

Client: Anchor QEA, LLC

Project: Gasco PDI

Location:Project No:GTX-310685Boring ID:---Tested By:mdSample ID:---Test Date:12/20/19Checked By:jsc

Depth: --- Test Id: 530866

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-107SPT	39- 41-190924		Wet, dark gray sand	34.2
PDI-108SPT	1.5- 3.5-19107		Wet, olive gray silt	86.6
PDI-109SPT	6.5- 8.5-191004		Wet, dark olive gray silt	96.1
PDI-109SPT	20- 22-191004		Wet, black silt	50.7
PDI-112SPT	6.5- 8.5-191003		Moist, olive gray silt	87.7
PDI-113SPT	47- 49-191011		Moist, dark grayish brown silty sand	32.1
PDI-114SPT	7.5- 9.5-191008		Wet, gray silt	63.9
PDI-114SPT	17.5- 19.5-191008		Wet, gray clay	65.6
PDI-115SPT	41.5- 43.5-191009		Wet, dark gray sandy silt	48.6

Notes: Temperature of Drying: 110° Celsius



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: md Sample ID: ---Test Date: 12/26/19 Checked By: jsc

Test Id: Depth: 530875

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-116SPT	9.5- 11.5-191002		Wet, gray silt with sand	55.2
PDI-116SPT	30- 32-190927		Moist, gray sand with silt	31.0
PDI-117SPT	58.5- 60.5-191002		Moist, dark brownish gray silty sand	29.5
PDI-118SPT	4.5- 6.5-191014		Wet, olive gray silt	83.2
PDI-118SPT	15- 17-191014		Wet, black silt	64.1
PDI-119SPT	36.5- 38.5-191001		Moist, dark gray sandy clay	41.7
PDI-121SPT	06- 08-190930		Wet, olive gray silt	84.5
PDI-122SPT	44- 46-190926		Moist, dark gray sand	31.0
PDI-123SPT	4.5- 6.5-190924		Wet, olive gray silt	69.2
PDI-123SPT	19.5- 21.5-190924		Wet, gray clay	71.3

Notes: Temperature of Drying: 110° Celsius



Client: Anchor QEA, LLC

Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 12/06/19 Checked By: jsc

Depth: --- Test Id: 532322

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-135RAB	19.1- 21-191120		Moist, very dark gray silty sand with gravel	17.2
PDI-137RAB	3.5- 14.8-191119		Moist, dark gray silty sand with gravel	17.7
PDI-138RAB	15.2- 18.6-191118		Moist, dark grayish brown sandy silt with gravel	25.4
PDI-139RAB	17.5- 21-191115		Moist, dark grayish brown sandy silt with gravel	28.2
PDI-140RAB	10- 12.7-191108		Moist, dark brown silty gravel with sand	29.6
PDI-141RAB	00- 10-191107		Moist, dark grayish brown clayey gravel with sand	12.0
PDI-142RAB	00- 10-191112		Moist, dark brown silty sand with gravel	6.6
PDI-143RAB	20- 31.1-191111		Moist, dark brown silty sand	10.9

Notes: Temperature of Drying: 110° Celsius



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 12/09/19 Checked By: jsc

Depth: --- Test Id: 532310

# Laboratory Determination of Density (Unit Weight) of Soil Specimens by ASTM D7263

Boring ID	Sample ID	Depth	Visual Description	Bulk Density pcf	Moisture Content %	Dry Density pcf	*
PDI- 108SPT	1.5- 3.5-19107		Wet, olive gray silt	92.16	86.65	49.38	(1)
PDI- 112SPT	6.5- 8.5-191003		Moist, olive gray silt	86.71	87.70	46.20	(2)
PDI- 114SPT	17.5- 19.5-191008		Wet, gray clay	100.3	65.59	60.60	(3)
PDI- 116SPT	9.5- 11.5-191002		Wet, gray silt with sand	94.24	55.15	60.74	(4)
PDI- 121SPT	06- 08-190930		Wet, olive gray silt	75.75	84.53	41.05	(5)
PDI- 123SPT	4.5- 6.5-190924		Wet, olive gray silt	96.54	69.18	57.06	(6)
PDI- 135RAB	19.1- 21-191120		Moist, very dark gray silty sand with gravel	83.21	17.21	70.99	(7)

#### \* Sample Comments

- (1): Method B-Cylinder, Intact
- (2): Method B-Cylinder, Intact
- (3): Method B-Cylinder, Intact
- (4): Method B-Cylinder, Intact
- (5): Method B-Cylinder, Intact
- (6): Method B-Cylinder, Intact
- (7): Method B-Cylinder, Intact

Notes: Moisture Content determined by ASTM D2216.



Client: Anchor QEA, LLC

Project: Gasco PDI

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 12/09/19 Checked By: jsc

Depth: --- Test Id: 532306

# Laboratory Determination of Density (Unit Weight) of Soil Specimens by ASTM D7263

Boring ID	Sample ID	Depth	Visual Description	Bulk Density pcf	Moisture Content %	Dry Density pcf	*
PDI- 137RAB	3.5- 14.8- 191119		Moist, dark gray silty sand with gravel	105.0	17.73	89.16	(1)
PDI- 138RAB	15.2- 18.6- 191118		Moist, dark grayish brown sandy silt with gravel	119.0	25.40	94.87	(2)
PDI- 139RAB	17.5- 21-191115		Moist, dark grayish brown sandy silt with gravel	125.7	28.22	98.03	(3)
PDI- 140RAB	10- 12.7- 191108		Moist, dark brown silty gravel with sand	109.8	29.58	84.73	(4)
PDI- 141RAB	00- 10-191107		Moist, dark grayish brown clayey gravel with sand	120.2	11.99	107.3	(5)
PDI- 142RAB	00- 10-191112		Moist, dark brown silty sand with gravel	103.4	6.640	96.93	(6)
PDI- 143RAB	20- 31.1- 191111		Moist, dark brown silty sand	104.2	10.93	93.92	(7)

#### \* Sample Comments

- (1): Method B-Cylinder, Reconstituted (compacted)
- (2): Method B-Cylinder, Reconstituted (compacted)
- (3): Method B-Volumetric, Reconstituted (compacted)
- (4): Method B-Cylinder, Reconstituted (compacted)
- (5): Method B-Cylinder, Reconstituted (compacted)
- (6): Method B-Cylinder, Reconstituted (compacted)
- (7): Method B-Cylinder, Reconstituted (compacted)

Notes: Moisture Content determined by ASTM D2216.



Location:Project No:GTX-310685Boring ID:PDI-119SPTSample Type: tubeTested By:md

Sample ID: 36.5-38.5-191001 Test Date: 12/20/19 Checked By: jsc Depth: --- Test Id: 531124

Test Comment: ---

Visual Description: Moist, dark gray sandy clay

Sample Comment: ---

# Laboratory Determination of Density (Unit Weight) of Soil Specimens by ASTM D7263

Boring ID	Sample ID	Depth	Visual Description	Bulk Density pcf	Moisture Content %	Dry Density pcf
PDI- 119SPT	36.5- 38.5- 191001		Moist, dark gray sandy clay	106.9	41.68	75.45

<sup>\*</sup> Sample Comments

(1): Method B-Cylinder, Intact

Notes: Moisture Content determined by ASTM D2216.



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg Sample ID: ---Test Date: 12/12/19 Checked By: jsc

Test Id: Depth: 532330

## Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI- 135RAB	19.1- 21-191120		Moist, very dark gray silty sand with gravel	2.66	
PDI- 137RAB	3.5- 14.8-191119		Moist, dark gray silty sand with gravel		
PDI- 138RAB	15.2- 18.6-191118		Moist, dark grayish brown sandy silt with gravel	2.79	
PDI- 139RAB	17.5- 21-191115		Moist, dark grayish brown sandy silt with gravel	2.81	
PDI- 140RAB	10- 12.7-191108		Moist, dark brown silty gravel with sand	2.84	
PDI- 141RAB	00- 10-191107		Moist, dark grayish brown clayey gravel with sand	2.88	
PDI- 142RAB	00- 10-191112		Moist, dark brown silty sand with gravel	2.80	
PDI- 143RAB	20- 31.1-191111		Moist, dark brown silty sand	2.77	

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854 Moisture Content determined by ASTM D2216.



Location: Project No: GTX-310685 Boring ID: PDI-071SC Sample Type: bag Tested By: ckg

531000

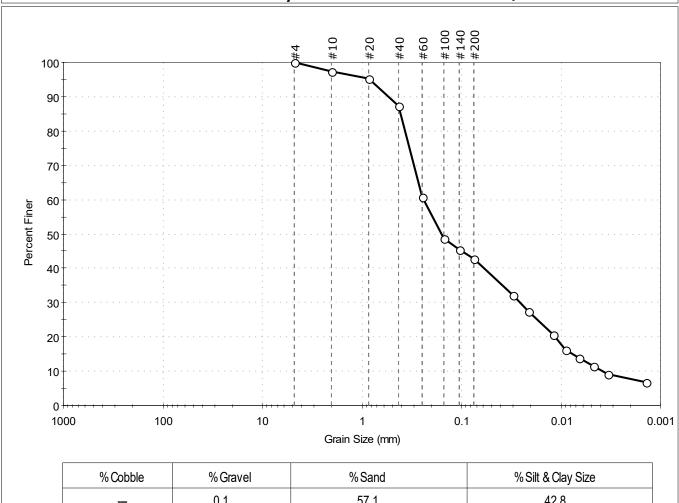
Test Date: 11/27/19 Checked By: bfs Sample ID: 2-06-08-191001 Test Id:

Depth: Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.1	57.1	42.8

		<del></del>		
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	97		
#20	0.85	95		
#40	0.42	87		
#60	0.25	61		
#100	0.15	49		
#140	0.11	45		
#200	0.075	43		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0303	32		
	0.0214	28		
	0.0120	21		
	0.0089	16		
	0.0067	14		
	0.0048	11		
	0.0033	9		
	0.0014	7		

<u>Coefficients</u>					
D <sub>85</sub> = 0.4063 mm	$D_{30} = 0.0257 \text{ mm}$				
D <sub>60</sub> = 0.2426 mm	$D_{15} = 0.0078 \text{ mm}$				
D <sub>50</sub> = 0.1586 mm	$D_{10} = 0.0038 \text{ mm}$				
Cu =63.842	$C_c = 0.716$				

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: PDI-084SC Sample Type: bag Tested By: ckg

531001

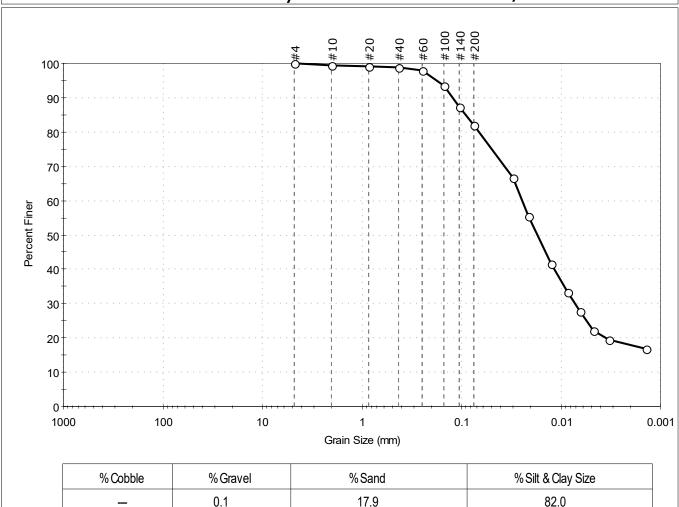
11/27/19 Checked By: bfs Test Date: Sample ID: 2-06-08-191002

Test Id: Depth: Test Comment:

Moist, dark grayish brown silt with sand Visual Description:

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	93		
#140	0.11	87		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0306	67		
	0.0210	56		
	0.0125	42		
	0.0086	33		
	0.0064	28		
	0.0047	22		
	0.0033	19		
	0.0014	17		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0906 mm	$D_{30} = 0.0072 \text{ mm}$			
D <sub>60</sub> = 0.0244 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0171 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_c = N/A$			

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: PDI-112SPT Sample Type: tube Tested By: ckg

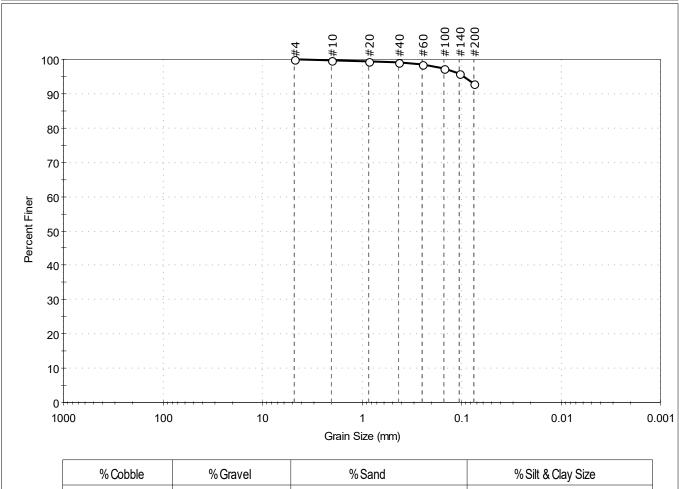
Sample ID: 6.5-8.5-191003 Test Date: 12/16/19 Checked By: bfs

Test Id: Depth: 531045

Test Comment:

Visual Description: Moist, olive gray silt Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	6.9	93.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	99		
#100	0.15	97		
#140	0.11	96		
#200	0.075	93		

<u>Coefficients</u>		
$D_{85} = N/A$	$D_{30} = N/A$	
$D_{60} = N/A$	$D_{15} = N/A$	
D <sub>50</sub> = N/A	$D_{10} = N/A$	
$C_u = N/A$	C <sub>c</sub> =N/A	

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Location:Project No:GTX-310685Boring ID:PDI-113SPTSample Type: tubeTested By:ckg

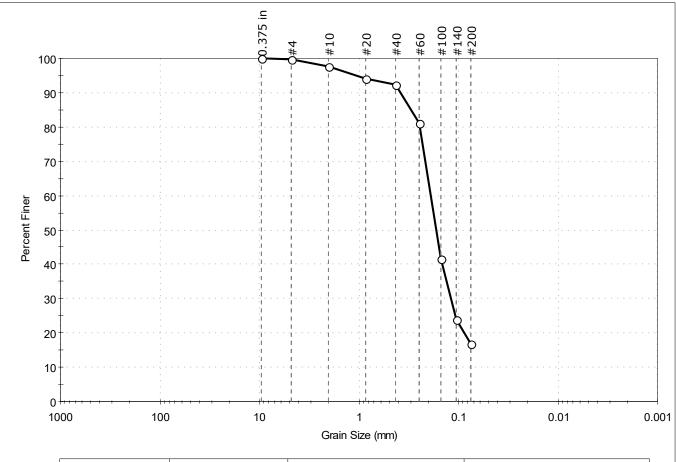
Boring ID: PDI-113SPT Sample Type: tube Tested By: ckg
Sample ID: 47-49-191011 Test Date: 12/23/19 Checked By: bfs
Depth: --- Test Id: 531046

Depth: ---Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

#### Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.4	82.7	16.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	98		
#20	0.85	94		
#40	0.42	92		
#60	0.25	81		
#100	0.15	42		
#140	0.11	24		
#200	0.075	17		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2993 mm	$D_{30} = 0.1197 \text{ mm}$			
D <sub>60</sub> = 0.1902 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.1672 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_C = N/A$			

ASTM N/A

Classification

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape: --Sand/Gravel Hardness: ---



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: PDI-115SPT Sample Type: tube Tested By: ckg

531047

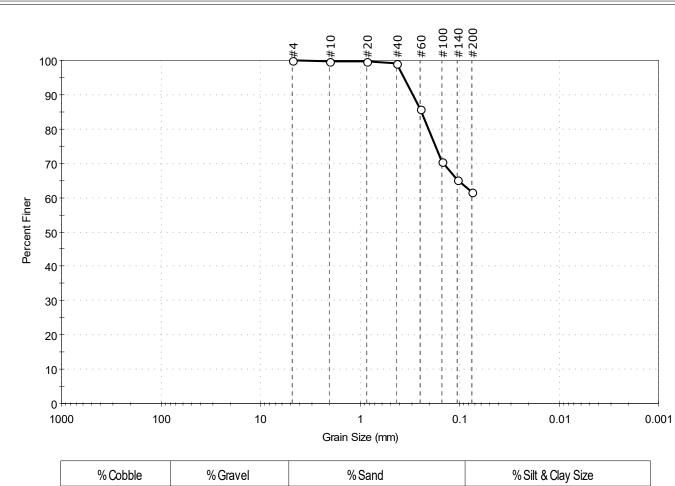
Sample ID: 41.5-43.5-191009 Test Date: 12/04/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Wet, dark gray sandy silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	38.2	61.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	86		
#100	0.15	71		
#140	0.11	65		
#200	0.075	62		

<u>Coefficients</u>		
D <sub>85</sub> = 0.2425 mm	$D_{30} = N/A$	
$D_{60} = N/A$	$D_{15} = N/A$	
D <sub>50</sub> = N/A	$D_{10} = N/A$	
$C_u = N/A$	$C_c = N/A$	

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---Sand/Gravel Hardness: ---



Client: Anchor QEA, LLC Gasco PDI

Project:

Location: Project No: Boring ID: PDI-116SPT Sample Type: tube Tested By: ckg Sample ID: 30-32-190927 Test Date: 12/16/19 Checked By: bfs

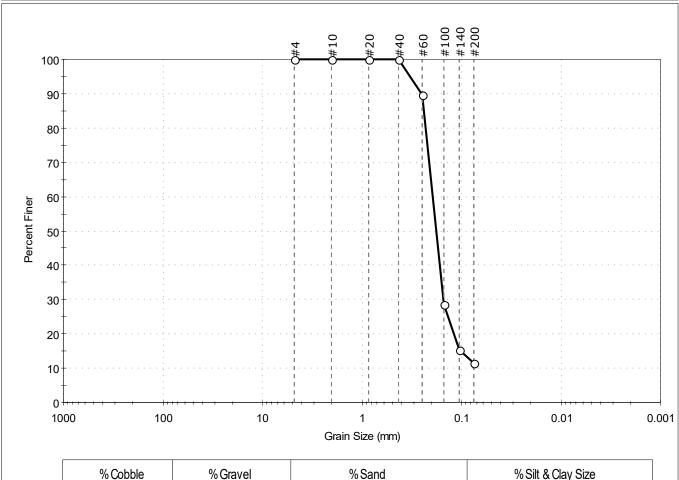
Test Id: Depth: 531048

Test Comment:

Visual Description: Moist, gray sand with silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	88.4	11.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	90		
#100	0.15	29		
#140	0.11	15		
#200	0.075	12		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2403 mm	$D_{30} = 0.1516 \text{ mm}$			
D <sub>60</sub> = 0.1949 mm	$D_{15} = 0.1019 \text{ mm}$			
D <sub>50</sub> = 0.1792 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_C = N/A$			

GTX-310685

Classification <u>ASTM</u> N/A AASHTO Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---Sand/Gravel Hardness: ---



Location:Project No:GTX-310685Boring ID:PDI-117SPTSample Type: tubeTested By:ckg

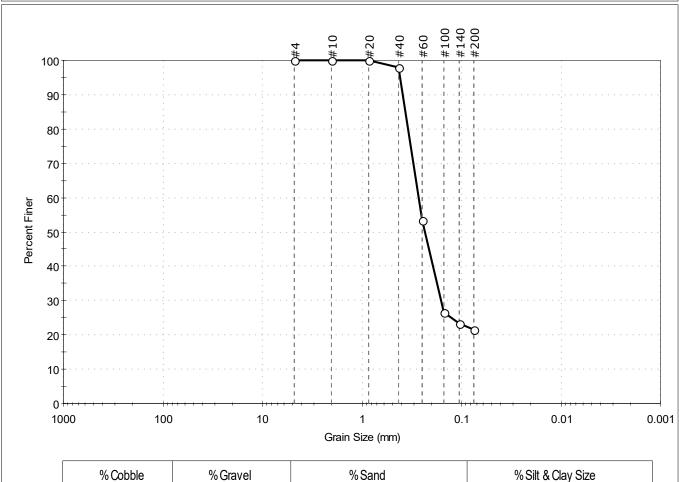
Boring ID: PDI-117SPT Sample Type: tube Tested By: ckg
Sample ID: 58.5-60.5-191002 Test Date: 12/13/19 Checked By: bfs
Depth: --- Test Id: 531049

Depth: --Test Comment: ---

Visual Description: Moist, dark brownish gray silty sand

Sample Comment: ----

### Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	78.6	21.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	53		
#100	0.15	27		
#140	0.11	23		
#200	0.075	21		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3641 mm	$D_{30} = 0.1598 \text{ mm}$			
D <sub>60</sub> = 0.2703 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.2340 mm	$D_{10} = N/A$			
C <sub>u</sub> =N/A	$C_C = N/A$			

ASTM N/A Classification

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness : ---



Location: Project No: GTX-310685
Boring ID: PDI-135RAB Sample Type: bag Tested By: ckg

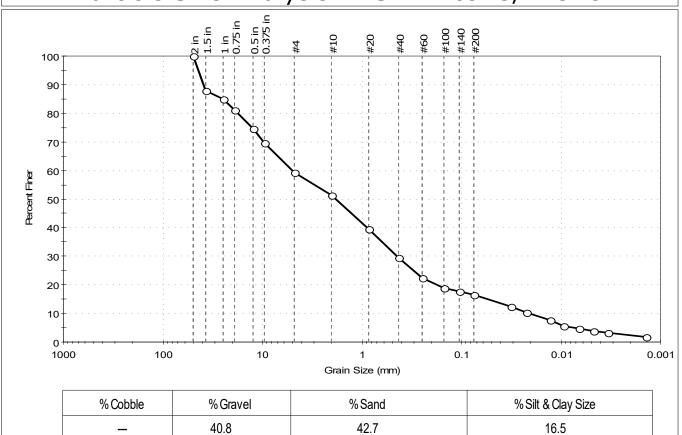
Boring ID: PDI-135RAB Sample Type: bag Tested By: ckg
Sample ID: 19.1-21-191120 Test Date: 12/09/19 Checked By: bfs
Depth: --- Test Id: 532318

Depth: ---Test Comment: ---

Visual Description: Moist, very dark gray silty sand with gravel

Sample Comment: ---

### Particle Size Analysis - ASTM D6913/D7928



L				
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
2 in	50.00	100		
1.5 in	37.50	88		
1 in	25.00	85		
0.75 in	19.00	81		
0.5 in	12.50	75		
0.375 in	9.50	70		
#4	4.75	59		
#10	2.00	51		
#20	0.85	39		
#40	0.42	30		
#60	0.25	22		
#100	0.15	19		
#140	0.11	18		
#200	0.075	17		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0317	12		
	0.0224	10		
	0.0130	8		
	0.0094	6		
	0.0067	5		
	0.0047	4		
	0.0034	3		
	0.0014	2		

<u>Coefficients</u>			
$D_{85} = 25.0254 \text{ mm}$	$D_{30} = 0.4377 \text{ mm}$		
$D_{60} = 5.0175 \text{ mm}$	$D_{15} = 0.0549 \text{ mm}$		
$D_{50} = 1.8218 \text{ mm}$	$D_{10} = 0.0206 \text{ mm}$		
C., =243 568	$C_c = 1.854$		

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ANGULAR

Sand/Gravel Hardness: HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: PDI-137RAB Sample Type: bag Tested By: ckg

532319

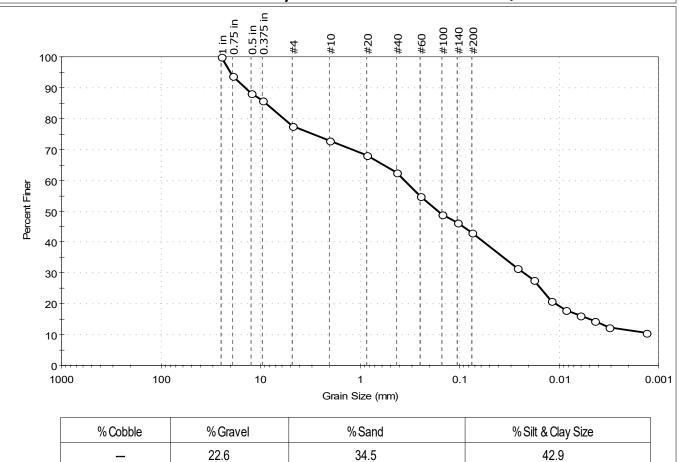
12/10/19 Checked By: bfs Sample ID: 3.5-14.8-191119 Test Date:

Depth: Test Id: Test Comment:

Visual Description: Moist, dark gray silty sand with gravel

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	94		
0.5 in	12.50	88		
0.375 in	9.50	86		
#4	4.75	77		
#10	2.00	73		
#20	0.85	68		
#40	0.42	63		
#60	0.25	55		
#100	0.15	49		
#140	0.11	46		
#200	0.075	43		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0264	31		
	0.0181	28		
	0.0121	21		
	0.0085	18		
	0.0061	16		
	0.0044	14		
	0.0032	12		
	0.0013	10		

<u>Coefficients</u>				
D <sub>85</sub> = 8.9167 mm	$D_{30} = 0.0228 \text{ mm}$			
D <sub>60</sub> = 0.3550 mm	$D_{15} = 0.0050 \text{ mm}$			
D <sub>50</sub> = 0.1650 mm	$D_{10} = N/A$			
C <sub>u</sub> =N/A	$C_c = N/A$			

Classification <u>ASTM</u> N/A

AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ANGULAR

Sand/Gravel Hardness: HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: PDI-138RAB Sample Type: bag Tested By: ckg

532316

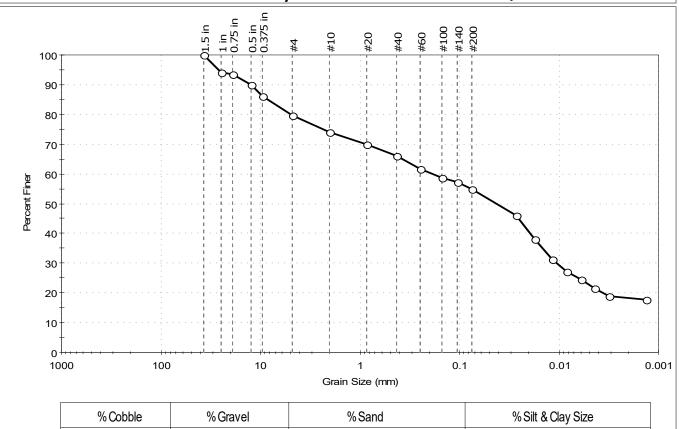
12/10/19 Checked By: bfs Test Date: Sample ID: 15.2-18.6-191118

Test Id: Depth: Test Comment:

Visual Description: Moist, dark grayish brown sandy silt with gravel

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	%Sand	% Silt & Clay Size
_	20.5	24.7	54.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies	
1.5 in	37.50	100			
1 in	25.00	94			
0.75 in	19.00	94			
0.5 in	12.50	90			
0.375 in	9.50	86			
#4	4.75	80			
#10	2.00	74			
#20	0.85	70			
#40	0.42	66			
#60	0.25	62			
#100	0.15	59			
#140	0.11	57			
#200	0.075	55			
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies	
	0.0271	46			
	0.0176	38			
	0.0117	31			
	0.0085	27			
	0.0060	24			
	0.0044	22			
	0.0032	19			
	0.0013	18			
	1				

<u>Coefficients</u>				
D <sub>85</sub> = 8.3973 mm	$D_{30} = 0.0106 \text{ mm}$			
D <sub>60</sub> = 0.1863 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0427 mm	$D_{10} = N/A$			
C <sub>u</sub> =N/A	C <sub>c</sub> =N/A			

Classification N/A <u>ASTM</u>

AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ANGULAR

Sand/Gravel Hardness: HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: PDI-139RAB Tested By:

Sample Type: bag ckg Test Date: 12/09/19 Checked By: bfs Sample ID: 17.5-21-191115

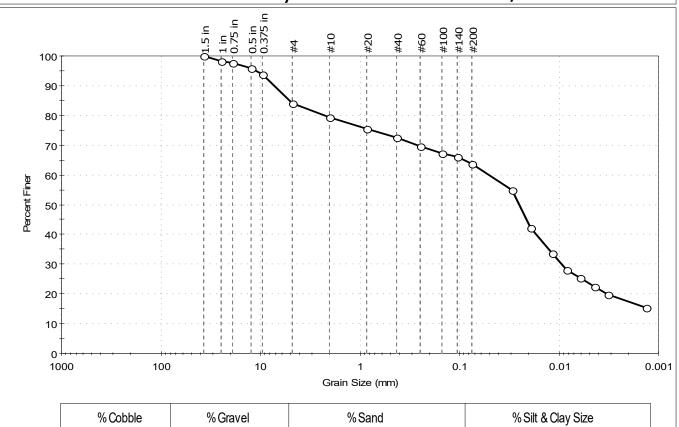
Test Id: Depth: 532317

Test Comment:

Visual Description: Moist, dark grayish brown sandy silt with gravel

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	16.0	20.1	63.9

Sieve Name   Sieve Size, mm   Percent Finer   Spec. Percent   Complie				
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	98		
0.75 in	19.00	98		
0.5 in	12.50	96		
0.375 in	9.50	94		
#4	4.75	84		
#10	2.00	79		
#20	0.85	76		
#40	0.42	72		
#60	0.25	70		
#100	0.15	67		
#140	0.11	66		
#200	0.075	64		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0299	55		
	0.0193	42		
	0.0118	34		
	0.0084	28		
	0.0061	25		
	0.0044	22		
	0.0032	20		
	0.0013	15		

<u>Coefficients</u>						
$D_{85} = 5.1115 \text{ mm}$	$D_{30} = 0.0094 \text{ mm}$					
$D_{60} = 0.0507 \text{ mm}$	$D_{15} = N/A$					
$D_{50} = 0.0253 \text{ mm}$	$D_{10} = N/A$					
$C_u = N/A$	$C_{c} = N/A$					

Classification N/A <u>ASTM</u>

AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ANGULAR

Sand/Gravel Hardness: HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685
Boring ID: PDI-140RAB Sample Type: bag Tested By: ckg

532312

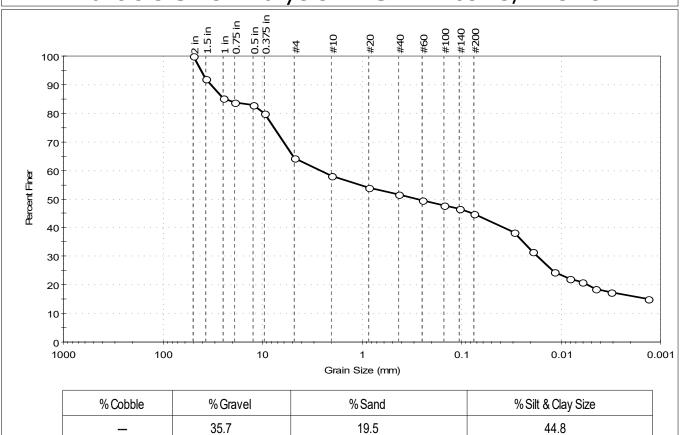
Boring ID: PDI-140RAB Sample Type: bag Tested By: ckg Sample ID: 10-12.7-191108 Test Date: 12/09/19 Checked By: bfs

Depth: --- Test Id:
Test Comment: ---

Visual Description: Moist, dark brown silty gravel with sand

Sample Comment: ---

#### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
2 in	50.00	100		
1.5 in	37.50	92		
1 in	25.00	85		
0.75 in	19.00	84		
0.5 in	12.50	83		
0.375 in	9.50	80		
#4	4.75	64		
#10	2.00	58		
#20	0.85	54		
#40	0.42	52		
#60	0.25	49		
#100	0.15	48		
#140	0.11	47		
#200	0.075	45		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0299	38		
	0.0192	31		
	0.0117	24		
	0.0083	22		
	0.0061	21		
	0.0044	19		
	0.0032	17		
	0.0013	15		

<u>Coefficients</u>							
D <sub>85</sub> = 23.5073 mm	$D_{30} = 0.0173 \text{ mm}$						
D <sub>60</sub> = 2.6348 mm	$D_{15} = N/A$						
D <sub>50</sub> = 0.2879 mm	$D_{10} = N/A$						
$C_u = N/A$	$C_c = N/A$						

ASTM N/A

AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: PDI-141RAB Sample Type: bag Tested By: ckg

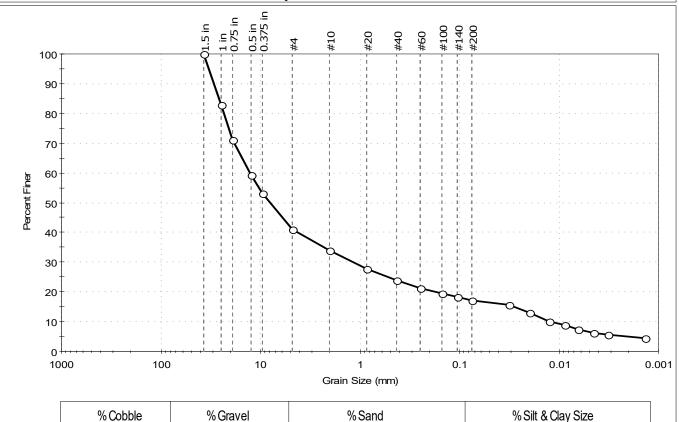
Test Date: Sample ID: 00-10-191107 12/10/19 Checked By: bfs

Test Id: 532313 Depth: Test Comment:

Moist, dark grayish brown clayey gravel with sand Visual Description:

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	59.0	23.8	17.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	83		
0.75 in	19.00	71		
0.5 in	12.50	59		
0.375 in	9.50	53		
#4	4.75	41		
#10	2.00	34		
#20	0.85	28		
#40	0.42	24		
#60	0.25	21		
#100	0.15	19		
#140	0.11	18		
#200	0.075	17		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0322	16		
	0.0197	13		
	0.0127	10		
	0.0089	9		
	0.0064	7		
	0.0045	6		
	0.0032	6		
	0.0014	4		
H	+			

<u>Coefficients</u>						
D <sub>85</sub> = 26.2239 mm	$D_{30} = 1.1689 \text{ mm}$					
D <sub>60</sub> = 12.8536 mm	D <sub>15</sub> =0.0285 mm					
D <sub>50</sub> = 7.9307 mm	$D_{10} = 0.0127 \text{ mm}$					
C <sub>u</sub> =1012.094	$C_c = 8.370$					

Classification N/A <u>ASTM</u>

<u>AASHTO</u> Stone Fragments, Gravel and Sand (A-1-b(0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ANGULAR Sand/Gravel Hardness: HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685
Boring ID: PDI-142RAB Sample Type: bag Tested By: ckg

Boring ID: PDI-142RAB Sample Type: bag Tested By: ckg Sample ID: 00-10-191112 Test Date: 12/09/19 Checked By: bfs

