9	34.6' 36.1'	11 10 10	No Sieve Analysis - Indication of wet medium dense orangish gray mottled silty sand w/trace of rock fragments. 6" RECOVERY		
37.7					End of Boring		
40.6							
43.5							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Clayey sand

Poorly graded, silty or clayey sands and gravel

Frac rock

Notes:

1. **Exploratory borings were drilled on 9-8-2009 using a 3 1/4 - inch diameter hollow stem auger. Rig is a ATV CME 55.**

2. **No free water was encountered at the time of drilling or when re-checked the following day, unless recorded on 1st page.**

3. **Boring locations were taped from existing features and elevations extrapolated from survey unless otherwise reported.**

4. **These logs are subject to the limitations, conclusions, and recommendations in this report.**

5. **Results of tests conducted on samples recovered are reported on the logs.**

6. **All blow counts are uncorrected.**