DELAWARE DEPARTMENT OF TRANSPORTATION — PAGE 1 OF 2
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH SECTION

. Project: — Boring No.: B # 1
ontract: 23-106-05 S.R. 141 - U.S. 202 - EAST SIDE IMPROVEMENTS
Boring Loc.: 46+90, 45' Rt. BASELINE - BRIDGE G2

Boring Surface Elev: + 192.0' — 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: 1.5'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
/ /					
/ /					
/ /					
/ /					

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:		Ft.

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

Remarks: INSPECTOR - K. GIBNEY UNSAMPLED

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.

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BORING NO. B # 1

CONTRACT: 23-106-05 S.R. 141 - U.S. 202 - EAST SIDE IMPROVEMENTS
BORING LOCATION: 46+90, 45' Rt. BASELINE - BRIDGE G2

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/4/05	-	0.0'		Unsampled - Possible Boulder	----------	
		1.5'		Going to reposition rig to avoid it.		

(END)

BORING NO. B # 1
SURFACE ELEV. + 192.0'

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

CONTRACT- 23-106-05
DATE----- JANUARY 29, 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 # 1																
STA.	0.0- 1.5	UNSAMPLED														
46+90	POSSIBLE BOULDER - GOING TO REPOSITION RIG TO AVOID IT.															
45' Rt.	END															
BASELINE																
BRIDGE																
G2																

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.: 46+98 45' Rt. BASELINE - BRIDGE G2

Boring No.: B # 1A

Boring Surface Elev: + 185.0' 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: 1.5'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
/ /					
/ /					
/ /					
/ /					

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: Ft.

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

Remarks: INSPECTOR - K. GIBNEY UNSAMPLED

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 # 1A

CONTRACT: 23-106-05 S.R. 141 - U.S. 202 - EAST SIDE IMPROVEMENTS
BORING LOCATION: 46+98 45' Rt. BASELINE - BRIDGE G2

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/4/05	-	0.0'		Unsampled - Possible Boulder	----------	
		1.5'		Going to try to relocate one more time.		

(END)

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----- JANUARY 29, 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 # 1A																
STA.	0.0- 1.5 UNSAMPLED															
46+98	POSSIBLE BOULDER - GOING TO TRY TO RELOCATE ONE MORE TIME.															
45' Rt.	END															
BASELINE																
BRIDGE																
G2																

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.: 46+94, 45' Rt. BASELINE - BRIDGE G2

Boring No.: B # 1B

Boring Surface Elev: + 188.2' 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: 1.0'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
01/04/05	0 HOUR	10.5'		5.2'	183.0'
01/05/05	24 HOUR	10.5'		8.0'	180.2'
/ /					
/ /					

Pay Quantities:
2 1/2 in. Dia.Dry Sample Boring: 1.0 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: 9.5 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.

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BORING NO. B # 1B

CONTRACT: 23-106-05 S.R. 141 - U.S. 202 - EAST SIDE IMPROVEMENTS
BORING LOCATION: 46+94, 45' Rt. BASELINE - BRIDGE G2

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/4/05	-	0.0' 1.0'		Unsampled	----------	
	Run # 1	1.0' 5.5'	Core Drilling	Gneiss, grayish blue, very hard, slightly weathered to fresh, intensely banded, closely to medium spaced fractures. 51" Recovery = 86.0% RQD = 36% (poor)	----------	RQD = Rock Quality Designation
	Run # 2	5.5' 10.5'	Core Drilling	Gneiss, grayish blue, very hard, slightly weathered to fresh, intensely banded, closely to medium spaced fractures. 60" Recovery = 100.0% RQD = 40% (poor)	----------	RQD = Rock Quality Designation
			(END)			

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

CONTRACT- 23-106-05
DATE----- JANUARY 29, 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 # 1B STA. 46+94 45' Rt. BASELINE BRIDGE G2	0.0- 1.0	UNSAMPLED														
	END SPLIT-BARREL SAMPLER															
	START CORE DRILLING															
CORE DRILLING RUN # 1	1.0' - 5.5'	51" RECOVERY = 86.0%														
RUN # 2	5.5' - 10.5'	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.: 46+75, BASELINE - BRIDGE G2

Boring No.: B # 2

Boring Surface Elev: + 187.0' 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: 4.2'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
01/03/05	0 HOUR	14.2'	4.2'	1.8'	185.2'
01/04/05	24 HOUR	14.2'	4.2'	4.3'	182.7'
/ /					
/ /					

Pay Quantities:
2 1/2 in. Dia.Dry Sample Boring: 4.2 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: 10.0 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.

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BORING NO. B # 2

CONTRACT: 23-106-05 S.R. 141 - U.S. 202 - EAST SIDE IMPROVEMENTS
BORING LOCATION: 46+75, BASELINE - BRIDGE G2

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/3/05	1	3.5' 4.2'	16 50/2"	Saturated hard brownish red clay w/some fine to coarse sand.	A-7-5 (15)	

7" Recovery

Run # 1	4.2' 9.2'	Core Drilling	Gneiss, grayish blue, very hard, fresh, intensely banded, medium spaced fractures. 51" Recovery = 85.0% RQD = 80% (good)	----------	RQD = Rock Quality Designation
Run # 2	9.2' 14.2'	Core Drilling	Gneiss, grayish blue, very hard, fresh, intensely banded, medium spaced fractures. 60" Recovery = 100.0% RQD = 100% (excellent)	----------	RQD = Rock Quality Designation

(END)

BORING NO. B # 2
SURFACE ELEV. + 187.0'

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

CONTRACT- 23-106-05
DATE----- JANUARY 29, 2005

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

LOCATION	DEPTH	2.5	2	1	3/8	4	10	40	200	LL	PL	MO	OR	PI	CLASS	GI
		********** PERCENT PASSING **********														
B # 2 STA. 46+75 BASELINE BRIDGE G2	S#1 3.5- 4.2	100	100	100	100	100	100	88	71	58	39	43	--	19	A-7-5	15

END SPLIT-BARREL SAMPLER

START CORE DRILLING

CORE DRILLING

RUN # 1 4.2' - 9.2' 51" RECOVERY = 85.0%

RUN # 2 9.2' - 14.2' 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.: 46+51, 30' Lt. BASELINE - BRIDGE G2

Boring No.: B # 3

Boring Surface Elev: + 192.0' 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: 8.7'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
01/03/05	0 HOUR	23.7'	8.7'	13.0'	179.0'
01/04/05	24 HOUR	23.7'	8.7'	15.0'	177.0'
/ /					
/ /					

Pay Quantities:
2 1/2 in. Dia.Dry Sample Boring: 8.7 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: 15.0 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 # 3

CONTRACT: 23-106-05 S.R. 141 - U.S. 202 - EAST SIDE IMPROVEMENTS
BORING LOCATION: 46+51, 30' Lt. BASELINE - BRIDGE G2

DAILY PROGRESS	SAMPLE NO.	DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/3/05	1	3.5'	5 9	Wet stiff brownish red fine to coarse sandy silt w/some clay, trace of gravel.	A-4 (0)	
		5.0'	4			
				17" Recovery		
	2	8.5'	50/2"	No Sieve Analysis		
		8.7'				
				2" Recovery		
	Run # 1	8.7' 13.7'	Core Drilling	Gneiss, grayish blue, very hard, slightly weathered to fresh, intensely banded, closely fractured. 40" Recovery = 66.7% RQD = 34% (poor)		RQD = ROck Quality Designation
	Run # 2	13.7' 18.7'	Core Drilling	Gneiss, grayish blue, very hard, slightly weathered to fresh, intensely banded, closely fractured. 29" Recovery = 48.3% RQD = 0% (very poor)		RQD = Rock Quality Designation
	Run # 3	18.7' 23.7'	Core Drilling	Gneiss, grayish blue, very hard, fresh, intensely banded, medium spaced fractures. 52" Recovery = 86.7% RQD = 86% (good)		RQD = Rock Quality Designation

(END)

BORING NO. B # 3
SURFACE ELEV. + 192.0'

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

CONTRACT- 23-106-05
DATE----- JANUARY 29, 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 # 3	S#1															
STA.	3.5- 5.0	100	100	100	97	96	91	67	43	33	27	19	--	6	A-4	0
46+51	S#2															
30' Lt.	8.5- 8.7	NO SIEVE ANALYSIS								29	22	8	--	7	-----	--
BASELINE																
BRIDGE																
G2																

END SPLIT-BARREL SAMPLER

START CORE DRILLING

CORE DRILLING

RUN # 1 8.7' - 13.7' 40" RECOVERY = 66.7%

RUN # 2 13.7' - 18.7' 29" RECOVERY = 48.3%

RUN # 3 18.7' - 23.7' 52" RECOVERY = 86.7%

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.: 48+93 28' Lt. BASELINE - BRIDGE G2

Boring No.: B # 6

Boring Surface Elev: + 199.5' 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: 58.8'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
01/20/05	0 HOUR	66.8'	58.8'	15.5'	+184.0'
01/21/05	24 HOUR	66.8'	58.8'	15.5'	+184.0'
/ /					
/ /					

Pay Quantities:

2 1/2 in. Dia.Dry Sample Boring:	58.8	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: 8.0	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 # 6

CONTRACT: 23-106-05 S.R. 141 - U.S. 202 - EAST SIDE IMPROVEMENTS
BORING LOCATION: 48+93 28' Lt. BASELINE - BRIDGE G2

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/20/05	1	3.5'	6	Saturated stiff reddish brown silty clay	A-6 (9)	
			6	w/some fine to coarse sand, trace of		
		5.0'	7	gravel.		
				10" Recovery		
	2	8.5'	7	Saturated stiff reddish brown silty clay	A-6 (9)	
			5	w/some fine to coarse sand, trace of		
		10.0'	6	gravel.		
				10" Recovery		
	3	13.5'	6	Saturated stiff brownish gray clay w/trace	A-7-6 (16)	
			7	of fine to coarse sand and gravel.		
		15.0'	6			
				11" Recovery		
	4	18.5'	9	Saturated very stiff brownish gray clayey	A-4 (8)	
			10	silt w/trace of fine to coarse sand		
		20.0'	6	and gravel.		
				10" Recovery		
	5	23.5'	3	Saturated stiff brown organic fine sandy	A-7-6 (5)	
			3	clay w/some coarse sand.		
		25.0'	6			
				6" Recovery		
	6	28.5'	6	Saturated stiff brownish gray fine sandy	A-7-5 (16)	
			5	clay w/some coarse sand, trace of gravel.		
		30.0'	5			
				14" Recovery		
	7	33.5'	6	Saturated stiff brownish gray clay w/some	A-7-6 (31)	
			6	fine sand, trace of coarse sand and gravel.		
		35.0'	7			
				10" Recovery		
	8	38.5'	6	Saturated stiff brownish gray coarse sandy	A-7-5 (15)	
			7	clay w/some fine sand, trace of gravel.		
		40.0'	7			
				11" Recovery		

BORING NO. B # 6
SURFACE ELEV. + 199.5'

BORING NO. B # 6

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 48+93 28' Lt. BASELINE - BRIDGE G2

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/18/05	9	43.5'	8	Saturated very stiff brownish gray fine	A-7-5 (21)	
			8	sandy clay w/trace of coarse sand and		
		45.0'	8	gravel.		
				13" Recovery		
	10	48.5'	6	Saturated stiff multicolored fine sandy	A-7-5 (19)	
			6	clay w/some coarse sand, trace of gravel.		
		50.0'	6			
				12" Recovery		
	11	53.5'	8	Saturated hard multicolored clay w/some	A-7-5 (18)	
			11	fine to coarse sand, trace of gravel.		
		55.0'	19			
				14" Recovery		
	12	58.5'	50/0.4"	Saturated hard multicolored gravelly clay	A-7-6 (16)	
		58.8'		w/some fine to coarse sand.		
				4" Recovery		
1/20/05	Run # 1	58.8' - 61.8'	Core Drilling	Gneiss, grayish blue, hard to very hard, fresh, intensely to very thinly banded, closely fractured. 30" Recovery = 83.0% RQD = 50% (fair)	----------	RQD = Rock Quality Designation
	Run # 2	61.8' - 66.8'	Core Drilling	Gneiss, grayish blue, hard to very hard, fresh, intensely to very thinly banded, closely fractured. 57.6" Recovery = 96.0% RQD = 90% (good)	----------	RQD = Rock Quality Designation

(END)

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

CONTRACT- 23-106-05
DATE----- JULY 24, 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 # 6	S#1															
STA.	3.5- 5.0	100	100	100	96	95	93	81	64	40	23	21	--	17	A-6	9
48+93	S#2															
28' Lt.	8.5-10.0	100	100	100	100	100	98	86	71	37	22	21	--	15	A-6	9
BASELINE	S#3															
BRIDGE	13.5-15.0	100	100	100	100	100	99	95	88	41	24	23	--	17	A-7-6	16
G2	S#4															
	18.5-20.0	100	100	100	100	100	99	97	89	30	20	21	--	10	A-4	8
	S#5															
	23.5-25.0	100	100	100	100	100	100	82	56	41	29	44	9	12	A-7-6	5
	S#6															
	28.5-30.0	100	100	100	99	99	98	86	62	63	38	45	--	25	A-7-5	16
	S#7															
	33.5-35.0	100	100	100	100	100	98	90	75	68	29	45	--	39	A-7-6	31
	S#8															
	38.5-40.0	100	100	100	100	100	99	73	54	68	37	41	--	31	A-7-5	15
	S#9															
	43.5-45.0	100	100	100	100	100	95	87	65	64	32	44	--	32	A-7-5	21
	S#10															
	48.5-50.0	100	100	100	100	100	98	84	63	65	34	43	--	31	A-7-5	19
	S#11															
	53.5-55.0	100	100	100	100	99	92	74	56	73	39	54	--	34	A-7-5	18
	S#12															
	58.5-58.8	100	100	100	97	91	78	67	52	65	27	40	--	38	A-7-6	16
	END SPLIT-BARREL SAMPLER															

START CORE DRILLING

CORE DRILLING
RUN # 1 58.8' - 61.8' 30" RECOVERY = 83.0%

RUN # 2 61.8' - 66.8' 57.6" RECOVERY = 96.0%
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.: 48+94 4' Lt. BASELINE - BRIDGE G2

Boring No.: B # 7

Boring Surface Elev: + 191.7'

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: 58.7'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
01/18/05	0 HOUR	68.8'	58.7'	8'10"	+182.8'
01/20/05	24 HOUR	68.8'	58.7'	8'5"	+183.3'
/ /					
/ /					

Pay Quantities:

2 1/2 in. Dia.Dry Sample Boring:	58.7	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: 10.1	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 # 7

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 48+94 4' Lt. BASELINE - BRIDGE G2

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/17/05	1	3.5'	4 3	No Sample Recovery	----------	
		5.0'	4			
	2	8.5'	7 5	Saturated stiff gray silt w/some clay and gravel, trace of fine to coarse sand.	A-4 (6)	
		10.0'	6			
				10" Recovery		
	3	13.5'	24 7	Saturated stiff gray clayey silt w/trace of fine to coarse sand and gravel.	A-4 (7)	
		15.0'	8			
				12" Recovery		
	4	18.5'	3 4	Saturated stiff multicolored clay w/some fine sand, trace of coarse sand and gravel.	A-7-5 (31)	
		20.0'	5			
				18" Recovery		
	5	23.5'	8 7	Saturated stiff multicolored clay w/some fine sand, trace of coarse sand and	A-7-5 (42)	
		25.0'	7	gravel.		
				18" Recovery		
	6	28.5'	6 7	Saturated stiff brownish gray clay w/trace of fine to coarse sand and gravel.	A-7-5 (49)	
		30.0'	6			
				13" Recovery		
	7	33.5'	4 5	Saturated stiff brownish gray clay w/trace of fine to coarse sand and gravel.	A-7-5 (39)	
		35.0'	6			
				10" Recovery		
	8	38.5'	14 12	Saturated very stiff brown coarse sandy clay w/some fine sand.	A-7-5 (6)	
		40.0'	8			
				12" Recovery		