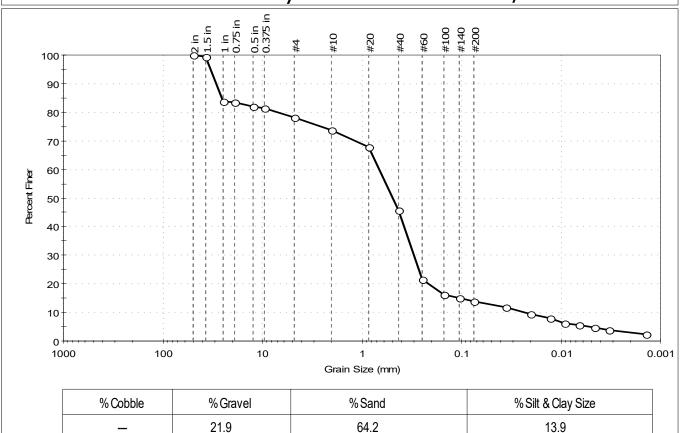
Depth: --- Test Id: 532315

Test Comment: ---

Visual Description: Moist, dark brown silty sand with gravel

Sample Comment: ---

### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
2 in	50.00	100		
1.5 in	37.50	99		
1 in	25.00	84		
0.75 in	19.00	83		
0.5 in	12.50	82		
0.375 in	9.50	82		
#4	4.75	78		
#10	2.00	74		
#20	0.85	68		
#40	0.42	46		
#60	0.25	22		
#100	0.15	16		
#140	0.11	15		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0357	12		
	0.0203	9		
	0.0127	8		
	0.0093	6		
	0.0066	6		
	0.0046	5		
	0.0033	4		
	0.0014	2		

Coefficients							
D <sub>85</sub> = 25.8783 mm	$D_{30} = 0.3005 \text{ mm}$						
D <sub>60</sub> = 0.6646 mm	$D_{15} = 0.1028 \text{ mm}$						
D <sub>50</sub> = 0.4844 mm	$D_{10} = 0.0232 \text{ mm}$						
$C_u = 28.647$	$C_c = 5.857$						

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ANGULAR

 ${\sf Sand/Gravel\ Hardness: HARD}$ 

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: PDI-143RAB Sample Type: bag Tested By: ckg

Test Date: Sample ID: 20-31.1-191111 12/09/19 Checked By: bfs Test Id:

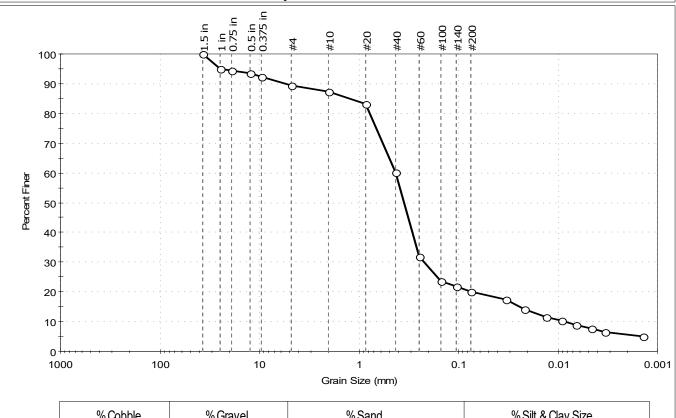
532314

Depth: Test Comment:

Visual Description: Moist, dark brown silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	10.6	69.5	19.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1.5 in	37.50	100		
1 in	25.00	95		
0.75 in	19.00	94		
0.5 in	12.50	94		
0.375 in	9.50	92		
#4	4.75	89		
#10	2.00	87		
#20	0.85	83		
#40	0.42	60		
#60	0.25	32		
#100	0.15	24		
#140	0.11	22		
#200	0.075	20		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0330	17		
	0.0219	14		
	0.0130	12		
	0.0092	10		
	0.0066	9		
	0.0046	8		
	0.0033	6		
	0.0014	5		

<u>Coefficients</u>							
D <sub>85</sub> = 1.2464 mm	$D_{30} = 0.2222 \text{ mm}$						
$D_{60} = 0.4230 \text{ mm}$	$D_{15} = 0.0245 \text{ mm}$						
$D_{50} = 0.3508 \text{ mm}$	$D_{10} = 0.0086 \text{ mm}$						
C <sub>11</sub> =49.186	$C_c = 13.572$						

Classification N/A <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ANGULAR

Sand/Gravel Hardness: HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location:

Boring ID: PDI- 108SPT Sample Type: tube Tested By: cam Sample ID: 1.5-3.5-19107 Test Date: 12/12/19 Checked By: bfs

Project No:

GTX-310685

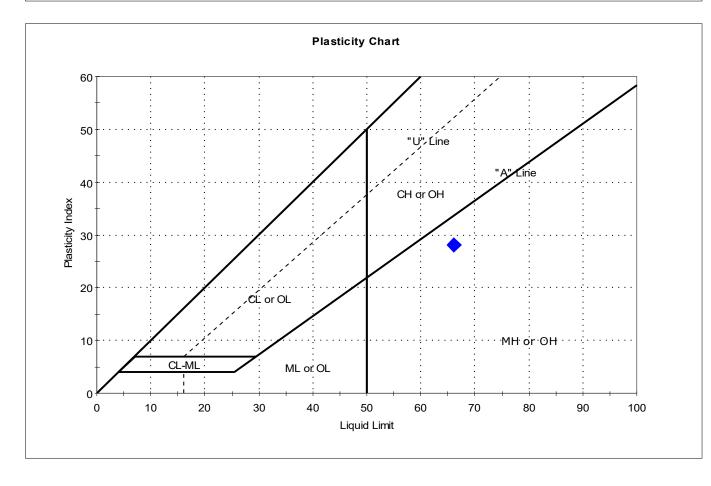
Depth: --- Test Id: 531039

Test Comment: ---

Visual Description: Wet, olive gray silt

Sample Comment: ---

#### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	1.5-3.5-19107	PDI- 108SPT		87	66	38	28	1.7	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



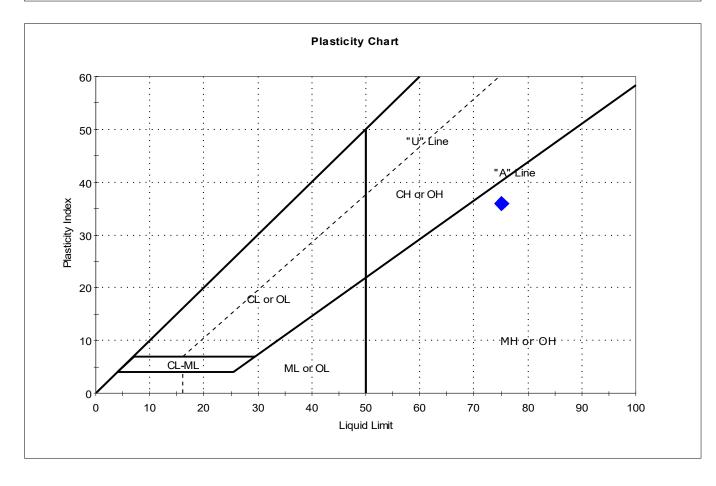
Location:Project No:GTX-310685Boring ID: PDI- 109SPTSample Type: tubeTested By: camSample ID: 6.5-8.5-191004Test Date:12/11/19Checked By: bfs

Sample ID: 6.5-8.5-191004 Test Date: 12/11/19
Depth: --- Test Id: 531040

Test Comment: ---

Visual Description: Wet, dark olive gray silt Sample Comment: Sample contains organics

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	6.5-8.5-191004	PDI- 109SPT		96	75	39	36	1.6	

Sample Prepared using the WET method



Location:Project No:GTX-310685Boring ID:PDI- 114SPTSample Type: tubeTested By:cam

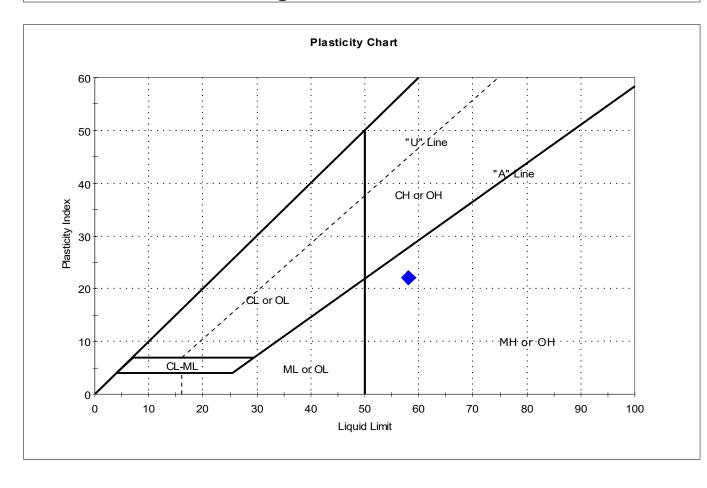
Boring ID: PDI- 114SPT Sample Type: tube Tested By: can Sample ID: 7.5-9.5-191008 Test Date: 12/13/19 Checked By: bfs Depth: --- Test Id: 531041

Test Comment: ---

Visual Description: Wet, gray silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	7.5-9.5-191008	PDI- 114SPT		64	58	36	22	1.3	

Sample Prepared using the WET method



Location:Project No:GTX-310685Boring ID: PDI- 118SPTSample Type: tubeTested By: camSample ID: 4.5-6.5-191014Test Date:12/13/19Checked By: bfs

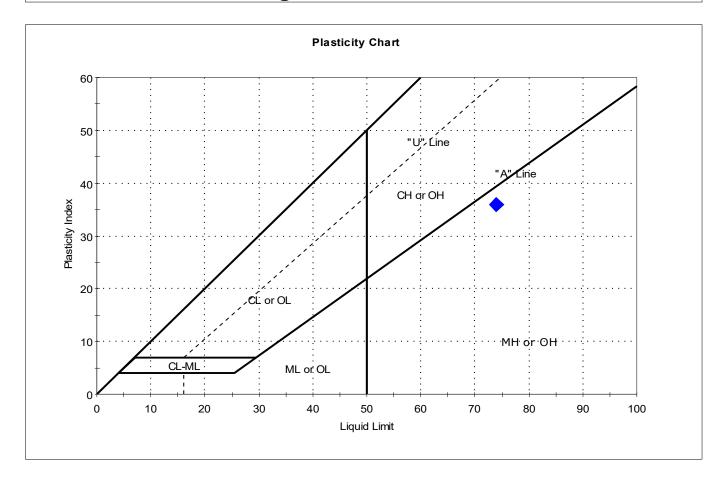
Depth: --- Test Id: 531042

Test Comment: ---

Visual Description: Wet, olive gray silt

Sample Comment: ---

#### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	4.5-6.5-191014	PDI- 118SPT		83	74	38	36	1.3	

Sample Prepared using the WET method



Location: Project No: GTX-310685

Boring ID: PDI- 121SPT Sample Type: tube Tested By: cam

Sample ID: 06-08-190930 Test Date: 12/13/19 Checked By: bfs

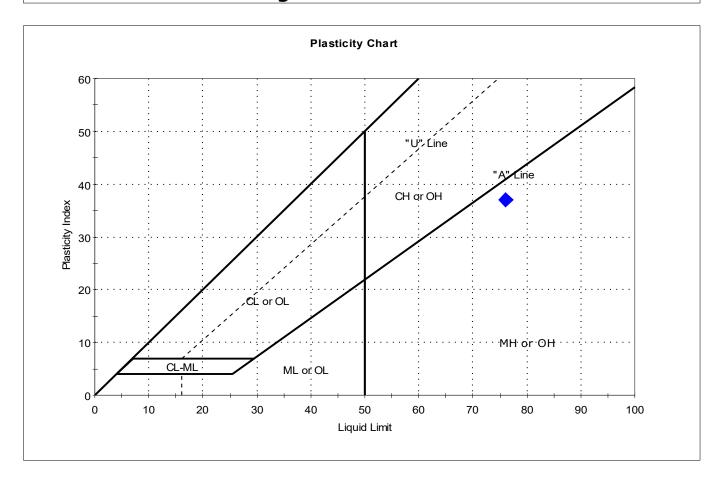
Depth: --- Test Id: 531043

Test Comment: ---

Visual Description: Wet, olive gray silt

Sample Comment: ---

#### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	06-08-190930	PDI- 121SPT		85	76	39	37	1.2	

Sample Prepared using the WET method



Location: Project No: GTX-310685

Boring ID: PDI- 123SPT Sample Type: tube Tested By: cam

Sample ID: 4.5-6.5-190924 Test Date: 12/11/19 Checked By: bfs

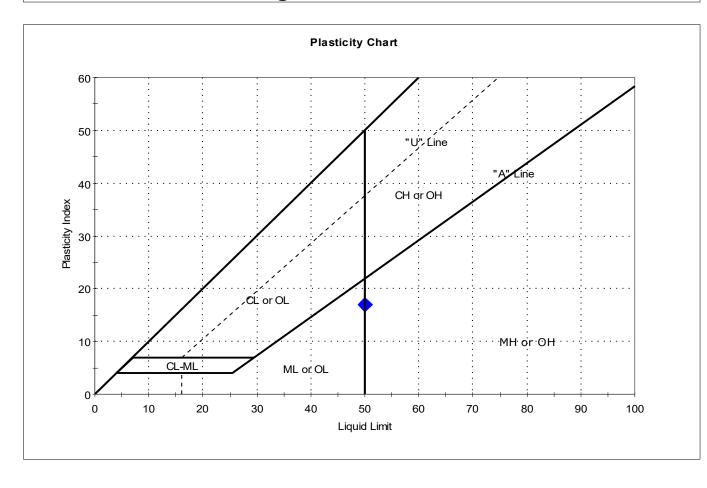
Depth: --- Test Id: 531044

Test Comment: ---

Visual Description: Wet, olive gray silt

Sample Comment: ---

#### Atterberg Limits - ASTM D4318



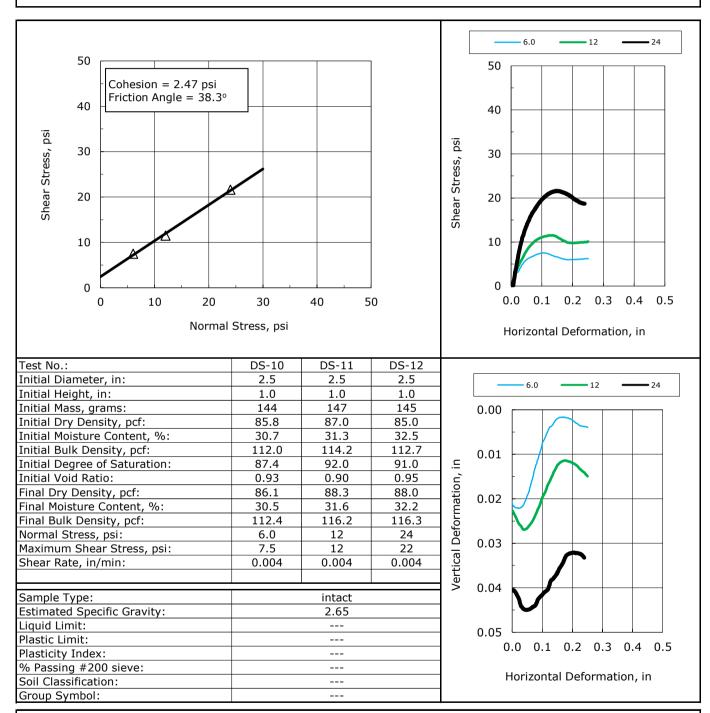
Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	4.5-6.5-190924	PDI- 123SPT		69	50	33	17	2.1	

Sample Prepared using the WET method



Client:	Anchor QEA, LLC
Project Name:	Gasco PDI
Project Location:	
GTX #:	310685
Test Date:	12/12/19
Tested By:	md
Checked By:	njh
Boring ID:	PDI-107SPT
Sample ID:	39-41-190924
Depth, ft:	
Visual Description:	Moist, black sand

## Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



#### Notes:

Moisture content obtained before shear from sample trimmings

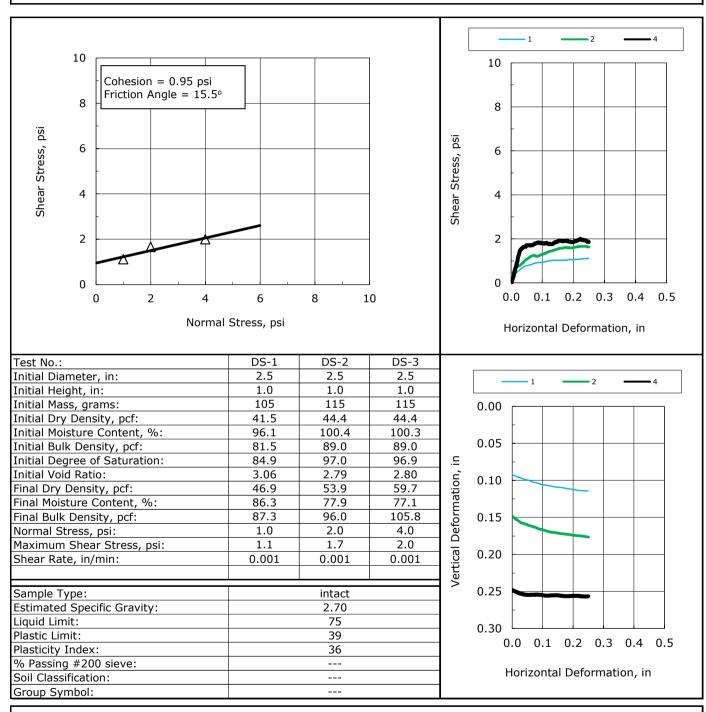
Moisture Content determined by ASTM D2216

Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.



Client:	Anchor QEA, LLC
Project Name:	Gasco PDI
Project Location:	
GTX #:	310685
Test Date:	12/11/19
Tested By:	md
Checked By:	njh
Boring ID:	PDI-109SPT
Sample ID:	6.5-8.5-191004
Depth, ft:	
Visual Description:	Wet, dark olive gray silt

## Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



#### Notes:

Moisture content obtained before shear from sample trimmings

Moisture Content determined by ASTM D2216

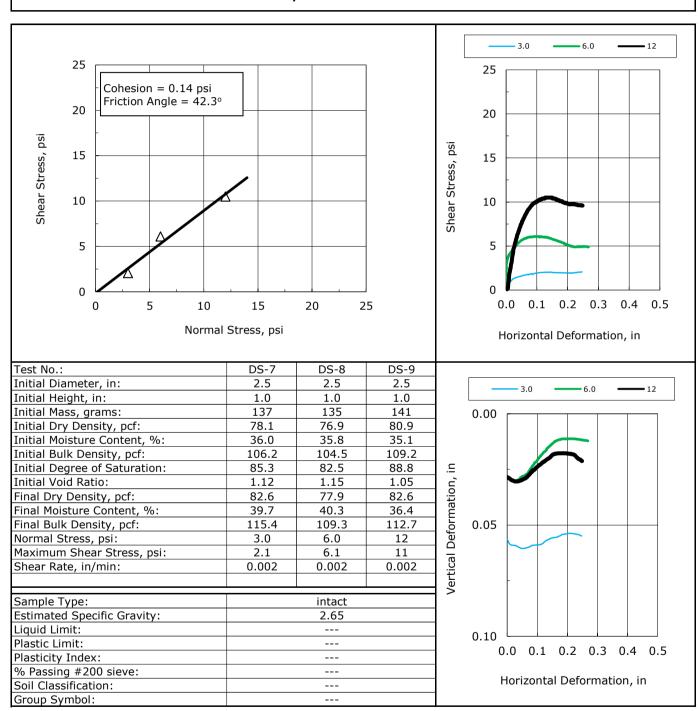
Atterberg Limits determined by ASTM D4318

Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.



Client: Anchor QEA, LLC Project Name: Gasco PDI Project Location: 310685 GTX #: Test Date: 12/12/19 Tested By: md Checked By: njh Boring ID: PDI-109SPT Sample ID: 20-22-191004 Depth, ft: Visual Description: Moist, black sand with silt

## Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



#### Notes:

Moisture content obtained before shear from sample trimmings

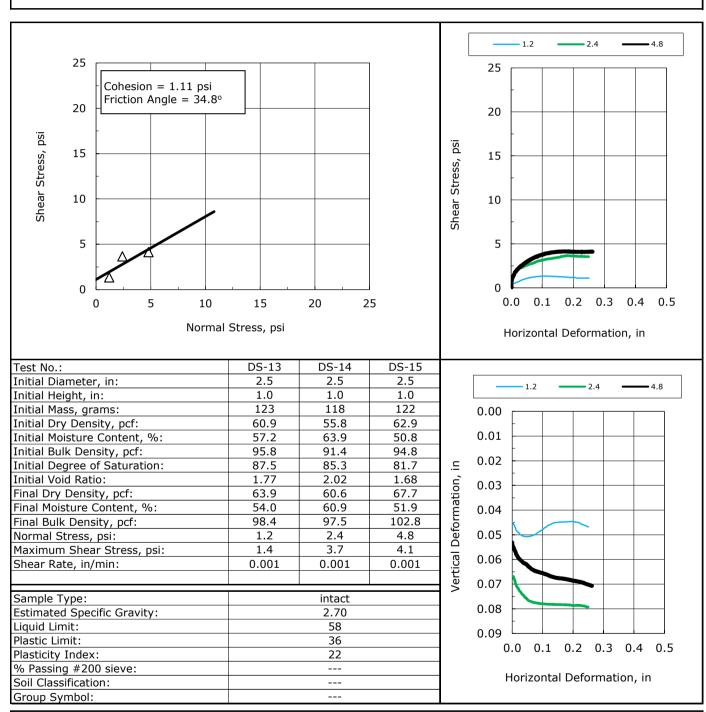
Moisture Content determined by ASTM D2216

Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.



Client:	Anchor QEA, LLC
Project Name:	Gasco PDI
Project Location:	
GTX #:	310685
Test Date:	12/13/19
Tested By:	md
Checked By:	njh
Boring ID:	PDI-114SPT
Sample ID:	7.5-9.5-191008
Depth, ft:	
Visual Description:	Wet, gray silt

## Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



#### Notes:

Moisture content obtained before shear from sample trimmings

Moisture Content determined by ASTM D2216

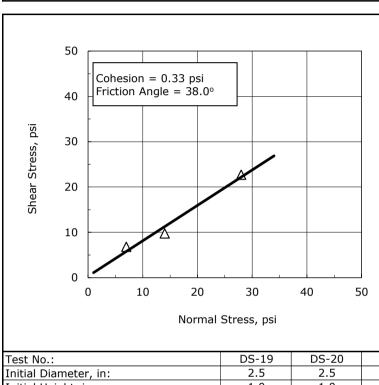
Atterberg Limits determined by ASTM D4318

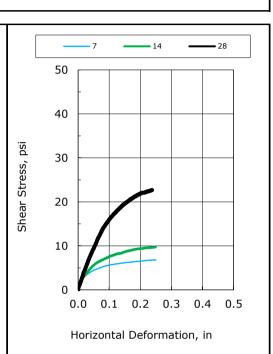
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.



Client:	Anchor QEA, LLC
Project Name:	Gasco PDI
Project Location:	
GTX #:	310685
Test Date:	12/17/19
Tested By:	md
Checked By:	njh
Boring ID:	PDI-115SPT
Sample ID:	41.5-43.5-190100
Depth, ft:	
Visual Description:	Wet, dark gray sandy silt

## Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





Test No.:	DS-19	DS-20	DS-21		
Initial Diameter, in:	2.5	2.5	2.5		
Initial Height, in:	1.0	1.0	1.0		
Initial Mass, grams:	138	133	132		
Initial Dry Density, pcf:	72.2	69.7	68.9		
Initial Moisture Content, %:	48.6	48.6	48.6		
Initial Bulk Density, pcf:	107.3	103.6	102.4		
Initial Degree of Saturation:	99.7	93.8	92.0		
Initial Void Ratio:	1.29	1.37	1.40		
Final Dry Density, pcf:	82.1	82.8	83.0		
Final Moisture Content, %:	47.8	4689.0	73.3		
Final Bulk Density, pcf:	121.3	3964.3	143.7		
Normal Stress, psi:	7.0	14	28		
Maximum Shear Stress, psi:	6.8	10	23		
Shear Rate, in/min:	0.0004	0.0004	0.0004		
Carranta Tarran		to be ab			
Sample Type:	intact				
Estimated Specific Gravity:	2.65				
Liquid Limit:					

	7 — 14 — 28
	0.00
	0.02
.⊑	0.04
Vertical Deformation, in	0.06
rmal	0.08
Defo	0.10
ical	0.12
Ver	0.14
	0.16
	0.18
	0.0 0.1 0.2 0.3 0.4 0.5
	Horizontal Deformation, in

Group	Symbol:
Notes:	

Plastic Limit:
Plasticity Index:
% Passing #200 sieve:

Soil Classification:

Moisture content obtained before shear from sample trimmings

Moisture Content determined by ASTM D2216

% Passing #200 Sieve determined by ASTM D6913

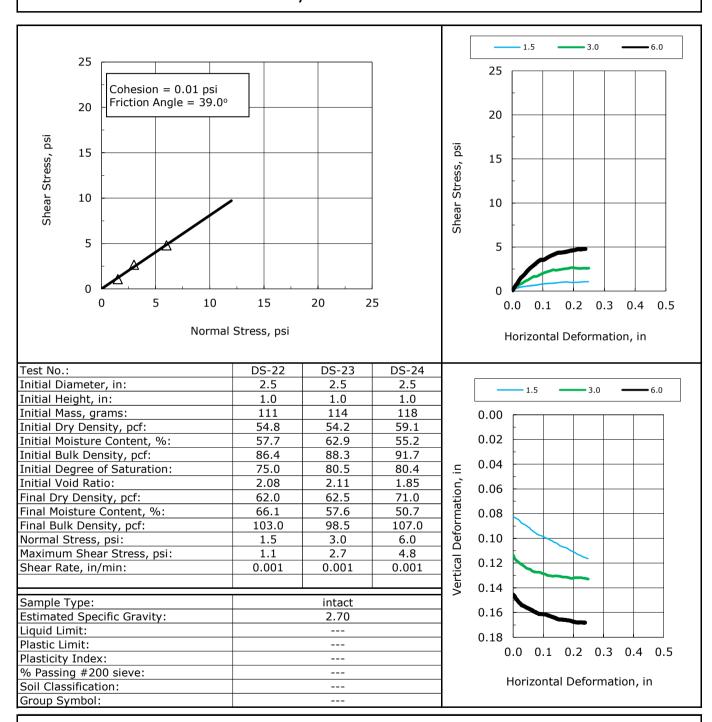
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

61.8



Client: Anchor QEA, LLC Project Name: Gasco PDI Project Location: GTX #: 310685 Test Date: 12/18/19 Tested By: md Checked By: njh Boring ID: PDI-116SPT Sample ID: 9.5-11.5-191002 Depth, ft: Visual Description: Wet, gray silt with sand

## Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



#### Notes:

Moisture content obtained before shear from sample trimmings

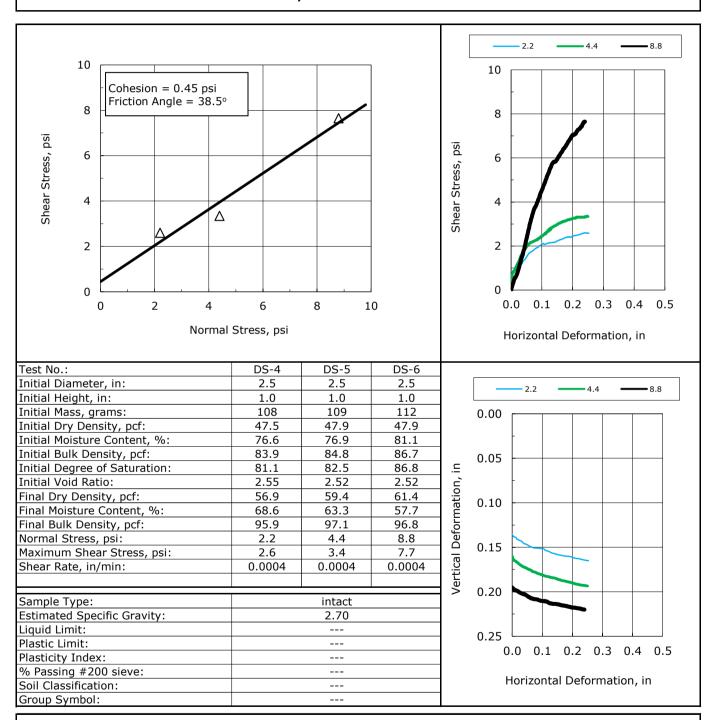
Moisture Content determined by ASTM D2216

Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.



Client: Anchor QEA, LLC Project Name: Gasco PDI Project Location: 310685 GTX #: Test Date: 12/11/19 Tested By: md Checked By: njh Boring ID: PDI-118SPT Sample ID: 15-17-191014 Depth, ft: Visual Description: Wet, black silt

## Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



#### Notes:

Moisture content obtained before shear from sample trimmings

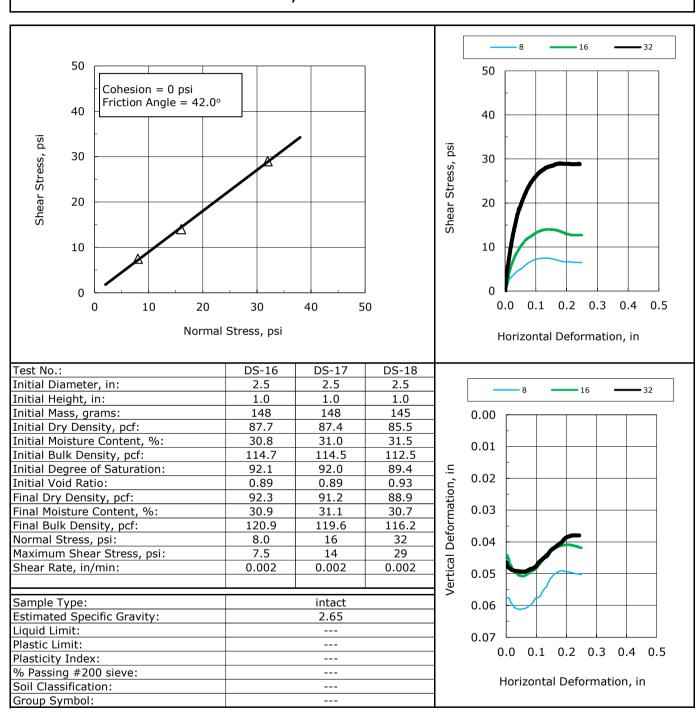
Moisture Content determined by ASTM D2216

Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.



Client: Anchor QEA, LLC Project Name: Gasco PDI Project Location: 310685 GTX #: Test Date: 12/16/19 Tested By: md Checked By: njh Boring ID: PDI-122SPT Sample ID: 44-46-190926 Depth, ft: Visual Description: Moist, dark gray sand

## Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080



#### Notes:

Moisture content obtained before shear from sample trimmings

Moisture Content determined by ASTM D2216

Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

#### UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850 1.0 psi ô 0.5 0.0 0.0 0.5 1.0 1.5 2.0 2.5 3.0 p, psi Symbol 0 $\triangle$ Sample No. 191007 191007 191007 3.5 -Test No. UU-1-1 UU-1-2 UU - 1 - 3Depth 1.5-3.5 ft 1.5-3.5 ft 1.5-3.5 ft Tested by trm $\operatorname{trm}$ trm 3.0 12/16/19|12/17/19|12/16/19 Test Date Checked by anm anm anm 2.5 2/06/20 Check Date 2/06/20 2/06/20 psi 1.93 1.93 1.93 Diameter, in DEVIATOR STRESS, 2.0 Height, in 4.4 4.4 4.15 Water Content, % 86.6 86.3 67.3 Dry Density, pcf 49.38 49.01 59.8 1.5 Saturation, % 96.9 95.5 99.9 Void Ratio 2.41 2.44 1.82 Confining Stress, psi 0.1 0.2 0.4 1.0 Undrained Strength, psi 0.5743 0.5143 0.5666 Max. Dev. Stress, psi 1.149 1.029 1.133 0.5 Strain at Failure, % 5.38 1.13 11.9 Strain Rate, %/min 1 1 1 2.7 2.7 2.7 Estimated Specific Gravity 0.0 20 10 15 Liquid Limit 66 66 66 VERTICAL STRAIN, % Plastic Limit 38 38 38 Plasticity Index 28 28 28 Project: Gasco PDI Location: ---Project No.: GTX-310685 GeoTestii Boring No.: PDI-108SPT EXPRESS Sample Type: intact Description: Wet, olive gray silt Remarks: System PP

#### UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850 20 psi ò 10 0 -10 20 30 50 40 60 p, psi Symbol 0 $\triangle$ Sample No. 191011 191011 191011 70 -Test No. UU-2-1 UU-2-2 UU-2-3 Depth 47-49 ft 47-49 ft 47-49 ft Tested by trm trm trm 60 12/19/19|12/19/19|12/19/19 Test Date Checked by anm anm anm 50 2/05/20 2/05/20 2/05/20 Check Date . So 1.93 1.93 1.93 Diameter, in DEVIATOR STRESS, Height, in 4.3 4.1 4.15 40 Water Content, % 32.1 32.9 35.1 Dry Density, pcf 84.1 85.78 85.19 30 Saturation, % 94.0 98.7 88.1 0.967 Void Ratio 0.928 0.942 Confining Stress, psi 4 8 16 20 Undrained Strength, psi 9.392 14.46 17.67 Max. Dev. Stress, psi 18.78 28.92 35.35 10 -Strain at Failure, % 15 11.5 15 Strain Rate, %/min 1 1 1 Estimated Specific Gravity 2.65 2.65 2.65 0 10 15 20 Liquid Limit VERTICAL STRAIN, % Plastic Limit Plasticity Index Project: Gasco PDI Location: ---Project No.: GTX-310685 GeoTestii Boring No.: PDI-113SPT EXPRESS Sample Type: intact Description: Moist, dark grayish brown silty sand Remarks: System F

#### UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850 20 psi ò 10 0 20 50 30 40 60 p, psi Symbol $\bigcirc$ $\triangle$ Sample No. 190927 190927 70 -Test No. UU-4-1 UU-4-2 Depth 30-32 ft 30-32 ft Tested by trm trm 60 12/16/19 12/16/19 Test Date Checked by anm anm 50 2/06/20 2/06/20 Check Date . Isd Diameter, in 1.93 1.93 DEVIATOR STRESS, 4.4 Height, in 4.2 40 Water Content, % 31.0 29.8 77.63 Dry Density, pcf 81.27 30 Saturation, % 79.4 69.7 Void Ratio 1.13 1.04 10 Confining Stress, psi 2.5 20 Undrained Strength, psi 2.573 16.86 Max. Dev. Stress, psi 5.145 33.71 10 Strain at Failure, % 1.75 10.8 Strain Rate, %/min 1 1 Estimated Specific Gravity 2.65 2.65 0 10 15 20 Liquid Limit VERTICAL STRAIN, % Plastic Limit Plasticity Index Project: Gasco PDI Location: ---Project No.: GTX-310685 Boring No.: PDI-116SPT EXPRESS Sample Type: intact Description: Moist, dark gray sand with gravel Remarks: System F

#### UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850 2 psi 0 p, psi Symbol 0 $\triangle$ Sample No. 191014 191014 191014 7 Test No. UU-7-1 UU-7-2 UU-7-3 Depth 4.5-6.5 ft 4.5-6.5 ft 4.5-6.5 ft Tested by trm trm trm 6 12/16/19|12/16/19|12/16/19 Test Date Checked by anm anm anm 5 2/06/20 2/06/20 2/06/20 Check Date SO 1.93 1.93 1.93 Diameter, in DEVIATOR STRESS, Height, in 4.5 4.4 4.3 Water Content, % 83.2 82.5 62.6 Dry Density, pcf 51.13 50.66 60.49 3 Saturation, % 97.9 95.7 94.6 Void Ratio 2.3 2.33 1.79 Confining Stress, psi 0.35 0.7 1.4 2 Undrained Strength, psi 1.372 0.751 1.926 Max. Dev. Stress, psi 2.744 1.502 3.852 1 Strain at Failure, % 2.3 9.98 10.8 Strain Rate, %/min 1 1 1 Estimated Specific Gravity 2.7 2.7 2.7 0 10 15 20 Liquid Limit 74 74 74 VERTICAL STRAIN, % Plastic Limit 38 38 38 36 36 36 Plasticity Index Project: Gasco PDI Location: ---Project No.: GTX-31685 GeoTestir Boring No.: PDI-118SPT EXPRESS Sample Type: intact Description: Wet, olive gray silt Remarks: System R

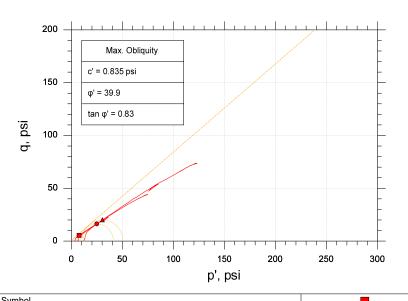
#### UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850 1.0 psi. 0.5 0.0 -0.5 1.0 1.5 2.0 2.5 3.0 p, psi Symbol 0 $\triangle$ Sample No. 190930 190930 3.5 -Test No. UU-5-1 UU-5-2 Depth 6-8 ft 6-8 ft Tested by $\operatorname{trm}$ trm 3.0 12/16/19 12/16/19 Test Date Checked by anm anm 2.5 Check Date 2/06/20 2/06/20 . S Diameter, in 1.93 1.93 DEVIATOR STRESS, 4.2 Height, in 4.05 2.0 Water Content, % 84.5 77.3 Dry Density, pcf 41.05 54.38 1.5 Saturation, % 73.5 99.4 Void Ratio 2.1 3.11 Confining Stress, psi 0.5 2 1.0 Undrained Strength, psi 1.179 0.2495 Max. Dev. Stress, psi 2.358 0.499 0.5 Strain at Failure, % 5.4 7.65 Strain Rate, %/min 1 1 Estimated Specific Gravity 2.7 2.7 0.0 20 10 15 Liquid Limit 76 76 VERTICAL STRAIN, % Plastic Limit 39 39 Plasticity Index 37 37 Project: Gasco PDI Location: ---Project No.: GTX-31685 Boring No.: PDI-121SPT EXPRESS Sample Type: intact Description: Wet, olive gray silt Remarks: System R

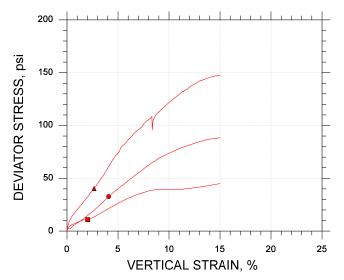
#### UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850 1.0 psi. 0.5 0.0 -0.5 1.0 1.5 2.0 2.5 3.0 p, psi Symbol 0 $\triangle$ Sample No. 190924 190924 190924 3.5 -Test No. UU-3-1 UU-3-2 UU-3-3 Depth 4.5-6.5 ft 4.5-6.5 ft 4.5-6.5 ft Tested by trm trm trm 3.0 12/16/19|12/17/19|12/16/19 Test Date Checked by anm anm 2.5 2/06/20 2/06/20 2/06/20 Check Date . S Diameter, in 1.93 1.93 1.93 DEVIATOR STRESS, 2.0 Height, in 4.3 4.4 4.35 Water Content, % 69.2 73.4 78.6 Dry Density, pcf 57.06 54.29 51.85 1.5 Saturation, % 95.6 94.1 94.3 Void Ratio 1.95 2.25 2.1 1.0 Confining Stress, psi 0.35 0.7 1.4 Undrained Strength, psi 0.7212 0.9639 0.8775 Max. Dev. Stress, psi 1.442 1.928 1.755 0.5 Strain at Failure, % 11.1 3.16 7.86 Strain Rate, %/min 1 1 1 Estimated Specific Gravity 2.7 2.7 2.7 0.0 10 15 20 Liquid Limit 50 50 50 VERTICAL STRAIN, % Plastic Limit 33 33 33 17 17 17 Plasticity Index Project: Gasco PDI Location: ---Project No.: GTX-310685 GeoTesti Boring No.: PDI-123SPT EXPRESS Sample Type: intact Description: Wet, olive gray silt Remarks: System PP

#### UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850 2 psi 0 p, psi Symbol $\bigcirc$ $\triangle$ Sample No. 191008 191008 191008 7 Test No. UU-6-1 UU-6-2 UU-6-3 Depth 7.5-9.5 ft 7.5-9.5 ft 7.5-9.5 ft Tested by trm trm trm 6 12/17/19|12/17/19|12/16/19 Test Date Checked by anm anm anm 5 2/06/20 2/06/20 Check Date 2/06/20 . IS 1.93 1.93 1.93 Diameter, in DEVIATOR STRESS, Height, in 4.6 4.7 4.65 Water Content, % 67.1 78.2 75.8 Dry Density, pcf 58.57 51.91 53.09 3 Saturation, % 94.1 96.5 93.9 Void Ratio 2.25 1.88 2.18 Confining Stress, psi 0.6 1.2 2.4 2 Undrained Strength, psi 2.116 2.591 1.644 Max. Dev. Stress, psi 4.232 5.182 3.289 1 Strain at Failure, % 8.96 2.91 9.13 Strain Rate, %/min 1 1 1 Estimated Specific Gravity 2.7 2.7 2.7 0 10 15 20 Liquid Limit 58 58 58 VERTICAL STRAIN, % Plastic Limit 36 36 36 Plasticity Index 22 22 22 Project: Gasco PDI Location: ---Project No.: GTX-310685 GeoTestir Boring No.: PDI-114SPT EXPRESS Sample Type: intact Description: Wet, gray silt Remarks: System QQ



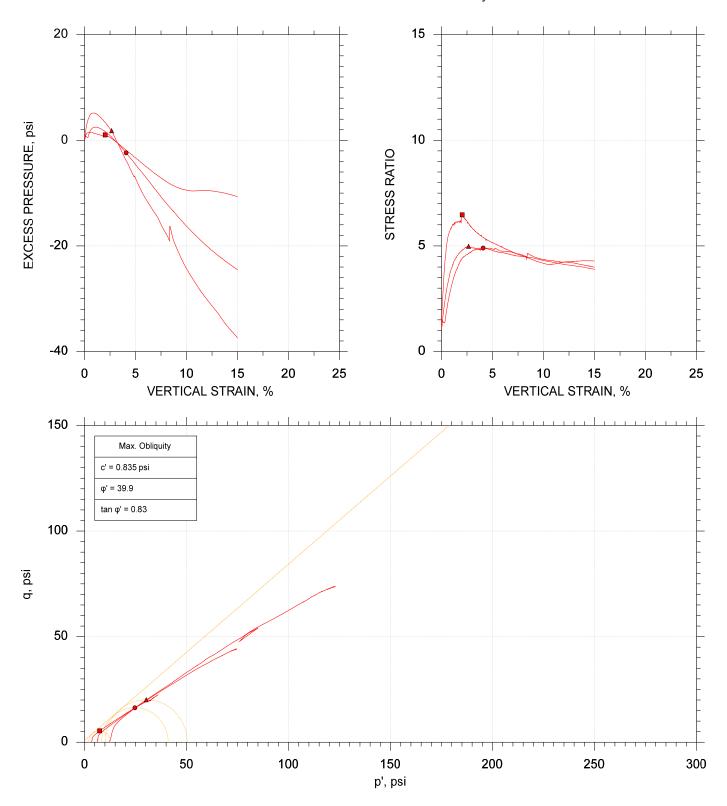
	Client: Anchor QEA, LLC						
	Project Name: Gasco PDI						
	Project Location:	Project Location:					
	Project Number: GTX-310685						
	Tested By: trm	Checked By: njh					
Boring ID: PDI-107SPT							
Preparation: intact							
	Description: Wet, dark gray sand						
Classification:							
Group Symbol:							
	Liquid Limit:	Plastic Limit:					
	Plasticity Index:	Estimated Specific Gravity: 2.65					





	50	- - - - - - -	DEVIATO 0		- - - - - -
	0 50 100 150 200 p', psi	250 300	0 !	5 10 15 VERTICAL STRAIN,	20 25
				VERTIONE STRAIN,	70
	mbol		•	<u> </u>	
	mple ID	190924	190924	190924	
	oth, ft	39-41	39-41	39-41	
Tes	st Number	CU-8-1	CU-8-2	CU-8-3	
	Height, in	4.500	4.200	4.500	
	Diameter, in	1.930	1.930	1.930	
Initial	Moisture Content (from Cuttings), %	34.2	33.5	33.9	
드	Dry Density, pcf	79.6	82.9	73.8	
	Saturation (Wet Method), %	84.0	89.4	72.5	
	Void Ratio	1.08	0.995	1.24	
	Moisture Content, %	41.0	37.5	48.6	
Shear	Dry Density, pcf	79.2	82.9	72.3	
S	Cross-sectional Area (Method A), in²	2.933	2.927	3.002	
Before	Saturation, %	100.0	100.0	100.0	
B	Void Ratio	1.09	0.995	1.29	
	Back Pressure, psi	156.0	161.0	161.0	
	tical Effective Consolidation Stress, psi	3.007	6.003	11.94	
Hor	rizontal Effective Consolidation Stress, psi	2.994	5.987	11.96	
Ver	tical Strain after Consolidation, %	0.0000	0.01899	0.3484	
Vol	umetric Strain after Consolidation, %	0.1850	-0.07463	-2.490	
Tim	ne to 50% Consolidation, min			0.1600	
	ear Strength, psi	5.399	16.33	20.12	
	ain at Failure, %	2.03	4.08	2.65	
Stra	ain Rate, %/min	0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		10.80	32.65	40.24	
Effective Minor Principal Stress at Failure, psi		1.973	8.368	10.11	
Effective Major Principal Stress at Failure, psi		12.77	41.02	50.35	
	/alue	0.95	0.95	0.99	
Notes: - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Deviator Stress includes membrane correction Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.					

Remarks: System R



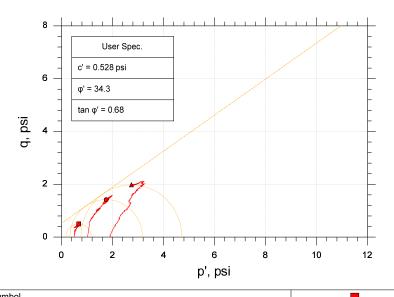
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•	190924	CU-8-1	39-41	trm	12/13/19	njh	2/7/2020	310685-CU-8-1n.dat
•	190924	CU-8-2	39-41	trm	12/13/19	njh	2/7/2020	310685-CU-8-2n.dat
<b>A</b>	190924	CU-8-3	39-41	trm	12/12/19	njh	2/7/2020	310685-CU-8-3n.dat

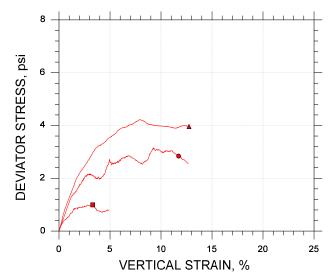


Project: Gasco PDI	Location:	Project No.: GTX-310685					
Boring No.: PDI-107SPT							
Description: Wet, dark gray sand							
Remarks: System R							



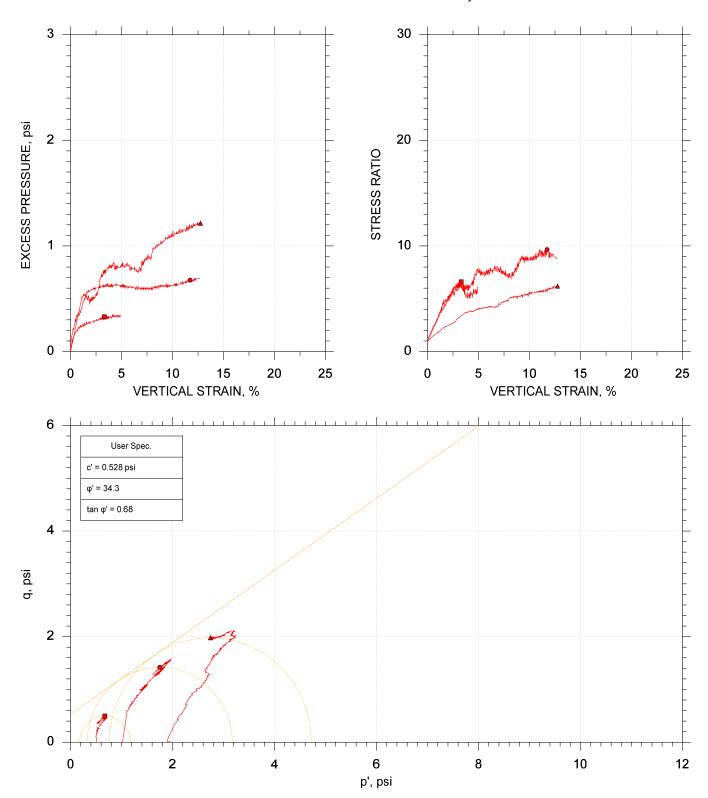
Client: Anchor QEA, LLC						
Project Name: Gasco PDI						
Project Location:						
Project Number: GTX-310685						
Tested By: trm Checked By: njh						
Boring ID: PDI-109SPT	·					
Preparation: intact						
Description: Wet, dark olive gray silt						
Classification:	Classification:					
Group Symbol:						
Liquid Limit: 75	Plastic Limit: 39					
Plasticity Index: 36	Fetimated Specific Cravity: 2.7					





	0 2 4 6 8 p', psi	10 12	DEVIN	5 10 15 VERTICAL STRAIN,	20 25
Syr	nbol		•	<b>A</b>	
Sar	nple ID	191004	191004	191004	
Dep	oth, ft	6.5-8.5	6.5-8.5	6.5-8.5	
Tes	t Number	CU-5-1	CU-5-2	CU-5-3	
	Height, in	4.200	4.550	4.600	
	Diameter, in	1.930	1.930	1.930	
Initial	Moisture Content (from Cuttings), %	76.1	90.2	82.4	
l ii	Dry Density, pcf	55.1	47.9	50.6	
	Saturation (Wet Method), %	99.9	96.6	95.5	
	Void Ratio	2.06	2.52	2.33	
	Moisture Content, %	67.0	91.5	87.2	
ear	Dry Density, pcf	60.0	48.6	50.3	
Before Shear	Cross-sectional Area (Method A), in²	2.764	2.882	2.943	
fore	Saturation, %	100.0	100.0	100.0	
Be	Void Ratio	1.81	2.47	2.35	
	Back Pressure, psi	113.2	40.98	160.8	
Ver	tical Effective Consolidation Stress, psi	0.4813	1.022	1.979	
Hor	izontal Effective Consolidation Stress, psi	0.5062	1.017	1.988	
Ver	tical Strain after Consolidation, %	0.3160	0.002070	0.1552	
Vol	umetric Strain after Consolidation, %	0.8702	1.559	0.04152	
Tim	e to 50% Consolidation, min			9.600	
She	ear Strength, psi	0.4964	1.421 1.979		
Stra	ain at Failure, %	3.30	11.7	12.7	
Stra	ain Rate, %/min	0.01600	0.01600	0.01600	
Dev	riator Stress at Failure, psi	0.9928	2.841	3.958	
Effe	ective Minor Principal Stress at Failure, psi	0.1773	0.3282	0.7621	
	ective Major Principal Stress at Failure, psi	1.170	3.169	4.720	
B-Value		0.96	0.98	0.95	
Notes:  - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Atterberg Limits determined by ASTM D4318 Deviator Stress includes membrane correction Values for c and $\phi$ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.					

Remarks:



	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
-	191004	CU-5-1	6.5-8.5	trm	12/5/19	njh	2/6/2020	310685-CU-5-1n.dat
•	191004	CU-5-2	6.5-8.5	jlw/trm	12/05/19	njh	2/6/2020	310685-CU-5-2n.dat
<b>A</b>	191004	CU-5-3	6.5-8.5	jlw/trm	12/05/19	njh	2/6/2020	310685-CU-5-3n.dat



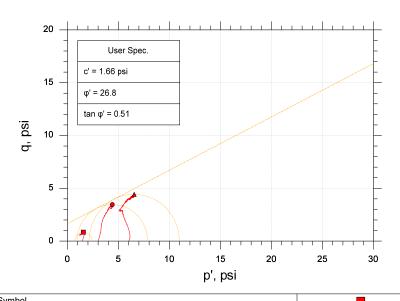
Project: Gasco PDI	Location:	Project No.: GTX-310685	
Boring No.: PDI-109SPT	Sample Type: intact		

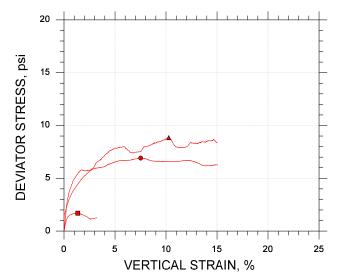
Description: Wet, dark olive gray silt

Remarks: System E, Test Specimen CU-5-1 was not used in determining cohesion and friction values



	Client: Anchor QEA, LLC					
	Project Name: Gasco PDI					
	Project Location:					
	Project Number: GTX-310685					
	Tested By: md	Checked By: njh				
	Boring ID: PDI-114SPT					
	Preparation: intact					
	Description: Wet, gray clay					
Classification: Group Symbol:						
						Liquid Limit:
	Plasticity Index:	Estimated Specific Gravity: 2.7				



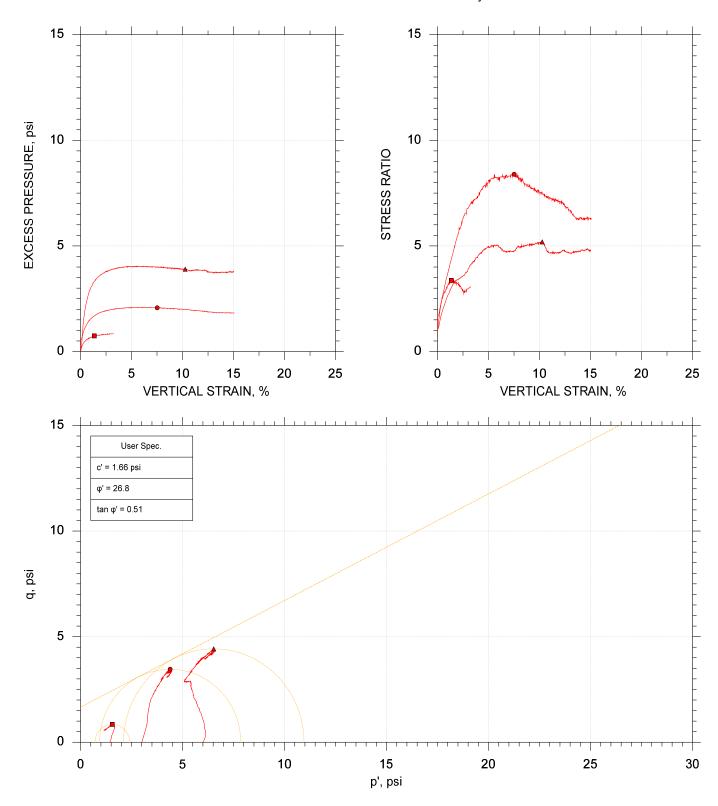


	0 5 10 15 20 p', psi	25 30	5 0 0 0 5 10 15 20 25 VERTICAL STRAIN, %			
Syr	mbol		•	<u> </u>		
Sar	mple ID	191008	191008	191008	1	
Der	pth, ft	17.5-19.5	17.5-19.5	17.5-19.5		
Tes	st Number	CU-3-1	CU-3-2	CU-3-3		
	Height, in	4.000	4.180	4.400		
	Diameter, in	1.930	1.930	1.930		
Initial	Moisture Content (from Cuttings), %	60.1	76.1	65.6		
<u>=</u>	Dry Density, pcf	63.3	55.1	60.6		
	Saturation (Wet Method), %	97.6	99.9	99.4		
'	Void Ratio	1.66	2.06	1.78		
	Moisture Content, %	41.2	73.2	59.1		
a l	Dry Density, pcf	79.8	56.6	65.0		
Shear	Cross-sectional Area (Method A), in <sup>2</sup>	2.419	2.867	2.792		
Before	Saturation, %	100.0	100.0	100.0		
Bef	Void Ratio	1.11	1.98	1.59		
	Back Pressure, psi	151.0	103.0	161.0		
Ver	rtical Effective Consolidation Stress, psi	1.408	2.963	5.947		
Hor	rizontal Effective Consolidation Stress, psi	1.474	3.007	6.008	i	
Ver	rtical Strain after Consolidation, %	0.8168	0.5256	0.7459	i	
Vol	lumetric Strain after Consolidation, %	12.13	2.387	2.207		
Tim	ne to 50% Consolidation, min			4.400		
She	ear Strength, psi	0.8463	3.457	4.421		
Stra	ain at Failure, %	1.35	7.51	10.3		
Stra	ain Rate, %/min	0.01600	0.01600	0.01600		
Dev	viator Stress at Failure, psi	1.693	6.913	8.841	i	
Effe	ective Minor Principal Stress at Failure, psi	0.7134	0.9349	2.110		
Eff€	ective Major Principal Stress at Failure, psi	2.406	7.848	10.95		
B-V	/alue	1.0	0.95	0.97		
Notes:  Before Shear Saturation set to 100% for phase calculation.  Moisture Content determined by ASTM D2216.  Deviator Stress includes membrane correction.  Values for early determined from best fit straight line for the specific test conditions. Actual						

System QQ, Test Specimen CU-3-1 was not used in determining cohesion and friction values

 - Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.

Remarks:

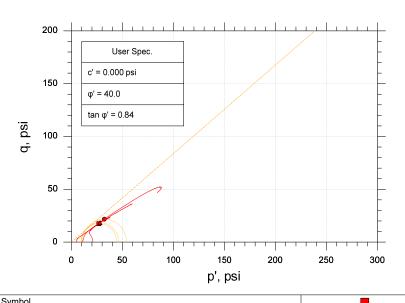


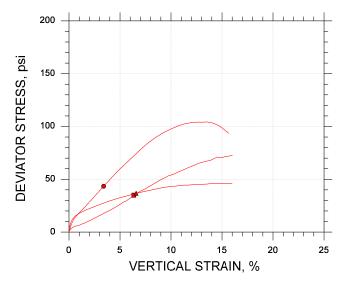
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
-	191008	CU-3-1	17.5-19.5	md	11/30/19	njh	1/28/2020	310685-CU-3-1n.dat
•	191008	CU-3-2	17.5-19.5	md	11/30/19	njh	1/28/2020	310685-CU-3-2n.dat
<b>A</b>	191008	CU-3-3	17.5-19.5	md	11/30/19	njh	1/28/2020	310685-CU-3-3n.dat

	GeoTesting EXPRESS						
		Project: Gasco PDI	Location:	Project No.: GTX-310685			
		Boring No.: PDI-114SPT	Sample Type: intact				
		Description: Wet, gray clay					
		Remarks: System QQ, Test Specimen CU-3-1 was not used in determining cohesion and friction values					



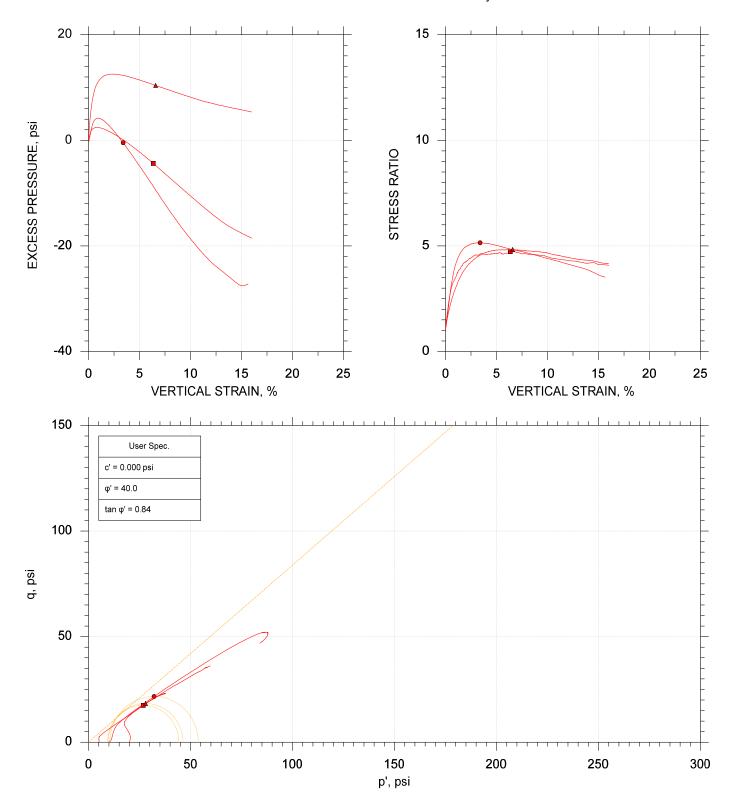
Client: Anchor QEA, LLC					
Project Name: Gasco PDI					
Project Location:					
Project Number: GTX-310685					
Tested By: md Checked By: njh					
Boring ID: PDI-117SPT					
Preparation: intact					
Description: Moist, dark brownish gray silty sand					
Classification:					
Group Symbol:					
Liquid Limit: Plastic Limit:					
Plasticity Index:	Estimated Specific Gravity: 2.65				





	50 0 0 50 100 150 200	250 300	DEVIATOR	5 10 15	20 25
	p', psi			VERTICAL STRAIN,	%
Syn			•	<b>A</b>	
	pple ID	191002	191002	191002	
	th, ft	58.5-60.5	58.5-60.5	58.5-60.5	
Tes	Number	CU-1-1	CU-1-2	CU-1-3	
	Height, in	4.400	4.500	4.500	
	Diameter, in	1.930	1.930	1.930	
Initial	Moisture Content (from Cuttings), %	29.1	30.7	32.8	
Ē	Dry Density, pcf	88.3	87.0	85.2	
	Saturation (Wet Method), %	88.2	90.3	92.2	
	Void Ratio	0.874	0.902	0.941	
	Moisture Content, %	32.0	33.1	25.9	
ear	Dry Density, pcf	89.5	88.1	98.1	
Before Shear	Cross-sectional Area (Method A), in <sup>2</sup>	2.899	2.901	2.663	
fore	Saturation, %	100.0	100.0	100.0	
Bei	Void Ratio	0.849	0.878	0.687	
	Back Pressure, psi	135.0	151.0	151.0	
Ver	ical Effective Consolidation Stress, psi	4.971	9.967	19.87	
Hor	zontal Effective Consolidation Stress, psi	4.986	9.995	19.97	
Ver	ical Strain after Consolidation, %	0.2302	0.3939	1.304	
Volu	metric Strain after Consolidation, %	0.6439	1.229	3.669	
Tim	e to 50% Consolidation, min			0.2500	
She	ar Strength, psi	17.46	21.68	18.36	
Stra	in at Failure, %	6.35	3.39	6.58	
Stra	in Rate, %/min	0.01600	0.01600	0.01600	
Dev	ator Stress at Failure, psi	34.93	43.36	36.71	
Effe	ctive Minor Principal Stress at Failure, psi	9.355	10.45	9.586	
Effective Major Principal Stress at Failure, psi		44.28	53.81	46.30	
B-V	alue	0.95	0.96	0.96	
- Moi - Dev - Vali stre	es:  ore Shear Saturation set to 100% for phase calculation.  sture Content determined by ASTM D2216.  attor Stress includes membrane correction.  es for c and p determined from best-fit straight line for the specific test conditions. Actual only parameters may vary and should be determined by an engineer for site conditions.  harks:				
1761	iaino.				

System R



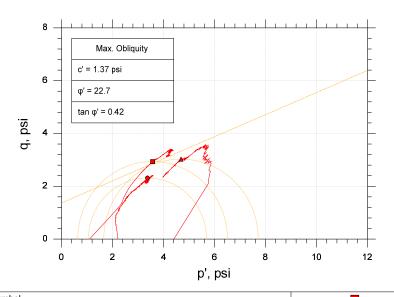
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
-	191002	CU-1-1	58.5-60.5	md	11/29/19	njh	1/28/2020	310685-CU-1-1n.dat
•	191002	CU-1-2	58.5-60.5	md	11/29/19	njh	1/28/2020	310685-CU-1-2n.dat
<b>A</b>	191002	CU-1-3	58.5-60.5	md	11/29/19	njh	1/28/2020	310685-CU-1-3n.dat

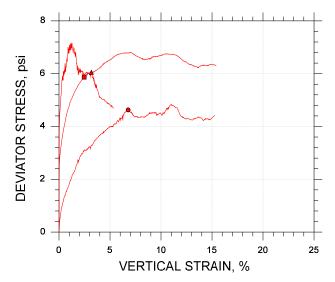


Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-117SPT	Sample Type: intact				
Description: Moist, dark brownish gray silty sand					
Remarks: System R					



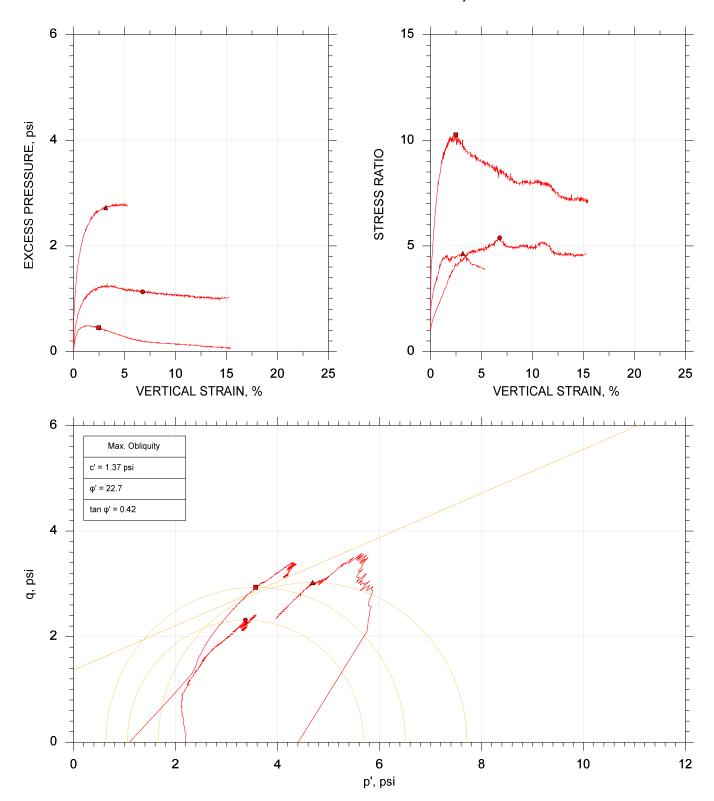
Client: Anchor QEA, LLC						
Project Name: Gasco PDI						
Project Location:	Project Location:					
Project Number: GTX-310685						
Tested By: md Checked By: njh						
Boring ID: PDI-118SPT	·					
Preparation: intact						
Description: Wet, black silt						
Classification:						
Group Symbol:						
Liquid Limit: Plastic Limit:						
Plasticity Index:	Estimated Specific Gravity: 2.7					





	2	10 12	DEVIATION OF STATE OF	5 10 15  VERTICAL STRAIN, 9	20 25
Syr	nbol			<u> </u>	
_	mple ID	191014	191014	191014	
	oth, ft	15-17	15-17	15-17	
	st Number	CU-2-1	CU-2-2	CU-2-3	
	Height, in	4.330	4.410	4.000	
'	Diameter, in	1.930	1.930	1.930	
<u></u>	Moisture Content (from Cuttings), %	64.1	72.4	62.8	
Initial	Dry Density, pcf	61.0	55.4	62.5	
'	Saturation (Wet Method), %	98.2	95.6	100.0	
'	Void Ratio	1.76	2.04	1.70	
'	Moisture Content, %	58.8	70.9	56.9	
Į Ž	Dry Density, pcf	65.1	57.8	66.5	
Shear	Cross-sectional Area (Method A), in²	2.788	2.842	2.816	
Before	Saturation, %	100.0	100.0	100.0	
Be	Void Ratio	1.59	1.91	1.54	
	Back Pressure, psi	62.74	86.98	95.01	
Ver	tical Effective Consolidation Stress, psi	1.102	2.150	4.300	
Hor	rizontal Effective Consolidation Stress, psi	1.097	2.200	4.405	
Ver	tical Strain after Consolidation, %	0.005610	0.6233	1.267	
Vol	umetric Strain after Consolidation, %	1.401	1.928	2.949	
Tim	ne to 50% Consolidation, min			46.00	
She	ear Strength, psi	2.936	2.314	3.027	
Stra	ain at Failure, %	2.47	6.78	3.17	
Stra	ain Rate, %/min	0.01600	0.01600	0.01600	
Dev	viator Stress at Failure, psi	5.872	4.628	6.053	
Eff€	ective Minor Principal Stress at Failure, psi	0.6345	1.056	1.659	
Effe	ective Major Principal Stress at Failure, psi	6.506	5.684	7.712	
B-V	alue	0.97	0.96	0.96	
B-Value  Notes: - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Deviator Stress includes membrane correction Values for c and φ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.					