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BORING NO. B # 7

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 48+94 4' Lt. BASELINE - BRIDGE G2

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/17/05	9	43.5'	9 8 9	Saturated very stiff brownish gray clay w/some fine sand, trace of coarse sand and gravel.	A-7-5 (20)	
		45.0'				
				12" Recovery		
	10	48.5'	50/0.5"	No Sieve Analyis		
		48.9'				
				4" Recovery		
	11	53.5'	17 24	Saturated dense brown silty fine to coarse sand w/trace of gravel.	A-2-5 (0)	
		55.0'	15			
				13" Recovery		
	12	58.5'	50/0.3"	Saturated very dense reddish brown clayey coarse to fine sand w/trace of gravel.	A-2-7 (1)	
		58.7'				
				2" Recovery		
	Run # 1	58.7' 61.7'	Core Drilling	Gneiss, grayish blue, very hard, fresh, very thinly banded, closely to medium spaced fractures. 28" Recovery = 77.8% RQD = 52.8% (fair)		RQD = Rock Quality Designation
	Run # 2	61.7' 66.7'	Core Drilling	Gneiss, grayish blue, very hard, fresh, very thinly banded, closely to medium spaced fractures. 57" Recovery = 95.0% RQD = 81.7% (good)		RQD = Rock Quality Designation
	Run # 3	66.7' 68.8'	Core Drilling	Gneiss, grayish blue, very hard, fresh, very thinly banded, closely to medium spaced fractures. 25" Recovery = 100.0% RQD = 60% (fair)		RQD = Rock Quality Designation

(END)

BORING NO. B # 7
SURFACE ELEV. + 191.7'

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

CONTRACT- 23-106-05
DATE----- JULY 24, 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 # 7	S#1															
STA.	3.5- 5.0	NO SAMPLE RECOVERY														
48+94	S#2															
4' Lt.	8.5-10.0	100	100	91	91	91	89	86	82	30	21	22	--	9	A-4	6
BASELINE	S#3															
BRIDGE	13.5-15.0	100	100	100	100	98	95	91	82	30	20	22	--	10	A-4	7
G2	S#4															
	18.5-20.0	100	100	100	100	99	94	86	75	73	36	45	--	37	A-7-5	31
	S#5															
	23.5-25.0	100	100	100	100	99	99	94	82	78	33	53	--	45	A-7-5	42
	S#6															
	28.5-30.0	100	100	100	100	100	100	97	94	90	51	66	--	39	A-7-5	49
	S#7															
	33.5-35.0	100	100	100	100	98	98	94	87	77	40	60	--	37	A-7-5	39
	S#8															
	38.5-40.0	100	100	100	100	100	100	57	42	56	31	38	--	25	A-7-5	6
	S#9															
	43.5-45.0	100	100	100	100	100	93	85	71	61	35	54	--	26	A-7-5	20
	S#10															
	48.5-48.9	NO SIEVE ANALYSIS								52	40	43	--	12	-----	--
	S#11															
	53.5-55.0	100	100	100	92	92	92	64	34	46	--	40	--	NP	A-2-5	0
	S#12															
	58.5-58.7	100	100	100	100	99	95	57	32	43	30	34	--	13	A-2-7	1
	END SPLIT-BARREL SAMPLER															

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

CONTRACT- 23-106-05
DATE----- JULY 24, 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
	START CORE DRILLING															
CORE DRILLING																
RUN # 1	58.7' - 61.7' 28" RECOVERY = 77.8%															
RUN # 2	61.7' - 66.7' 57" RECOVERY = 95.0%															
RUN # 3	66.7' - 68.8' 25" 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.: 46+25 46' Rt. BASELINE - BRIDGE G2

Boring No.: B # 8

49

Boring Surface Elev: + 187.2' 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: 58.9'
HOLLOW STEM AUGER From Depth of: To:

Water Level Readings:

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev.of Water
01/06/05	0 HOUR	71.0'	58.9'	5.0'	+182.2'
01/07/05	24 HOUR	71.0'	58.9'	0.0'	+187.2'
/ /					
/ /					

Pay Quantities:
2 1/2 in. Dia.Dry Sample Boring: 56.9 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: 14.1 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 # 8

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 46+25 46' Rt. BASELINE - BRIDGE G2

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/6/05	1	3.5'	5 6	Saturated stiff gray silty clay w/trace of fine to coarse sand and gravel.	A-6 (10)	
		5.0'	6			
				15" Recovery		
	Run # 1	7.5' 9.5'	Core Drilling	Cobbles	----------	RQD = Rock Quality Designation
				11" Recovery = 45.8% RQD = 0% (very poor)		
	2	13.5'	5 40	Saturated hard multicolored silt w/some fine sand, gravel and clay, trace of	A-4 (3)	
		15.0'	15	coarse sand.		
				8" Recovery		
	3	18.5'	4 3	No Sample Recovery	----------	
		20.0'	2			
	4	23.5'	5 5	Saturated stiff brownish gray gravelly clay w/some fine sand, trace of coarse sand.	A-7-5 (4)	
		25.0'	4			
				10" Recovery		
	5	28.5'	3 3	Saturated firm multicolored clay w/some fine to coarse sand, trace of gravel.	A-7-5 (18)	
		30.0'	5			
				7" Recovery		
	6	33.5'	3 3	Saturated firm multicolored fine sandy silt w/some coarse sand.	A-5 (0)	
		35.0'	5			
				8" Recovery		
	7	38.5'	6 8	Saturated very stiff multicolored clay w/trace of fine to coarse sand and	A-7-5 (30)	
		40.0'	8	gravel.		
				8" Recovery		

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BORING NO. B # 8

CONTRACT: 23-106-05 S.R. 141 - U.S. 202, EAST SIDE IMPROVEMENTS
BORING LOCATION: 46+25 46' Rt. BASELINE - BRIDGE G2

DAILY PROGRESS	NO.	SAMPLE DEPTH	BLOWS/6"	SAMPLE DESCRIPTION	CLASS/G.I.	REMARKS
1/6/05	8	43.5'	5 7	Saturated stiff brownish red fine sandy clay w/trace of coarse sand and gravel.	A-7-5 (5)	
		45.0'	8			
				10" Recovery		
	9	48.5'	8 12	Saturated very stiff multicolored fine sandy clay w/trace of coarse sand and	A-7-5 (11)	
		50.0'	15	gravel.		
				13" Recovery		
	10	53.5'	12 16	Saturated hard multicolored fine to coarse sandy silt w/trace of gravel.	A-5 (0)	
		55.0'	18			
				14" Recovery		
	11	58.5'	50/0.4"	Saturated hard multicolored fine to coarse sandy silt w/trace of gravel.	A-5 (0)	
		58.9'				
				4" Recovery		
Run # 2		58.9' Core 61.0' Drilling		Gneiss, dark gray, medium hard to soft, moderately to completely weathered, no apparent banding, very closely fractured. 6" Recovery = ~~46.2%~~ 23.8% RQD = 0% (very poor)	----------	RQD = Rock Quality Designation
Run # 3		61.0' Core 66.0' Drilling		Gneiss, dark gray, medium to very hard, moderately to slightly weathered, very thinly banded, very closely fractured. 48" Recovery = 80.0% RQD = 0% (very poor)	----------	RQD = Rock Quality Designation
Run # 4		66.0' Core 71.0' Drilling		Gneiss, blueish gray, very hard, fresh, very thinly banded, closely to medium spaced fractures. 60" Recovery = 100.0% RQD = ~~65%~~ (fair) 80%	----------	RQD = Rock Quality Designation
		(END)				

BORING NO. B # 8
SURFACE ELEV. + 187.2'

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

CONTRACT- 23-106-05
DATE----- JANUARY 29, 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 # 8	S#1															
STA. 146+25 46' Rt. BASELINE BRIDGE G2	3.5- 5.0	100	100	100	99	99	99	97	92	32	21	23	--	11	A-6	10

STOP SPLIT-BARREL SAMPLER

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

CONTRACT- 23-106-05
DATE----- JANUARY 29, 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
	START CORE DRILLING															
CORE DRILLING RUN # 1	7.5' - 9.5' 11" RECOVERY = 45.8%															
	STOP CORE DRILLING															
	START SPLIT-BARREL SAMPLER															
	S#2															
	13.5-15.0	100	100	100	87	85	83	73	56	31	22	24	--	9	A-4	3
	S#3															
	18.5-20.0	NO SAMPLE RECOVERY														
	S#4															
	23.5-25.0	100	100	92	76	74	67	59	48	44	31	27	--	13	A-7-5	4
	S#5															
	28.5-30.0	100	100	100	100	100	96	84	65	63	36	44	--	27	A-7-5	18
	S#6															
	33.5-35.0	100	100	100	100	100	100	83	44	49	--	46	--	NP	A-5	0
	S#7															
	38.5-40.0	100	100	100	98	98	93	89	82	84	59	59	--	25	A-7-5	30
	S#8															
	43.5-45.0	100	100	100	94	94	93	83	51	52	40	54	--	12	A-7-5	5
	S#9															
	48.5-50.0	100	100	100	99	98	98	88	61	56	38	49	--	18	A-7-5	11
	S#10															
	53.5-55.0	100	100	100	94	94	93	72	38	44	--	37	--	NP	A-5	0
	S#11															
	58.5-58.9	100	100	100	96	95	93	71	40	41	--	40	--	NP	A-5	0
	END SPLIT-BARREL SAMPLER															

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

CONTRACT- 23-106-05
DATE----- JANUARY 29, 2005

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

		********** PERCENT PASSING **********													
LOCATION	DEPTH	2.5	2	1	3/8	4	10	40	200	LL	PL	MO	OR	PI	CLASS	GI

START CORE DRILLING

CORE DRILLING

RUN # 2 58.9' - 61.0' 6" RECOVERY = 46.2%

RUN # 3 61.0' - 66.0' 48" RECOVERY = 80.0%

RUN # 4 66.0' - 71.0' 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: 0.0

Elevation: Source: BRG2B-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: 11/10/2009

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:	41.67	32.48	627.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	36.82	30.73	567.85	
WT. OF WATER LOST:	4.85	1.75	59.55	POST-IGNITION
WT. OF BOTTLE:	22.78	22.10	87.62	DISH & SOIL:
WT. OF DRY SOIL:	14.04	8.63	480.23	
PERCENT OF WATER:	34.50	20.30	12.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	34.5			LOSS %:

WT PASSING #10 SIEVE: 351

WT. OF TOTAL SAMPLE: 480.2 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"	22.4	22.4	4.7	95.3
#4	55.7	33.3	6.9	88.4
#10	129.6	73.9	15.4	73.0
#40	12.6	12.6	8.5	64.5
#200	32.2	19.6	13.2	51.3
PASS #200		76.1	51.3	

SUMMARY

LIQUID LIMIT:	34.5
PLASTIC LIMIT:	20.3
PLASTICITY INDEX:	14.2
% SAND AND GRAVEL:	48.7
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(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.: 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: BRG2B-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: 11/10/2009

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:	29.60	23.15	337.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	27.22	21.72	311.98	
WT. OF WATER LOST:	2.38	1.43	25.42	POST-IGNITION
WT. OF BOTTLE:	20.98	15.43	86.41	DISH & SOIL:
WT. OF DRY SOIL:	6.24	6.29	225.57	
PERCENT OF WATER:	38.10	22.70	11.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	38.1			LOSS %:

WT PASSING #10 SIEVE: 132

WT. OF TOTAL SAMPLE: 225.6 WT. OF WASH SAMPLE: 53.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	42.6	42.6	18.9	81.1
#4	56.4	13.8	6.1	75.0
#10	93.6	37.2	16.5	58.5
#40	7.0	7.0	7.7	50.8
#200	17.4	10.4	11.5	39.3
PASS #200		35.7	39.3	

SUMMARY

LIQUID LIMIT:	38.1
PLASTIC LIMIT:	22.7
PLASTICITY INDEX:	15.4
% SAND AND GRAVEL:	60.7
% 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.: 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: BRG2B-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: 11/10/2009

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:	38.35	20.61	792.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	33.92	19.12	699.51	
WT. OF WATER LOST:	4.43	1.49	93.29	POST-IGNITION
WT. OF BOTTLE:	22.35	12.72	98.20	DISH & SOIL:
WT. OF DRY SOIL:	11.57	6.40	601.31	
PERCENT OF WATER:	38.30	23.30	15.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	38.3			LOSS %:

WT PASSING #10 SIEVE: 601

WT. OF TOTAL SAMPLE: 601.3 WT. OF WASH SAMPLE: 106.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#10	0.0	0.0	0.0	100.0
#40	2.9	2.9	2.7	97.3
#200	8.3	5.4	5.1	92.2
PASS #200		98.3	92.2	

SUMMARY

LIQUID LIMIT:	38.3
PLASTIC LIMIT:	23.3
PLASTICITY INDEX:	15.0
% SAND AND GRAVEL:	7.8
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(15)

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: 6.0

Elevation: Source: BRG2B-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: 11/10/2009

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:	35.23	21.02	702.30	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.66	19.51	567.54	
WT. OF WATER LOST:	3.57	1.51	134.76	POST-IGNITION
WT. OF BOTTLE:	22.26	13.10	87.30	DISH & SOIL:
WT. OF DRY SOIL:	9.40	6.41	480.24	
PERCENT OF WATER:	38.00	23.60	28.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	38.0			LOSS %:

WT PASSING #10 SIEVE: 424

WT. OF TOTAL SAMPLE: 480.2 WT. OF WASH SAMPLE: 102.7

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	10.8	10.8	2.2	97.8
#4	16.7	5.9	1.2	96.5
#10	56.5	39.8	8.3	88.2
#40	10.5	10.5	9.0	79.2
#200	28.6	18.1	15.6	63.7
PASS #200		74.1	63.7	

SUMMARY

LIQUID LIMIT:	38.0
PLASTIC LIMIT:	23.6
PLASTICITY INDEX:	14.4
% SAND AND GRAVEL:	36.3
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(7)

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.:** BRG2B-10

Contract: 25-106-02

Boring Location: Sta. 46+60, Rt. Ramp 5

Boring Surface Elev.: 196.68 **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:** 7.4'

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

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
9/14/2009				Dry	
					196.7
					196.7
					196.7

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: 7.4 **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:** 10.0 **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'	3 14 18 25	Moist hard brown gravelly clay w/some fine sand, trace of coarse sand.	A-6(4)	
1.33			2.0'		16" RECOVERY		
		2	2.0'	46 50/0"	Moist hard brown gravelly clay w/some fine sand, trace of coarse sand.	A-6(2)	
2.66							
3.99			4.0'		6" RECOVERY		
		3	4.0'	14 24 38 29	Moist hard orange clay w/trace of fine to coarse sand.	A-6(15)	
5.32			6.0'		17" RECOVERY		
		4	6.0'	21 21 50/5"	Wet hard orange clay w/some fine sand and gravel, trace of coarse sand.	A-6(7)	
6.65			7.4'		16.8" RECOVERY		