Remarks: System E



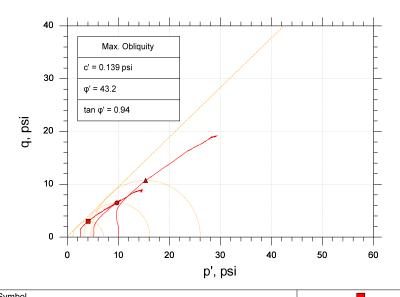
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
-	191014	CU-2-1	15-17	md	12/03/19	njh	1/28/2020	310685-CU-2-1n.dat
•	191014	CU-2-2	15-17	md	12/03/19	njh	1/28/2020	310685-CU-2-2n.dat
<b>A</b>	191014	CU-2-3	15-17	md	12/03/19	njh	1/28/2020	310685-CU-2-3n.dat

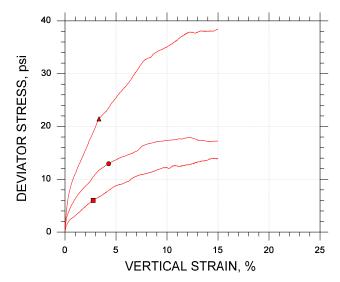


	Project: Gasco PDI	Location:	Project No.: GTX-310685					
J	Boring No.: PDI-118SPT	Sample Type: intact						
	Description: Wet, black silt							
	Remarks: System E							



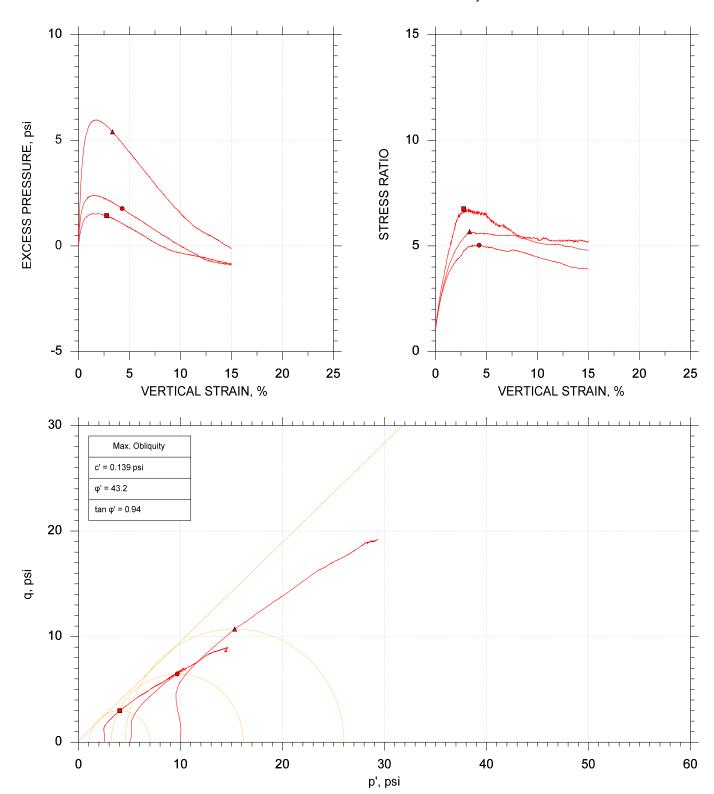
Client: Anchor QEA, LLC					
Project Name: Gasco PDI					
Project Location:					
Project Number: GTX-310685					
Tested By: trm Checked By: njh					
Boring ID: PDI-119SPT					
Preparation: intact					
Description: Moist, dark gray sandy clay					
Classification:					
Group Symbol:					
Liquid Limit: Plastic Limit:					
Plasticity Index:	Estimated Specific Gravity: 2.7				





	10 0 10 20 30 40 p', psi	50 60	DEVIAT	5 10 15 VERTICAL STRAIN,	20 25 %
Syr	mbol		•	<b>A</b>	
Sar	mple ID	191001	191001	191001	
Der	pth, ft	36.5-38.5	36.5-38.5	63.5-38.5	
Tes	st Number	CU-6-1	CU-6-2	CU-6-3	
	Height, in	4.100	4.500	4.650	
1 1	Diameter, in	1.930	1.930	1.930	
Initial	Moisture Content (from Cuttings), %	41.4	44.2	41.2	
ן <u>בֿ</u>	Dry Density, pcf	76.2	74.2	79.8	
1 1	Saturation (Wet Method), %	92.3	93.9	100.0	
I _'	Void Ratio	1.21	1.27	1.11	
i	Moisture Content, %	43.1	38.1	25.9	
ä	Dry Density, pcf	77.9	83.1	99.2	
Before Shear	Cross-sectional Area (Method A), in²	2.883	2.630	2.383	
fore	Saturation, %	100.0	100.0	100.0	
Be	Void Ratio	1.16	1.03	0.700	
1'	Back Pressure, psi	131.0	161.0	163.0	
Ver	tical Effective Consolidation Stress, psi	2.475	4.965	9.938	
Hor	rizontal Effective Consolidation Stress, psi	2.491	5.000	9.993	
Ver	rtical Strain after Consolidation, %	0.3139	0.4299	0.8871	
Vol	umetric Strain after Consolidation, %	0.8759	10.07	18.69	
Tim	ne to 50% Consolidation, min			2.250	
	ear Strength, psi	2.995	6.473	10.72	
Stra	ain at Failure, %	2.75	4.28	3.33	
Stra	ain Rate, %/min	0.01600	0.01600	0.01600	
Dev	viator Stress at Failure, psi	5.991	12.95	21.44	
Effe	ective Minor Principal Stress at Failure, psi	1.040	3.207	4.590	
Effe	ective Major Principal Stress at Failure, psi	7.030	16.15	26.03	
	/alue	0.96	0.95	0.96	
Notes:  - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Deviator Stress includes membrane correction Values for c and \( \phi\) determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.					

Remarks: System 00



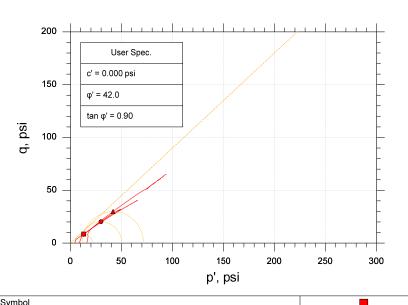
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•	191001	CU-6-1	36.5-38.5	trm	12/13/19	njh	2/6/2020	310685-CU-6-1n.dat
•	191001	CU-6-2	36.5-38.5	trm	12/13/19	njh	2/6/2020	310685-CU-6-2n.dat
<b>A</b>	191001	CU-6-3	63.5-38.5	trm	12/13/19	njh	2/6/2020	310685-CU-6-3n.dat

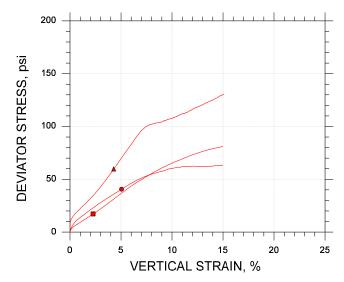


Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-119SPT	Sample Type: intact				
Description: Moist, dark gray sandy clay					
Remarks: System OO					



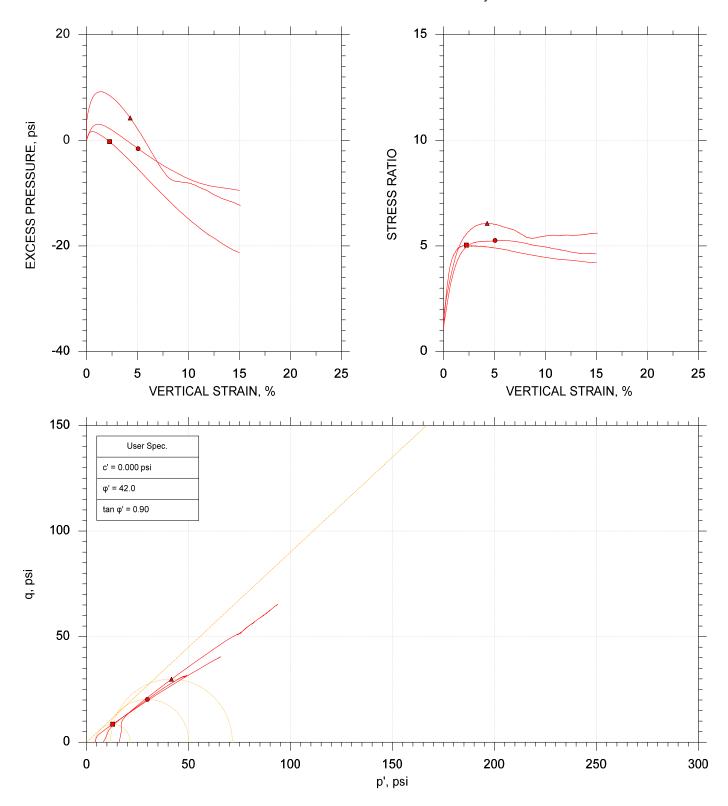
Client: Anchor QEA, LLC				
Project Name: Gasco PDI				
Project Location:				
Project Number: GTX-310685				
Tested By: trm	Checked By: njh			
Boring ID: PDI-122SPT				
Preparation: intact				
Description: Moist, dark gray sand				
Classification:				
Group Symbol:				
Liquid Limit:	Plastic Limit:			
Plasticity Index:	Estimated Specific Gravity: 2.65			





	50		DEVIATO		
	0 50 100 150 200 p', psi	250 300	0 5	5 10 15 VERTICAL STRAIN,	20 25 %
Syn	nbol		•	<u> </u>	
Sar	nple ID	190926	190926	190926	
Dep	oth, ft	44-46	44-46	44-46	
Tes	t Number	CU-7-1	CU-7-2	CU-7-3	
	Height, in	4.500	4.500	4.100	
	Diameter, in	1.930	1.930	1.930	
<u>.</u>	Moisture Content (from Cuttings), %	30.3	29.9	28.3	
Initial	Dry Density, pcf	77.7	78.3	82.2	
	Saturation (Wet Method), %	71.2	71.2	74.0	
	Void Ratio	1.13	1.11	1.01	
	Moisture Content, %	42.6	33.6	17.9	
ar	Dry Density, pcf	77.7	87.5	112.	
Before Shear	Cross-sectional Area (Method A), in²	2.921	2.635	2.201	
ore	Saturation, %	100.0	100.0	100.0	
Bef	Void Ratio	1.13	0.891	0.476	
	Back Pressure, psi	125.0	29.00	119.0	
Ver	tical Effective Consolidation Stress, psi	3.996	7.987	15.90	
Hor	izontal Effective Consolidation Stress, psi	3.991	7.995	16.01	
Ver	tical Strain after Consolidation, %	0.004162	0.2147	1.453	
Vol	umetric Strain after Consolidation, %	0.5562	9.366	24.16	
Tim	e to 50% Consolidation, min			0.1600	
She	ar Strength, psi	8.557	20.30	29.85	
Stra	in at Failure, %	2.25	5.05	4.28	
Stra	nin Rate, %/min	0.01600	0.01600	0.01600	
Deviator Stress at Failure, psi		17.11	40.60	59.71	
Effective Minor Principal Stress at Failure, psi		4.235	9.528	11.78	
Effe	ctive Major Principal Stress at Failure, psi	21.35	50.13	71.48	
B-V	alue	0.95	1.0	0.95	
Notes:  - Before Shear Saturation set to 100% for phase calculation.  - Moisture Content determined by ASTM D2216.  - Deviator Stress includes membrane correction.  - Values for c and $\phi$ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.					

Remarks:
System KK



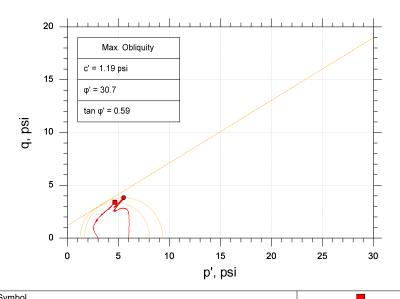
	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
•	190926	CU-7-1	44-46	trm	12/12/19	njh	2/7/2020	310685-CU-7-1n.dat
•	190926	CU-7-2	44-46	trm	12/12/19	njh	2/7/2020	310685-CU-7-2n.dat
<b>A</b>	190926	CU-7-3	44-46	trm	12/11/19	njh	2/7/2020	310685-CU-7-3n.dat

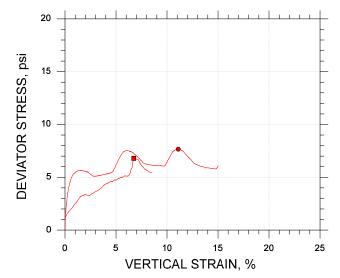


	Project: Gasco PDI	Location:	Project No.: GTX-310685		
	Boring No.: PDI-122SPT				
	Description: Moist, dark gray sand				
	Remarks: System KK				

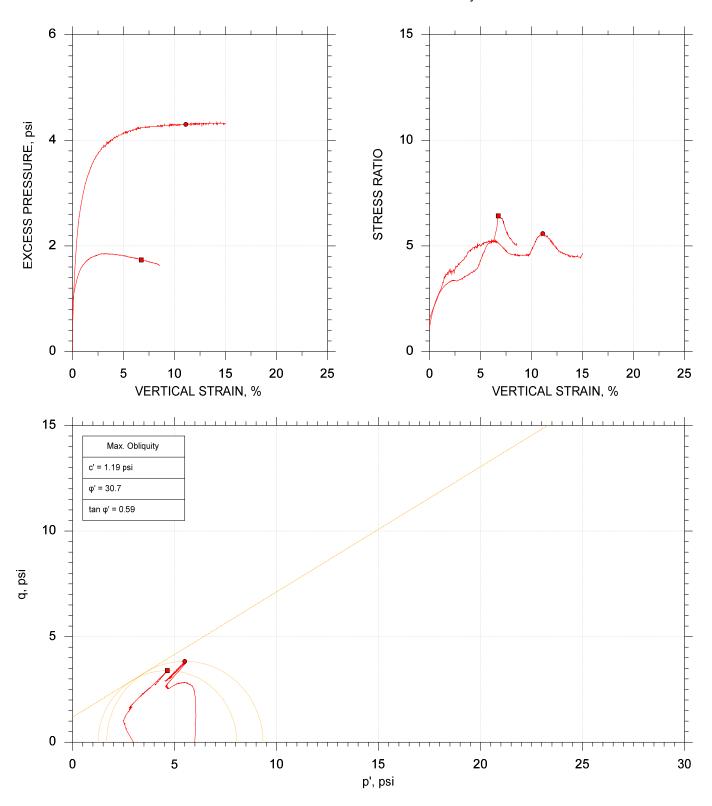


Client: Anchor QEA, LLC			
Project Name: Gasco PDI			
Project Location:			
Project Number: GTX-310685			
Tested By: trm Checked By: njh			
Boring ID: PDI-123SPT			
Preparation: intact			
Description: Wet, gray clay			
Classification:			
Group Symbol:			
Liquid Limit: Plastic Limit:			
Plasticity Index:	Estimated Specific Gravity: 2.7		





	0 5 10 15 20	25 30	> 5 - 0 - 0 - 0 - 0 - 0	5 10 15 20 25
	p', psi			VERTICAL STRAIN, %
Syn	abol		•	
San	pple ID	190924	190924	
Dep	th, ft	19.5-21.5	19.5-21.5	
Tes	t Number	CU-4-2	CU-4-3	
	Height, in	4.100	4.200	
	Diameter, in	1.930	1.930	
Initial	Moisture Content (from Cuttings), %	67.5	73.0	
Ξ	Dry Density, pcf	57.0	56.5	
	Saturation (Wet Method), %	93.1	99.5	
	Void Ratio	1.96	1.98	
	Moisture Content, %	71.7	62.3	
ä	Dry Density, pcf	57.4	62.9	
Before Shear	Cross-sectional Area (Method A), in <sup>2</sup>	2.926	2.750	
ore	Saturation, %	100.0	100.0	
Bef	Void Ratio	1.94	1.68	
	Back Pressure, psi	80.99	151.0	
Ver	ical Effective Consolidation Stress, psi	2.907	5.754	
Hor	zontal Effective Consolidation Stress, psi	2.987	5.992	
Ver	ical Strain after Consolidation, %	0.9609	2.758	
Volu	metric Strain after Consolidation, %	1.277	5.489	
Tim	e to 50% Consolidation, min		12.25	
She	ar Strength, psi	3.397	3.831	
Stra	in at Failure, %	6.74	11.1	
Stra	in Rate, %/min	0.01600	0.01600	
Dev	iator Stress at Failure, psi	6.793	7.661	
Effe	ctive Minor Principal Stress at Failure, psi	1.253	1.670	
Effe	ctive Major Principal Stress at Failure, psi	8.046	9.331	
B-Value		0.98	0.96	
Notes: - Before Shear Saturation set to 100% for phase calculation Moisture Content determined by ASTM D2216 Deviator Stress includes membrane correction Values for c and $\varphi$ determined from best-fit straight line for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site conditions.  Remarks:				
	tem V			

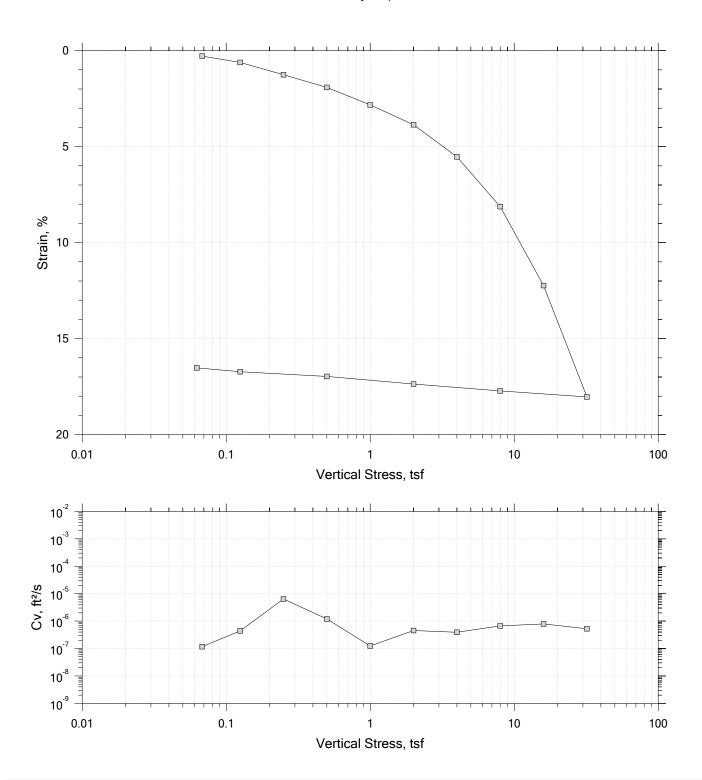


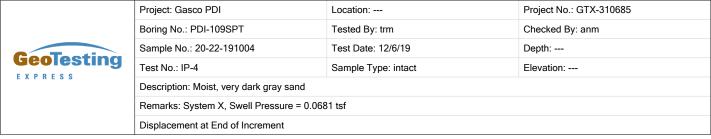
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•	190924	CU-4-3	19.5-21.5	trm	12/4/19	njh	1/28/2020	310685-CU-4-3n.dat



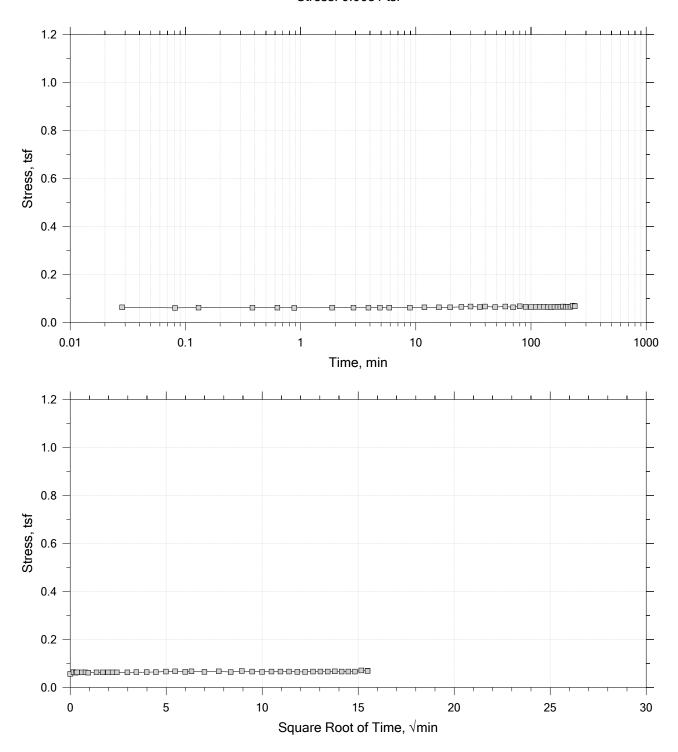
	Project: Gasco PDI	Location:	Project No.: GTX-310685			
J	Boring No.: PDI-123SPT	Sample Type: intact				
	Description: Wet, gray clay					
Remarks: System Y						

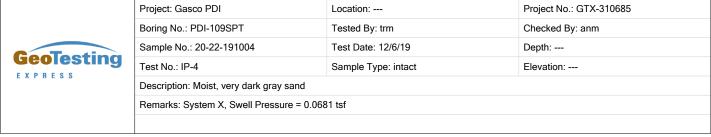
#### **Summary Report**



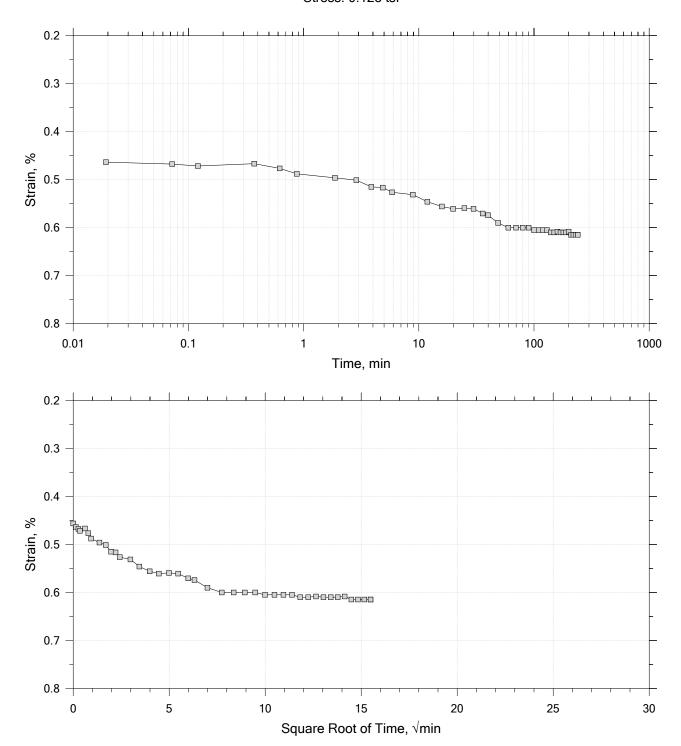


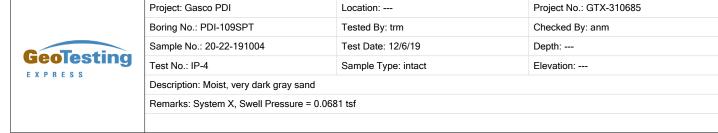
Time Curve 1 of 15 Constant Volume Step Stress: 0.0681 tsf



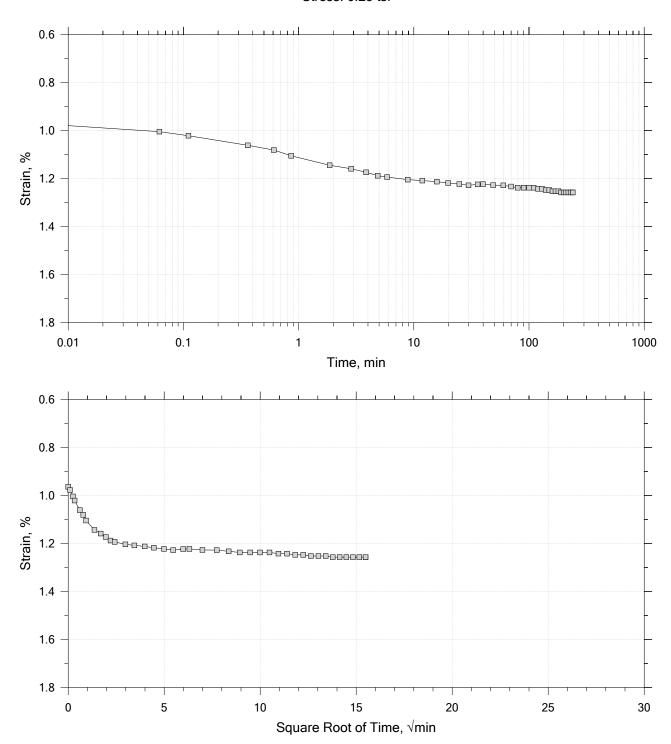


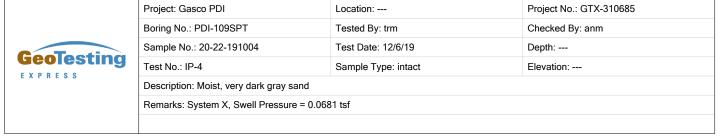
Time Curve 2 of 15 Constant Load Step Stress: 0.125 tsf



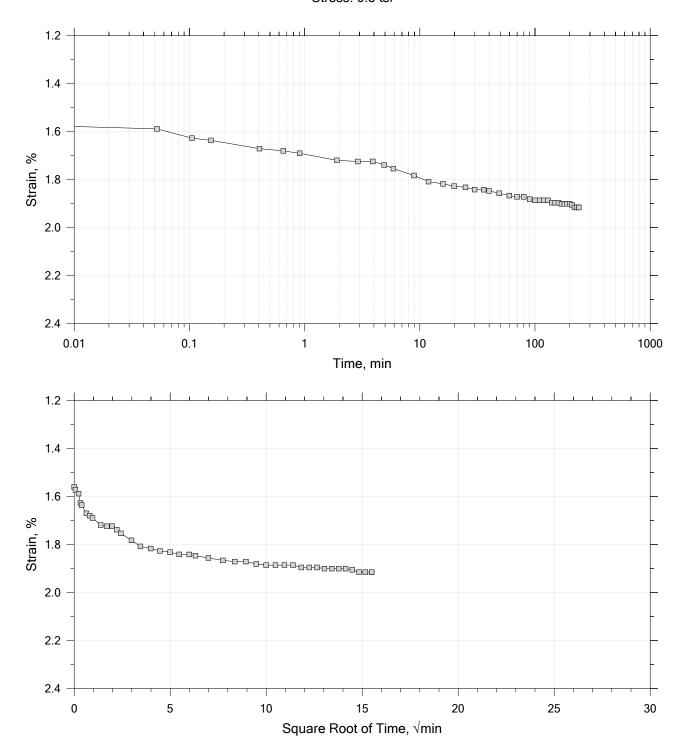


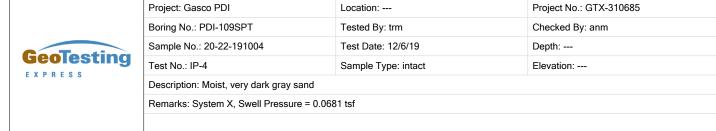
Time Curve 3 of 15 Constant Load Step Stress: 0.25 tsf



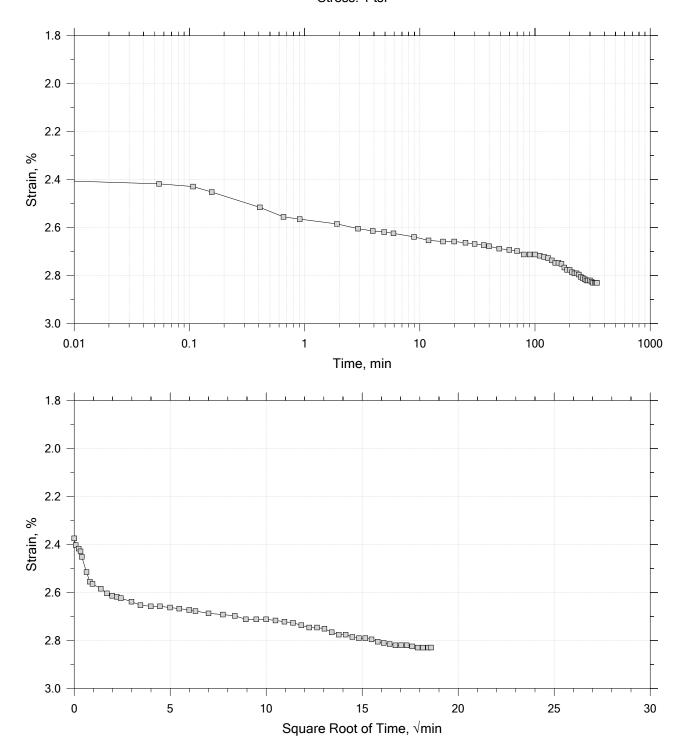


Time Curve 4 of 15 Constant Load Step Stress: 0.5 tsf





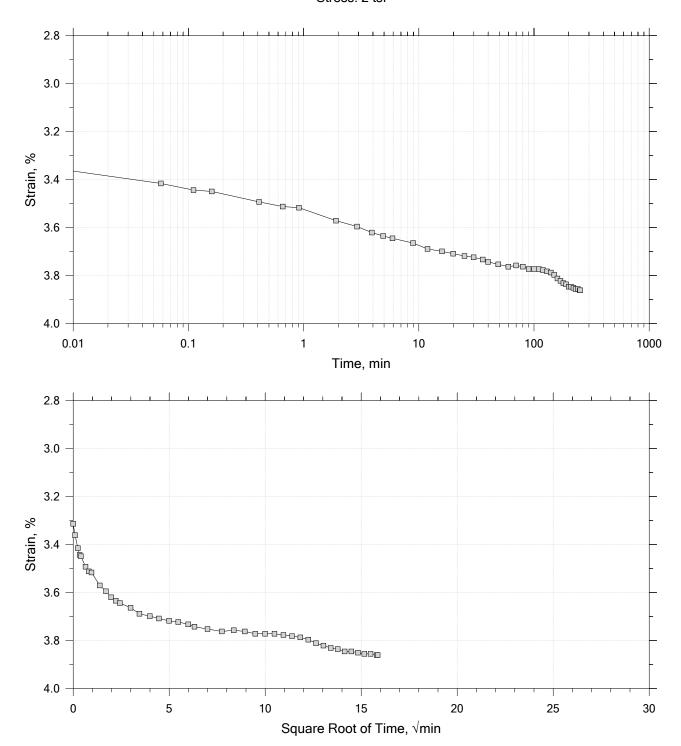
Time Curve 5 of 15 Constant Load Step Stress: 1 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-109SPT	Tested By: trm	Checked By: anm		
Sample No.: 20-22-191004	Test Date: 12/6/19	Depth:		
Test No.: IP-4	Sample Type: intact	Elevation:		
Description: Moist, very dark gray sand				
Remarks: System X, Swell Pressure = 0.0681 tsf				

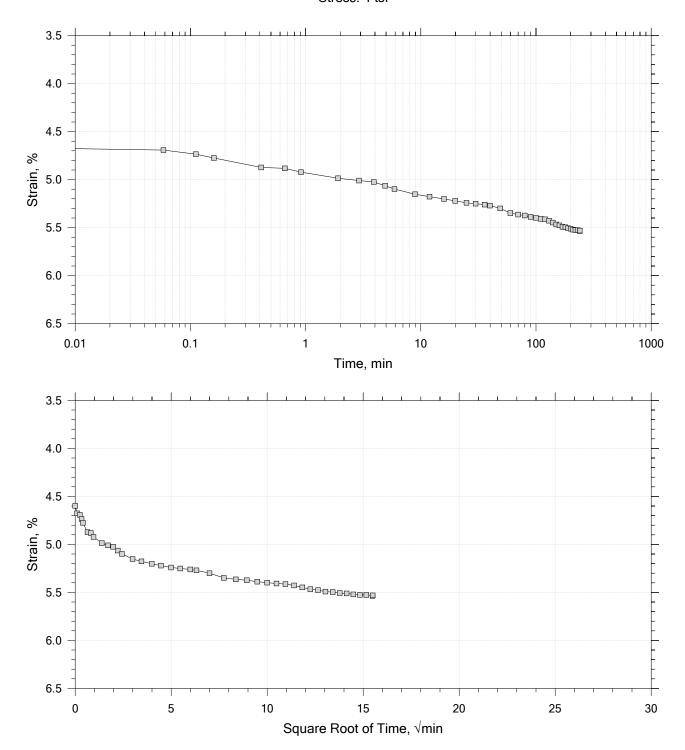
Time Curve 6 of 15 Constant Load Step Stress: 2 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-109SPT	Tested By: trm	Checked By: anm		
Sample No.: 20-22-191004	Test Date: 12/6/19	Depth:		
Test No.: IP-4	Sample Type: intact	Elevation:		
Description: Moist, very dark gray sand				
Remarks: System X, Swell Pressure = 0.0681 tsf				

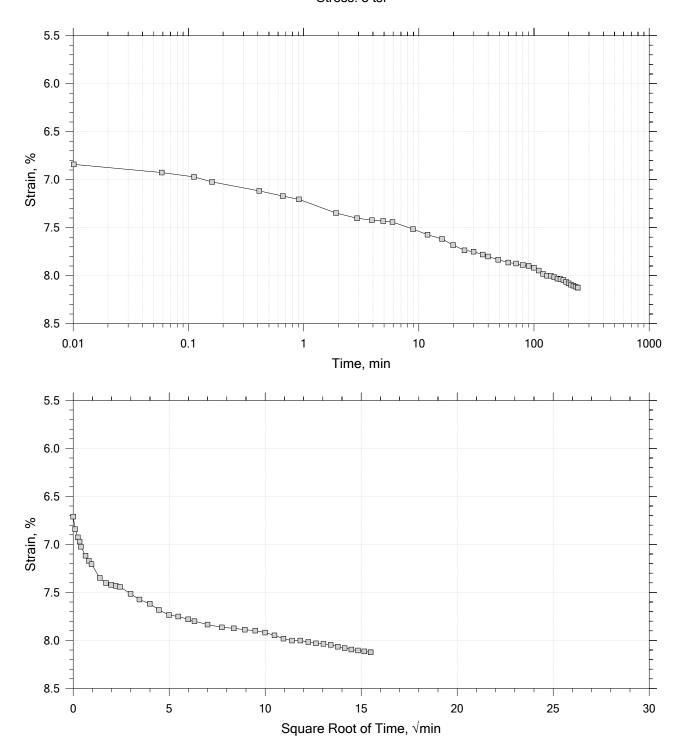
Time Curve 7 of 15 Constant Load Step Stress: 4 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-109SPT	Tested By: trm	Checked By: anm			
Sample No.: 20-22-191004	Test Date: 12/6/19	Depth:			
Test No.: IP-4	Sample Type: intact	Elevation:			
Description: Moist, very dark gray sand	Description: Moist, very dark gray sand				
Remarks: System X, Swell Pressure = 0.0681 tsf					

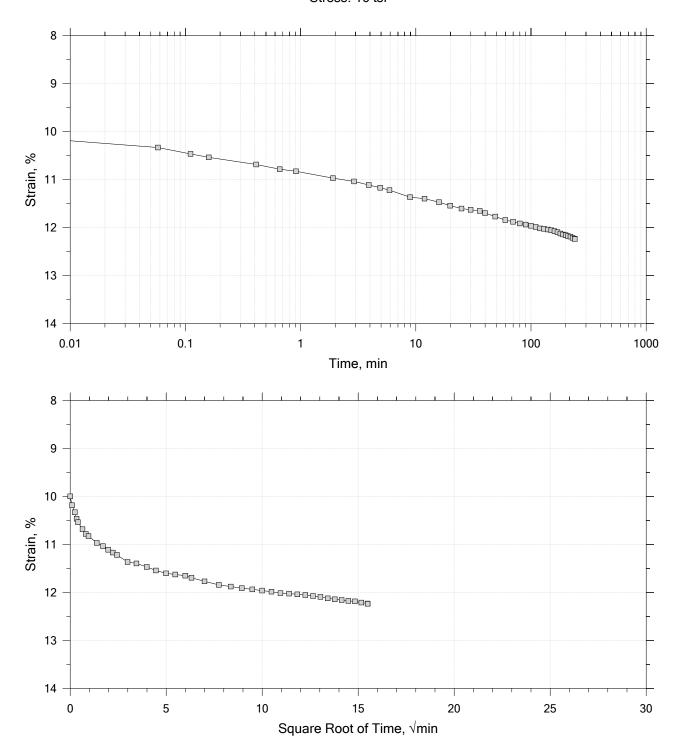
Time Curve 8 of 15 Constant Load Step Stress: 8 tsf

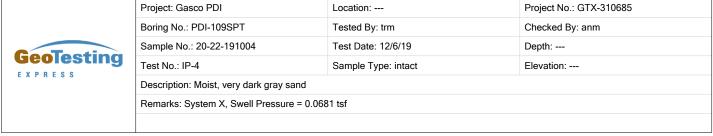




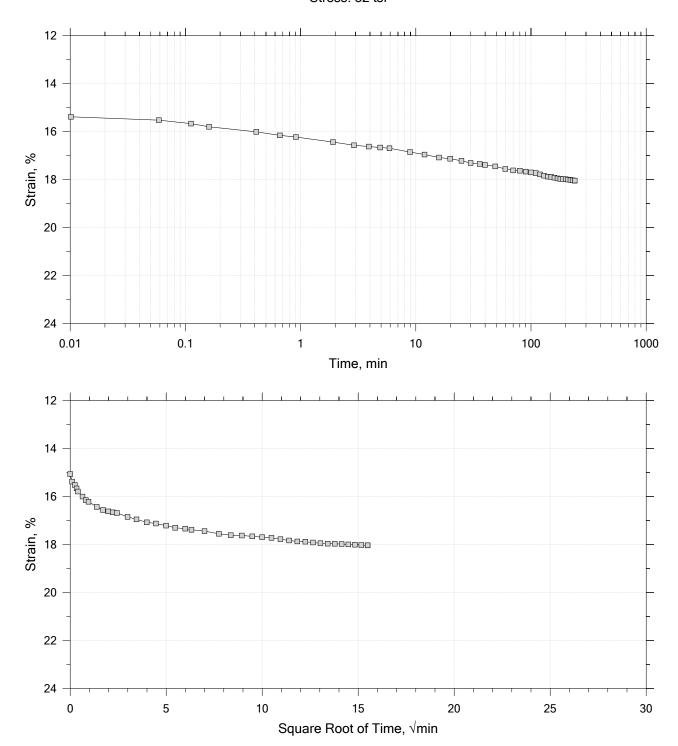
Project: Gasco PDI	Location:	Project No.: GTX-310685	
Boring No.: PDI-109SPT	Tested By: trm	Checked By: anm	
Sample No.: 20-22-191004	Test Date: 12/6/19	Depth:	
Test No.: IP-4	Sample Type: intact	Elevation:	
Description: Moist, very dark gray sand			
Remarks: System X, Swell Pressure = 0.0681 tsf			