Remarks: GTA Inspector - T. Kane

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.: BRG2B-10

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		R-1	7.4'		Gniess, gray, hard 40" Recovery = 66.67% RQD = 52.7% (fair)		RQD - Rock quality Designation
7.98							
9.31							
10.64							
11.97							
			12.4'		40" RECOVERY		
		R-2	12.4'		Gniess, gray, hard 56" Recovery = 93.33% RQD = 87.5% (good)		RQD - Rock quality Designation
13.3							
14.63							
15.96							
17.29							
			17.4'		56" RECOVERY		
					End of Boring		
18.62							
19.95							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Poorly graded, silty or clayey sands and gravel

Clayey sand

Frac rock

Notes:

1. **Exploratory borings were drilled on 9-14-2009 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: BRG2B-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: 11/10/2009

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:	48.99	22.58	732.70	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	43.11	20.77	650.76	
WT. OF WATER LOST:	5.88	1.81	81.94	POST-IGNITION
WT. OF BOTTLE:	22.29	13.09	86.88	DISH & SOIL:
WT. OF DRY SOIL:	20.82	7.68	563.88	
PERCENT OF WATER:	28.20	23.60	14.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	28.2			LOSS %:

WT PASSING #10 SIEVE: 494

WT. OF TOTAL SAMPLE: 563.9 WT. OF WASH SAMPLE: 104.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	10.7	10.7	1.9	98.1
#4	19.1	8.4	1.5	96.6
#10	70.0	50.9	9.0	87.6
#40	12.7	12.7	10.7	76.9
#200	31.3	18.6	15.6	61.3
PASS #200		73.1	61.3	

SUMMARY

LIQUID LIMIT:	28.2
PLASTIC LIMIT:	23.6
PLASTICITY INDEX:	4.6
% SAND AND GRAVEL:	38.7
% 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: BRG2B-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: 11/10/2009

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:	31.45	20.89	328.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	28.46	19.54	300.35	
WT. OF WATER LOST:	2.99	1.35	27.65	POST-IGNITION
WT. OF BOTTLE:	19.35	12.71	85.91	DISH & SOIL:
WT. OF DRY SOIL:	9.11	6.83	214.44	
PERCENT OF WATER:	32.80	19.80	12.90	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	32.8			LOSS %: _____

WT PASSING SIEVE:

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

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

SUMMARY

LIQUID LIMIT:	32.8
PLASTIC LIMIT:	19.8
PLASTICITY INDEX:	13.0
% 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.: 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: BRG2B-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: 11/10/2009

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:	34.53	23.58	734.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.35	22.10	650.46	
WT. OF WATER LOST:	3.18	1.48	83.94	POST-IGNITION
WT. OF BOTTLE:	22.37	15.41	76.50	DISH & SOIL:
WT. OF DRY SOIL:	8.98	6.69	573.96	
PERCENT OF WATER:	35.40	22.10	14.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	35.4			LOSS %:

WT PASSING #10 SIEVE: 574

WT. OF TOTAL SAMPLE: 574.0 WT. OF WASH SAMPLE: 105.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#10	0.0	0.0	0.0	100.0
#40	4.9	4.9	4.6	95.4
#200	13.2	8.3	7.8	87.5
PASS #200		92.7	87.5	

SUMMARY

LIQUID LIMIT:	35.4
PLASTIC LIMIT:	22.1
PLASTICITY INDEX:	13.3
% SAND AND GRAVEL:	12.5
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(11)

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: 6.0

Elevation: _____ Source: BRG2B-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: 11/10/2009

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:	36.29	20.83	546.90	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.25	19.33	476.75	
WT. OF WATER LOST:	4.04	1.50	70.15	POST-IGNITION
WT. OF BOTTLE:	21.71	12.72	87.60	DISH & SOIL:
WT. OF DRY SOIL:	10.54	6.61	389.15	
PERCENT OF WATER:	38.30	22.70	18.00	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	38.3			LOSS %: _____

WT PASSING #10 SIEVE: 380

WT. OF TOTAL SAMPLE: 389.1 WT. OF WASH SAMPLE: 117.7

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	1.1	1.1	0.3	99.7
#10	9.4	8.3	2.1	97.6
#40	5.5	5.5	4.6	93.0
#200	14.9	9.4	7.8	85.2
PASS #200		102.8	85.2	

SUMMARY

LIQUID LIMIT:	38.3
PLASTIC LIMIT:	22.7
PLASTICITY INDEX:	15.6
% SAND AND GRAVEL:	14.8
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(13)

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: 8.0

Elevation: _____ Source: BRG2B-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: 11/10/2009

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:	32.27	20.62	651.30	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.26	18.85	543.58	
WT. OF WATER LOST:	3.01	1.77	107.72	POST-IGNITION
WT. OF BOTTLE:	22.26	12.94	78.58	DISH & SOIL:
WT. OF DRY SOIL:	7.00	5.91	465.00	
PERCENT OF WATER:	43.00	29.90	23.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	43.0			LOSS %: _____

WT PASSING #10 SIEVE: 400

WT. OF TOTAL SAMPLE: 465.0 WT. OF WASH SAMPLE: 123.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	25.1	25.1	5.4	94.6
#4	29.9	4.8	1.0	93.6
#10	64.7	34.8	7.5	86.1
#40	15.6	15.6	10.9	75.2
#200	38.8	23.2	16.2	58.9
PASS #200		84.2	58.9	

SUMMARY

LIQUID LIMIT:	43.0
PLASTIC LIMIT:	29.9
PLASTICITY INDEX:	13.1
% SAND AND GRAVEL:	41.1
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(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.: 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: 10.0

Elevation: Source: BRG2B-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: 11/10/2009

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:	36.72	27.09	608.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.15	25.01	486.17	
WT. OF WATER LOST:	5.57	2.08	121.83	POST-IGNITION
WT. OF BOTTLE:	19.18	18.79	75.56	DISH & SOIL:
WT. OF DRY SOIL:	11.97	6.22	410.61	
PERCENT OF WATER:	46.50	33.40	29.70	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	46.5			LOSS %:

WT PASSING #10 SIEVE: 338

WT. OF TOTAL SAMPLE: 410.6 WT. OF WASH SAMPLE: 107.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	35.7	35.7	8.7	91.3
#4	45.4	9.7	2.4	88.9
#10	72.6	27.2	6.6	82.3
#40	24.1	24.1	18.5	63.8
#200	47.0	22.9	17.6	46.3
PASS #200		60.3	46.3	

SUMMARY

LIQUID LIMIT:	46.5
PLASTIC LIMIT:	33.4
PLASTICITY INDEX:	13.1
% SAND AND GRAVEL:	53.7
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(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.:** BRG2B-11

Contract: 25-106-02

Boring Location: Sta. 46+30.85, 27' Lt. Ramp 5

Boring Surface Elev.: 199.70 **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:** 12.0'

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

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
9/10/2009				Dry	
					199.7
					199.7
					199.7

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: 12.0 **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:** 5.0 **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'	6 7 11 19	Moist very stiff brown silt w/some clay, fine to coarse sand and gravel.	A-4(1)	
1.43			2.0'		17" RECOVERY		
		2	2.0'	16 50/0"	No Sieve Analysis - Indication of moist hard brown sandy silt.		
2.86			4.0'		6" RECOVERY		
4.29		3	4.0'	7 10 23 24	Moist hard brown clay w/trace of fine to coarse sand.	A-6(11)	
5.72			6.0'		18" RECOVERY		
		4	6.0'	33 41 32 36	Moist hard orange clay w/trace of fine to coarse sand and gravel.	A-6(13)	
7.15			8.0'		13" RECOVERY		

Remarks: GTA Inspector - D. Zmijewski - Boring offset 10' South and 6' East due to topography.

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.:** BRG2B-11
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		5	8.0'	10 11 12 10	Wet very stiff brownish red clay w/some fine to coarse sand and gravel.	A-7-5(6)	
8.58							
10.01			10.0'		14" RECOVERY		
		6	10.0'	34 21 28 18	Wet hard brownish red clay w/some fine to coarse sand and gravel.	A-7-5(3)	
11.44							
			12.0'		12" RECOVERY		
		R-1	12.0'		Gniess, ble gray, coarse grained, unweathered, hard 60" Recovery = 100.0% RQD = 93.3% (excellent)		RQD - Rock Quality Designation
12.87							
14.3							
15.73							
			17.0'		60" RECOVERY		
17.16					End of Boring		
18.59							
20.02							
21.45							

KEY TO SYMBOLS

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

Notes:

1. Exploratory borings were drilled on 9-10-2009 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: BRG2B-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: 11/10/2009

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:	34.09	26.33	564.12	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.90	25.00	486.42	
WT. OF WATER LOST:	3.19	1.33	77.70	POST-IGNITION
WT. OF BOTTLE:	22.88	19.37	78.95	DISH & SOIL:
WT. OF DRY SOIL:	8.02	5.63	407.47	
PERCENT OF WATER:	39.80	23.60	19.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	39.8			LOSS %:

WT PASSING #10 SIEVE: 407

WT. OF TOTAL SAMPLE: 407.5 WT. OF WASH SAMPLE: 100.5

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#10	0.0	0.0	0.0	100.0
#40	10.3	10.3	10.2	89.8
#200	25.9	15.6	15.5	74.2
PASS #200		74.6	74.2	

SUMMARY

LIQUID LIMIT:	39.8
PLASTIC LIMIT:	23.6
PLASTICITY INDEX:	16.2
% SAND AND GRAVEL:	25.8
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(11)

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: BRG2B-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: 11/10/2009

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:	41.07	22.71	523.51	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	34.68	20.90	422.30	
WT. OF WATER LOST:	6.39	1.81	101.21	POST-IGNITION
WT. OF BOTTLE:	21.35	14.80	77.25	DISH & SOIL:
WT. OF DRY SOIL:	13.33	6.10	345.05	
PERCENT OF WATER:	47.90	29.70	29.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	47.9			LOSS %: _____

WT PASSING #10 SIEVE: 345

WT. OF TOTAL SAMPLE: 345.1 WT. OF WASH SAMPLE: 102.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#10	0.0	0.0	0.0	100.0
#40	20.2	20.2	19.8	80.2
#200	48.7	28.5	27.9	52.3
PASS #200		53.3	52.3	

SUMMARY

LIQUID LIMIT:	47.9
PLASTIC LIMIT:	29.7
PLASTICITY INDEX:	18.2
% SAND AND GRAVEL:	47.7
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(7)

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: BRG2B-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: 11/10/2009

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:	34.40	28.30	751.99	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.18	26.70	550.78	
WT. OF WATER LOST:	4.22	1.60	201.21	POST-IGNITION
WT. OF BOTTLE:	22.14	22.71	86.53	DISH & SOIL:
WT. OF DRY SOIL:	8.04	3.99	464.25	
PERCENT OF WATER:	52.50	40.10	43.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	52.5			LOSS %:

WT PASSING #10 SIEVE: 459

WT. OF TOTAL SAMPLE: 464.3 WT. OF WASH SAMPLE: 101.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	2.2	2.2	0.5	99.5
#10	5.7	3.5	0.8	98.8
#40	23.0	23.0	22.4	76.4
#200	52.0	29.0	28.2	48.1
PASS #200		49.4	48.1	

SUMMARY

LIQUID LIMIT:	52.5
PLASTIC LIMIT:	40.1
PLASTICITY INDEX:	12.4
% SAND AND GRAVEL:	51.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(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: 6.0

Elevation: _____ Source: BRG2B-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: 11/10/2009

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:	34.56		513.84	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.73		397.39	
WT. OF WATER LOST:	3.83		116.45	POST-IGNITION
WT. OF BOTTLE:	21.90		78.20	DISH & SOIL:
WT. OF DRY SOIL:	8.83		319.19	
PERCENT OF WATER:	43.40		36.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	43.4			LOSS %: _____

WT PASSING #10 SIEVE: 305

WT. OF TOTAL SAMPLE: 319.2 WT. OF WASH SAMPLE: 104.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	13.7	13.7	4.3	95.7
#40	32.9	32.9	30.2	65.5
#200	67.9	35.0	32.1	33.5
PASS #200		36.5	33.5	

SUMMARY

LIQUID LIMIT:	43.4
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	66.5
% 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

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: 8.0

Elevation: _____ Source: BRG2B-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: 11/10/2009

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:	30.03		570.05	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	26.49		426.03	
WT. OF WATER LOST:	3.54		144.02	POST-IGNITION
WT. OF BOTTLE:	19.38		87.40	DISH & SOIL:
WT. OF DRY SOIL:	7.11		338.63	
PERCENT OF WATER:	49.80		42.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	49.8			LOSS %: _____

WT PASSING #10 SIEVE: 332

WT. OF TOTAL SAMPLE: 338.6 WT. OF WASH SAMPLE: 105.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	6.3	6.3	1.9	98.1
#40	9.8	9.8	9.1	89.0
#200	51.6	41.8	38.9	50.1
PASS #200		53.8	50.1	

SUMMARY

LIQUID LIMIT:	49.8
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	49.9
% 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

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: 10.0

Elevation: _____ Source: BRG2B-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: 11/10/2009

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:	35.29		699.85	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.79		537.31	
WT. OF WATER LOST:	4.50		162.54	POST-IGNITION
WT. OF BOTTLE:	20.67		86.06	DISH & SOIL:
WT. OF DRY SOIL:	10.12		451.25	
PERCENT OF WATER:	44.50		36.00	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	44.5			LOSS %: _____

WT PASSING #10 SIEVE: 410

WT. OF TOTAL SAMPLE: 451.3 WT. OF WASH SAMPLE: 102.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	14.2	14.2	3.1	96.9
#10	41.5	27.3	6.0	90.8
#40	22.5	22.5	20.0	70.8
#200	62.0	39.5	35.1	35.7
PASS #200		40.1	35.7	

SUMMARY

LIQUID LIMIT:	44.5
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	64.3
% 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

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: 12.0

Elevation: Source: BRG2B-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: 11/10/2009

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:			627.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			459.71	
WT. OF WATER LOST:			168.09	POST-IGNITION
WT. OF BOTTLE:			86.60	DISH & SOIL:
WT. OF DRY SOIL:			373.11	
PERCENT OF WATER:			45.10	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:	NV			LOSS %:

WT PASSING #10 SIEVE: 350

WT. OF TOTAL SAMPLE: 373.1 WT. OF WASH SAMPLE: 122.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	7.0	7.0	1.9	98.1
#4	7.5	0.5	0.1	98.0
#10	23.4	15.9	4.3	93.7
#40	39.0	39.0	29.8	63.9
#200	88.0	49.0	37.5	26.5
PASS #200		34.6	26.5	

SUMMARY

LIQUID LIMIT:	NV
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	73.5
% SILT:	
% CLAY:	
CLASSIFICATION:	A-2-4(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.: 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: 14.0

Elevation: _____ Source: BRG2B-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: 11/10/2009

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:			150.08	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			144.84	
WT. OF WATER LOST:			5.24	POST-IGNITION
WT. OF BOTTLE:			86.93	DISH & SOIL:
WT. OF DRY SOIL:			57.91	
PERCENT OF WATER:			9.00	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

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG2B-12

Contract: 25-106-02

Boring Location: Sta. 47+90.82, Rt. Ramp 5

Boring Surface Elev.: 180.59 **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:** 14.7'

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

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
8/20/2009				6.9'	173.7
					180.6
					180.6
					180.6

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: 14.7 **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:** 20.0 **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 7	Moist stiff orange clay w/some fine sand, trace of coarse sand.	A-6(11)	Topsoil - 3".
			2.0'		17" RECOVERY		
2.43		2	2.0'	8 10 12 14	Wet very stiff orange fine sandy clay w/some coarse sand.	A-7-5(7)	
			4.0'		20" RECOVERY		
		3	4.0'	2 4 6 8	Wet stiff orangish brown mottled fine to coarse sandy clay w/trace of gravel.	A-7-5(4)	
4.86			6.0'		24" RECOVERY		
		4	6.0'	7 9 9 11	Wet medium dense orange silty fine to coarse sand w/trace of gravel.	A-2-5(0)	
7.29	▽		8.0'		18" RECOVERY		
		5	8.0'	4 4 7 8	Wet stiff orange fine sandy silt w/trace of coarse sand and gravel.	A-5(0)	
9.72			10.0'		20" RECOVERY		
		6	10.0'	10 10 10 10	Wet very stiff orange fine sandy silt w/some coarse sand, trace of gravel.	A-5(0)	
			12.0'		23" RECOVERY		
12.15		7	12.0'	4 5 7 10	Wet medium dense orange silty fine to coarse sand w/trace of gravel.	A-2-4(0)	
			14.0'		19" RECOVERY		

Remarks: GTA Inspector - D. Zmijewski - Boring offset 10' South due to topography.