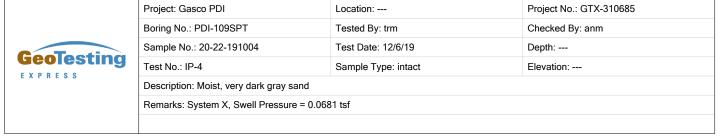
Time Curve 9 of 15 Constant Load Step Stress: 16 tsf



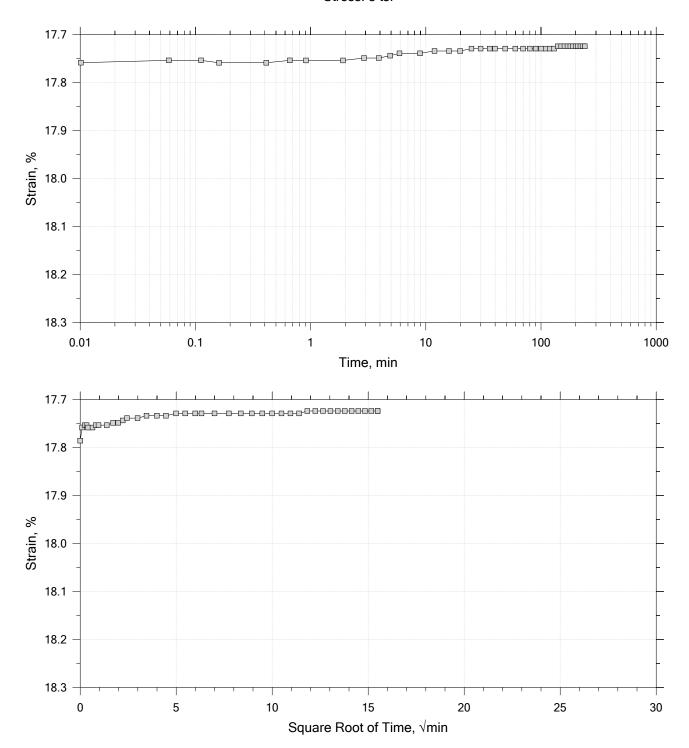


Time Curve 10 of 15 Constant Load Step Stress: 32 tsf





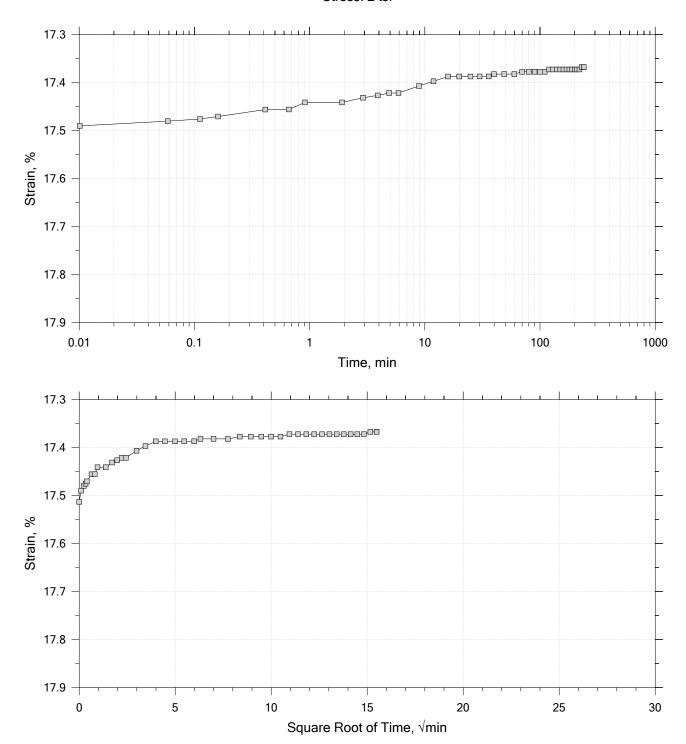
Time Curve 11 of 15 Constant Load Step Stress: 8 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685	
Boring No.: PDI-109SPT	Tested By: trm	Checked By: anm	
Sample No.: 20-22-191004	Test Date: 12/6/19	Depth:	
Test No.: IP-4	Sample Type: intact	Elevation:	
Description: Moist, very dark gray sand			
Remarks: System X, Swell Pressure = 0.0681 tsf			

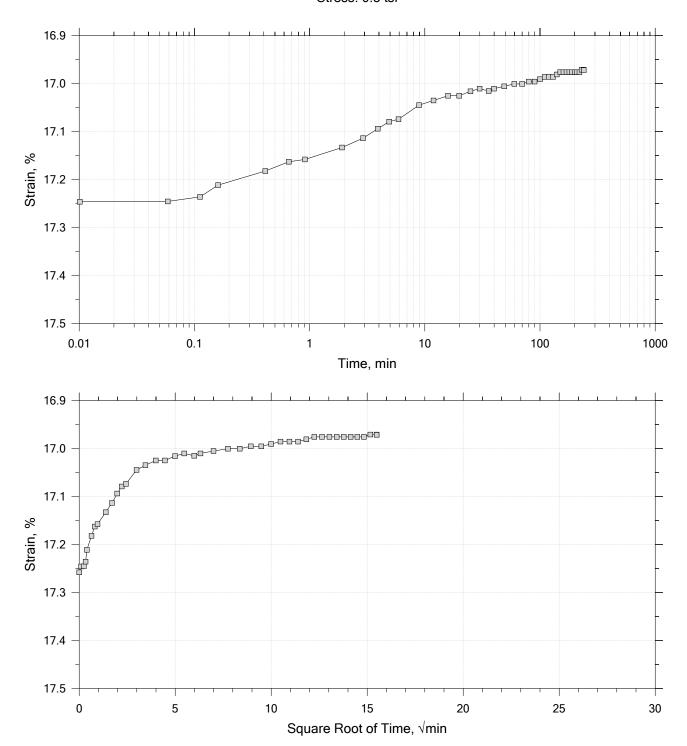
Time Curve 12 of 15 Constant Load Step Stress: 2 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685	
Boring No.: PDI-109SPT	Tested By: trm	Checked By: anm	
Sample No.: 20-22-191004	Test Date: 12/6/19	Depth:	
Test No.: IP-4	Sample Type: intact	Elevation:	
Description: Moist, very dark gray sand			
Remarks: System X, Swell Pressure = 0.0681 tsf			

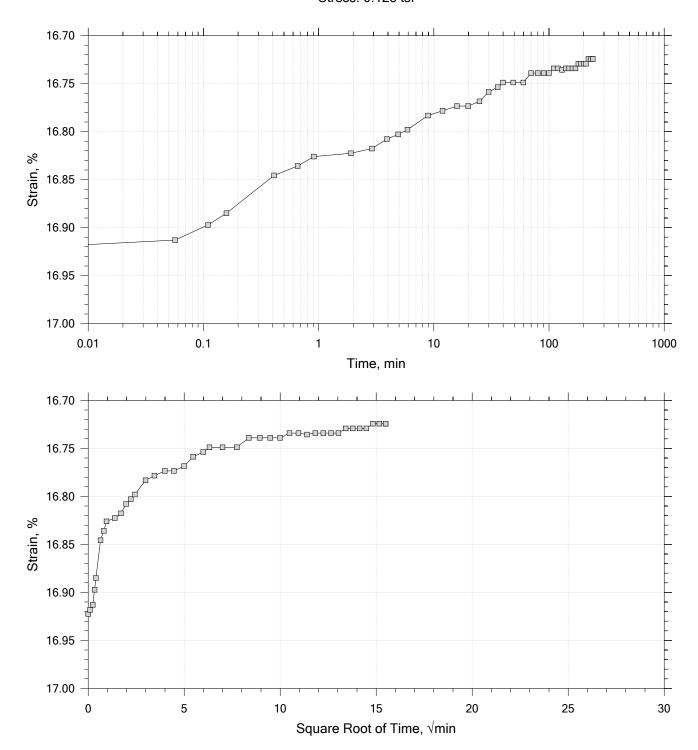
Time Curve 13 of 15 Constant Load Step Stress: 0.5 tsf

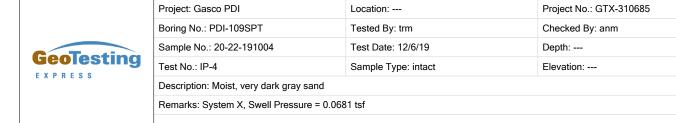




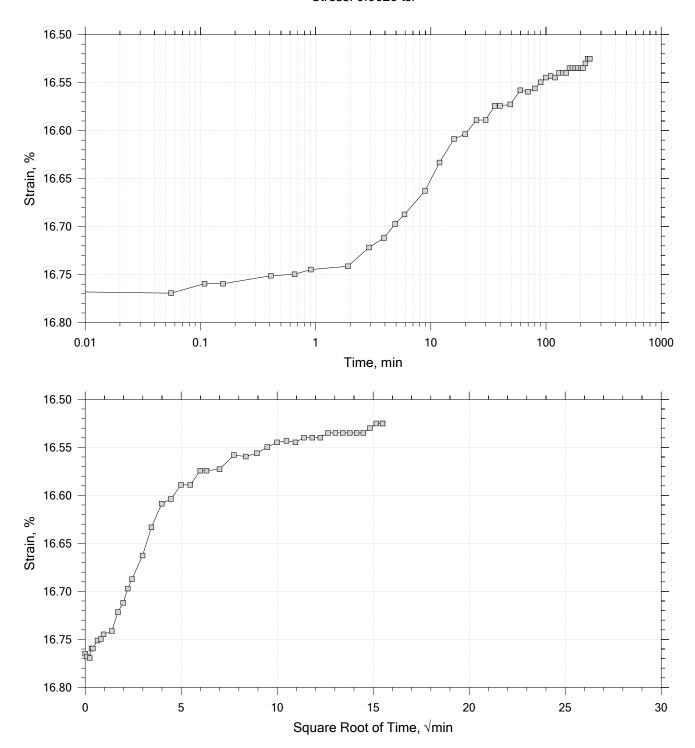
Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-109SPT	Tested By: trm	Checked By: anm			
Sample No.: 20-22-191004	Test Date: 12/6/19	Depth:			
Test No.: IP-4	Sample Type: intact	Elevation:			
Description: Moist, very dark gray sand					
Remarks: System X, Swell Pressure = 0.0681 tsf					

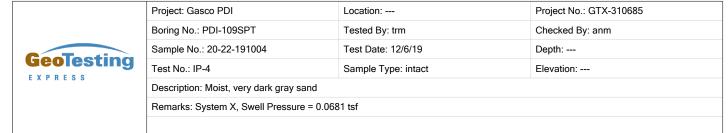
Time Curve 14 of 15 Constant Load Step Stress: 0.125 tsf





Time Curve 15 of 15 Constant Load Step Stress: 0.0625 tsf





Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.65	Liquid Limit:
Initial Height: 1.00 in	Initial Void Ratio: 1.21	Plastic Limit:
Final Height: 0.86 in	Final Void Ratio: 0.9	Plasticity Index:

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	A1611	RING		B-2329
Mass Container, gm	8.86	108.85	108.85	9.13
Mass Container + Wet Soil, gm	244.76	248.35	238.1	137.71
Mass Container + Dry Soil, gm	165.44	205.34	205.34	105.12
Mass Dry Soil, gm	156.58	96.49	96.49	95.99
Water Content, %	50.66	44.57	33.95	33.95
Void Ratio		1.21	0.90	
Degree of Saturation, %		97.70	100.00	
Dry Unit Weight, pcf		74.884	87.075	

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.



Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-109SPT	Tested By: trm	Checked By: anm			
Sample No.: 20-22-191004	Test Date: 12/6/19	Depth:			
Test No.: IP-4	Sample Type: intact	Elevation:			
Description: Moist, very dark gray sand					
Remarks: System X, Swell Pressure = 0.0681 tsf					

#### Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0681	0.002859	1.20	0.286	0.000	0.00e+00	4.20e-02	0.00e+00	0.00e+00
2	0.125	0.006149	1.20	0.615	0.000	0.00e+00	5.79e-02	0.00e+00	0.00e+00
3	0.250	0.01258	1.18	1.26	0.902	6.20e-06	5.14e-02	8.60e-04	0.00e+00
4	0.500	0.01916	1.17	1.92	5.027	1.10e-06	2.63e-02	7.80e-05	0.00e+00
5	1.00	0.02830	1.15	2.83	0.000	0.00e+00	1.83e-02	0.00e+00	0.00e+00
6	2.00	0.03861	1.12	3.86	0.000	0.00e+00	1.03e-02	0.00e+00	0.00e+00
7	4.00	0.05531	1.09	5.53	0.000	0.00e+00	8.35e-03	0.00e+00	0.00e+00
8	8.00	0.08125	1.03	8.12	0.000	0.00e+00	6.48e-03	0.00e+00	0.00e+00
9	16.0	0.1224	0.938	12.2	0.000	0.00e+00	5.14e-03	0.00e+00	0.00e+00
10	32.0	0.1804	0.810	18.0	0.000	0.00e+00	3.63e-03	0.00e+00	0.00e+00
11	8.00	0.1772	0.817	17.7	0.000	0.00e+00	1.31e-04	0.00e+00	0.00e+00
12	2.00	0.1737	0.825	17.4	0.000	0.00e+00	5.94e-04	0.00e+00	0.00e+00
13	0.500	0.1697	0.834	17.0	0.000	0.00e+00	2.64e-03	0.00e+00	0.00e+00
14	0.125	0.1672	0.839	16.7	0.000	0.00e+00	6.60e-03	0.00e+00	0.00e+00
15	0.0625	0.1653	0.844	16.5	7.668	5.17e-07	3.19e-02	4.44e-05	0.00e+00



Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-109SPT	Tested By: trm	Checked By: anm			
Sample No.: 20-22-191004	Test Date: 12/6/19	Depth:			
Test No.: IP-4	Sample Type: intact	Elevation:			
Description: Moist, very dark gray sand					
Remarks: System X, Swell Pressure = 0.0681 tsf					
Displacement at End of Increment					

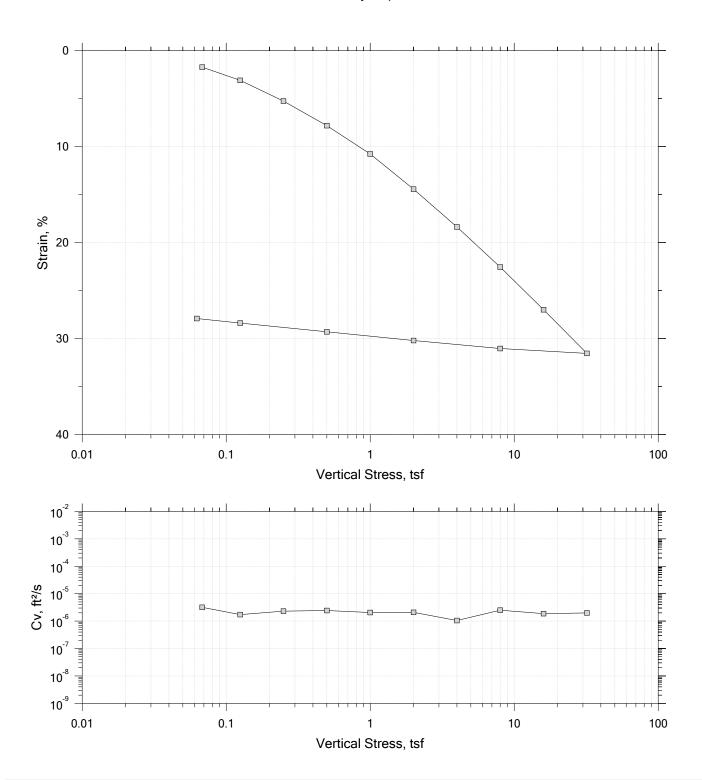
#### **Square Root of Time Coefficients**

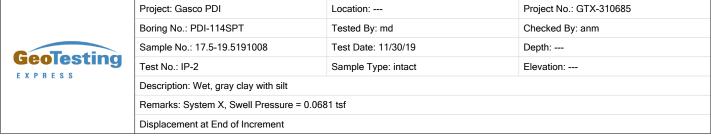
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0681	0.002859	1.20	0.286	226.194	1.08e-07	4.20e-02	1.22e-05
2	0.125	0.006149	1.20	0.615	59.870	4.06e-07	5.79e-02	6.34e-05
3	0.250	0.01258	1.18	1.26	5.104	4.72e-06	5.14e-02	6.54e-04
4	0.500	0.01916	1.17	1.92	13.275	1.79e-06	2.63e-02	1.27e-04
5	1.00	0.02830	1.15	2.83	270.954	8.63e-08	1.83e-02	4.26e-06
6	2.00	0.03861	1.12	3.86	191.862	1.19e-07	1.03e-02	3.32e-06
7	4.00	0.05531	1.09	5.53	66.166	3.37e-07	8.35e-03	7.59e-06
8	8.00	0.08125	1.03	8.12	29.579	7.20e-07	6.48e-03	1.26e-05
9	16.0	0.1224	0.938	12.2	26.937	7.35e-07	5.14e-03	1.02e-05
10	32.0	0.1804	0.810	18.0	33.262	5.31e-07	3.63e-03	5.20e-06
11	8.00	0.1772	0.817	17.7	24.912	6.64e-07	1.31e-04	2.34e-07
12	2.00	0.1737	0.825	17.4	15.909	1.05e-06	5.94e-04	1.68e-06
13	0.500	0.1697	0.834	17.0	9.994	1.68e-06	2.64e-03	1.20e-05
14	0.125	0.1672	0.839	16.7	9.119	1.86e-06	6.60e-03	3.31e-05
15	0.0625	0.1653	0.844	16.5	35.906	4.75e-07	3.19e-02	4.08e-05



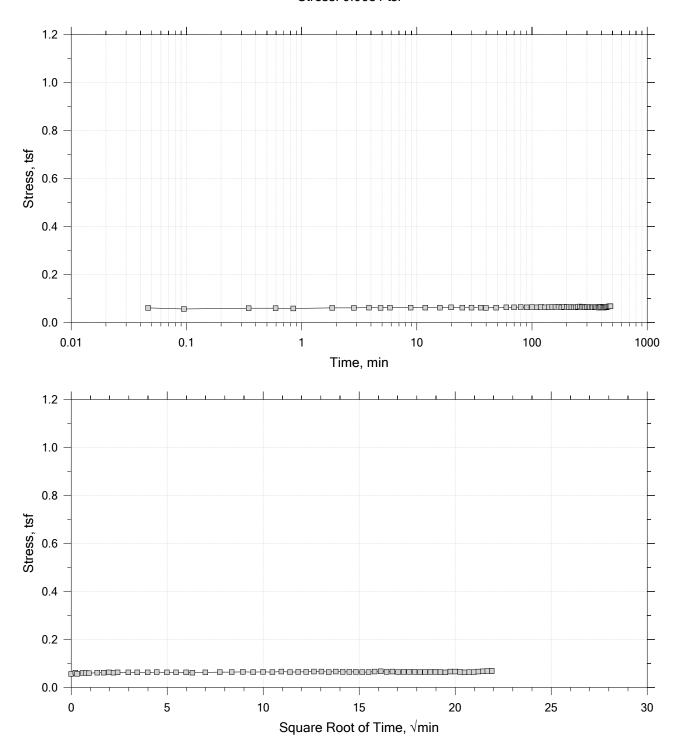
Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-109SPT	Tested By: trm	Checked By: anm			
Sample No.: 20-22-191004	Test Date: 12/6/19	Depth:			
Test No.: IP-4	Sample Type: intact	Elevation:			
Description: Moist, very dark gray sand					
Remarks: System X, Swell Pressure = 0.0681 tsf					
Displacement at End of Increment					

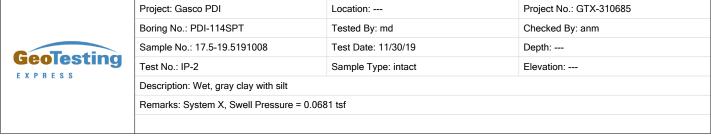
#### **Summary Report**



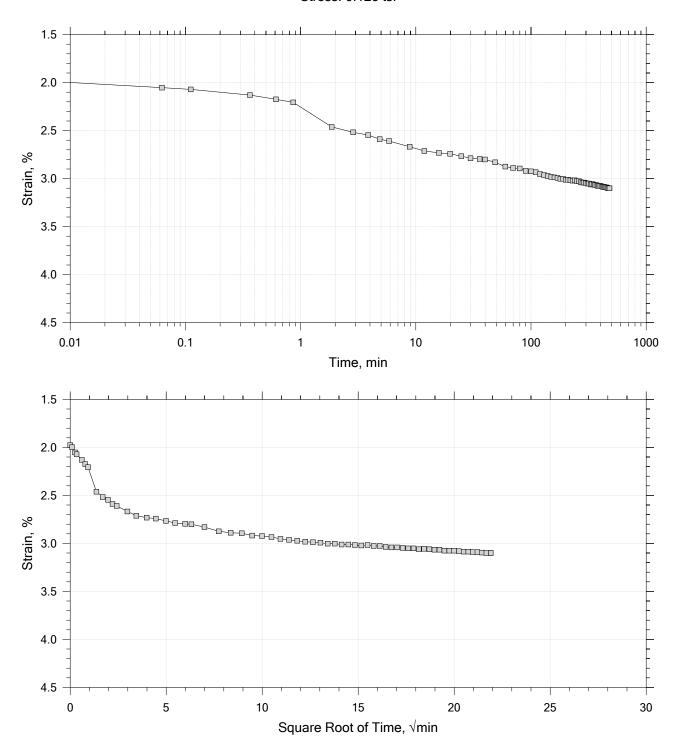


Time Curve 1 of 15 Constant Volume Step Stress: 0.0681 tsf





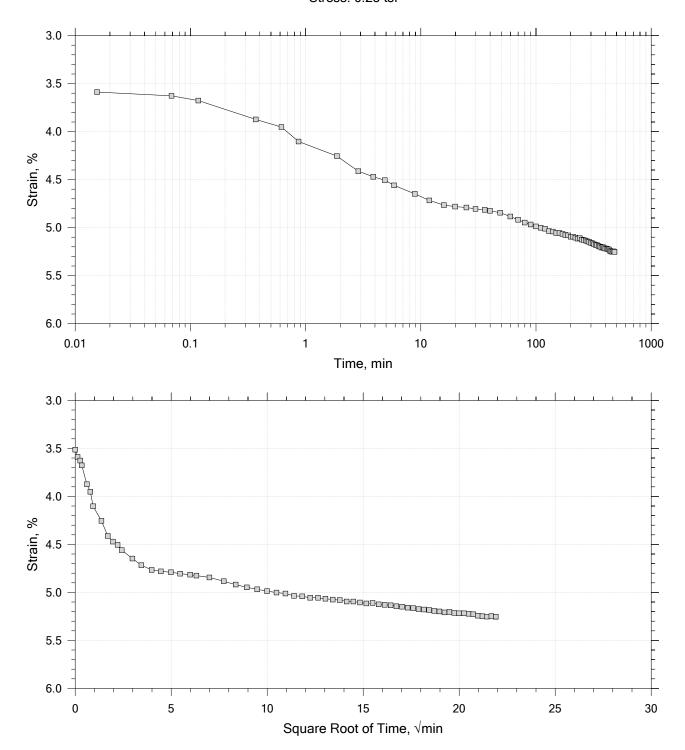
Time Curve 2 of 15 Constant Load Step Stress: 0.125 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-114SPT	Tested By: md	Checked By: anm		
Sample No.: 17.5-19.5191008	Test Date: 11/30/19	Depth:		
Test No.: IP-2 Sample Type: intact		Elevation:		
Description: Wet, gray clay with silt				
Remarks: System X, Swell Pressure = 0.0681 tsf				

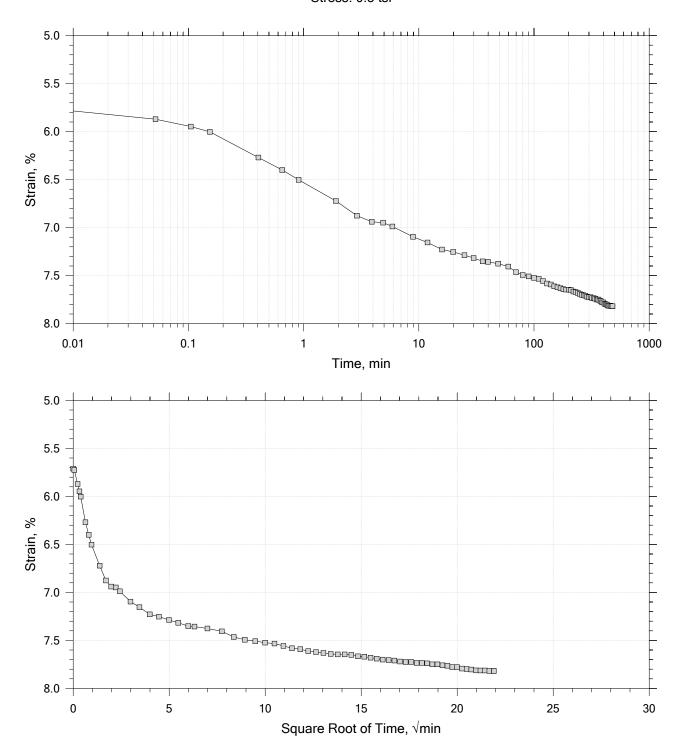
Time Curve 3 of 15 Constant Load Step Stress: 0.25 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-114SPT	Tested By: md	Checked By: anm		
Sample No.: 17.5-19.5191008	Test Date: 11/30/19	Depth:		
Test No.: IP-2	Sample Type: intact	Elevation:		
Description: Wet, gray clay with silt				
Remarks: System X, Swell Pressure = 0.0681 tsf				

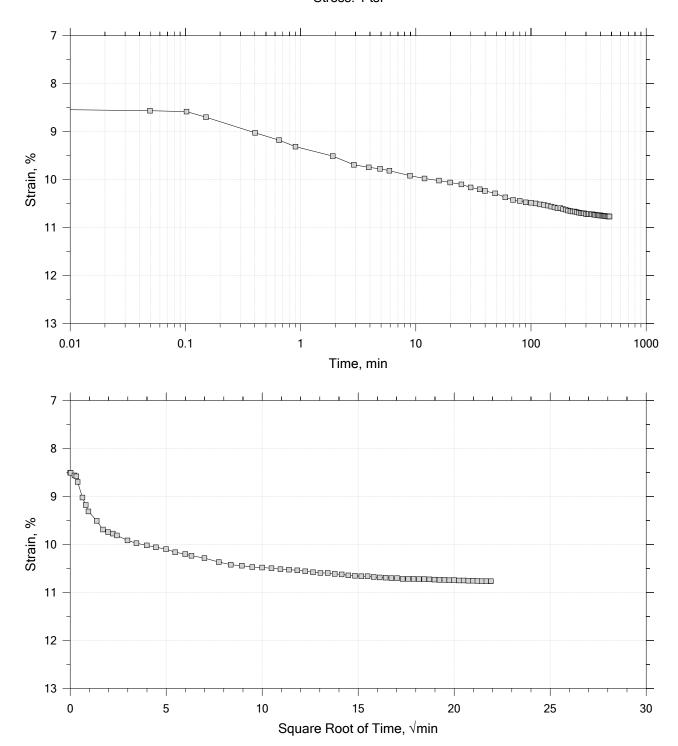
Time Curve 4 of 15 Constant Load Step Stress: 0.5 tsf

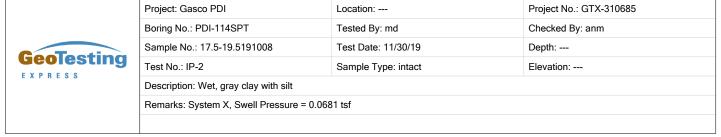




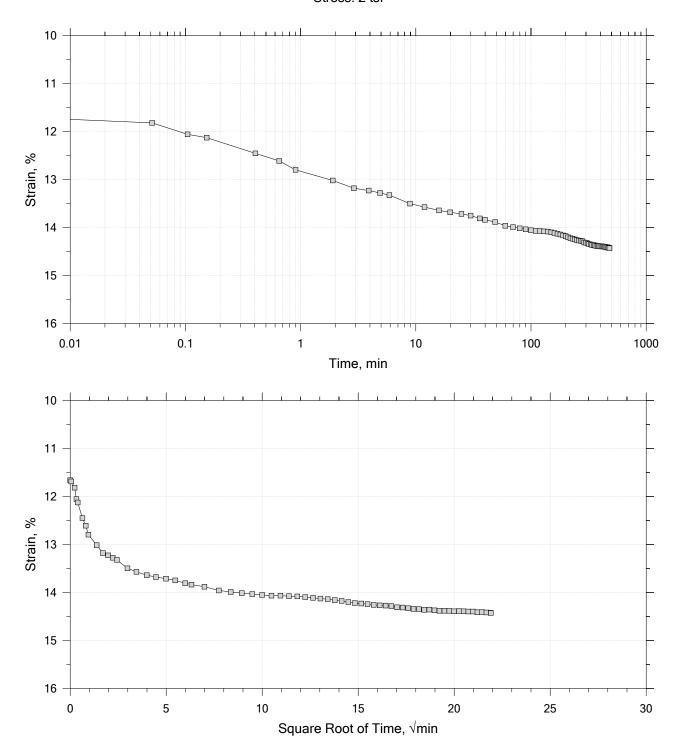
Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-114SPT	Tested By: md	Checked By: anm		
Sample No.: 17.5-19.5191008	Test Date: 11/30/19	Depth:		
Test No.: IP-2	Sample Type: intact	Elevation:		
Description: Wet, gray clay with silt				
Remarks: System X, Swell Pressure = 0.0681 tsf				

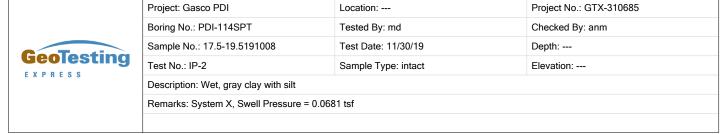
Time Curve 5 of 15 Constant Load Step Stress: 1 tsf



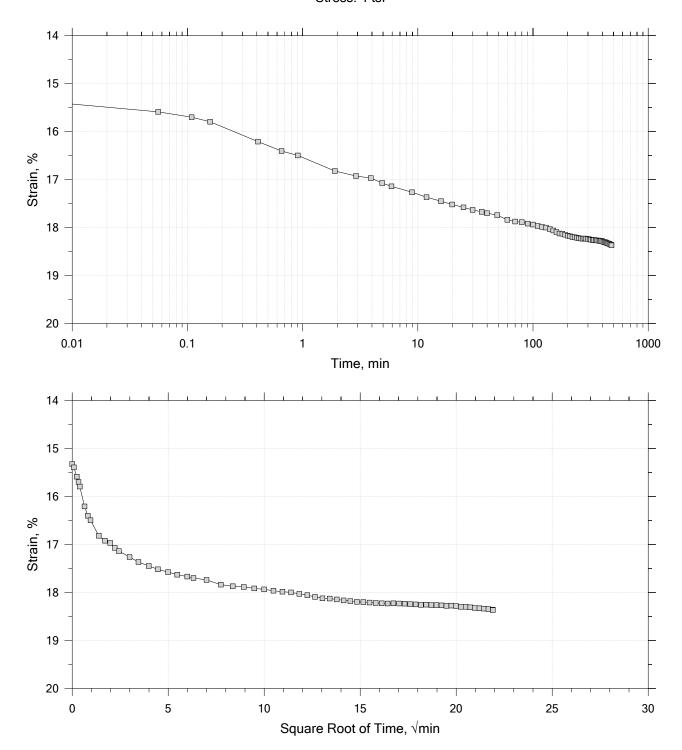


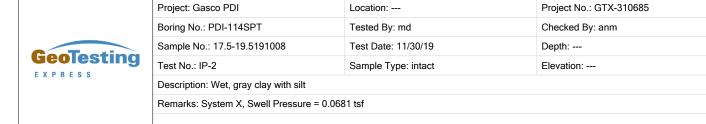
Time Curve 6 of 15 Constant Load Step Stress: 2 tsf



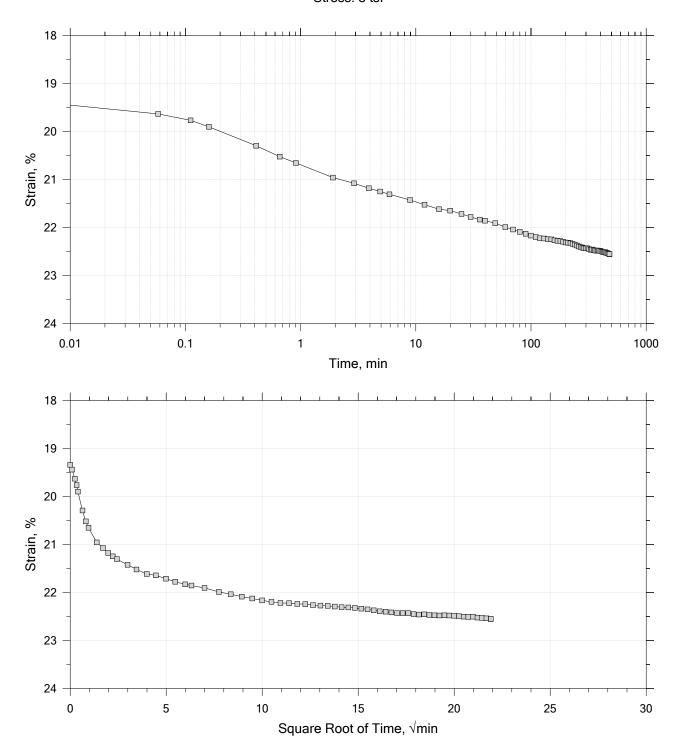


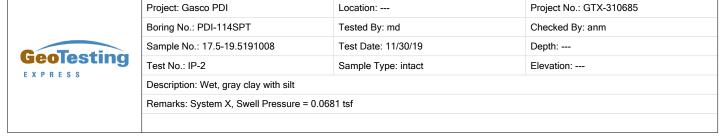
Time Curve 7 of 15 Constant Load Step Stress: 4 tsf