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.: BRG2B-12

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
14.58		8	14.0' 14.5'	50/4"	No Sieve Analysis - Indication of wet very dense orange silty sand, trace of rock fragments.		
		R-1	14.7'		1" RECOVERY Gneiss, blue gray, hard 43" Recovery = 71.67% RQD = 36.7% (poor)		RQD = Rock Quality Designation
17.01							
19.44			19.7'		43" RECOVERY		
		R-2	19.7'		Gneiss, blue gray, hard 30" Recovery = 50.0% RQD = 18.3% (very poor)		RQD = Rock Quality Designation
21.87							
24.3			24.7'		30" RECOVERY		
		R-3	24.7'		Gneiss, blue gray, hard 45.5" Recovery = 75.83% RQD = 45.0% (poor)		RQD = Rock Quality Designation
26.73							
29.16			29.7'		45.5" RECOVERY		
		R-4	29.7'		Gneiss, blue gray, hard 48" Recovery = 80.0% RQD = 58.3% (fair)		RQD = Rock Quality Designation
31.59							
34.02			34.7'		48" RECOVERY		
					End of Boring		
36.45							

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Poorly graded, silty or clayey sands and gravel
	Well graded gravels and sands
	Silty sand
	Elastic silt
	Frac rock
Misc. Symbols	
	Water table during drilling

Notes:

1. Exploratory borings were drilled on 8-20-2009 using a 3 1/4 - inch diameter hollow stem auger. Rig is a ATV TRAK 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: BRG2B-13

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: 11/10/2009

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:	36.08	30.35	481.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.02	28.99	406.69	
WT. OF WATER LOST:	4.06	1.36	74.71	POST-IGNITION
WT. OF BOTTLE:	18.93	22.79	86.77	DISH & SOIL:
WT. OF DRY SOIL:	13.09	6.20	319.92	
PERCENT OF WATER:	31.00	21.90	23.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	31.0			LOSS %:

WT PASSING #10 SIEVE: 274

WT. OF TOTAL SAMPLE: 319.9 WT. OF WASH SAMPLE: 103.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	6.2	6.2	1.9	98.1
#4	13.9	7.7	2.4	95.7
#10	45.9	32.0	10.0	85.7
#40	14.9	14.9	12.4	73.3
#200	33.2	18.3	15.2	58.1
PASS #200		70.1	58.1	

SUMMARY

LIQUID LIMIT:	31.0
PLASTIC LIMIT:	21.9
PLASTICITY INDEX:	9.1
% SAND AND GRAVEL:	41.9
% 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.: 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: BRG2B-13

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: 11/10/2009

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:	31.09	26.94	193.30	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	28.26	26.10	180.68	
WT. OF WATER LOST:	2.83	0.84	12.62	POST-IGNITION
WT. OF BOTTLE:	19.60	22.04	87.62	DISH & SOIL:
WT. OF DRY SOIL:	8.66	4.06	93.06	
PERCENT OF WATER:	32.70	20.70	13.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	32.7			LOSS %: _____

WT PASSING SIEVE:

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

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

SUMMARY

LIQUID LIMIT:	32.7
PLASTIC LIMIT:	20.7
PLASTICITY INDEX:	12.0
% 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.: 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: BRG2B-13

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: 11/10/2009

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:	32.58	26.04	688.60	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.16	24.89	595.40	
WT. OF WATER LOST:	3.42	1.15	93.20	POST-IGNITION
WT. OF BOTTLE:	18.80	19.43	86.88	DISH & SOIL:
WT. OF DRY SOIL:	10.36	5.46	508.52	
PERCENT OF WATER:	33.00	21.10	18.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	33.0			LOSS %:

WT PASSING #10 SIEVE: 464

WT. OF TOTAL SAMPLE: 508.5 WT. OF WASH SAMPLE: 103.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	11.6	11.6	2.3	97.7
#4	16.3	4.7	0.9	96.8
#10	44.9	28.6	5.6	91.2
#40	10.4	10.4	9.2	82.0
#200	24.0	13.6	12.0	70.0
PASS #200		79.3	70.0	

SUMMARY

LIQUID LIMIT:	33.0
PLASTIC LIMIT:	21.1
PLASTICITY INDEX:	11.9
% SAND AND GRAVEL:	30.0
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(7)

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: 6.0

Elevation: _____ Source: BRG2B-13

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: 11/10/2009

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:	33.92	25.82	791.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.05	24.60	689.32	
WT. OF WATER LOST:	2.87	1.22	101.68	POST-IGNITION
WT. OF BOTTLE:	22.61	19.35	87.08	DISH & SOIL:
WT. OF DRY SOIL:	8.44	5.25	602.24	
PERCENT OF WATER:	34.00	23.20	16.90	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	34.0			LOSS %: _____

WT PASSING #10 SIEVE: 408

WT. OF TOTAL SAMPLE: 602.2 WT. OF WASH SAMPLE: 106.7

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	100.6	100.6	16.7	83.3
#4	119.6	19.0	3.2	80.1
#10	194.6	75.0	12.5	67.7
#40	11.5	11.5	7.3	60.4
#200	26.0	14.5	9.2	51.2
PASS #200		80.7	51.2	

SUMMARY

LIQUID LIMIT:	34.0
PLASTIC LIMIT:	23.2
PLASTICITY INDEX:	10.8
% SAND AND GRAVEL:	48.8
% 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.: 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: 8.0

Elevation: _____ Source: BRG2B-13

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: 11/10/2009

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:	35.48	24.89	832.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.25	23.78	702.80	
WT. OF WATER LOST:	3.23	1.11	129.20	POST-IGNITION
WT. OF BOTTLE:	22.10	19.13	79.18	DISH & SOIL:
WT. OF DRY SOIL:	10.15	4.65	623.62	
PERCENT OF WATER:	31.80	23.90	20.70	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	31.8			LOSS %: _____

WT PASSING #10 SIEVE: 575

WT. OF TOTAL SAMPLE: 623.6 WT. OF WASH SAMPLE: 104.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	1.7	1.7	0.3	99.7
#4	8.3	6.6	1.1	98.7
#10	48.6	40.3	6.5	92.2
#40	4.3	4.3	3.8	88.4
#200	9.4	5.1	4.5	83.9
PASS #200		95.5	83.9	

SUMMARY

LIQUID LIMIT:	31.8
PLASTIC LIMIT:	23.9
PLASTICITY INDEX:	7.9
% SAND AND GRAVEL:	16.1
% 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.: 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: 10.0

Elevation: _____ Source: BRG2B-13

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: 11/10/2009

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:	34.32	26.85	705.70	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.94	25.51	571.51	
WT. OF WATER LOST:	4.38	1.34	134.19	POST-IGNITION
WT. OF BOTTLE:	19.56	20.95	98.20	DISH & SOIL:
WT. OF DRY SOIL:	10.38	4.56	473.31	
PERCENT OF WATER:	42.20	29.40	28.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	42.2			LOSS %: _____

WT PASSING #10 SIEVE: 397

WT. OF TOTAL SAMPLE: 473.3 WT. OF WASH SAMPLE: 104.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	10.7	10.7	2.3	97.7
#4	26.3	15.6	3.3	94.4
#10	76.6	50.3	10.6	83.8
#40	18.9	18.9	15.2	68.6
#200	41.1	22.2	17.8	50.8
PASS #200		63.3	50.8	

SUMMARY

LIQUID LIMIT:	42.2
PLASTIC LIMIT:	29.4
PLASTICITY INDEX:	12.8
% SAND AND GRAVEL:	49.2
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-6(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.: 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: 12.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	31.30	27.13	868.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	27.45	25.79	707.20	
WT. OF WATER LOST:	3.85	1.34	161.60	POST-IGNITION
WT. OF BOTTLE:	19.19	21.36	79.07	DISH & SOIL:
WT. OF DRY SOIL:	8.26	4.43	628.13	
PERCENT OF WATER:	46.60	30.20	25.70	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	46.6			LOSS %:

WT PASSING #10 SIEVE: 582

WT. OF TOTAL SAMPLE: 628.1 WT. OF WASH SAMPLE: 104.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	5.5	5.5	0.9	99.1
#10	46.4	40.9	6.5	92.6
#40	10.7	10.7	9.5	83.1
#200	27.5	16.8	15.0	68.1
PASS #200		76.5	68.1	

SUMMARY

LIQUID LIMIT:	46.6
PLASTIC LIMIT:	30.2
PLASTICITY INDEX:	16.4
% SAND AND GRAVEL:	31.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(11)

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: 14.0

Elevation: _____ Source: BRG2B-13

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: 11/10/2009

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:	33.45	27.33	752.50	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.82	26.15	649.44	
WT. OF WATER LOST:	2.63	1.18	103.06	POST-IGNITION
WT. OF BOTTLE:	21.72	20.85	78.58	DISH & SOIL:
WT. OF DRY SOIL:	9.10	5.30	570.86	
PERCENT OF WATER:	28.90	22.30	18.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	28.9			LOSS %: _____

WT PASSING #10 SIEVE: 538

WT. OF TOTAL SAMPLE: 570.9 WT. OF WASH SAMPLE: 108.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	7.0	7.0	1.2	98.8
#4	7.6	0.6	0.1	98.7
#10	32.9	25.3	4.4	94.2
#40	3.1	3.1	2.7	91.5
#200	8.6	5.5	4.8	86.8
PASS #200		100.0	86.8	

SUMMARY

LIQUID LIMIT:	28.9
PLASTIC LIMIT:	22.3
PLASTICITY INDEX:	6.6
% SAND AND GRAVEL:	13.2
% 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.: 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: 16.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	33.11	28.24	772.10	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.25	27.21	658.14	
WT. OF WATER LOST:	2.86	1.03	113.96	POST-IGNITION
WT. OF BOTTLE:	21.71	22.37	81.46	DISH & SOIL:
WT. OF DRY SOIL:	8.54	4.84	576.68	
PERCENT OF WATER:	33.50	21.30	19.80	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	33.5			LOSS %:

WT PASSING #10 SIEVE: 547

WT. OF TOTAL SAMPLE: 576.7 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"	2.9	2.9	0.5	99.5
#4	5.1	2.2	0.4	99.1
#10	29.2	24.1	4.2	94.9
#40	3.8	3.8	3.3	91.6
#200	10.1	6.3	5.5	86.1
PASS #200		98.2	86.1	

SUMMARY

LIQUID LIMIT:	33.5
PLASTIC LIMIT:	21.3
PLASTICITY INDEX:	12.2
% SAND AND GRAVEL:	13.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(11)

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: 18.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	33.86	25.70	931.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.44	24.48	792.93	
WT. OF WATER LOST:	2.42	1.22	138.87	POST-IGNITION
WT. OF BOTTLE:	23.27	18.88	87.61	DISH & SOIL:
WT. OF DRY SOIL:	8.17	5.60	705.32	
PERCENT OF WATER:	29.60	21.80	19.70	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	29.6			LOSS %:

WT PASSING #10 SIEVE: 657

WT. OF TOTAL SAMPLE: 705.3 WT. OF WASH SAMPLE: 111.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	6.9	6.9	1.0	99.0
#10	48.5	41.6	5.9	93.1
#40	4.3	4.3	3.6	89.5
#200	11.9	7.6	6.3	83.2
PASS #200		100.0	83.2	

SUMMARY

LIQUID LIMIT:	29.6
PLASTIC LIMIT:	21.8
PLASTICITY INDEX:	7.8
% SAND AND GRAVEL:	16.8
% 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.: 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: 20.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	32.74	25.67	540.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.10	24.58	463.00	
WT. OF WATER LOST:	2.64	1.09	77.20	POST-IGNITION
WT. OF BOTTLE:	22.14	19.37	88.22	DISH & SOIL:
WT. OF DRY SOIL:	7.96	5.21	374.78	
PERCENT OF WATER:	33.20	20.90	20.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	33.2			LOSS %:

WT PASSING #10 SIEVE: 356

WT. OF TOTAL SAMPLE: 374.8 WT. OF WASH SAMPLE: 115.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	2.0	2.0	0.5	99.5
#10	18.7	16.7	4.5	95.0
#40	5.0	5.0	4.1	90.9
#200	13.9	8.9	7.3	83.6
PASS #200		101.7	83.6	

SUMMARY

LIQUID LIMIT:	33.2
PLASTIC LIMIT:	20.9
PLASTICITY INDEX:	12.3
% SAND AND GRAVEL:	16.4
% 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.: 12

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: 22.0

Elevation: _____ Source: BRG2B-13

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: 11/10/2009

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:	23.42	20.57	758.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	20.66	19.52	640.13	
WT. OF WATER LOST:	2.76	1.05	118.67	POST-IGNITION
WT. OF BOTTLE:	12.96	15.09	86.88	DISH & SOIL:
WT. OF DRY SOIL:	7.70	4.43	553.25	
PERCENT OF WATER:	35.80	23.70	21.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	35.8			LOSS %: _____

WT PASSING #10 SIEVE: 507

WT. OF TOTAL SAMPLE: 553.3 WT. OF WASH SAMPLE: 106.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	4.5	4.5	0.8	99.2
#4	7.4	2.9	0.5	98.7
#10	46.1	38.7	7.0	91.7
#40	5.2	5.2	4.5	87.2
#200	15.2	10.0	8.6	78.5
PASS #200		90.8	78.5	

SUMMARY

LIQUID LIMIT:	35.8
PLASTIC LIMIT:	23.7
PLASTICITY INDEX:	12.1
% SAND AND GRAVEL:	21.5
% 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.: 13

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: 24.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	26.00	20.32	805.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	22.15	18.73	657.04	
WT. OF WATER LOST:	3.85	1.59	148.36	POST-IGNITION
WT. OF BOTTLE:	12.95	13.24	87.30	DISH & SOIL:
WT. OF DRY SOIL:	9.20	5.49	569.74	
PERCENT OF WATER:	41.80	29.00	26.00	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	41.8			LOSS %:

WT PASSING #10 SIEVE: 533

WT. OF TOTAL SAMPLE: 569.7 WT. OF WASH SAMPLE: 121.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	4.8	4.8	0.8	99.2
#10	36.3	31.5	5.5	93.6
#40	14.7	14.7	11.3	82.3
#200	34.3	19.6	15.1	67.2
PASS #200		87.0	67.2	

SUMMARY

LIQUID LIMIT:	41.8
PLASTIC LIMIT:	29.0
PLASTICITY INDEX:	12.8
% SAND AND GRAVEL:	32.8
% 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.: 13A

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: 25.5

Elevation: _____ Source: BRG2B-13

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: 11/10/2009

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:	24.76	19.49	289.60	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	22.09	18.22	248.62	
WT. OF WATER LOST:	2.67	1.27	40.98	POST-IGNITION
WT. OF BOTTLE:	12.74	12.60	80.76	DISH & SOIL:
WT. OF DRY SOIL:	9.35	5.62	167.86	
PERCENT OF WATER:	28.60	22.60	24.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	28.6			LOSS %: _____

WT PASSING #10 SIEVE: 165

WT. OF TOTAL SAMPLE: 167.9 WT. OF WASH SAMPLE: 53.5

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	2.9	2.9	1.7	98.3
#40	37.8	37.8	69.4	28.8
#200	42.0	4.2	7.7	21.1
PASS #200		11.5	21.1	

SUMMARY

LIQUID LIMIT:	28.6
PLASTIC LIMIT:	22.6
PLASTICITY INDEX:	6.0
% SAND AND GRAVEL:	78.9
% 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

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 14

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: 26.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	40.32	24.41	767.10	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	35.94	22.86	645.39	
WT. OF WATER LOST:	4.38	1.55	121.71	POST-IGNITION
WT. OF BOTTLE:	22.09	15.43	78.00	DISH & SOIL:
WT. OF DRY SOIL:	13.85	7.43	567.39	
PERCENT OF WATER:	31.60	20.90	21.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	31.6			LOSS %:

WT PASSING #10 SIEVE: 547

WT. OF TOTAL SAMPLE: 567.4 WT. OF WASH SAMPLE: 121.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	7.8	7.8	1.4	98.6
#4	7.8	0.0	0.0	98.6
#10	20.1	12.3	2.2	96.5
#40	4.0	4.0	3.2	93.3
#200	11.5	7.5	6.0	87.3
PASS #200		109.8	87.3	

SUMMARY

LIQUID LIMIT:	31.6
PLASTIC LIMIT:	20.9
PLASTICITY INDEX:	10.7
% SAND AND GRAVEL:	12.7
% 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.: 15

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: 29.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	43.25	25.56	773.70	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	37.65	23.84	616.16	
WT. OF WATER LOST:	5.60	1.72	157.54	POST-IGNITION
WT. OF BOTTLE:	22.38	15.50	86.53	DISH & SOIL:
WT. OF DRY SOIL:	15.27	8.34	529.63	
PERCENT OF WATER:	36.70	20.60	29.70	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	36.7			LOSS %:

WT PASSING #10 SIEVE: 523

WT. OF TOTAL SAMPLE: 529.6 WT. OF WASH SAMPLE: 109.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	7.1	7.1	1.3	98.7
#40	5.3	5.3	4.8	93.9
#200	19.6	14.3	12.9	80.9
PASS #200		89.5	80.9	

SUMMARY

LIQUID LIMIT:	36.7
PLASTIC LIMIT:	20.6
PLASTICITY INDEX:	16.1
% SAND AND GRAVEL:	19.1
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(12)

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.: 16

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: 38.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	36.49	20.95	301.60	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.63	19.39	237.78	
WT. OF WATER LOST:	5.86	1.56	63.82	POST-IGNITION
WT. OF BOTTLE:	21.87	13.06	76.35	DISH & SOIL:
WT. OF DRY SOIL:	8.76	6.33	161.43	
PERCENT OF WATER:	66.90	24.60	39.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	66.9			LOSS %:

WT PASSING SIEVE:

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

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

SUMMARY

LIQUID LIMIT:	66.9
PLASTIC LIMIT:	24.6
PLASTICITY INDEX:	42.3
% 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.: 17

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: 43.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	31.49	26.96	224.90	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	27.90	25.65	182.68	
WT. OF WATER LOST:	3.59	1.31	42.22	POST-IGNITION
WT. OF BOTTLE:	22.79	22.03	87.32	DISH & SOIL:
WT. OF DRY SOIL:	5.11	3.62	95.36	
PERCENT OF WATER:	70.30	36.20	44.30	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	70.3			LOSS %:

WT PASSING SIEVE:

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

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

SUMMARY

LIQUID LIMIT:	70.3
PLASTIC LIMIT:	36.2
PLASTICITY INDEX:	34.1
% 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.: 18

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: 48.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	29.48	23.88	497.60	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	25.50	22.80	360.76	
WT. OF WATER LOST:	3.98	1.08	136.84	POST-IGNITION
WT. OF BOTTLE:	19.38	19.34	87.33	DISH & SOIL:
WT. OF DRY SOIL:	6.12	3.46	273.43	
PERCENT OF WATER:	65.00	31.20	50.00	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	65.0			LOSS %:

WT PASSING #10 SIEVE: 254

WT. OF TOTAL SAMPLE: 273.4 WT. OF WASH SAMPLE: 101.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	17.1	17.1	6.3	93.7
#4	17.1	0.0	0.0	93.7
#10	19.5	2.4	0.9	92.9
#40	1.4	1.4	1.3	91.6
#200	18.3	16.9	15.5	76.1
PASS #200		83.0	76.1	

SUMMARY

LIQUID LIMIT:	65.0
PLASTIC LIMIT:	31.2
PLASTICITY INDEX:	33.8
% SAND AND GRAVEL:	23.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(28)

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.: 19

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: 53.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	34.35	19.95	309.90	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.27	17.92	245.20	
WT. OF WATER LOST:	5.08	2.03	64.70	POST-IGNITION
WT. OF BOTTLE:	18.81	12.70	87.60	DISH & SOIL:
WT. OF DRY SOIL:	10.46	5.22	157.60	
PERCENT OF WATER:	48.60	38.90	41.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	48.6			LOSS %:

WT PASSING #10 SIEVE: 157

WT. OF TOTAL SAMPLE: 157.6 WT. OF WASH SAMPLE: 50.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	1.0	1.0	0.6	99.4
#40	7.3	7.3	14.5	84.9
#200	24.1	16.8	33.3	51.6
PASS #200		26.0	51.6	

SUMMARY

LIQUID LIMIT:	48.6
PLASTIC LIMIT:	38.9
PLASTICITY INDEX:	9.7
% SAND AND GRAVEL:	48.4
% SILT:	
% CLAY:	
CLASSIFICATION:	A-5(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.: 20

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: 58.0

Elevation: Source: BRG2B-13

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: 11/10/2009

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:	33.90	23.74	312.30	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.89	21.66	251.56	
WT. OF WATER LOST:	4.01	2.08	60.74	POST-IGNITION
WT. OF BOTTLE:	21.04	16.54	87.63	DISH & SOIL:
WT. OF DRY SOIL:	8.85	5.12	163.93	
PERCENT OF WATER:	45.30	40.60	37.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	45.3			LOSS %:

WT PASSING #10 SIEVE: 136

WT. OF TOTAL SAMPLE: 163.9 WT. OF WASH SAMPLE: 53.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	2.8	2.8	1.7	98.3
#4	9.3	6.5	4.0	94.3
#10	27.9	18.6	11.3	83.0
#40	17.1	17.1	26.7	56.3
#200	35.5	18.4	28.8	27.5
PASS #200		17.6	27.5	

SUMMARY

LIQUID LIMIT:	45.3
PLASTIC LIMIT:	40.6
PLASTICITY INDEX:	4.7
% SAND AND GRAVEL:	72.5
% 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.:** BRG2B-13

Contract: 25-106-02

Boring Location: Sta. 49+22.43, 30' Lt. Ramp 5

Boring Surface Elev.: 207.75 **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:** 33.0'

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

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
9/1/2009				13.1'	194.7
					207.8
					207.8
					207.8

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring: 59.5 **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:** 5.0 **Ft.**

Boring Contractor: Walton Corporation

Driller: Billy Holden

Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1	0.0' – 2.0'	6 5 8 8	Moist stiff brown clayey silt w/some fine to coarse sand and gravel. 12" RECOVERY	A-4(3)	
		2	2.0' – 4.0'	5 4 4 6	No Sieve Analysis - Indication of moist firm brown sandy lean clay. 2" RECOVERY		
4.3		3	4.0' – 6.0'	4 2 4 10	Moist firm brown clay w/some fine sand, trace of coarse sand and gravel. 14" RECOVERY	A-6(7)	
		4	6.0' – 8.0'	8 16 17 15	Moist hard brown gravelly clay w/trace of fine to coarse sand. 18" RECOVERY	A-6(3)	Rock Fragments
8.6		5	8.0' – 10.0'	7 10 12 15	Moist very stiff brownish red clayey silt w/trace of gravel and fine to coarse sand. 22" RECOVERY	A-4(6)	
		6	10.0' – 12.0'	19 17 16 11	Moist hard brownish red clay w/some fine sand and gravel, trace of coarse sand. 20" RECOVERY	A-7-6(4)	
12.9	▽	7	12.0' – 14.0'	8 8 10 10	Moist very stiff brownish red clay w/some fine sand, trace of coarse sand and gravel. 21" RECOVERY	A-7-5(11)	
		8	14.0' – 16.0'	8 7 8 9	Moist stiff brownish gray clayey silt w/trace of gravel and fine to coarse sand. 20" RECOVERY	A-4(5)	
17.2		9	16.0' – 18.0'	17 13 16 19	Moist very stiff brownish gray clay w/trace of fine to coarse sand and gravel. 20" RECOVERY	A-6(11)	
		10	18.0' – 20.0'	7 8 9 16	Moist very stiff brownish gray clayey silt w/ trace of gravel and fine to coarse sand. 19" RECOVERY	A-4(6)	
21.5		11	20.0' – 22.0'	5 9 9 10	Moist very stiff brownish orange clay w/trace of fine to coarse sand and gravel. 19" RECOVERY	A-6(9)	
		12	22.0' – 24.0'	9 9 15 15	Wet very stiff brown clay w/trace of fine to coarse and gravel. 20" RECOVERY	A-6(9)	

Remarks: GTA Inspector - J. Lafferty

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.:** BRG2B-13
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		13	24.0'	6 9 8	Wet very stiff brown clay w/some fine to coarse sand, trace of gravel.	A-7-6(8)	
25.8			25.5'		17" RECOVERY		
		13A	25.5'	9		A-1-b	
		14	26.0'	12 10 15 16	Wet medium dense gray clayey coarse sand w/ trace of fine sand and gravel.	A-6(9)	
			26.0'		3" RECOVERY		
			28.0'		Wet very stiff grayish orange mottled clay w/ trace of fine to coarse sand and gravel.		
		15	29.0'	1 3 5 5	22" RECOVERY	A-6(12)	
30.1					Wet firm grayish brown mottled clay w/some fine sand, trace of coarse sand and gravel.		
			31.0'		18" RECOVERY		
		R-1	33.0'		No Sample Recovery		Cored through boulder then back into soil at bottom of run.
34.4							
			38.0'		0" RECOVERY		
38.7		16	38.0'	5 6 6	No Sieve Analysis - Indication of wet stiff orange lean clay w/sand.		
			39.5'		8" RECOVERY		
43							
		17	43.0'	5 3 3	No Sieve Analysis - Indication of wet firm orange lean clay w/sand.		
			44.5'		5" RECOVERY		
47.3							
		18	48.0'	2 4 5	Wet stiff orange clay w/some fine sand, trace of gravel and coarse sand.	A-7-5(28)	
			49.5'		17" RECOVERY		
51.6							
		19	53.0'	5 4 4	Wet firm brownish gray clayey fine sandy silt w/some coarse sand, trace of gravel.	A-5(4)	
			54.5'		8" RECOVERY		
55.9							
		20	58.0'	10 11 15	Wet medium dense brownish red fine to coarse sand w/some clay and gravel.	A-2-5(0)	
			59.5'		9" RECOVERY		
60.2					End of Boring		
64.5							

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Poorly graded, silty or clayey sands and gravel
	Well graded gravels and sands
	Silty low plasticity clay
	Silty sand
	Frac rock
	High plasticity clay
Misc. Symbols	
	Water table during drilling

Notes:

1. Exploratory borings were drilled on 9-1-2009 using a 3 1/4 - inch diameter hollow stem auger. Rig is a SKID RIG CME 45.

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: BRG2B-14

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: 11/10/2009

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	21.43	424.90	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	34.81	20.13	385.85	
WT. OF WATER LOST:	2.99	1.30	39.05	POST-IGNITION
WT. OF BOTTLE:	22.10	13.08	89.39	DISH & SOIL:
WT. OF DRY SOIL:	12.71	7.05	296.46	
PERCENT OF WATER:	23.50	18.40	13.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	23.5			LOSS %:

WT PASSING #10 SIEVE: 223

WT. OF TOTAL SAMPLE: 296.5 WT. OF WASH SAMPLE: 107.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	15.3	15.3	5.2	94.8
#4	34.2	18.9	6.4	88.5
#10	73.5	39.3	13.3	75.2
#40	23.6	23.6	16.4	58.8
#200	59.0	35.4	24.7	34.1
PASS #200		48.9	34.1	

SUMMARY

LIQUID LIMIT:	23.5
PLASTIC LIMIT:	18.4
PLASTICITY INDEX:	5.1
% SAND AND GRAVEL:	65.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-2-4(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.: 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: BRG2B-14

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: 11/10/2009

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:	35.13	21.06	721.10	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.50	19.58	596.33	
WT. OF WATER LOST:	3.63	1.48	124.77	POST-IGNITION
WT. OF BOTTLE:	22.25	13.25	89.18	DISH & SOIL:
WT. OF DRY SOIL:	9.25	6.33	507.15	
PERCENT OF WATER:	39.20	23.40	24.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	39.2			LOSS %:

WT PASSING #10 SIEVE: 451

WT. OF TOTAL SAMPLE: 507.1 WT. OF WASH SAMPLE: 113.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	10.4	10.4	2.1	97.9
#4	18.8	8.4	1.7	96.3
#10	56.3	37.5	7.4	88.9
#40	8.6	8.6	6.8	82.1
#200	22.0	13.4	10.5	71.6
PASS #200		91.0	71.6	

SUMMARY

LIQUID LIMIT:	39.2
PLASTIC LIMIT:	23.4
PLASTICITY INDEX:	15.8
% SAND AND GRAVEL:	28.4
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(11)

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: 6.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	30.33	21.55	592.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	27.58	20.01	510.14	
WT. OF WATER LOST:	2.75	1.54	82.06	POST-IGNITION
WT. OF BOTTLE:	19.43	13.11	87.58	DISH & SOIL:
WT. OF DRY SOIL:	8.15	6.90	422.56	
PERCENT OF WATER:	33.70	22.30	19.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	33.7			LOSS %:

WT PASSING #10 SIEVE: 367

WT. OF TOTAL SAMPLE: 422.6 WT. OF WASH SAMPLE: 104.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	2.4	2.4	0.6	99.4
#4	6.7	4.3	1.0	98.4
#10	55.8	49.1	11.6	86.8
#40	3.4	3.4	2.8	84.0
#200	10.3	6.9	5.7	78.2
PASS #200		94.0	78.2	

SUMMARY

LIQUID LIMIT:	33.7
PLASTIC LIMIT:	22.3
PLASTICITY INDEX:	11.4
% SAND AND GRAVEL:	21.8
% 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.: 4A

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: 7.0

Elevation: _____ Source: BRG2B-14

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: 11/10/2009

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:	32.75	20.48	405.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.27	18.89	331.36	
WT. OF WATER LOST:	3.48	1.59	74.44	POST-IGNITION
WT. OF BOTTLE:	19.36	12.59	87.40	DISH & SOIL:
WT. OF DRY SOIL:	9.91	6.30	243.96	
PERCENT OF WATER:	35.10	25.20	30.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	35.1			LOSS %: _____

WT PASSING #10 SIEVE: 240

WT. OF TOTAL SAMPLE: 244.0 WT. OF WASH SAMPLE: 100.2

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	4.1	4.1	1.7	98.3
#40	2.7	2.7	2.6	95.7
#200	8.8	6.1	6.0	89.7
PASS #200		91.4	89.7	

SUMMARY

LIQUID LIMIT:	35.1
PLASTIC LIMIT:	25.2
PLASTICITY INDEX:	9.9
% SAND AND GRAVEL:	10.3
% SILT:	
% CLAY:	
CLASSIFICATION:	A-4(10)

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: 8.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	23.82	21.12	673.90	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	21.00	20.07	558.23	
WT. OF WATER LOST:	2.82	1.05	115.67	POST-IGNITION
WT. OF BOTTLE:	13.23	15.08	75.56	DISH & SOIL:
WT. OF DRY SOIL:	7.77	4.99	482.67	
PERCENT OF WATER:	36.30	21.00	24.00	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	36.3			LOSS %:

WT PASSING #10 SIEVE: 474

WT. OF TOTAL SAMPLE: 482.7 WT. OF WASH SAMPLE: 110.7

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	1.6	1.6	0.3	99.7
#10	8.4	6.8	1.4	98.3
#40	3.5	3.5	3.1	95.2
#200	10.5	7.0	6.2	88.9
PASS #200		100.2	88.9	

SUMMARY

LIQUID LIMIT:	36.3
PLASTIC LIMIT:	21.0
PLASTICITY INDEX:	15.3
% SAND AND GRAVEL:	11.1
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(13)

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: 10.0

Elevation: _____ Source: BRG2B-14

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: 11/10/2009

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:	35.27	26.64	436.10	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.63	24.86	368.45	
WT. OF WATER LOST:	4.64	1.78	67.65	POST-IGNITION
WT. OF BOTTLE:	19.10	15.48	79.08	DISH & SOIL:
WT. OF DRY SOIL:	11.53	9.38	289.37	
PERCENT OF WATER:	40.20	19.00	23.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	40.2			LOSS %: _____

WT PASSING #10 SIEVE: 288

WT. OF TOTAL SAMPLE: 289.4 WT. OF WASH SAMPLE: 100.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	1.0	1.0	0.3	99.7
#40	2.6	2.6	2.6	97.1
#200	8.9	6.3	6.2	90.9
PASS #200		92.0	90.9	

SUMMARY

LIQUID LIMIT:	40.2
PLASTIC LIMIT:	19.0
PLASTICITY INDEX:	21.2
% SAND AND GRAVEL:	9.1
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(20)

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: 12.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	39.47	34.29	788.70	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	35.22	32.41	659.24	
WT. OF WATER LOST:	4.25	1.88	129.46	POST-IGNITION
WT. OF BOTTLE:	21.56	22.88	87.57	DISH & SOIL:
WT. OF DRY SOIL:	13.66	9.53	571.67	
PERCENT OF WATER:	31.10	19.70	22.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	31.1			LOSS %:

WT PASSING #10 SIEVE: 526

WT. OF TOTAL SAMPLE: 571.7 WT. OF WASH SAMPLE: 110.8

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	9.4	9.4	1.6	98.4
#10	45.6	36.2	6.3	92.0
#40	13.0	13.0	10.8	81.2
#200	32.4	19.4	16.1	65.1
PASS #200		78.4	65.1	

SUMMARY

LIQUID LIMIT:	31.1
PLASTIC LIMIT:	19.7
PLASTICITY INDEX:	11.4
% SAND AND GRAVEL:	34.9
% 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.: 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: 14.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	40.36	30.06	715.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	33.83	28.42	579.35	
WT. OF WATER LOST:	6.53	1.64	135.85	POST-IGNITION
WT. OF BOTTLE:	22.68	22.19	86.56	DISH & SOIL:
WT. OF DRY SOIL:	11.15	6.23	492.79	
PERCENT OF WATER:	58.60	26.30	27.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	58.6			LOSS %:

WT PASSING #10 SIEVE: 355

WT. OF TOTAL SAMPLE: 492.8 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"	19.9	19.9	4.0	96.0
#4	53.9	34.0	6.9	89.1
#10	137.3	83.4	16.9	72.1
#40	14.2	14.2	10.0	62.1
#200	29.1	14.9	10.5	51.6
PASS #200		73.1	51.6	

SUMMARY

LIQUID LIMIT:	58.6
PLASTIC LIMIT:	26.3
PLASTICITY INDEX:	32.3
% SAND AND GRAVEL:	48.4
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-6(14)

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: 16.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	28.83	28.85	665.70	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	25.04	27.34	541.55	
WT. OF WATER LOST:	3.79	1.51	124.15	POST-IGNITION
WT. OF BOTTLE:	18.87	22.29	88.31	DISH & SOIL:
WT. OF DRY SOIL:	6.17	5.05	453.24	
PERCENT OF WATER:	61.40	29.90	27.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	61.4			LOSS %:

WT PASSING #10 SIEVE: 254

WT. OF TOTAL SAMPLE: 453.2 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"	45.0	45.0	9.9	90.1
#4	106.1	61.1	13.5	76.6
#10	198.9	92.8	20.5	56.1
#40	17.6	17.6	9.1	47.0
#200	31.3	13.7	7.1	39.9
PASS #200		77.0	39.9	

SUMMARY

LIQUID LIMIT:	61.4
PLASTIC LIMIT:	29.9
PLASTICITY INDEX:	31.5
% SAND AND GRAVEL:	60.1
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(7)

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: 18.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	33.09	23.87	627.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	27.78	22.58	439.33	
WT. OF WATER LOST:	5.31	1.29	187.67	POST-IGNITION
WT. OF BOTTLE:	22.27	19.39	77.61	DISH & SOIL:
WT. OF DRY SOIL:	5.51	3.19	361.72	
PERCENT OF WATER:	96.40	40.40	51.90	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	96.4			LOSS %:

WT PASSING #10 SIEVE: 312

WT. OF TOTAL SAMPLE: 361.7 WT. OF WASH SAMPLE: 101.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	1.6	1.6	0.4	99.6
#4	27.3	25.7	7.1	92.5
#10	50.0	22.7	6.3	86.2
#40	7.9	7.9	6.7	79.4
#200	16.8	8.9	7.6	71.8
PASS #200		84.2	71.8	

SUMMARY

LIQUID LIMIT:	96.4
PLASTIC LIMIT:	40.4
PLASTICITY INDEX:	56.0
% SAND AND GRAVEL:	28.2
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(44)

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: 24.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	32.61	17.96	632.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	27.50	16.43	429.60	
WT. OF WATER LOST:	5.11	1.53	203.20	POST-IGNITION
WT. OF BOTTLE:	20.66	12.63	78.14	DISH & SOIL:
WT. OF DRY SOIL:	6.84	3.80	351.46	
PERCENT OF WATER:	74.70	40.30	57.80	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	74.7			LOSS %:

WT PASSING #10 SIEVE: 323

WT. OF TOTAL SAMPLE: 351.5 WT. OF WASH SAMPLE: 106.7

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	1.2	1.2	0.3	99.7
#4	6.9	5.7	1.6	98.0
#10	28.6	21.7	6.2	91.9
#40	10.0	10.0	8.6	83.3
#200	28.2	18.2	15.7	67.6
PASS #200		78.5	67.6	

SUMMARY

LIQUID LIMIT:	74.7
PLASTIC LIMIT:	40.3
PLASTICITY INDEX:	34.4
% SAND AND GRAVEL:	32.4
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(26)

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.: 12

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: 29.0

Elevation: _____ Source: BRG2B-14

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: 11/10/2009

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:	39.37	27.44	709.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.86	25.95	484.35	
WT. OF WATER LOST:	7.51	1.49	225.45	POST-IGNITION
WT. OF BOTTLE:	21.89	22.14	86.06	DISH & SOIL:
WT. OF DRY SOIL:	9.97	3.81	398.29	
PERCENT OF WATER:	75.30	39.10	56.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	75.3			LOSS %: _____

WT PASSING #10 SIEVE: 377

WT. OF TOTAL SAMPLE: 398.3 WT. OF WASH SAMPLE: 106.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	2.1	2.1	0.5	99.5
#10	20.9	18.8	4.7	94.8
#40	17.3	17.3	15.5	79.3
#200	31.1	13.8	12.3	67.0
PASS #200		74.9	67.0	

SUMMARY

LIQUID LIMIT:	75.3
PLASTIC LIMIT:	39.1
PLASTICITY INDEX:	36.2
% SAND AND GRAVEL:	33.0
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(26)

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.: 13

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: 34.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	30.20	18.97	644.50	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	25.60	17.29	444.88	
WT. OF WATER LOST:	4.60	1.68	199.62	POST-IGNITION
WT. OF BOTTLE:	18.78	12.73	78.16	DISH & SOIL:
WT. OF DRY SOIL:	6.82	4.56	366.72	
PERCENT OF WATER:	67.40	36.80	54.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	67.4			LOSS %:

WT PASSING #10 SIEVE: 347

WT. OF TOTAL SAMPLE: 366.7 WT. OF WASH SAMPLE: 108.7

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	2.3	2.3	0.6	99.4
#10	19.7	17.4	4.7	94.6
#40	11.2	11.2	9.8	84.9
#200	42.3	31.1	27.1	57.8
PASS #200		66.4	57.8	

SUMMARY

LIQUID LIMIT:	67.4
PLASTIC LIMIT:	36.8
PLASTICITY INDEX:	30.6
% SAND AND GRAVEL:	42.2
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(16)

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.: 14

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: 39.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	35.10	17.58	662.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.21	16.29	445.89	
WT. OF WATER LOST:	4.89	1.29	216.31	POST-IGNITION
WT. OF BOTTLE:	19.56	12.95	84.96	DISH & SOIL:
WT. OF DRY SOIL:	10.65	3.34	360.93	
PERCENT OF WATER:	45.90	38.60	59.90	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	45.9			LOSS %:

WT PASSING #10 SIEVE: 333

WT. OF TOTAL SAMPLE: 360.9 WT. OF WASH SAMPLE: 100.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	2.5	2.5	0.7	99.3
#10	27.7	25.2	7.0	92.3
#40	15.5	15.5	14.3	78.1
#200	37.8	22.3	20.5	57.6
PASS #200		62.6	57.6	

SUMMARY

LIQUID LIMIT:	45.9
PLASTIC LIMIT:	38.6
PLASTICITY INDEX:	7.3
% SAND AND GRAVEL:	42.4
% SILT:	
% CLAY:	
CLASSIFICATION:	A-5(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.: 15

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: 44.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	30.19	26.21	664.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	25.48	24.85	435.27	
WT. OF WATER LOST:	4.71	1.36	228.93	POST-IGNITION
WT. OF BOTTLE:	18.03	21.26	86.56	DISH & SOIL:
WT. OF DRY SOIL:	7.45	3.59	348.71	
PERCENT OF WATER:	63.20	37.90	65.70	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	63.2			LOSS %:

WT PASSING #10 SIEVE: 321

WT. OF TOTAL SAMPLE: 348.7 WT. OF WASH SAMPLE: 110.7

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	4.9	4.9	1.4	98.6
#10	27.6	22.7	6.5	92.1
#40	14.3	14.3	11.9	80.2
#200	35.1	20.8	17.3	62.9
PASS #200		75.6	62.9	

SUMMARY

LIQUID LIMIT:	63.2
PLASTIC LIMIT:	37.9
PLASTICITY INDEX:	25.3
% SAND AND GRAVEL:	37.1
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(16)

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.: 16

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: 49.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	32.42		638.60	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	28.59		453.22	
WT. OF WATER LOST:	3.83		185.38	POST-IGNITION
WT. OF BOTTLE:	20.85		76.50	DISH & SOIL:
WT. OF DRY SOIL:	7.74		376.72	
PERCENT OF WATER:	49.50		49.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	49.5			LOSS %:

WT PASSING #10 SIEVE: 356

WT. OF TOTAL SAMPLE: 376.7 WT. OF WASH SAMPLE: 107.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	1.0	1.0	0.3	99.7
#10	20.3	19.3	5.1	94.6
#40	28.1	28.1	24.7	69.9
#200	72.4	44.3	39.0	31.0
PASS #200		35.2	31.0	

SUMMARY

LIQUID LIMIT:	49.5
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	69.0
% 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

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 17

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: 54.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:	35.36		565.20	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.42		392.93	
WT. OF WATER LOST:	4.94		172.27	POST-IGNITION
WT. OF BOTTLE:	21.34		80.84	DISH & SOIL:
WT. OF DRY SOIL:	9.08		312.09	
PERCENT OF WATER:	54.40		55.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	54.4			LOSS %:

WT PASSING #10 SIEVE: 302

WT. OF TOTAL SAMPLE: 312.1 WT. OF WASH SAMPLE: 104.2

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	9.9	9.9	3.2	96.8
#40	10.7	10.7	9.9	86.9
#200	55.7	45.0	41.8	45.1
PASS #200		48.5	45.1	

SUMMARY

LIQUID LIMIT:	54.4
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	54.9
% 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

MATERIALS AND RESEARCH LABORATORY

SOIL ANALYSIS REPORT

TEST NO.: 18

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: 58.0

Elevation: Source: BRG2B-14

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: 11/10/2009

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:			180.50	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			170.01	
WT. OF WATER LOST:			10.49	POST-IGNITION
WT. OF BOTTLE:			86.10	DISH & SOIL:
WT. OF DRY SOIL:			83.91	
PERCENT OF WATER:			12.50	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:	NV			LOSS %:

WT PASSING #10 SIEVE: 36

WT. OF TOTAL SAMPLE: 83.9 WT. OF WASH SAMPLE: 34.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	14.0	14.0	16.7	83.3
#4	29.8	15.8	18.8	64.5
#10	48.2	18.4	21.9	42.6
#40	16.3	16.3	20.0	22.5
#200	28.2	11.9	14.6	7.9
PASS #200		6.4	7.9	

SUMMARY

LIQUID LIMIT:	NV
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	92.1
% SILT:	
% CLAY:	
CLASSIFICATION:	A-1-a

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.:** BRG2B-14

Contract: 25-106-02

Boring Location: Sta. 49+19.22, Rt. Ramp 5

Boring Surface Elev.: 195.51 **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:** 58.0'

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

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
8/27/2009				18.3'	177.2
					195.5
					195.5
					195.5

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring:	58.1	**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:**		**Ft.**