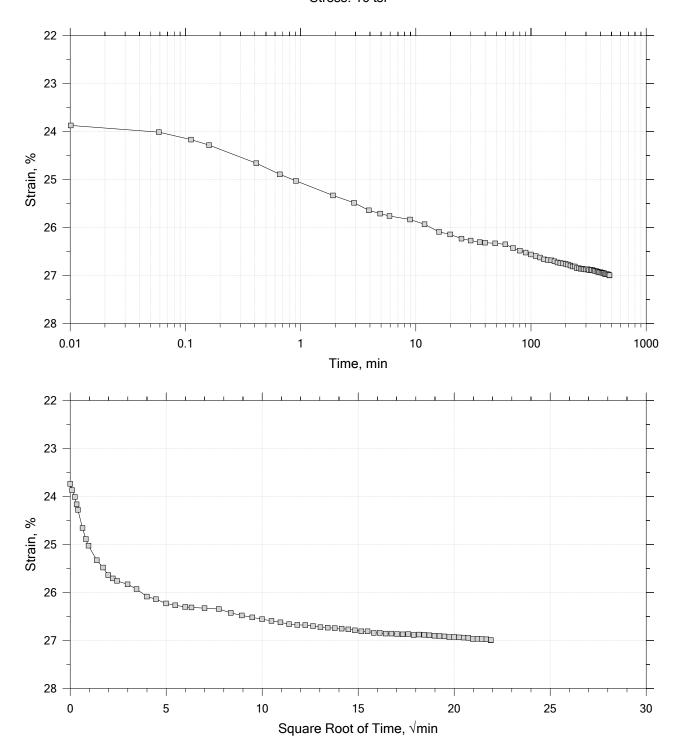


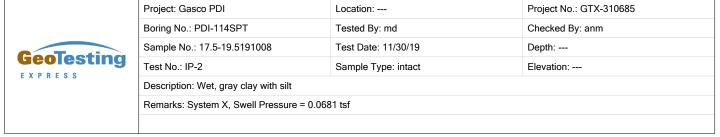
Time Curve 8 of 15 Constant Load Step Stress: 8 tsf



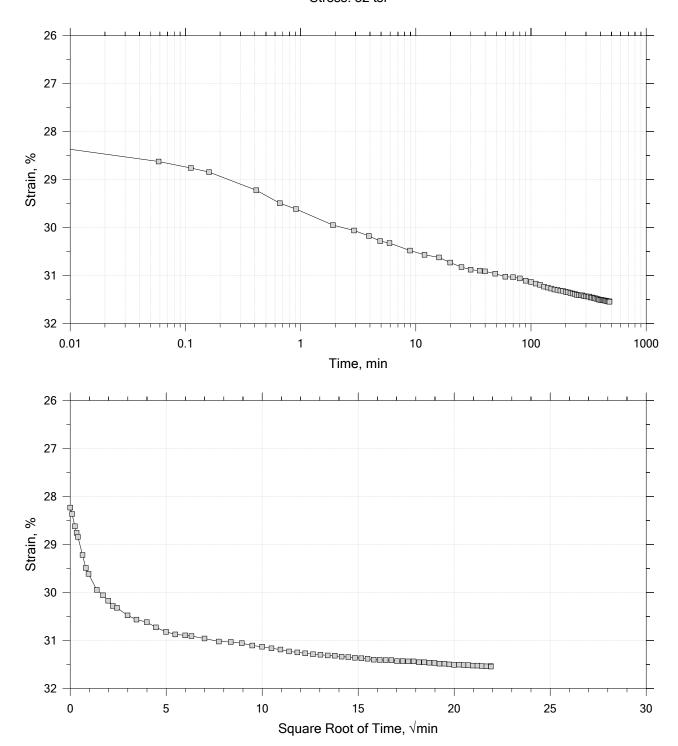


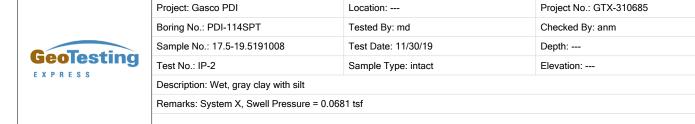
Time Curve 9 of 15 Constant Load Step Stress: 16 tsf



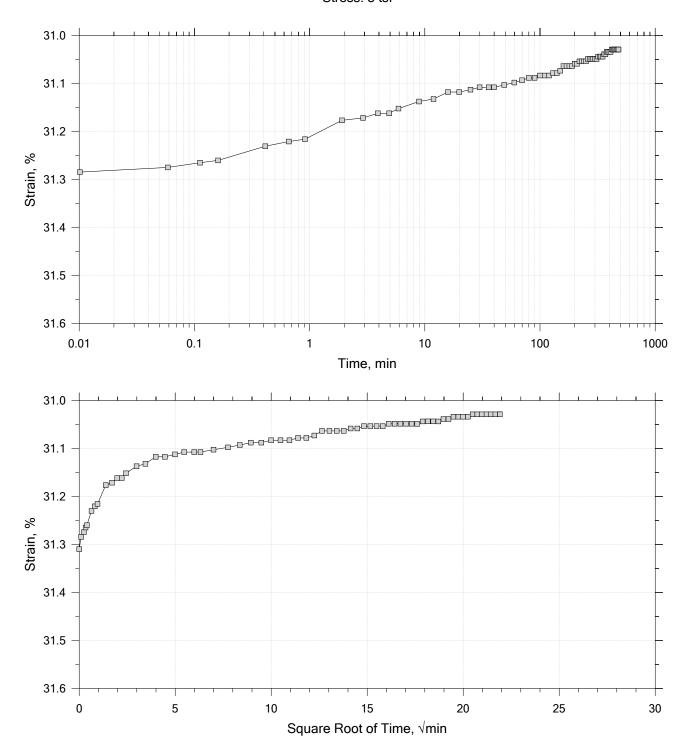


Time Curve 10 of 15 Constant Load Step Stress: 32 tsf





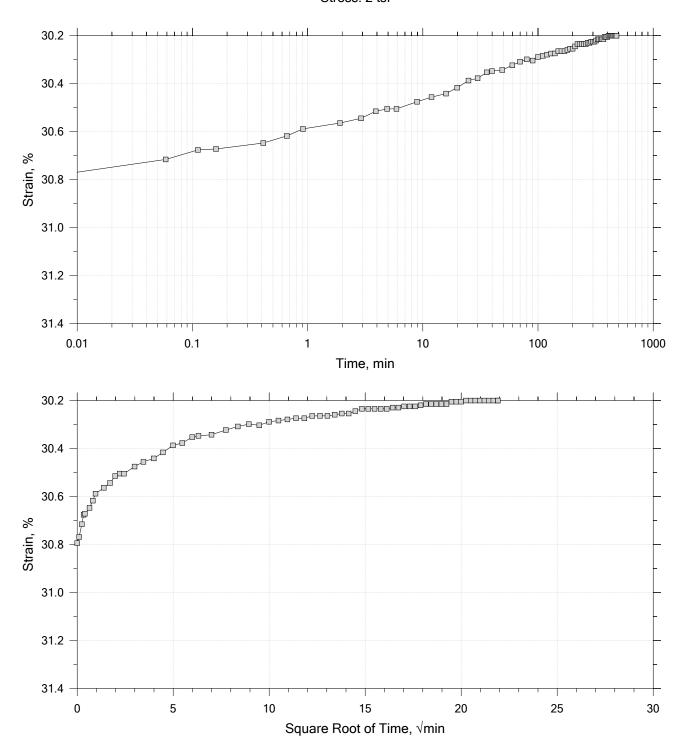
Time Curve 11 of 15 Constant Load Step Stress: 8 tsf

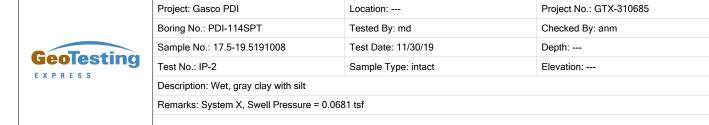




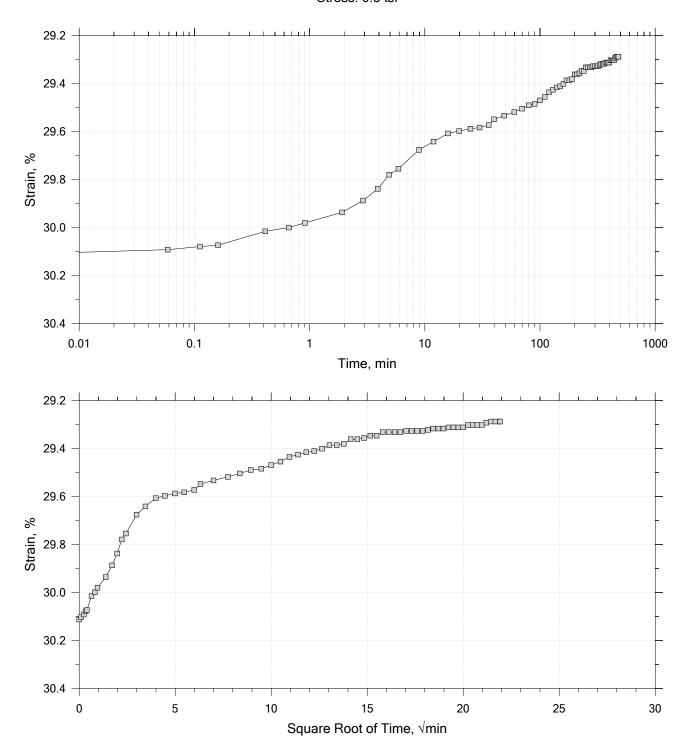
Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-114SPT	Tested By: md	Checked By: anm			
Sample No.: 17.5-19.5191008	Test Date: 11/30/19	Depth:			
Test No.: IP-2	Sample Type: intact	Elevation:			
Description: Wet, gray clay with silt					
Remarks: System X, Swell Pressure = 0.0681 tsf					

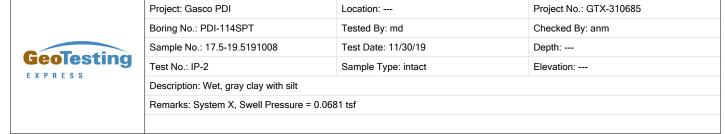
Time Curve 12 of 15 Constant Load Step Stress: 2 tsf



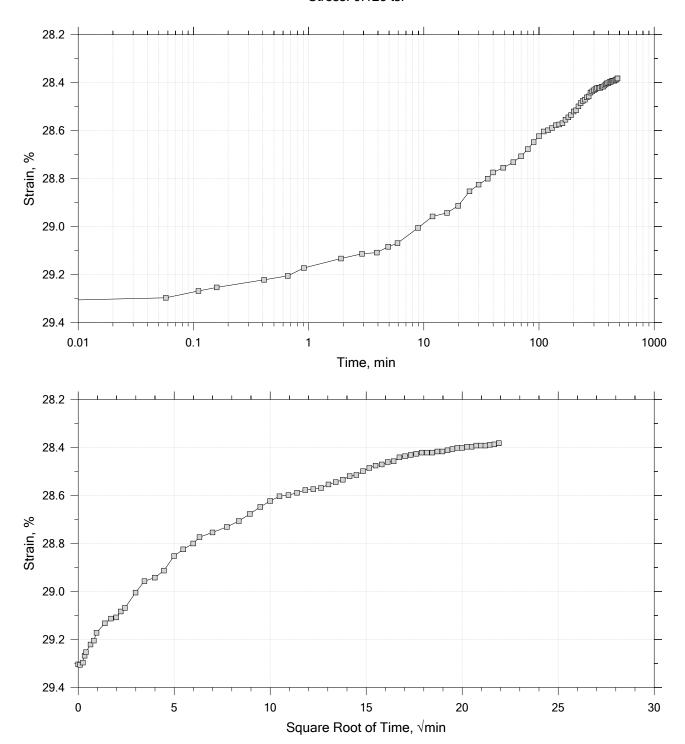


Time Curve 13 of 15 Constant Load Step Stress: 0.5 tsf





Time Curve 14 of 15 Constant Load Step Stress: 0.125 tsf

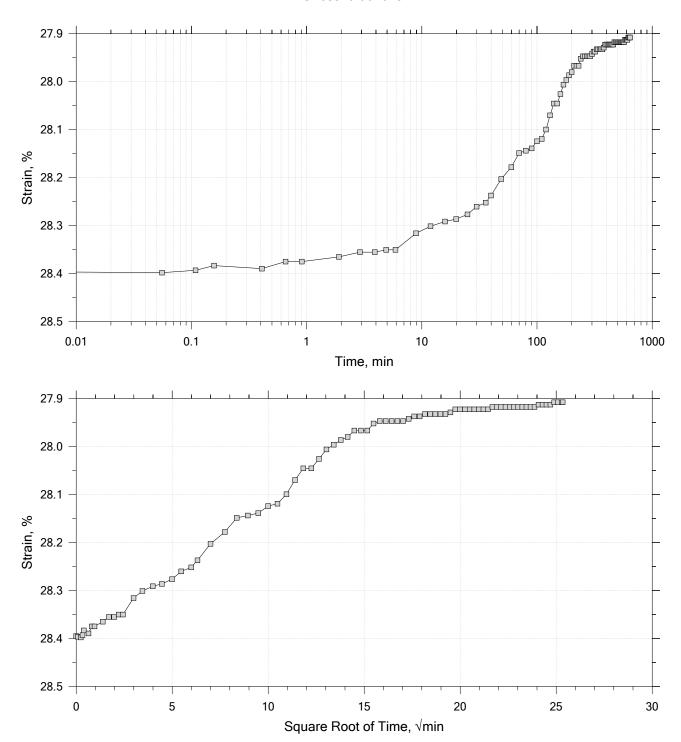


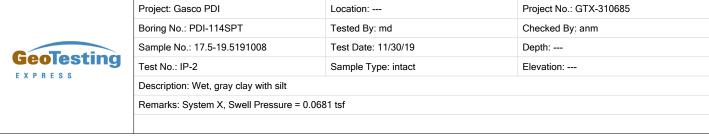


Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-114SPT	Tested By: md	Checked By: anm			
Sample No.: 17.5-19.5191008	Test Date: 11/30/19	Depth:			
Test No.: IP-2	Sample Type: intact	Elevation:			
Description: Wet, gray clay with silt					
Remarks: System X. Swell Pressure = 0.0681 tsf					

2019-12-19 16:01:29 2.3.16.137 / 2.2.15.59 15

Time Curve 15 of 15 Constant Load Step Stress: 0.0625 tsf





Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.74	Liquid Limit:
Initial Height: 1.00 in	Initial Void Ratio: 1.66	Plastic Limit:
Final Height: 0.74 in	Final Void Ratio: 0.967	Plasticity Index:

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	C-2810	RING		D-895
Mass Container, gm	9.08	108.81	108.81	8.25
Mass Container + Wet Soil, gm	173.54	240.58	220.97	120.22
Mass Container + Dry Soil, gm	117.77	191.7	191.7	91
Mass Dry Soil, gm	108.69	82.89	82.89	82.75
Water Content, %	51.31	58.97	35.31	35.31
Void Ratio		1.66	0.97	
Degree of Saturation, %		97.40	100.00	
Dry Unit Weight, pcf		64.33	86.932	

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.



Project: Gasco PDI	Location:	Project No.: GTX-310685				
Boring No.: PDI-114SPT	Tested By: md	Checked By: anm				
Sample No.: 17.5-19.5191008	Test Date: 11/30/19	Depth:				
Test No.: IP-2	Sample Type: intact	Elevation:				
Description: Wet, gray clay with silt						
Remarks: System X, Swell Pressure = 0.0681 tsf						

#### Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0681	0.01724	1.61	1.72	0.000	0.00e+00	2.53e-01	0.00e+00	0.00e+00
2	0.125	0.03101	1.58	3.10	1.715	3.17e-06	2.42e-01	2.07e-03	0.00e+00
3	0.250	0.05252	1.52	5.25	0.000	0.00e+00	1.72e-01	0.00e+00	0.00e+00
4	0.500	0.07818	1.45	7.82	0.000	0.00e+00	1.03e-01	0.00e+00	0.00e+00
5	1.00	0.1077	1.37	10.8	1.217	3.85e-06	5.90e-02	6.13e-04	0.00e+00
6	2.00	0.1443	1.28	14.4	0.000	0.00e+00	3.66e-02	0.00e+00	0.00e+00
7	4.00	0.1837	1.17	18.4	0.000	0.00e+00	1.97e-02	0.00e+00	0.00e+00
8	8.00	0.2255	1.06	22.6	0.978	3.69e-06	1.05e-02	1.04e-04	0.00e+00
9	16.0	0.2699	0.941	27.0	1.187	2.72e-06	5.55e-03	4.07e-05	0.00e+00
10	32.0	0.3154	0.820	31.5	1.004	2.84e-06	2.85e-03	2.18e-05	0.00e+00
11	8.00	0.3103	0.834	31.0	0.000	0.00e+00	2.15e-04	0.00e+00	0.00e+00
12	2.00	0.3020	0.856	30.2	9.426	2.91e-07	1.38e-03	1.08e-06	0.00e+00
13	0.500	0.2929	0.880	29.3	0.000	0.00e+00	6.08e-03	0.00e+00	0.00e+00
14	0.125	0.2838	0.904	28.4	0.000	0.00e+00	2.41e-02	0.00e+00	0.00e+00
15	0.0625	0.2791	0.917	27.9	0.000	0.00e+00	7.59e-02	0.00e+00	0.00e+00



Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-114SPT	Tested By: md	Checked By: anm			
Sample No.: 17.5-19.5191008	Test Date: 11/30/19	Depth:			
Test No.: IP-2	Sample Type: intact	Elevation:			
Description: Wet, gray clay with silt					
Remarks: System X, Swell Pressure = 0.0681 tsf					
Displacement at End of Increment					

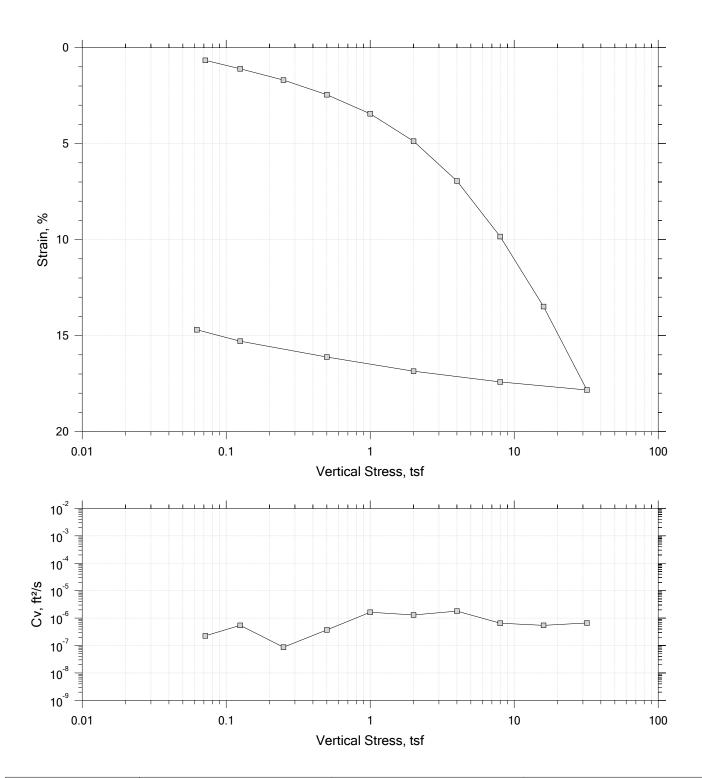
#### **Square Root of Time Coefficients**

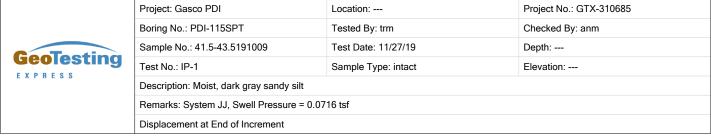
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0681	0.01724	1.61	1.72	11.235	2.15e-06	2.53e-01	1.46e-03
2	0.125	0.03101	1.58	3.10	30.010	7.79e-07	2.42e-01	5.08e-04
3	0.250	0.05252	1.52	5.25	15.043	1.50e-06	1.72e-01	6.95e-04
4	0.500	0.07818	1.45	7.82	14.890	1.44e-06	1.03e-01	3.98e-04
5	1.00	0.1077	1.37	10.8	24.725	8.17e-07	5.90e-02	1.30e-04
6	2.00	0.1443	1.28	14.4	15.174	1.24e-06	3.66e-02	1.22e-04
7	4.00	0.1837	1.17	18.4	21.371	8.02e-07	1.97e-02	4.26e-05
8	8.00	0.2255	1.06	22.6	14.991	1.04e-06	1.05e-02	2.92e-05
9	16.0	0.2699	0.941	27.0	15.800	8.79e-07	5.55e-03	1.32e-05
10	32.0	0.3154	0.820	31.5	14.438	8.50e-07	2.85e-03	6.53e-06
11	8.00	0.3103	0.834	31.0	42.571	2.72e-07	2.15e-04	1.58e-07
12	2.00	0.3020	0.856	30.2	38.421	3.07e-07	1.38e-03	1.14e-06
13	0.500	0.2929	0.880	29.3	46.081	2.63e-07	6.08e-03	4.31e-06
14	0.125	0.2838	0.904	28.4	109.804	1.13e-07	2.41e-02	7.37e-06
15	0.0625	0.2791	0.917	27.9	329.908	3.84e-08	7.59e-02	7.86e-06



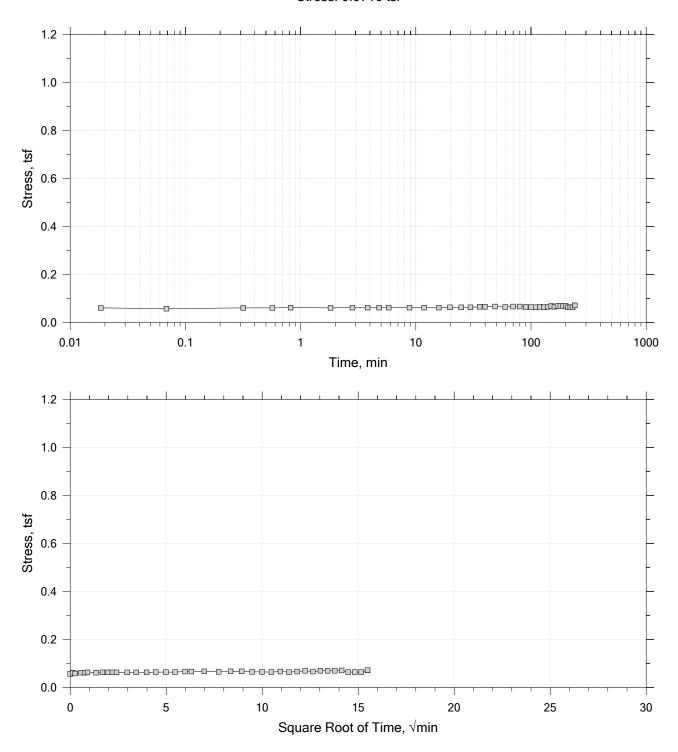
Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-114SPT	Tested By: md	Checked By: anm			
Sample No.: 17.5-19.5191008	Test Date: 11/30/19	Depth:			
Test No.: IP-2	Sample Type: intact	Elevation:			
Description: Wet, gray clay with silt					
Remarks: System X, Swell Pressure = 0.0681 tsf					
Displacement at End of Increment					

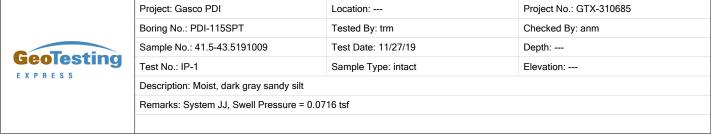
#### **Summary Report**



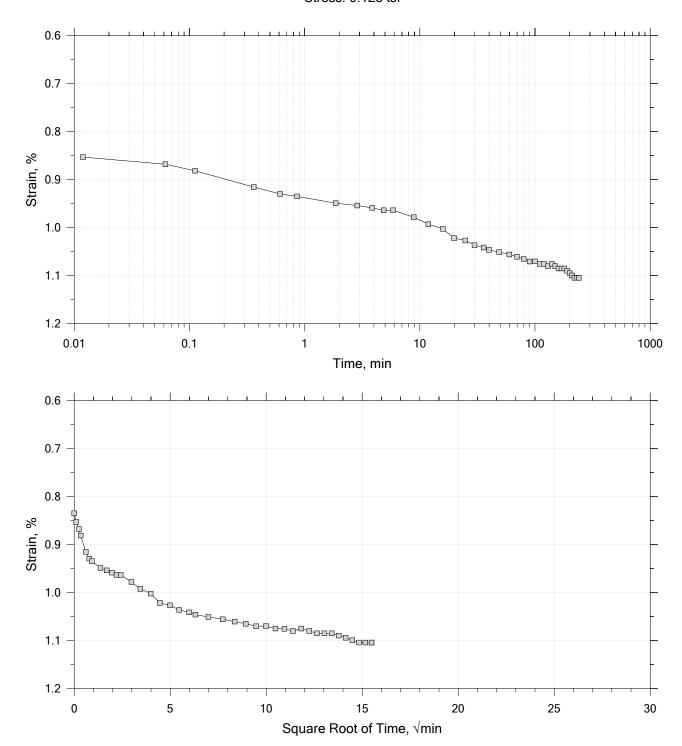


Time Curve 1 of 15 Constant Volume Step Stress: 0.0716 tsf





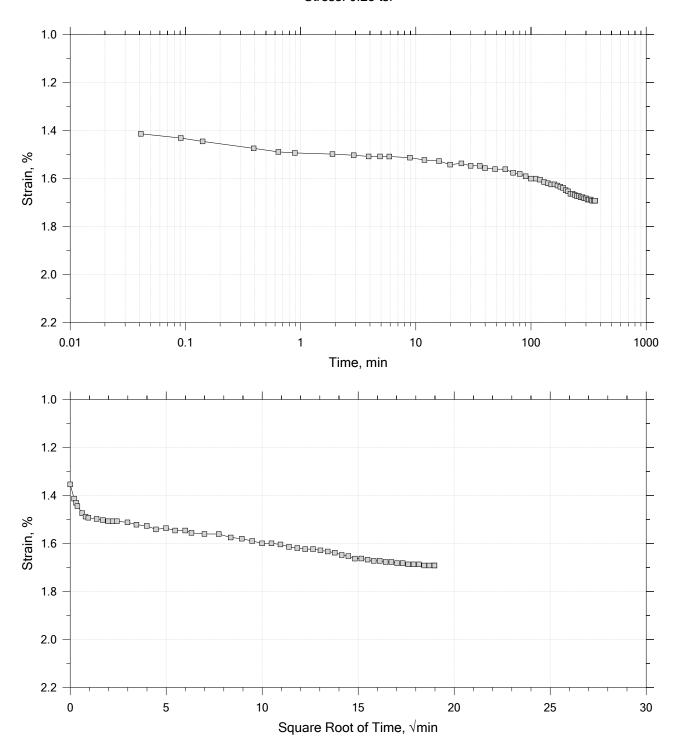
Time Curve 2 of 15 Constant Load Step Stress: 0.125 tsf

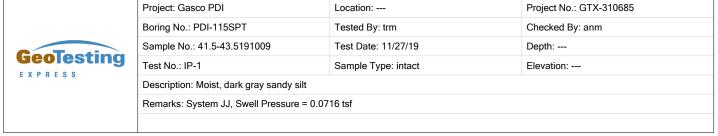




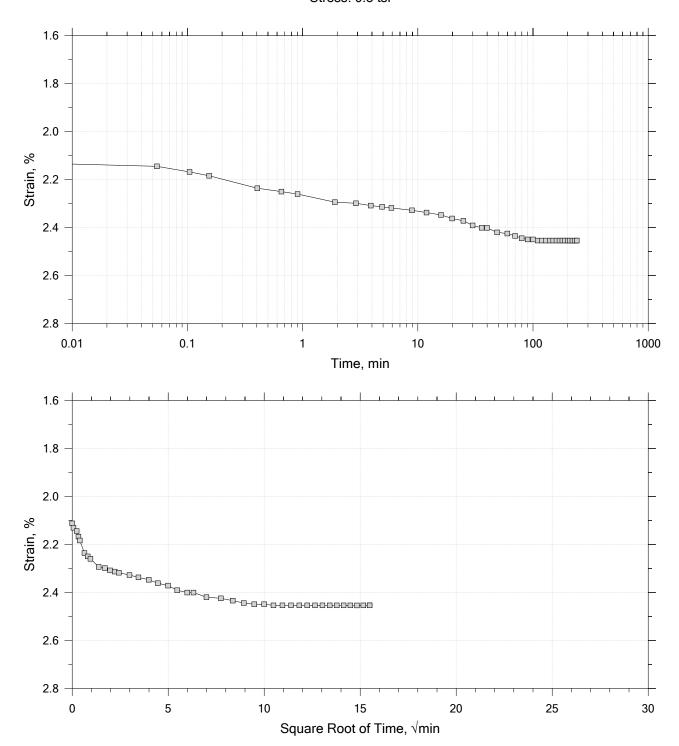
Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-115SPT	Tested By: trm	Checked By: anm			
Sample No.: 41.5-43.5191009	Test Date: 11/27/19	Depth:			
Test No.: IP-1	Sample Type: intact	Elevation:			
Description: Moist, dark gray sandy silt					
Remarks: System JJ, Swell Pressure = 0.0716 tsf					

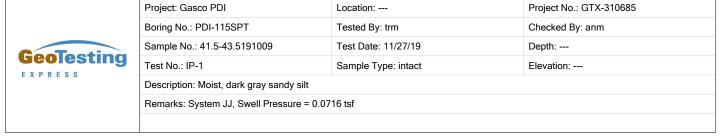
Time Curve 3 of 15 Constant Load Step Stress: 0.25 tsf



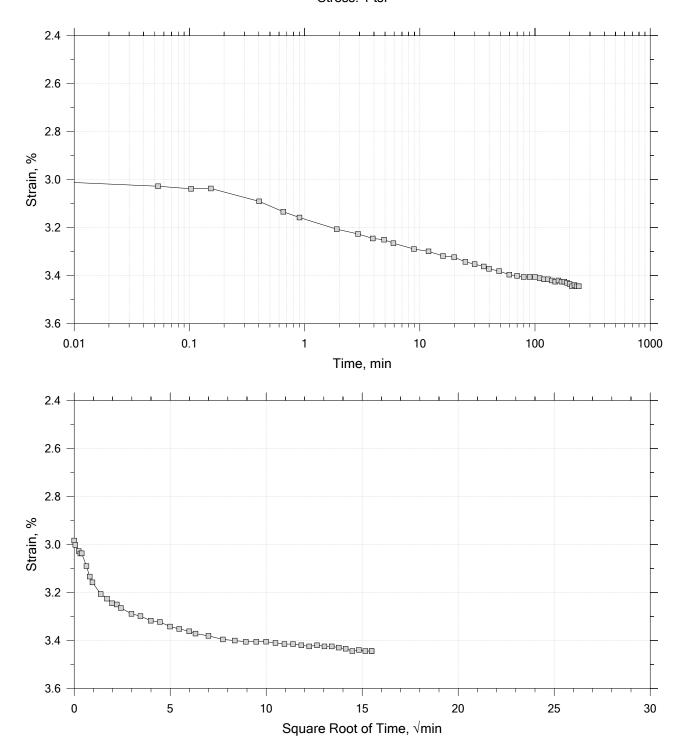


Time Curve 4 of 15 Constant Load Step Stress: 0.5 tsf





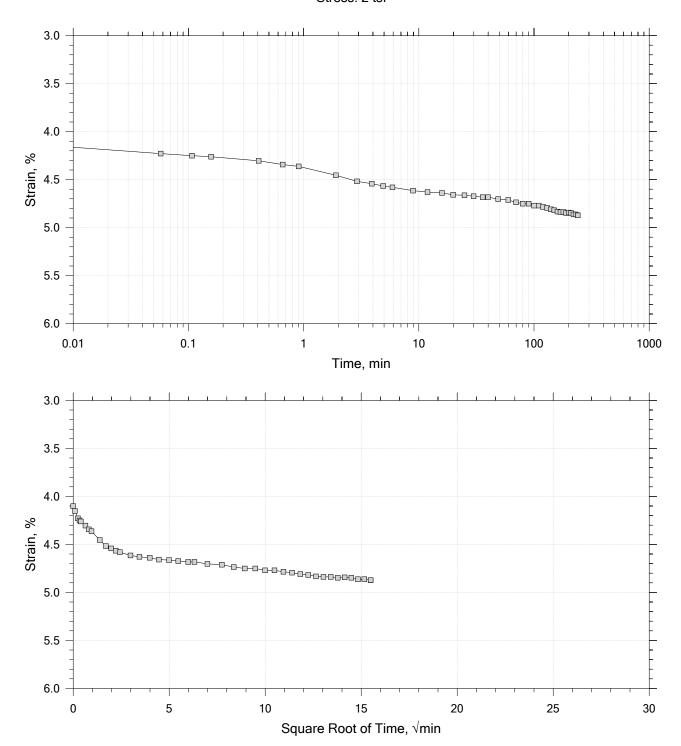
Time Curve 5 of 15 Constant Load Step Stress: 1 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-115SPT	Tested By: trm	Checked By: anm			
Sample No.: 41.5-43.5191009	Test Date: 11/27/19	Depth:			
Test No.: IP-1	Sample Type: intact	Elevation:			
Description: Moist, dark gray sandy silt					
Remarks: System JJ, Swell Pressure = 0.0716 tsf					

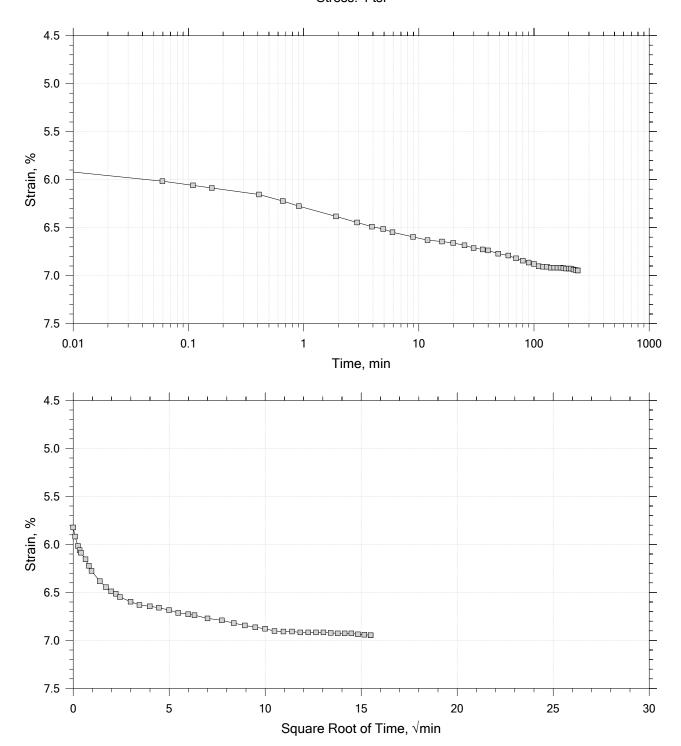
Time Curve 6 of 15 Constant Load Step Stress: 2 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-115SPT	Tested By: trm	Checked By: anm			
Sample No.: 41.5-43.5191009	Test Date: 11/27/19	Depth:			
Test No.: IP-1	Sample Type: intact	Elevation:			
Description: Moist, dark gray sandy silt					
Remarks: System JJ, Swell Pressure = 0.0716 tsf					

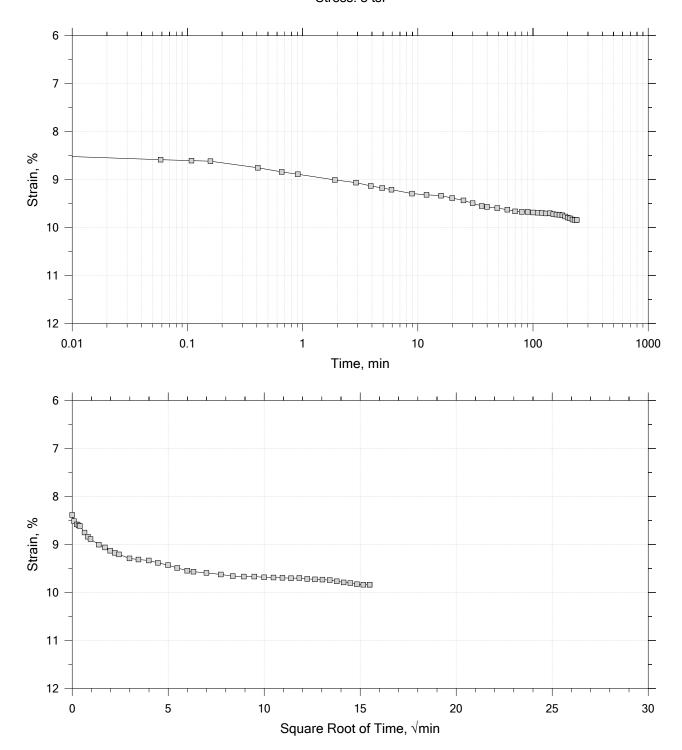
Time Curve 7 of 15 Constant Load Step Stress: 4 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-115SPT	Tested By: trm	Checked By: anm			
Sample No.: 41.5-43.5191009	Test Date: 11/27/19	Depth:			
Test No.: IP-1	Sample Type: intact	Elevation:			
Description: Moist, dark gray sandy silt					
Remarks: System JJ, Swell Pressure = 0.0716 tsf					

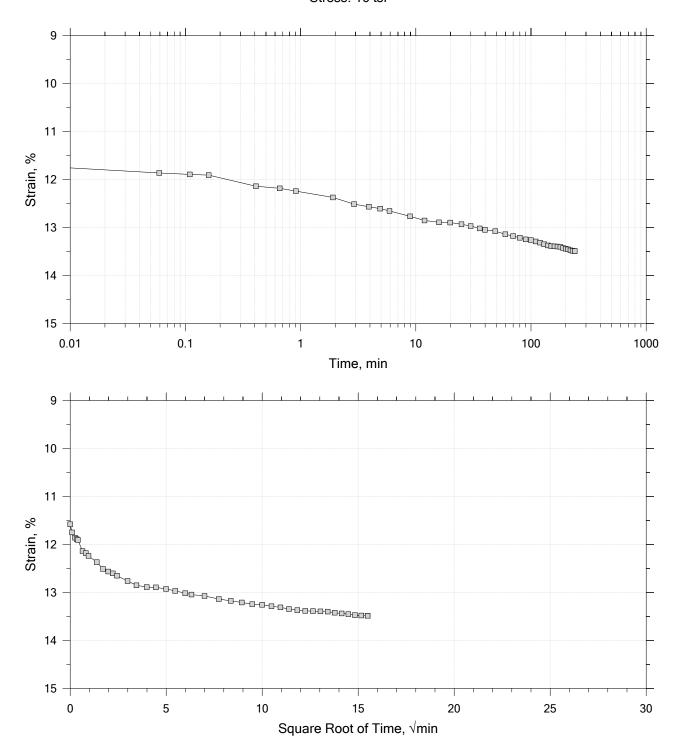
Time Curve 8 of 15 Constant Load Step Stress: 8 tsf

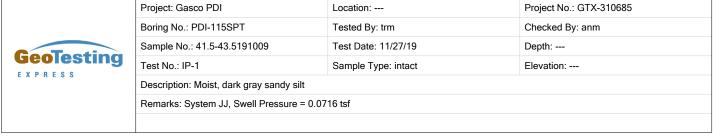




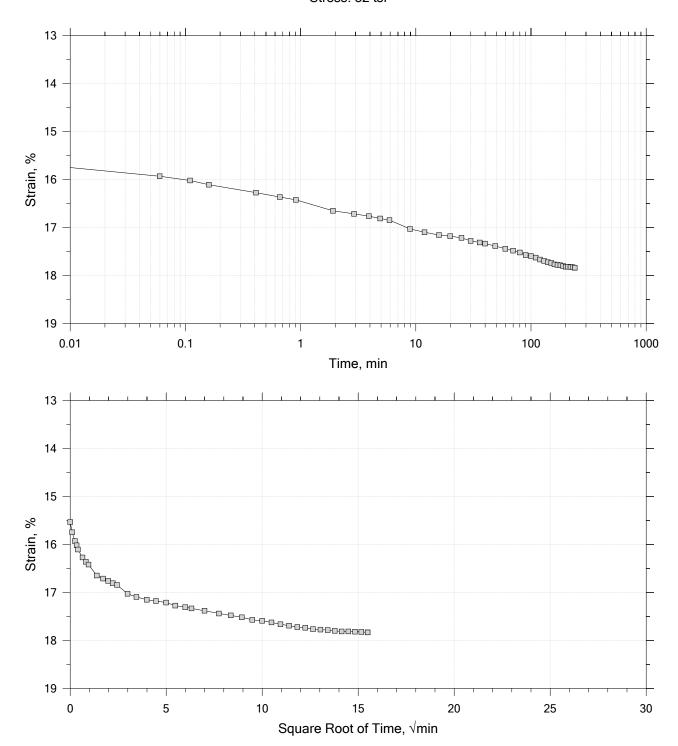
Project: Gasco PDI	Location:	Project No.: GTX-310685
Boring No.: PDI-115SPT	Tested By: trm	Checked By: anm
Sample No.: 41.5-43.5191009	Test Date: 11/27/19	Depth:
Test No.: IP-1	Sample Type: intact	Elevation:
Description: Moist, dark gray sandy silt		
Remarks: System JJ, Swell Pressure = 0.0716 tsf		

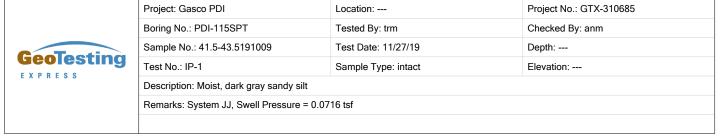
Time Curve 9 of 15 Constant Load Step Stress: 16 tsf



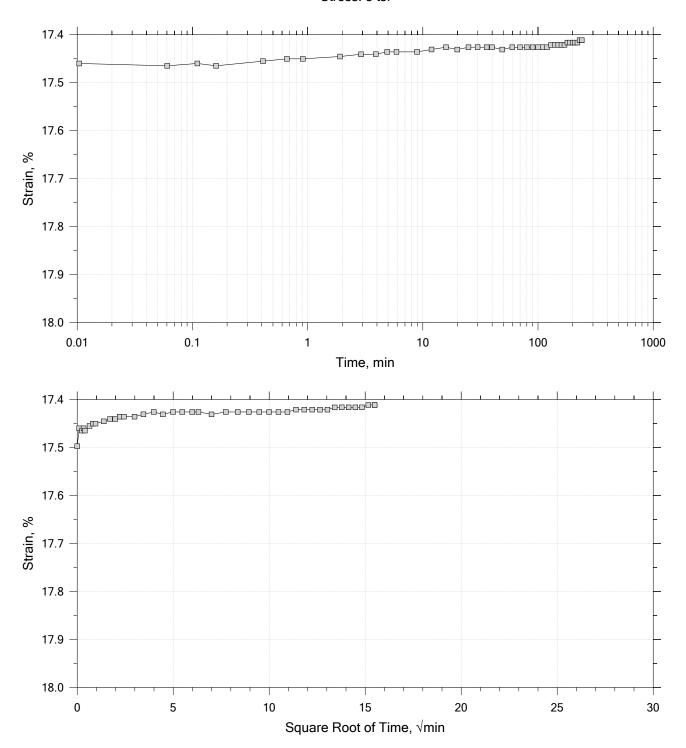


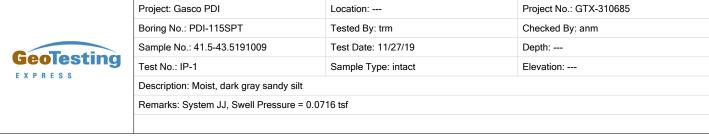
Time Curve 10 of 15 Constant Load Step Stress: 32 tsf



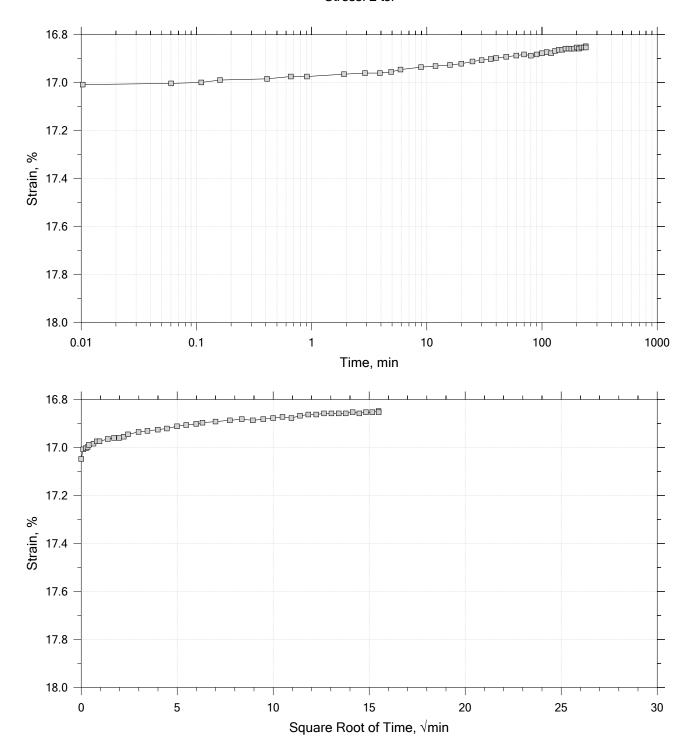


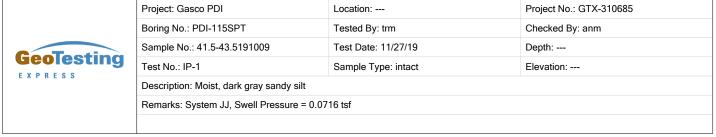
Time Curve 11 of 15 Constant Load Step Stress: 8 tsf



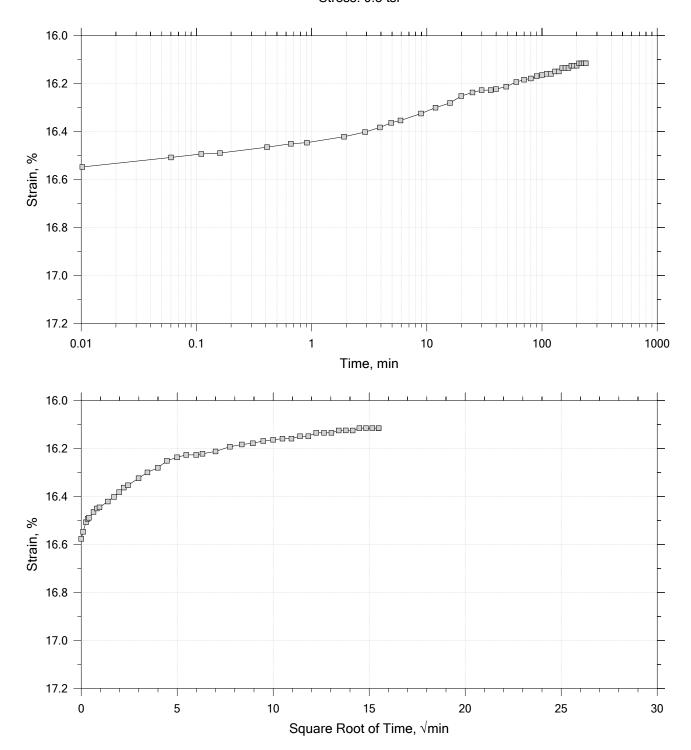


Time Curve 12 of 15 Constant Load Step Stress: 2 tsf





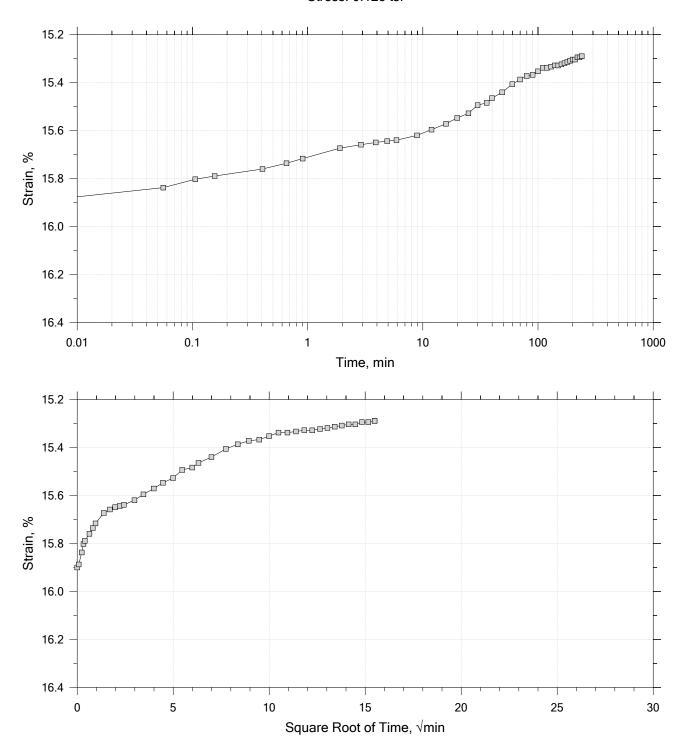
Time Curve 13 of 15 Constant Load Step Stress: 0.5 tsf

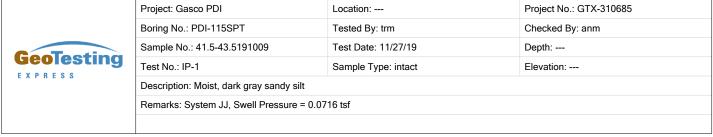




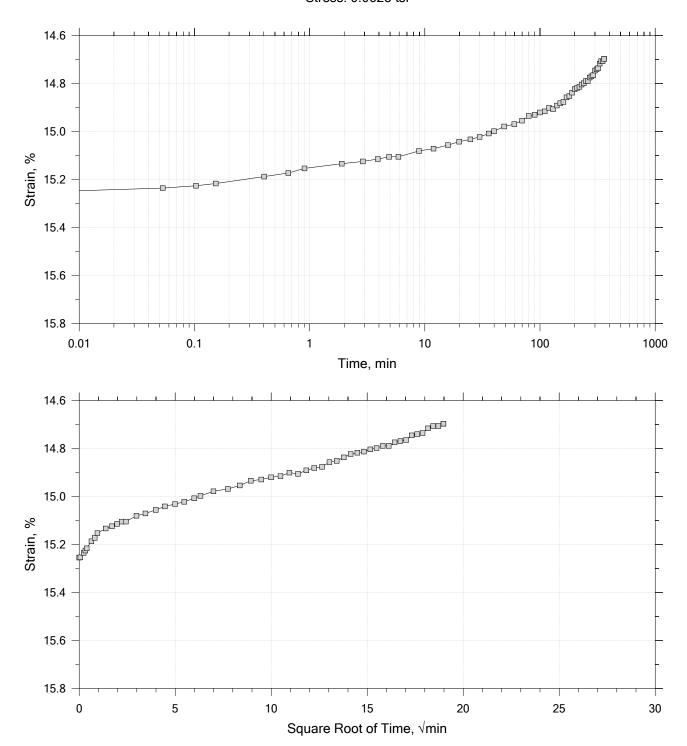
Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-115SPT	Tested By: trm	Checked By: anm			
Sample No.: 41.5-43.5191009	Test Date: 11/27/19	Depth:			
Test No.: IP-1	Sample Type: intact	Elevation:			
Description: Moist, dark gray sandy silt					
Remarks: System JJ, Swell Pressure = 0.0716 tsf					

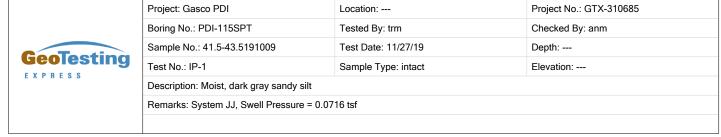
Time Curve 14 of 15 Constant Load Step Stress: 0.125 tsf





Time Curve 15 of 15 Constant Load Step Stress: 0.0625 tsf





Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.68	Liquid Limit:
Initial Height: 1.00 in	Initial Void Ratio: 1.11	Plastic Limit:
Final Height: 0.83 in	Final Void Ratio: 0.747	Plasticity Index:

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	B2573	RING		A-2270
Mass Container, gm	9.15	108.66	108.66	8.22
Mass Container + Wet Soil, gm	125.7	252.46	239.45	139.71
Mass Container + Dry Soil, gm	92.66	210.89	210.89	111
Mass Dry Soil, gm	83.51	102.23	102.23	102.78
Water Content, %	39.56	40.66	27.93	27.93
Void Ratio		1.11	0.75	
Degree of Saturation, %		98.43	100.00	
Dry Unit Weight, pcf		79.341	95.592	

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.



Project: Gasco PDI	Location:	Project No.: GTX-310685				
Boring No.: PDI-115SPT	Tested By: trm	Checked By: anm				
Sample No.: 41.5-43.5191009	Test Date: 11/27/19	Depth:				
Test No.: IP-1	Sample Type: intact	Elevation:				
Description: Moist, dark gray sandy silt						
Remarks: System JJ, Swell Pressure = 0.0716 tsf						

### Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0716	0.006595	1.09	0.659	0.000	0.00e+00	9.21e-02	0.00e+00	0.00e+00
2	0.125	0.01105	1.08	1.10	0.000	0.00e+00	8.33e-02	0.00e+00	0.00e+00
3	0.250	0.01692	1.07	1.69	0.000	0.00e+00	4.70e-02	0.00e+00	0.00e+00
4	0.500	0.02454	1.05	2.45	0.000	0.00e+00	3.05e-02	0.00e+00	0.00e+00
5	1.00	0.03445	1.03	3.44	0.000	0.00e+00	1.98e-02	0.00e+00	0.00e+00
6	2.00	0.04872	1.00	4.87	0.000	0.00e+00	1.43e-02	0.00e+00	0.00e+00
7	4.00	0.06946	0.959	6.95	0.000	0.00e+00	1.04e-02	0.00e+00	0.00e+00
8	8.00	0.09841	0.898	9.84	0.000	0.00e+00	7.24e-03	0.00e+00	0.00e+00
9	16.0	0.1349	0.821	13.5	0.000	0.00e+00	4.56e-03	0.00e+00	0.00e+00
10	32.0	0.1783	0.730	17.8	0.000	0.00e+00	2.72e-03	0.00e+00	0.00e+00
11	8.00	0.1741	0.739	17.4	0.000	0.00e+00	1.76e-04	0.00e+00	0.00e+00
12	2.00	0.1685	0.751	16.9	0.000	0.00e+00	9.30e-04	0.00e+00	0.00e+00
13	0.500	0.1612	0.766	16.1	5.549	7.16e-07	4.92e-03	9.50e-06	0.00e+00
14	0.125	0.1529	0.783	15.3	0.000	0.00e+00	2.20e-02	0.00e+00	0.00e+00
15	0.0625	0.1470	0.796	14.7	0.000	0.00e+00	9.49e-02	0.00e+00	0.00e+00



Project: Gasco PDI	Location:	Project No.: GTX-310685				
Boring No.: PDI-115SPT	Tested By: trm	Checked By: anm				
Sample No.: 41.5-43.5191009	Test Date: 11/27/19	Depth:				
Test No.: IP-1	Sample Type: intact	Elevation:				
Description: Moist, dark gray sandy silt						
Remarks: System JJ, Swell Pressure = 0.0716 tsf						
Displacement at End of Increment						

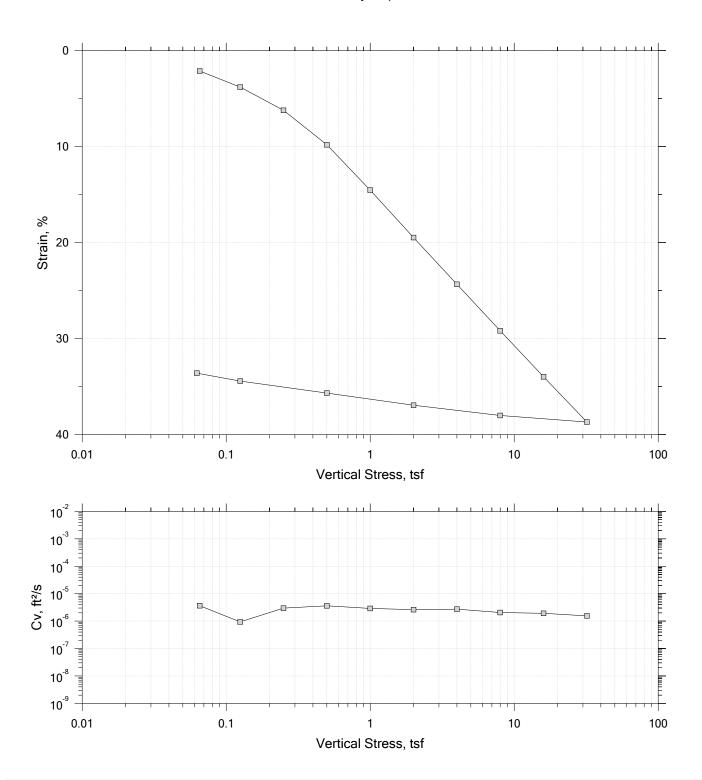
#### **Square Root of Time Coefficients**

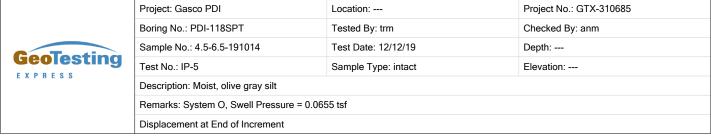
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0716	0.006595	1.09	0.659	181.433	1.34e-07	9.21e-02	3.34e-05
2	0.125	0.01105	1.08	1.10	40.385	5.97e-07	8.33e-02	1.34e-04
3	0.250	0.01692	1.07	1.69	305.688	7.80e-08	4.70e-02	9.89e-06
4	0.500	0.02454	1.05	2.45	52.375	4.49e-07	3.05e-02	3.69e-05
5	1.00	0.03445	1.03	3.44	16.782	1.38e-06	1.98e-02	7.36e-05
6	2.00	0.04872	1.00	4.87	20.097	1.12e-06	1.43e-02	4.32e-05
7	4.00	0.06946	0.959	6.95	13.993	1.55e-06	1.04e-02	4.34e-05
8	8.00	0.09841	0.898	9.84	37.898	5.43e-07	7.24e-03	1.06e-05
9	16.0	0.1349	0.821	13.5	40.484	4.73e-07	4.56e-03	5.81e-06
10	32.0	0.1783	0.730	17.8	24.923	7.00e-07	2.72e-03	5.13e-06
11	8.00	0.1741	0.739	17.4	0.000	0.00e+00	1.76e-04	0.00e+00
12	2.00	0.1685	0.751	16.9	42.506	3.96e-07	9.30e-04	9.95e-07
13	0.500	0.1612	0.766	16.1	21.830	7.84e-07	4.92e-03	1.04e-05
14	0.125	0.1529	0.783	15.3	71.935	2.42e-07	2.20e-02	1.44e-05
15	0.0625	0.1470	0.796	14.7	0.000	0.00e+00	9.49e-02	0.00e+00



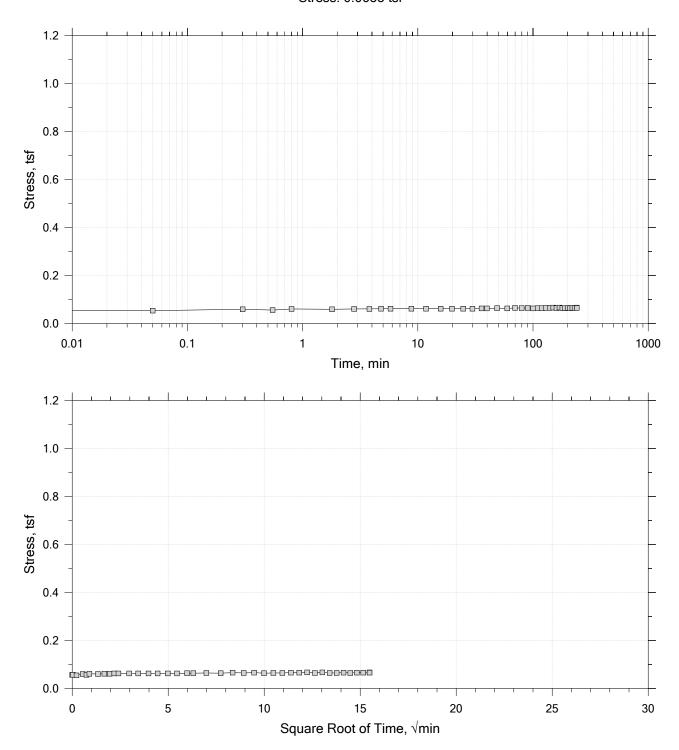
Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-115SPT	Tested By: trm	Checked By: anm			
Sample No.: 41.5-43.5191009	Test Date: 11/27/19	Depth:			
Test No.: IP-1	Sample Type: intact	Elevation:			
Description: Moist, dark gray sandy silt					
Remarks: System JJ, Swell Pressure = 0.0716 tsf					
Displacement at End of Increment					

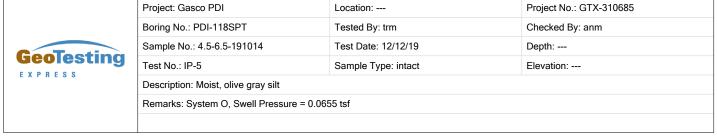
#### **Summary Report**



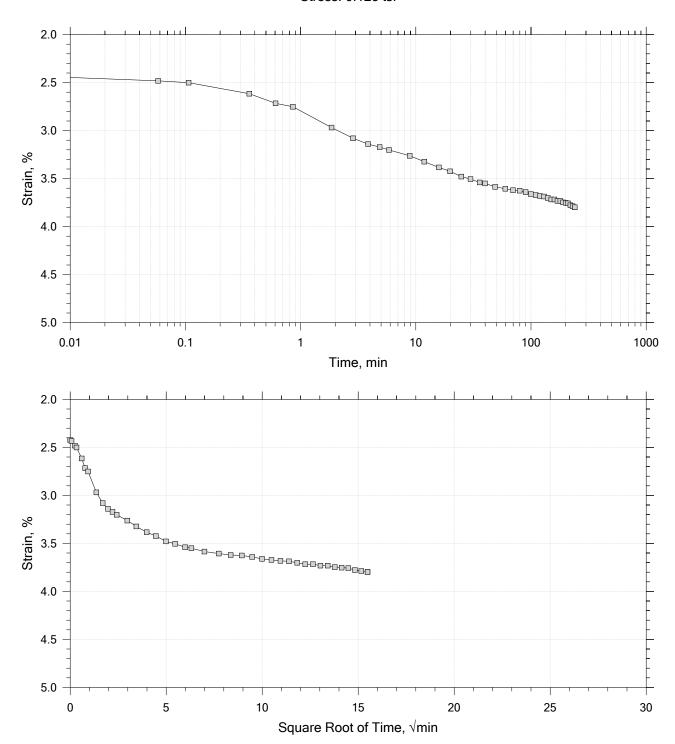


Time Curve 1 of 15 Constant Volume Step Stress: 0.0655 tsf





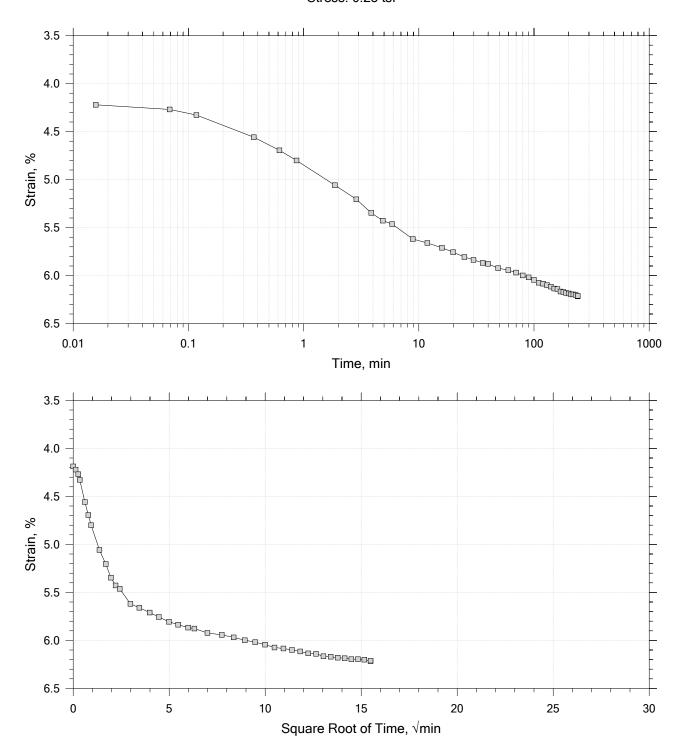
Time Curve 2 of 15 Constant Load Step Stress: 0.125 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:			
Test No.: IP-5	Sample Type: intact	Elevation:			
Description: Moist, olive gray silt					
Remarks: System O, Swell Pressure = 0.0655 tsf					

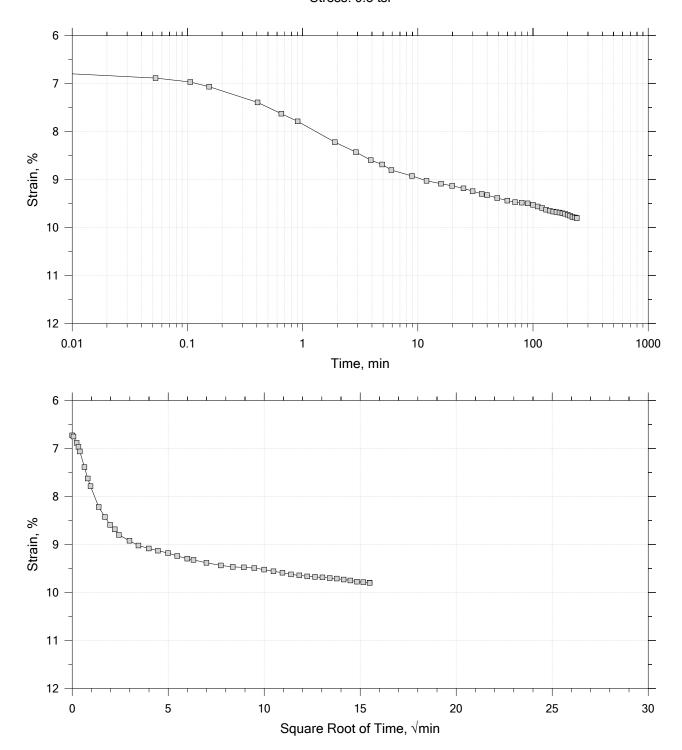
Time Curve 3 of 15 Constant Load Step Stress: 0.25 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:			
Test No.: IP-5	Sample Type: intact	Elevation:			
Description: Moist, olive gray silt					
Remarks: System O, Swell Pressure = 0.0655 tsf					

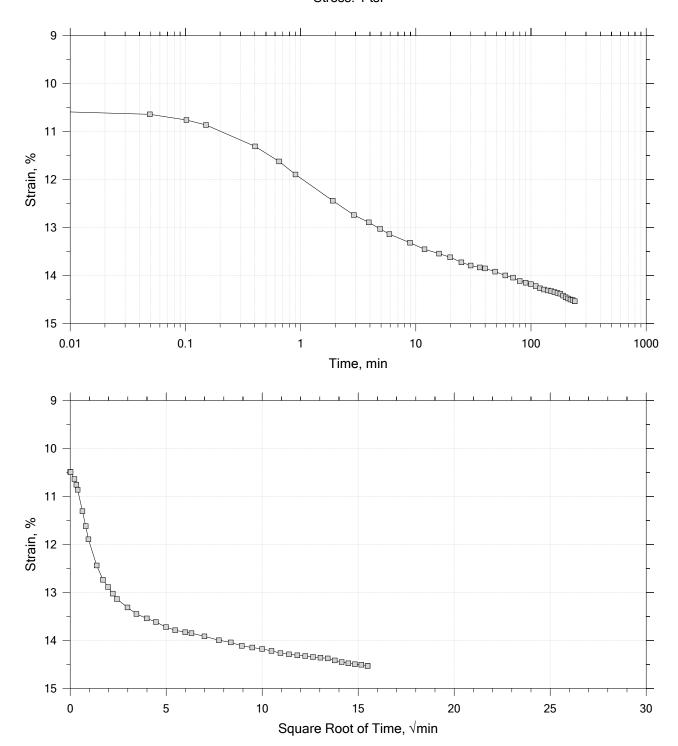
Time Curve 4 of 15 Constant Load Step Stress: 0.5 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:			
Test No.: IP-5	Sample Type: intact	Elevation:			
Description: Moist, olive gray silt					
Remarks: System O, Swell Pressure = 0.0655 tsf					

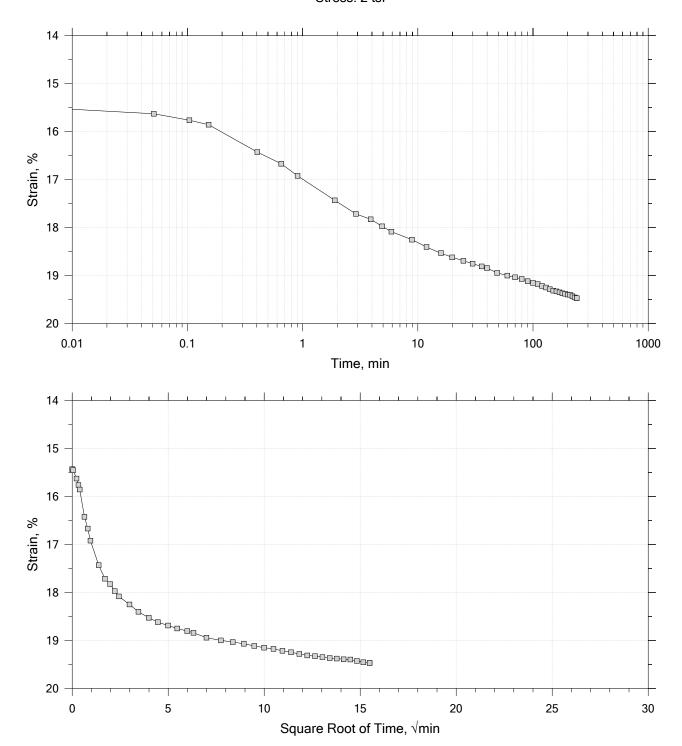
Time Curve 5 of 15 Constant Load Step Stress: 1 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:			
Test No.: IP-5	Sample Type: intact	Elevation:			
Description: Moist, olive gray silt					
Remarks: System O, Swell Pressure = 0.0655 tsf					