Boring Contractor: Walton Corporation
Driller: Billy Holden
Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1	0.5'	6 12 21	Moist dense brown fine sand and gravel w/some clay and coarse sand.	A-2-4(0)	Topsoil - 7".
			2.0'		10" RECOVERY		
2.43		2	2.0'	48 21 17 14	No Sample Recovery		
			4.0'		0" RECOVERY		
		3	4.0'	3 4 8 7	Moist stiff reddish brown mottled clay w/some gravel, trace of fine to coarse sand.	A-6(11)	
4.86			6.0'		15" RECOVERY		
		4	6.0'	11 13	Moist very stiff reddish brown mottled clay w/ some gravel, trace of fine to coarse sand.	A-6(9)	
			7.0'		10" RECOVERY		
7.29		4A	7.0'	14 10	Wet very stiff gray clayey silt w/trace of fine to coarse sand and gravel.	A-4(10)	
			8.0'		10" RECOVERY		
		5	8.0'	4 5 7 8	Wet stiff grayish orange mottled clay w/trace of fine to coarse sand and gravel.	A-6(13)	
9.72			10.0'		22" RECOVERY		
		6	10.0'	7 11 10 10	Wet very stiff grayish orange mottled clay w/ trace of fine to coarse sand.	A-6(20)	
12.15			12.0'		14" RECOVERY		
		7	12.0'	6 9 7 9	Wet very stiff grayish orange slightly mottled clay w/some fine to coarse sand, trace of gravel.	A-6(5)	
			14.0'		18" RECOVERY		

Remarks: GTA Inspector - J. Lafferty

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.:** BRG2B-14
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
14.58		8	14.0'	3 4 5 5	Wet stiff orange gravelly clay w/trace of fine to coarse sand.	A-7-6(14)	
			16.0'		22" RECOVERY		
17.01		9	16.0'	4 6 5 7	Wet stiff orange gravelly clay w/trace of coarse to fine sand.	A-7-5(7)	
			18.0'		19" RECOVERY		
19.44	▽	10	18.0'	3 4 5 7	Wet stiff orange clay w/some gravel, trace of fine to coarse sand.	A-7-5(44)	
			20.0'		18" RECOVERY		
21.87							
24.3		11	24.0'	2 4 8 9	Wet stiff orange clay w/some fine sand, trace of coarse sand and gravel.	A-7-5(26)	
			26.0'		19" RECOVERY		
26.73							
29.16		12	29.0'	4 5 9 11	Wet stiff orange clay w/some coarse to fine sand, trace of gravel.	A-7-5(26)	
			31.0'		22" RECOVERY		
31.59							
34.02		13	34.0'	5 6 6 8	Wet stiff white fine sandy clay w/trace of coarse sand and gravel.	A-7-5(16)	
			36.0'		20" RECOVERY		
36.45							

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

Boring No.: BRG2B-14

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
38.88							
		14	39.0'	6 6 7 7	Wet stiff orange and white clayey silt w/some fine to coarse sand, trace of gravel.	A-5(4)	
			41.0'		23" RECOVERY		
41.31							
43.74							
		15	44.0'	7 9 9 11	Wet very stiff black and white clay w/some fine to coarse sand, trace of gravel.	A-7-5(16)	
			46.0'		23" RECOVERY		
46.17							
48.6							
		16	49.0'	9 14 15 17	Wet medium dense brown silty fine to coarse sand w/trace of gravel.	A-2-5(0)	
51.03			51.0'		21" RECOVERY		
53.46							
		17	54.0'	11 14 20 16	Wet hard brown fine sandy silt w/trace of coarse sand and gravel.	A-5(0)	
55.89			56.0'		22" RECOVERY		
58.32		18	58.0'	50/1"	Wet very dense gray gravel and coarse sand w/ some fine sand, trace of silt.	A-1-a	Crushed Rock Fragments
			58.1'		1" RECOVERY		
					End of Boring		

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Poorly graded clayey silty sand
	Poorly graded, silty or clayey sands and gravel
	Well graded gravels and sands
	High plasticity clay
	Clayey sand
	Elastic silt
	Silty sand
	Well graded sand with silt
Misc. Symbols	
	Water table during drilling

Notes:

1. Exploratory borings were drilled on 8-27-2009 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: 1.0

Elevation: _____ Source: BRG2B-15

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: 11/10/2009

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:	31.48	19.78	350.39	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.06	18.62	318.27	
WT. OF WATER LOST:	2.42	1.16	32.12	POST-IGNITION
WT. OF BOTTLE:	21.72	12.99	84.44	DISH & SOIL:
WT. OF DRY SOIL:	7.34	5.63	233.83	
PERCENT OF WATER:	33.00	20.60	13.70	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	33.0			LOSS %:

WT PASSING SIEVE:

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

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

SUMMARY

LIQUID LIMIT:	33.0
PLASTIC LIMIT:	20.6
PLASTICITY INDEX:	12.4
% 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.: 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: BRG2B-15

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: 11/10/2009

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:	35.60	25.95	509.85	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.27	24.62	425.15	
WT. OF WATER LOST:	3.33	1.33	84.70	POST-IGNITION
WT. OF BOTTLE:	22.10	18.80	78.36	DISH & SOIL:
WT. OF DRY SOIL:	10.17	5.82	346.79	
PERCENT OF WATER:	32.70	22.90	24.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	32.7			LOSS %:

WT PASSING #10 SIEVE: 304

WT. OF TOTAL SAMPLE: 346.8 WT. OF WASH SAMPLE: 101.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	5.3	5.3	1.5	98.5
#4	9.7	4.4	1.3	97.2
#10	43.1	33.4	9.6	87.6
#40	21.9	21.9	19.0	68.6
#200	46.3	24.4	21.1	47.5
PASS #200		54.8	47.5	

SUMMARY

LIQUID LIMIT:	32.7
PLASTIC LIMIT:	22.9
PLASTICITY INDEX:	9.8
% SAND AND GRAVEL:	52.5
% 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.: 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: BRG2B-15

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: 11/10/2009

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:	31.42	30.51	225.37	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	28.38	29.05	199.64	
WT. OF WATER LOST:	3.04	1.46	25.73	POST-IGNITION
WT. OF BOTTLE:	19.37	22.38	77.90	DISH & SOIL:
WT. OF DRY SOIL:	9.01	6.67	121.74	
PERCENT OF WATER:	33.70	21.90	21.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	33.7			LOSS %:

WT PASSING #10 SIEVE: 122

WT. OF TOTAL SAMPLE: 121.7 WT. OF WASH SAMPLE: 50.5

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#10	0.0	0.0	0.0	100.0
#40	2.3	2.3	4.6	95.4
#200	4.5	2.2	4.4	91.1
PASS #200		46.0	91.1	

SUMMARY

LIQUID LIMIT:	33.7
PLASTIC LIMIT:	21.9
PLASTICITY INDEX:	11.8
% SAND AND GRAVEL:	8.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(11)

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: 6.0

Elevation: _____ Source: BRG2B-15

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: 11/10/2009

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:	31.99	23.27	157.93	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.12	22.00	144.01	
WT. OF WATER LOST:	2.87	1.27	13.92	POST-IGNITION
WT. OF BOTTLE:	21.91	15.45	78.30	DISH & SOIL:
WT. OF DRY SOIL:	7.21	6.55	65.71	
PERCENT OF WATER:	39.80	19.40	21.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	39.8			LOSS %: _____

WT PASSING SIEVE:

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

SUMMARY

LIQUID LIMIT:	39.8
PLASTIC LIMIT:	19.4
PLASTICITY INDEX:	20.4
% 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: 8.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:	33.77	23.42	476.54	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.96	22.07	411.94	
WT. OF WATER LOST:	2.81	1.35	64.60	POST-IGNITION
WT. OF BOTTLE:	22.29	15.12	86.22	DISH & SOIL:
WT. OF DRY SOIL:	8.67	6.95	325.72	
PERCENT OF WATER:	32.40	19.40	19.80	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	32.4			LOSS %:

WT PASSING #10 SIEVE: 274

WT. OF TOTAL SAMPLE: 325.7 WT. OF WASH SAMPLE: 100.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	11.5	11.5	3.5	96.5
#4	19.5	8.0	2.5	94.0
#10	51.9	32.4	9.9	84.1
#40	6.4	6.4	5.4	78.7
#200	15.2	8.8	7.4	71.3
PASS #200		85.2	71.3	

SUMMARY

LIQUID LIMIT:	32.4
PLASTIC LIMIT:	19.4
PLASTICITY INDEX:	13.0
% SAND AND GRAVEL:	28.7
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(7)

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: 10.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:	34.95	23.64	369.92	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.28	22.39	339.90	
WT. OF WATER LOST:	2.67	1.25	30.02	POST-IGNITION
WT. OF BOTTLE:	21.85	15.46	78.01	DISH & SOIL:
WT. OF DRY SOIL:	10.43	6.93	261.89	
PERCENT OF WATER:	25.60	18.00	11.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	25.6			LOSS %:

WT PASSING #10 SIEVE: 159

WT. OF TOTAL SAMPLE: 261.9 WT. OF WASH SAMPLE: 50.2

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	49.7	49.7	19.0	81.0
#4	64.7	15.0	5.7	75.3
#10	102.9	38.2	14.6	60.7
#40	19.1	19.1	23.1	37.6
#200	31.2	12.1	14.6	23.0
PASS #200		19.0	23.0	

SUMMARY

LIQUID LIMIT:	25.6
PLASTIC LIMIT:	18.0
PLASTICITY INDEX:	7.6
% SAND AND GRAVEL:	77.0
% SILT:	
% CLAY:	
CLASSIFICATION:	A-2-4(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: 12.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:	32.31	22.34	760.90	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	29.77	21.32	603.56	
WT. OF WATER LOST:	2.54	1.02	157.34	POST-IGNITION
WT. OF BOTTLE:	22.35	15.42	87.57	DISH & SOIL:
WT. OF DRY SOIL:	7.42	5.90	515.99	
PERCENT OF WATER:	34.20	17.30	30.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	34.2			LOSS %:

WT PASSING #10 SIEVE: 425

WT. OF TOTAL SAMPLE: 516.0 WT. OF WASH SAMPLE: 100.2

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	4.2	4.2	0.8	99.2
#4	25.9	21.7	4.2	95.0
#10	90.5	64.6	12.5	82.5
#40	10.9	10.9	9.0	73.5
#200	31.6	20.7	17.0	56.5
PASS #200		68.6	56.5	

SUMMARY

LIQUID LIMIT:	34.2
PLASTIC LIMIT:	17.3
PLASTICITY INDEX:	16.9
% SAND AND GRAVEL:	43.5
% SILT:	
% CLAY:	
CLASSIFICATION:	A-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.: 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: 14.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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	23.01	595.73	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.97	22.11	452.27	
WT. OF WATER LOST:	1.57	0.90	143.46	POST-IGNITION
WT. OF BOTTLE:	23.49	15.08	79.70	DISH & SOIL:
WT. OF DRY SOIL:	8.48	7.03	372.57	
PERCENT OF WATER:	18.50	12.80	38.50	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	18.5			LOSS %:

WT PASSING #10 SIEVE: 332

WT. OF TOTAL SAMPLE: 372.6 WT. OF WASH SAMPLE: 106.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	5.9	5.9	1.6	98.4
#10	40.4	34.5	9.3	89.2
#40	12.4	12.4	10.4	78.8
#200	35.0	22.6	18.9	59.9
PASS #200		71.6	59.9	

SUMMARY

LIQUID LIMIT:	18.5
PLASTIC LIMIT:	12.8
PLASTICITY INDEX:	5.7
% SAND AND GRAVEL:	40.1
% 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.: 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: 16.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:	27.62	21.91	664.17	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	25.38	21.09	486.34	
WT. OF WATER LOST:	2.24	0.82	177.83	POST-IGNITION
WT. OF BOTTLE:	18.88	16.54	97.48	DISH & SOIL:
WT. OF DRY SOIL:	6.50	4.55	388.86	
PERCENT OF WATER:	34.50	18.00	45.70	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	34.5			LOSS %:

WT PASSING #10 SIEVE: 356

WT. OF TOTAL SAMPLE: 388.9 WT. OF WASH SAMPLE: 107.4

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	2.4	2.4	0.6	99.4
#10	32.8	30.4	7.8	91.6
#40	0.8	0.8	0.7	90.9
#200	24.3	23.5	20.0	70.8
PASS #200		83.1	70.8	

SUMMARY

LIQUID LIMIT:	34.5
PLASTIC LIMIT:	18.0
PLASTICITY INDEX:	16.5
% SAND AND GRAVEL:	29.2
% 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.: 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: 18.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:	32.86	20.52	479.00	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.27	19.55	363.10	
WT. OF WATER LOST:	2.59	0.97	115.90	POST-IGNITION
WT. OF BOTTLE:	20.95	13.25	78.97	DISH & SOIL:
WT. OF DRY SOIL:	9.32	6.30	284.13	
PERCENT OF WATER:	27.80	15.40	40.80	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	27.8			LOSS %:

WT PASSING #10 SIEVE: 220

WT. OF TOTAL SAMPLE: 284.1 WT. OF WASH SAMPLE: 103.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	12.1	12.1	4.3	95.7
#4	19.8	7.7	2.7	93.0
#10	64.0	44.2	15.6	77.5
#40	12.1	12.1	9.1	68.4
#200	33.0	20.9	15.7	52.7
PASS #200		70.1	52.7	

SUMMARY

LIQUID LIMIT:	27.8
PLASTIC LIMIT:	15.4
PLASTICITY INDEX:	12.4
% SAND AND GRAVEL:	47.3
% SILT:	
% CLAY:	
CLASSIFICATION:	A-6(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.: 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: 23.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:	38.22	19.46	609.63	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	31.15	18.00	422.49	
WT. OF WATER LOST:	7.07	1.46	187.14	POST-IGNITION
WT. OF BOTTLE:	22.28	13.25	77.28	DISH & SOIL:
WT. OF DRY SOIL:	8.87	4.75	345.21	
PERCENT OF WATER:	79.70	30.70	54.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	79.7			LOSS %:

WT PASSING #10 SIEVE: 325

WT. OF TOTAL SAMPLE: 345.2 WT. OF WASH SAMPLE: 104.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	0.9	0.9	0.3	99.7
#10	20.0	19.1	5.5	94.2
#40	5.6	5.6	5.1	89.1
#200	27.0	21.4	19.3	69.8
PASS #200		77.3	69.8	

SUMMARY

LIQUID LIMIT:	79.7
PLASTIC LIMIT:	30.7
PLASTICITY INDEX:	49.0
% SAND AND GRAVEL:	30.2
% SILT:	
% CLAY:	
CLASSIFICATION:	A-7-5(35)

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.: 12

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: 28.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:	34.62	17.28	605.02	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	27.66	15.28	397.01	
WT. OF WATER LOST:	6.96	2.00	208.01	POST-IGNITION
WT. OF BOTTLE:	19.43	12.73	87.51	DISH & SOIL:
WT. OF DRY SOIL:	8.23	2.55	309.50	
PERCENT OF WATER:	84.60	78.40	67.20	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	84.6			LOSS %:

WT PASSING #10 SIEVE: 272

WT. OF TOTAL SAMPLE: 309.5 WT. OF WASH SAMPLE: 101.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
3/8"	0.0	0.0	0.0	100.0
#4	5.0	5.0	1.6	98.4
#10	37.1	32.1	10.4	88.0
#40	4.1	4.1	3.6	84.4
#200	18.3	14.2	12.4	72.1
PASS #200		82.7	72.1	

SUMMARY

LIQUID LIMIT:	84.6
PLASTIC LIMIT:	78.4
PLASTICITY INDEX:	6.2
% SAND AND GRAVEL:	27.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-5(14)

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.: 13

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: 33.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:	40.62		585.81	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	34.22		396.65	
WT. OF WATER LOST:	6.40		189.16	POST-IGNITION
WT. OF BOTTLE:	22.67		87.11	DISH & SOIL:
WT. OF DRY SOIL:	11.55		309.54	
PERCENT OF WATER:	55.40		61.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	55.4			LOSS %:

WT PASSING #10 SIEVE: 307

WT. OF TOTAL SAMPLE: 309.5 WT. OF WASH SAMPLE: 107.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	2.4	2.4	0.8	99.2
#40	4.7	4.7	4.3	94.9
#200	44.2	39.5	36.3	58.6
PASS #200		63.7	58.6	

SUMMARY

LIQUID LIMIT:	55.4
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	41.4
% SILT:	
% CLAY:	
CLASSIFICATION:	A-5(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.: 14

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: 38.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:			439.33	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			300.03	
WT. OF WATER LOST:			139.30	POST-IGNITION
WT. OF BOTTLE:			76.49	DISH & SOIL:
WT. OF DRY SOIL:			223.54	
PERCENT OF WATER:			62.30	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:	NV			LOSS %:

WT PASSING #10 SIEVE: 222

WT. OF TOTAL SAMPLE: 223.5 WT. OF WASH SAMPLE: 102.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	1.8	1.8	0.8	99.2
#40	11.8	11.8	11.4	87.8
#200	66.8	55.0	53.0	34.8
PASS #200		36.1	34.8	

SUMMARY

LIQUID LIMIT:	NV
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	65.2
% SILT:	
% CLAY:	
CLASSIFICATION:	A-2-4(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.: 14A

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: 39.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:	33.24	19.32	271.17	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.73	18.44	202.86	
WT. OF WATER LOST:	2.51	0.88	68.31	POST-IGNITION
WT. OF BOTTLE:	20.66	12.89	78.95	DISH & SOIL:
WT. OF DRY SOIL:	10.07	5.55	123.91	
PERCENT OF WATER:	24.90	15.90	55.10	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	24.9			LOSS %:

WT PASSING #10 SIEVE: 123

WT. OF TOTAL SAMPLE: 123.9 WT. OF WASH SAMPLE: 51.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	1.0	1.0	0.8	99.2
#40	6.0	6.0	11.6	87.5
#200	20.9	14.9	28.9	58.6
PASS #200		30.2	58.6	

SUMMARY

LIQUID LIMIT:	24.9
PLASTIC LIMIT:	15.9
PLASTICITY INDEX:	9.0
% SAND AND GRAVEL:	41.4
% 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.: 15

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: 43.0

Elevation: _____ Source: BRG2B-15

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: 11/10/2009

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:	38.01		588.27	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	36.51		397.46	
WT. OF WATER LOST:	1.50		190.81	POST-IGNITION
WT. OF BOTTLE:	21.55		86.90	DISH & SOIL:
WT. OF DRY SOIL:	14.96		310.56	
PERCENT OF WATER:	10.00		61.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	10.0			LOSS %: _____

WT PASSING #10 SIEVE: 297

WT. OF TOTAL SAMPLE: 310.6 WT. OF WASH SAMPLE: 101.1

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
#4	0.0	0.0	0.0	100.0
#10	13.2	13.2	4.3	95.7
#40	18.7	18.7	17.7	78.0
#200	59.2	40.5	38.4	39.7
PASS #200		41.9	39.7	

SUMMARY

LIQUID LIMIT:	10.0
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	60.3
% 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.: 16

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: 48.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:	22.04	34.87	643.63	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	20.98	33.22	461.53	
WT. OF WATER LOST:	1.06	1.65	182.10	POST-IGNITION
WT. OF BOTTLE:	15.47	19.09	87.11	DISH & SOIL:
WT. OF DRY SOIL:	5.51	14.13	374.42	
PERCENT OF WATER:	19.20	11.70	48.60	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	19.2			LOSS %:

WT PASSING #10 SIEVE: 303

WT. OF TOTAL SAMPLE: 374.4 WT. OF WASH SAMPLE: 104.9

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	18.9	18.9	5.0	95.0
#4	34.7	15.8	4.2	90.7
#10	71.0	36.3	9.7	81.0
#40	28.1	28.1	21.7	59.3
#200	68.9	40.8	31.5	27.8
PASS #200		36.0	27.8	

SUMMARY

LIQUID LIMIT:	19.2
PLASTIC LIMIT:	11.7
PLASTICITY INDEX:	7.5
% SAND AND GRAVEL:	72.2
% SILT:	
% CLAY:	
CLASSIFICATION:	A-2-4(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.: 17

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: 53.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:			688.93	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			536.47	
WT. OF WATER LOST:			152.46	POST-IGNITION
WT. OF BOTTLE:			77.86	DISH & SOIL:
WT. OF DRY SOIL:			458.61	
PERCENT OF WATER:			33.20	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:	NV			LOSS %:

WT PASSING #10 SIEVE: 312

WT. OF TOTAL SAMPLE: 458.6 WT. OF WASH SAMPLE: 106.0

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	76.0	76.0	16.6	83.4
#4	97.0	21.0	4.6	78.8
#10	147.0	50.0	10.9	67.9
#40	26.9	26.9	17.2	50.7
#200	74.6	47.7	30.6	20.1
PASS #200		31.4	20.1	

SUMMARY

LIQUID LIMIT:	NV
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	79.9
% SILT:	
% CLAY:	
CLASSIFICATION:	A-2-4(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.: 18

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: 58.0

Elevation: Source: BRG2B-15

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: 11/10/2009

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:			566.43	DISH & SOIL:
WT. DRY SOIL & BOTTLE:			459.62	
WT. OF WATER LOST:			106.81	POST-IGNITION
WT. OF BOTTLE:			75.05	DISH & SOIL:
WT. OF DRY SOIL:			384.57	
PERCENT OF WATER:			27.80	DISH:
BLOWS REQUIRED FOR CLOSURE:				
CORRECTED LIQUID LIMIT %:	NV			LOSS %:

WT PASSING #10 SIEVE: 275

WT. OF TOTAL SAMPLE: 384.6 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"	12.5	12.5	3.3	96.7
#4	36.6	24.1	6.3	90.5
#10	109.1	72.5	18.9	71.6
#40	39.5	39.5	25.8	45.8
#200	76.7	37.2	24.3	21.5
PASS #200		33.0	21.5	

SUMMARY

LIQUID LIMIT:	NV
PLASTIC LIMIT:	NP
PLASTICITY INDEX:	NP
% SAND AND GRAVEL:	78.5
% 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.:** BRG2B-15

Contract: 25-106-02

Boring Location: Sta. 49+40.52, 30' Rt. Ramp 5

Boring Surface Elev.: 192.35 **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:** 58.0'

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

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
9/2/2009				Dry	
					192.4
					192.4
					192.4

Pay Quantities:

2 1/2 in. Dia. Dry Sample Boring:	60.0	**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:**		**Ft.**

Boring Contractor: Walton Corporation
Driller: Billy Holden
Helpers:

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		1	1.0'	12 23	No Sieve Analysis - Indication of moist hard brown sandy lean clay.		Topsoil - 10".
			2.0'		6" RECOVERY		Piece of gravel in tip of spoon.
2.7		2	2.0'	5 7 9 10	Moist very stiff brown clayey fine sandy silt w/ some coarse sand and gravel.	A-4(2)	
			4.0'		17" RECOVERY		
5.4		3	4.0'	20 14 13 20	Moist very stiff grayish brown clay w/trace of coarse to fine sand.	A-6(11)	
			6.0'		5" RECOVERY		
		4	6.0'	20 12 15 13	No Sieve Analysis - Indication of moist very stiff grayish brown lean clay w/sand.		Piece of gravel in tip of spoon.
8.1			8.0'		3" RECOVERY		
		5	8.0'	5 12 14 30	Moist very stiff gray clay w/some gravel, trace of fine to coarse sand.	A-6(7)	
			10.0'		10" RECOVERY		
10.8		6	10.0'	14 50/3"	Moist very dense brown clayey gravel and coarse sand w/some fine sand.	A-2-4(0)	
			12.0'		6" RECOVERY		
13.5		7	12.0'	W/H 1 3 5	Wet soft orange clay w/some fine sand and gravel, trace of coarse sand.	A-6(6)	
			14.0'		20" RECOVERY		
		8	14.0'	3 4 6 5	Wet stiff orange clayey silt w/some fine sand and gravel, trace of coarse sand.	A-4(0)	
			16.0'		20" RECOVERY		

Remarks: GTA Inspector - J. Lafferty

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.:** BRG2B-15
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
		9	16.0'	6 8 7 7	Wet stiff orange clay w/some fine sand, trace of gravel and coarse sand.	A-6(9)	
			18.0'		22" RECOVERY		
		10	18.0'	4 5 6 8	Wet stiff brownish orange gravelly clay w/some fine sand, trace of coarse sand.	A-6(4)	
18.9			20.0'		10" RECOVERY		
21.6							
		11	23.0'	4 5 7 8	Wet stiff gray and black slightly mottled clay w/ some fine sand, trace of gravel and coarse sand.	A-7-5(35)	Mud Rotary @ 23.0'.
24.3			25.0'		18" RECOVERY		
27							
		12	28.0'	2 3 4 5	Wet firm gray and black slightly mottled clayey silt w/some fine sand and gravel, trace of coarse sand.	A-5(14)	
29.7			30.0'		18" RECOVERY		
32.4							
		13	33.0'	2 4 4 6	Wet firm orange fine sandy silt w/trace of coarse sand and gravel.	A-5(2)	
35.1			35.0'		19" RECOVERY		
37.8							
		14	38.0'	1 3	Wet loose orange silty fine sand w/some coarse sand, trace of gravel.	A-2-4(0)	
			39.0'		10" RECOVERY		
		14A	39.0'	5 11	Wet firm red and white slightly mottled clayey fine sandy silt w/some coarse sand, trace of gravel.	A-4(3)	
			40.0'		9" RECOVERY		
40.5							

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG2B-15
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
43.2		15	43.0' – 45.0'	4 7 7 6	Wet stiff brown fine sandy silt w/some coarse sand, trace of gravel. 22" RECOVERY	A-4(0)	
45.9							
48.6		16	48.0' – 50.0'	4 6 9 10	Wet medium dense brown clayey fine to coarse sand w/some gravel. 21" RECOVERY	A-2-4(0)	
51.3							
54		17	53.0' – 55.0'	6 13 24 19	Wet dense brown gravel and fine sand w/some silt and coarse sand. 20" RECOVERY	A-2-4(0)	
56.7							
59.4		18	58.0' – 60.0'	30 24 18 50/5"	Wet dense brown silty gravel and coarse to fine sand. 14" RECOVERY	A-1-b	
62.1					End of Boring		
64.8							

KEY TO SYMBOLS

Symbol	Description
Strata symbols	
	Clayey sand
	Poorly graded, silty or clayey sands and gravel
	Silty low plasticity clay
	High plasticity clay
	Elastic silt
	Silty sand
	Poorly graded clayey 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: BRG2B-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: 11/10/2009

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:	35.96	30.55	433.80	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	32.23	29.08	382.44	
WT. OF WATER LOST:	3.73	1.47	51.36	POST-IGNITION
WT. OF BOTTLE:	19.38	21.28	78.02	DISH & SOIL:
WT. OF DRY SOIL:	12.85	7.80	304.42	
PERCENT OF WATER:	29.00	18.80	16.90	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	29.0			LOSS %:

WT PASSING #10 SIEVE: 263

WT. OF TOTAL SAMPLE: 304.4 WT. OF WASH SAMPLE: 109.3

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	14.9	14.9	4.9	95.1
#4	26.4	11.5	3.8	91.3
#10	41.8	15.4	5.1	86.3
#40	13.6	13.6	10.7	75.5
#200	37.1	23.5	18.5	57.0
PASS #200		72.2	57.0	

SUMMARY

LIQUID LIMIT:	29.0
PLASTIC LIMIT:	18.8
PLASTICITY INDEX:	10.2
% SAND AND GRAVEL:	43.0
% 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.: 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: BRG2B-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: 11/10/2009

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:	34.06	30.85	424.40	DISH & SOIL:
WT. DRY SOIL & BOTTLE:	30.32	29.48	376.74	
WT. OF WATER LOST:	3.74	1.37	47.66	POST-IGNITION
WT. OF BOTTLE:	19.25	22.88	86.56	DISH & SOIL:
WT. OF DRY SOIL:	11.07	6.60	290.18	
PERCENT OF WATER:	33.80	20.80	16.40	DISH:
BLOWS REQUIRED FOR CLOSURE:	25			
CORRECTED LIQUID LIMIT %:	33.8			LOSS %: _____

WT PASSING #10 SIEVE: 187

WT. OF TOTAL SAMPLE: 290.2 WT. OF WASH SAMPLE: 114.6

SIEVE	CUM. RT. WT.	RT. WT.	% RET.	% PASSING
1"	0.0	0.0	0.0	100.0
3/8"	38.5	38.5	13.3	86.7
#4	52.4	13.9	4.8	81.9
#10	103.3	50.9	17.5	64.4
#40	4.8	4.8	2.7	61.7
#200	13.7	8.9	5.0	56.7
PASS #200		100.9	56.7	

SUMMARY

LIQUID LIMIT:	33.8
PLASTIC LIMIT:	20.8
PLASTICITY INDEX:	13.0
% SAND AND GRAVEL:	43.3
% 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

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

F.A. Project: I-95 & U.S. 202 Interchange **Boring No.:** BRG2B-9

Contract: 25-106-02

Boring Location: Sta. 46+77.75, 45' Rt. Ramp 5

Boring Surface Elev.: 191.47 **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:** 3.0'
Hollow Stem Auger: **From Depth of:** **To:**

Water Level Readings

Date	Time	Depth of Hole	Depth of Casing	Depth of Water	Elev. of Water
9/14/2009				Dry	
					191.5
					191.5
					191.5

Pay Quantities:
2 1/2 in. Dia. Dry Sample Boring: 3.0 **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:** 13.0 **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'	2 50	Moist hard brown clayey silt w/some fine sand and gravel, trace of coarse sand.	A-4(3)	Topsoil - 4". Rock Fragments
1.9			2.0'		6" RECOVERY		
		2	2.0'	6 24	Moist hard brown gravelly clay w/trace of fine to coarse sand.	A-6(5)	
			3.0'		6" RECOVERY		
		R-1	3.0'		Gniess, gray, hard 30" Recovery = 83.33% RQD = 25.0% (very poor)		RQD - Rock quality Designation
3.8							
5.7			6.0'		30" RECOVERY		
		R-2	6.0'		Gniess, gray, hard 57" Recovery = 95.0% RQD = 43.0% (poor)		RQD - Rock quality Designation
7.6							
9.5							
			11.0'		57" RECOVERY		

Remarks: GTA Inspector - T. Kane

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.:** BRG2B-9
Contract: 25-106-02

Depth (ft.)	Water Level	No.	Sample Depth	Blows/6"	Sample Description	Class./G.I.	Remarks
11.4		R-3	11.0'		Gniess, gray, hard 60" Recovery = 100.0% RQD = 85.0% (good)		RQD - Rock quality Designation
13.3							
15.2			16.0'		60" RECOVERY		
					End of Boring		
17.1							
19							
20.9							
22.8							
24.7							
26.6							
28.5							

KEY TO SYMBOLS

Symbol Description

Strata symbols

Poorly graded, silty or clayey sands and gravel

Frac rock

Notes:

1. **Exploratory borings were drilled on 9-14-2009 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.**