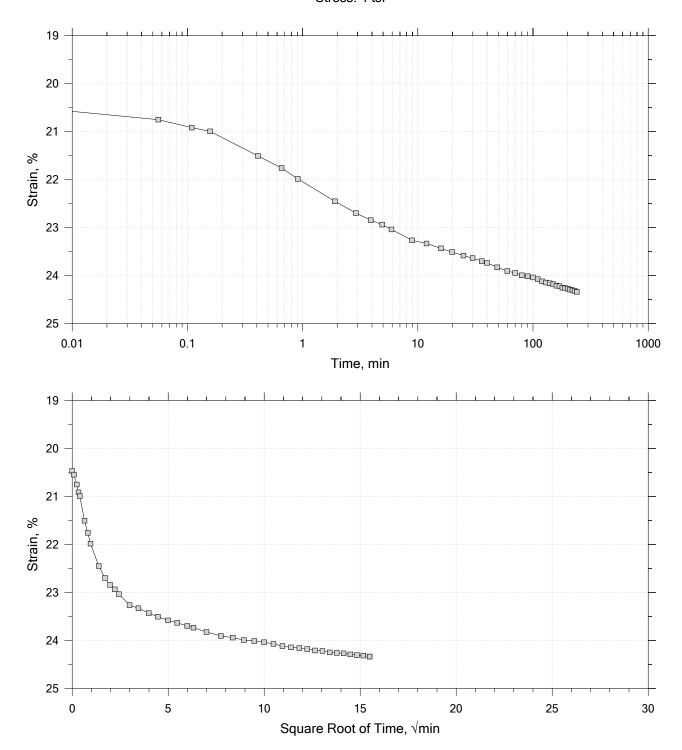
Time Curve 6 of 15 Constant Load Step Stress: 2 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm		
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:		
Test No.: IP-5	Sample Type: intact	Elevation:		
Description: Moist, olive gray silt				
Remarks: System O, Swell Pressure = 0.0655 tsf				

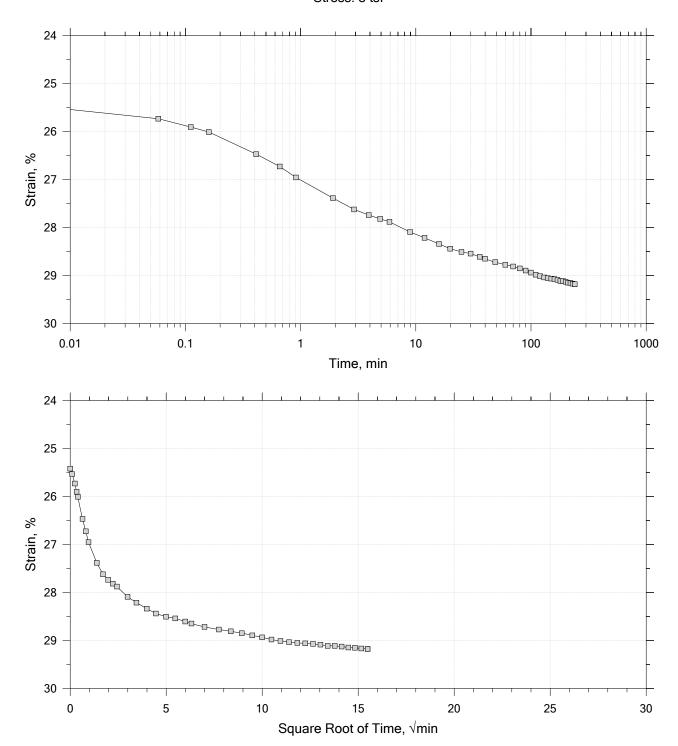
Time Curve 7 of 15 Constant Load Step Stress: 4 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm		
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:		
Test No.: IP-5	Sample Type: intact	Elevation:		
Description: Moist, olive gray silt				
Remarks: System O, Swell Pressure = 0.0655 tsf				

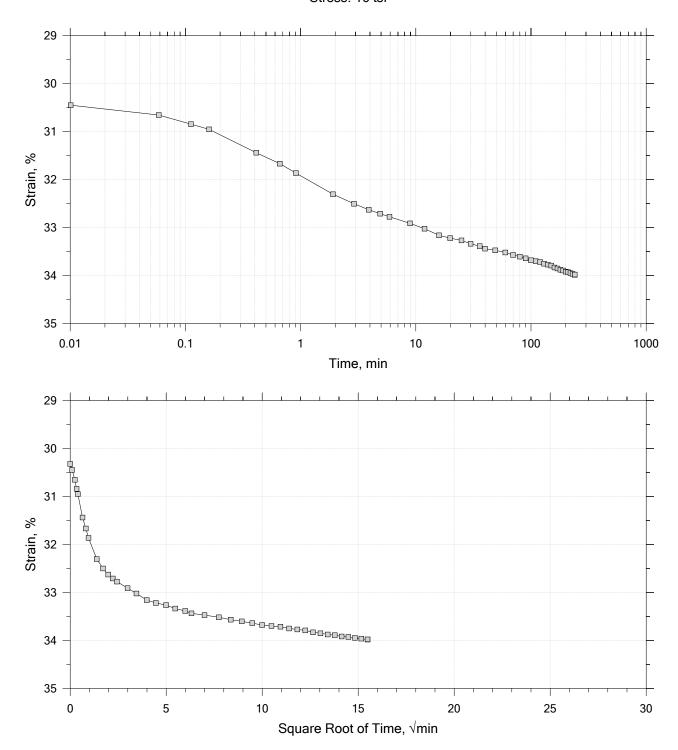
Time Curve 8 of 15 Constant Load Step Stress: 8 tsf

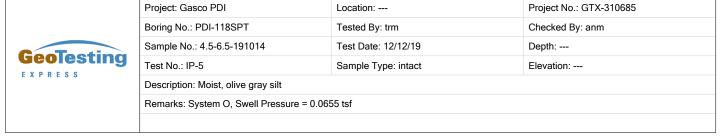




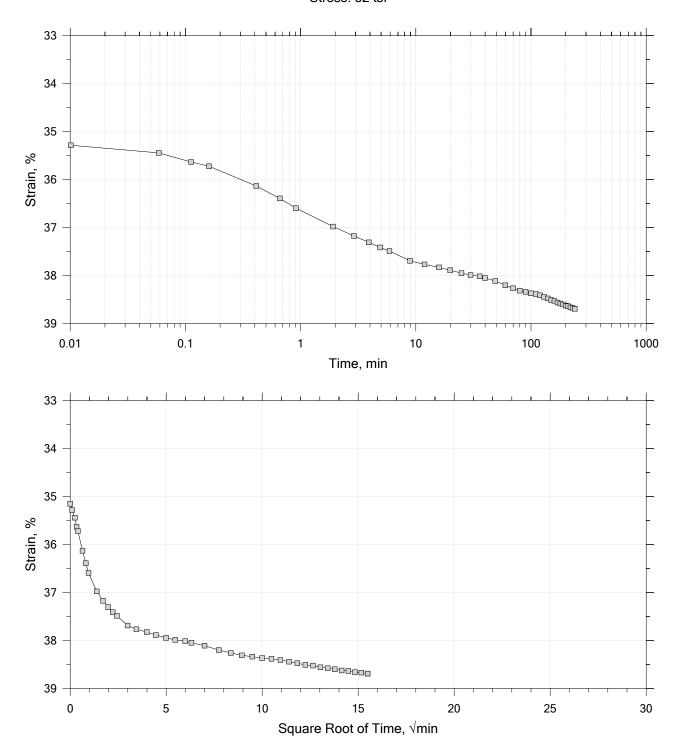
Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm		
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:		
Test No.: IP-5	Sample Type: intact	Elevation:		
Description: Moist, olive gray silt				
Remarks: System O, Swell Pressure = 0.0655 tsf				

Time Curve 9 of 15 Constant Load Step Stress: 16 tsf





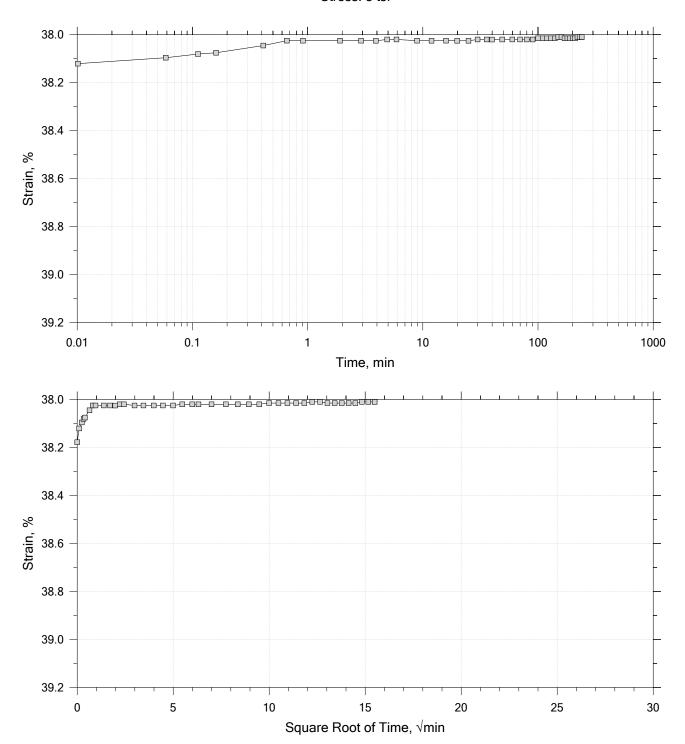
Time Curve 10 of 15 Constant Load Step Stress: 32 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm		
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:		
Test No.: IP-5	Sample Type: intact	Elevation:		
Description: Moist, olive gray silt				
Remarks: System O, Swell Pressure = 0.0655 tsf				

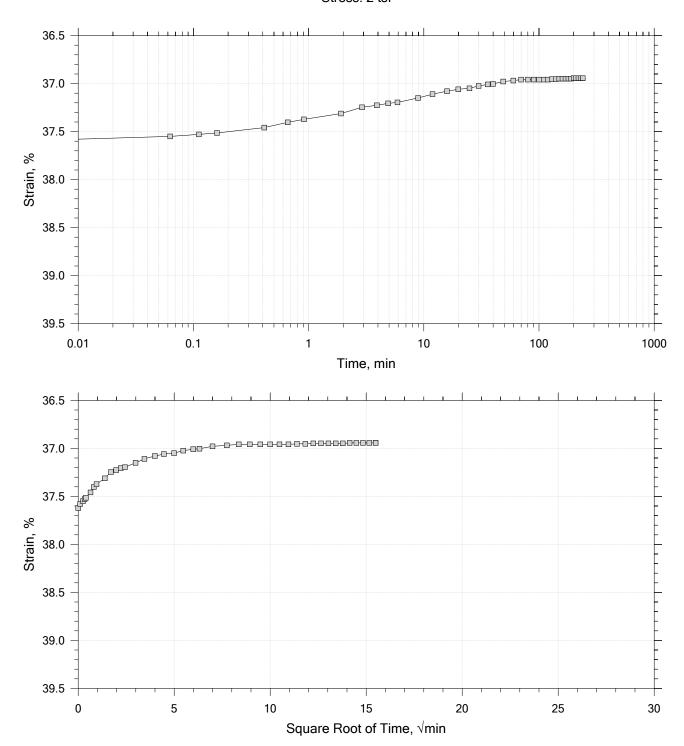
Time Curve 11 of 15 Constant Load Step Stress: 8 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm		
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:		
Test No.: IP-5	Sample Type: intact	Elevation:		
Description: Moist, olive gray silt				
Remarks: System O, Swell Pressure = 0.0655 tsf				

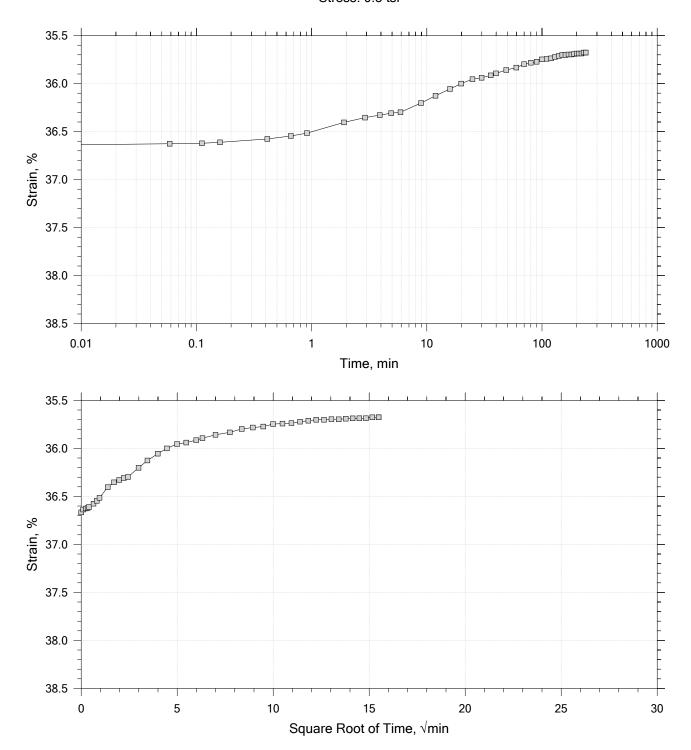
Time Curve 12 of 15 Constant Load Step Stress: 2 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm		
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:		
Test No.: IP-5	Sample Type: intact	Elevation:		
Description: Moist, olive gray silt				
Remarks: System O, Swell Pressure = 0.0655 tsf				

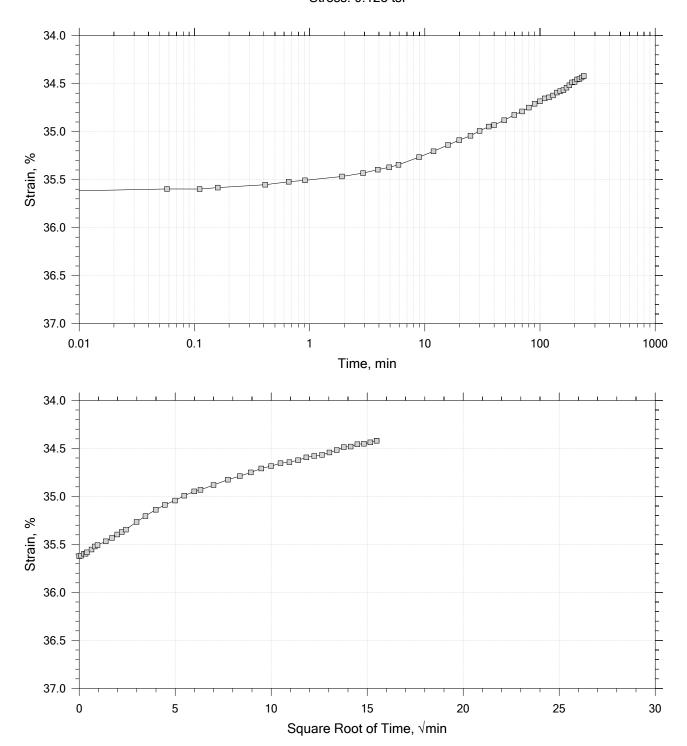
Time Curve 13 of 15 Constant Load Step Stress: 0.5 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm		
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:		
Test No.: IP-5	Sample Type: intact	Elevation:		
Description: Moist, olive gray silt				
Remarks: System O, Swell Pressure = 0.0655 tsf				

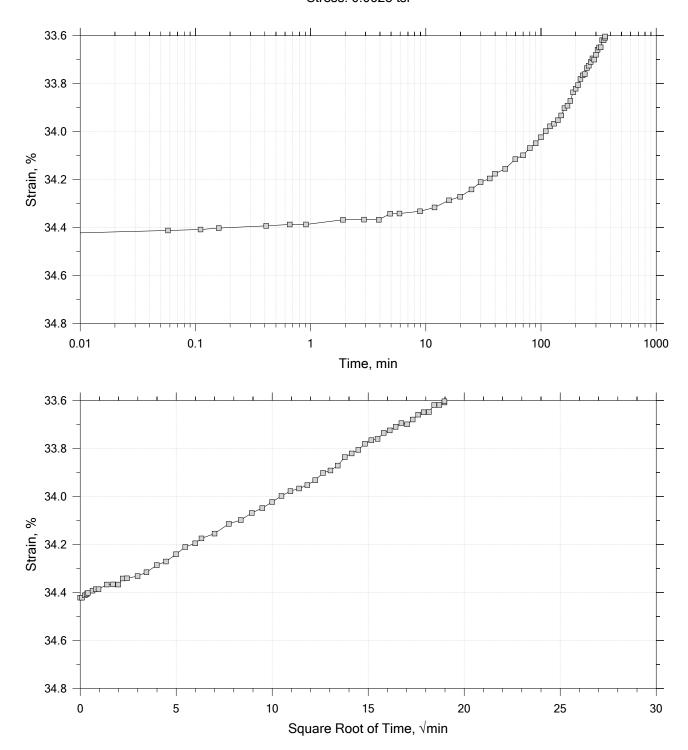
Time Curve 14 of 15 Constant Load Step Stress: 0.125 tsf

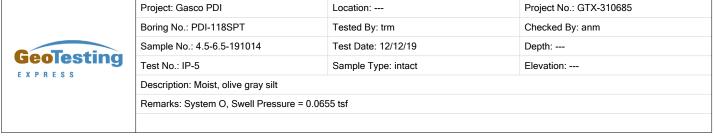




Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm		
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:		
Test No.: IP-5	Sample Type: intact	Elevation:		
Description: Moist, olive gray silt				
Remarks: System O, Swell Pressure = 0.0655 tsf				

Time Curve 15 of 15 Constant Load Step Stress: 0.0625 tsf





Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.69	Liquid Limit: 74		
Initial Height: 1.00 in	Initial Void Ratio: 1.68	Plastic Limit: 38		
Final Height: 0.70 in	Final Void Ratio: 0.877	Plasticity Index: 36		

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	D909	RING		B-2656
Mass Container, gm	8.3	109.13	109.13	8.27
Mass Container + Wet Soil, gm	258.06	239.47	216	111.39
Mass Container + Dry Soil, gm	163.24	189.69	189.69	86
Mass Dry Soil, gm	154.94	80.557	80.557	77.73
Water Content, %	61.20	61.80	32.66	32.66
Void Ratio		1.68	0.88	
Degree of Saturation, %		98.69	100.00	
Dry Unit Weight, pcf		62.519	89.312	

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.



Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:			
Test No.: IP-5	Sample Type: intact	Elevation:			
Description: Moist, olive gray silt					
Remarks: System O, Swell Pressure = 0.0655 tsf					

#### Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0655	0.02125	1.62	2.12	1.440	3.87e-06	3.24e-01	3.39e-03	0.00e+00
2	0.125	0.03798	1.58	3.80	0.000	0.00e+00	2.81e-01	0.00e+00	0.00e+00
3	0.250	0.06211	1.52	6.21	1.694	3.04e-06	1.93e-01	1.58e-03	0.00e+00
4	0.500	0.09803	1.42	9.80	1.197	4.03e-06	1.44e-01	1.56e-03	0.00e+00
5	1.00	0.1453	1.29	14.5	1.190	3.69e-06	9.46e-02	9.43e-04	0.00e+00
6	2.00	0.1947	1.16	19.5	1.121	3.50e-06	4.94e-02	4.66e-04	0.00e+00
7	4.00	0.2434	1.03	24.3	1.063	3.27e-06	2.43e-02	2.15e-04	0.00e+00
8	8.00	0.2918	0.899	29.2	1.030	2.97e-06	1.21e-02	9.69e-05	0.00e+00
9	16.0	0.3398	0.771	34.0	0.993	2.69e-06	6.00e-03	4.35e-05	0.00e+00
10	32.0	0.3869	0.644	38.7	0.987	2.34e-06	2.95e-03	1.86e-05	0.00e+00
11	8.00	0.3801	0.662	38.0	0.000	0.00e+00	2.84e-04	0.00e+00	0.00e+00
12	2.00	0.3694	0.691	36.9	1.994	1.12e-06	1.78e-03	5.36e-06	0.00e+00
13	0.500	0.3568	0.725	35.7	8.202	2.82e-07	8.44e-03	6.42e-06	0.00e+00
14	0.125	0.3442	0.759	34.4	0.000	0.00e+00	3.35e-02	0.00e+00	0.00e+00
15	0.0625	0.3360	0.781	33.6	0.000	0.00e+00	1.31e-01	0.00e+00	0.00e+00



Project: Gasco PDI	Location:	Project No.: GTX-310685
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:
Test No.: IP-5	Sample Type: intact	Elevation:
Description: Moist, olive gray silt		
Remarks: System O, Swell Pressure = 0.0655 tsf		
Displacement at End of Increment		

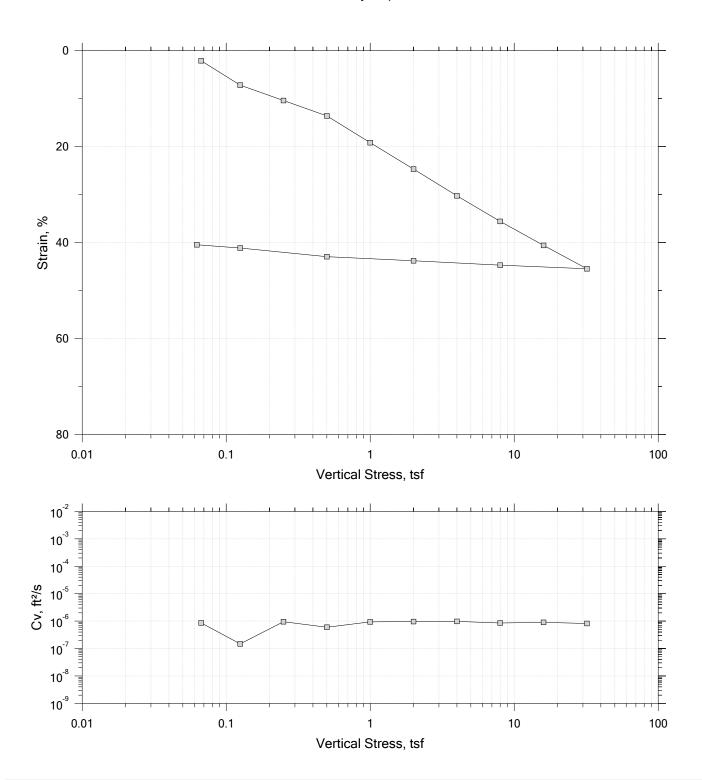
#### **Square Root of Time Coefficients**

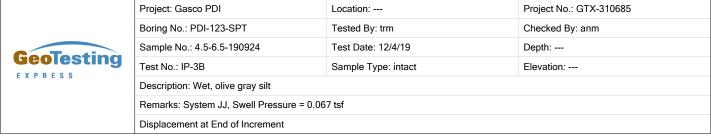
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0655	0.02125	1.62	2.12	7.427	3.23e-06	3.24e-01	2.83e-03
2	0.125	0.03798	1.58	3.80	27.984	8.26e-07	2.81e-01	6.26e-04
3	0.250	0.06211	1.52	6.21	8.732	2.54e-06	1.93e-01	1.32e-03
4	0.500	0.09803	1.42	9.80	7.566	2.74e-06	1.44e-01	1.06e-03
5	1.00	0.1453	1.29	14.5	9.964	1.90e-06	9.46e-02	4.85e-04
6	2.00	0.1947	1.16	19.5	10.289	1.64e-06	4.94e-02	2.19e-04
7	4.00	0.2434	1.03	24.3	7.994	1.87e-06	2.43e-02	1.23e-04
8	8.00	0.2918	0.899	29.2	10.821	1.22e-06	1.21e-02	3.97e-05
9	16.0	0.3398	0.771	34.0	9.891	1.16e-06	6.00e-03	1.88e-05
10	32.0	0.3869	0.644	38.7	10.669	9.32e-07	2.95e-03	7.41e-06
11	8.00	0.3801	0.662	38.0	1.531	6.09e-06	2.84e-04	4.67e-06
12	2.00	0.3694	0.691	36.9	14.086	6.81e-07	1.78e-03	3.27e-06
13	0.500	0.3568	0.725	35.7	30.578	3.26e-07	8.44e-03	7.41e-06
14	0.125	0.3442	0.759	34.4	70.876	1.46e-07	3.35e-02	1.32e-05
15	0.0625	0.3360	0.781	33.6	268.654	3.98e-08	1.31e-01	1.40e-05



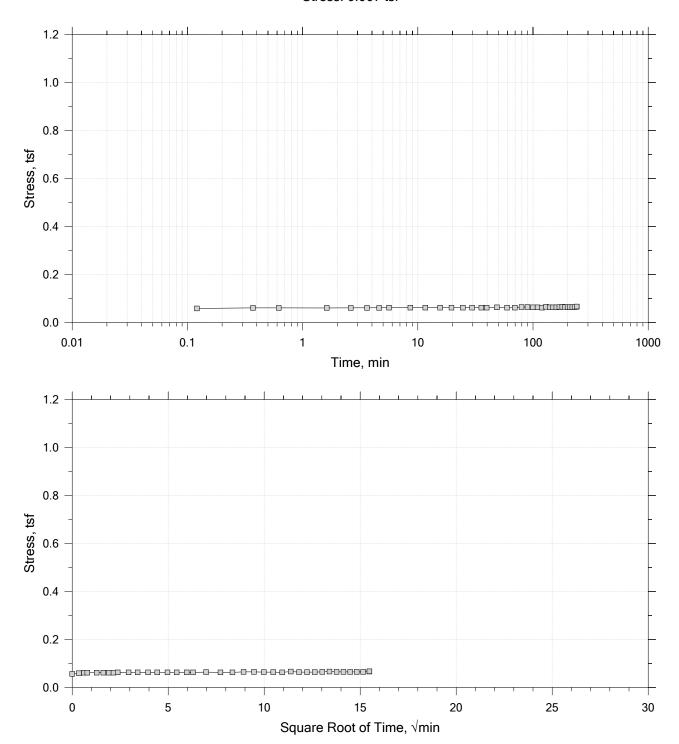
Project: Gasco PDI	Location:	Project No.: GTX-310685
Boring No.: PDI-118SPT	Tested By: trm	Checked By: anm
Sample No.: 4.5-6.5-191014	Test Date: 12/12/19	Depth:
Test No.: IP-5	Sample Type: intact	Elevation:
Description: Moist, olive gray silt		
Remarks: System O, Swell Pressure = 0.0655 tsf		
Displacement at End of Increment		

#### **Summary Report**





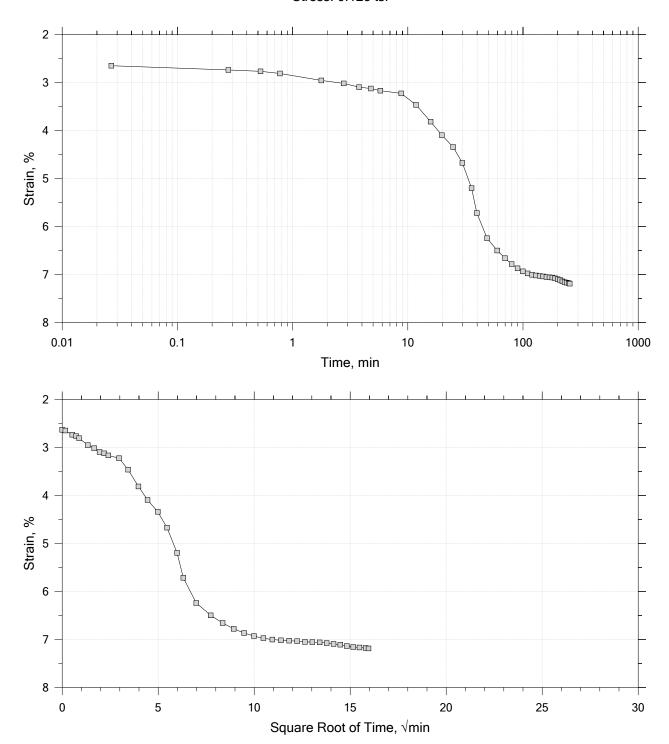
Time Curve 1 of 15 Constant Volume Step Stress: 0.067 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:
Test No.: IP-3B	Sample Type: intact	Elevation:
Description: Wet, olive gray silt		
Remarks: System JJ, Swell Pressure = 0.067 tsf		

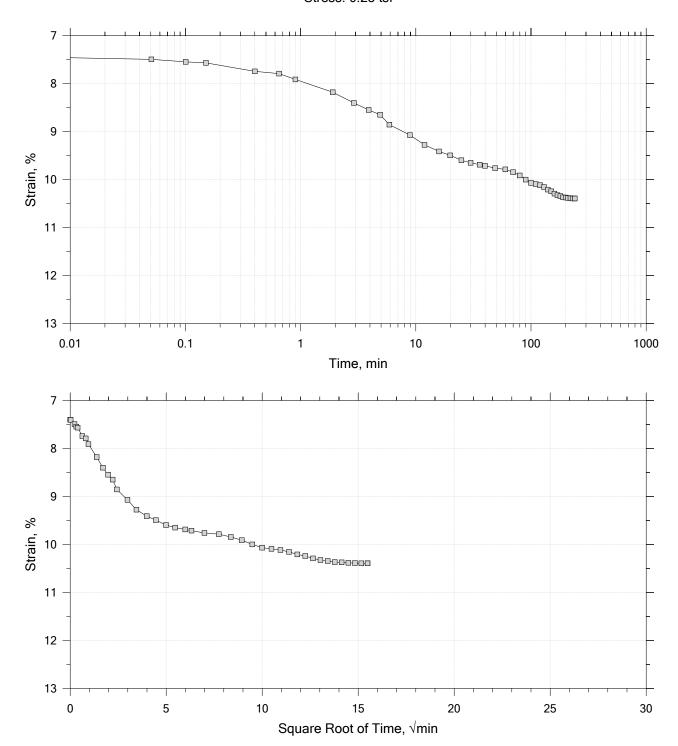
Time Curve 2 of 15 Constant Load Step Stress: 0.125 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:
Test No.: IP-3B	Sample Type: intact	Elevation:
Description: Wet, olive gray silt		
Remarks: System JJ, Swell Pressure = 0.067 tsf		

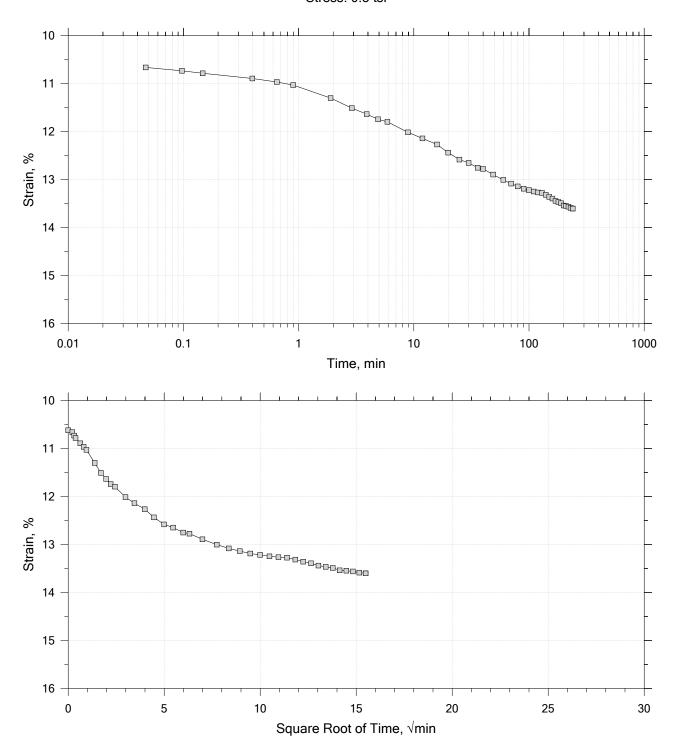
Time Curve 3 of 15 Constant Load Step Stress: 0.25 tsf

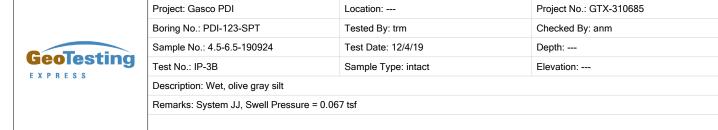




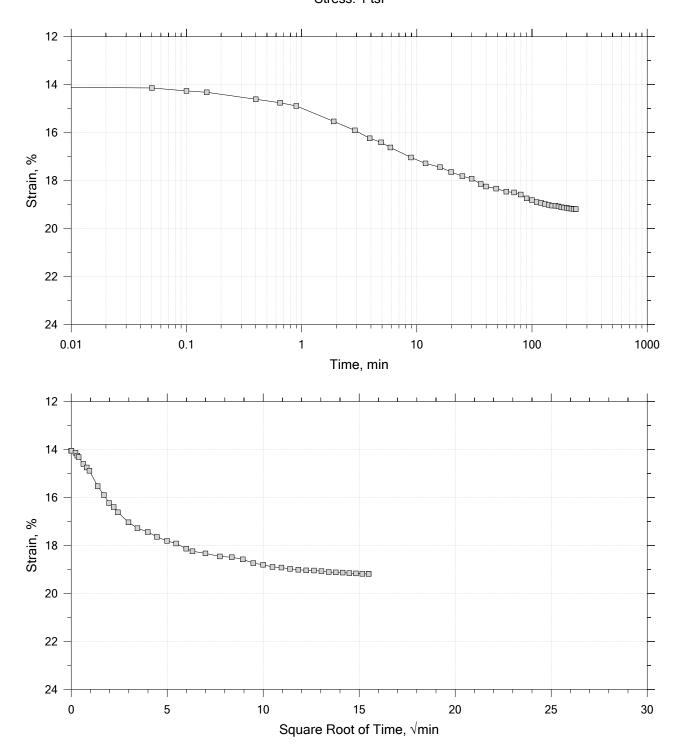
Project: Gasco PDI	Location:	Project No.: GTX-310685
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:
Test No.: IP-3B	Sample Type: intact	Elevation:
Description: Wet, olive gray silt		
Remarks: System JJ, Swell Pressure = 0.067 tsf		

Time Curve 4 of 15 Constant Load Step Stress: 0.5 tsf





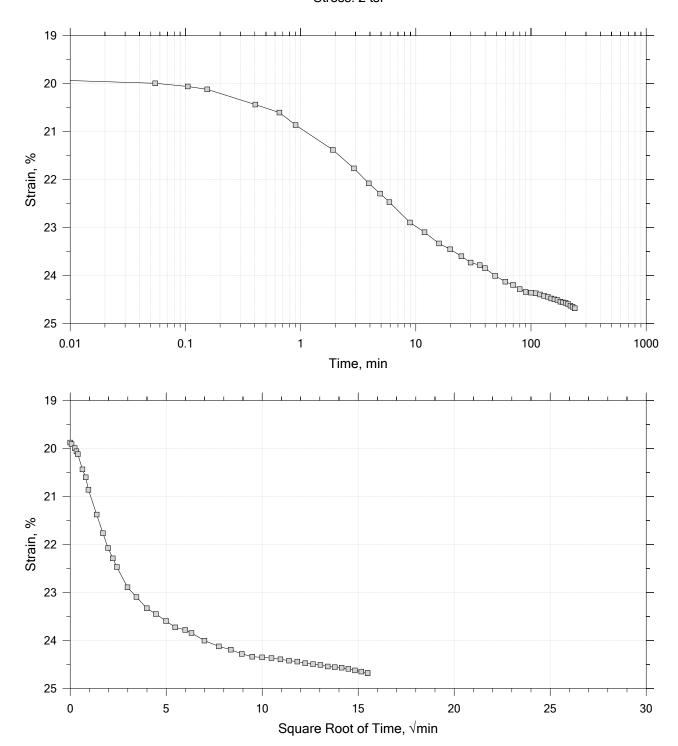
Time Curve 5 of 15 Constant Load Step Stress: 1 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:
Test No.: IP-3B	Sample Type: intact	Elevation:
Description: Wet, olive gray silt		
Remarks: System JJ, Swell Pressure = 0.067 tsf		

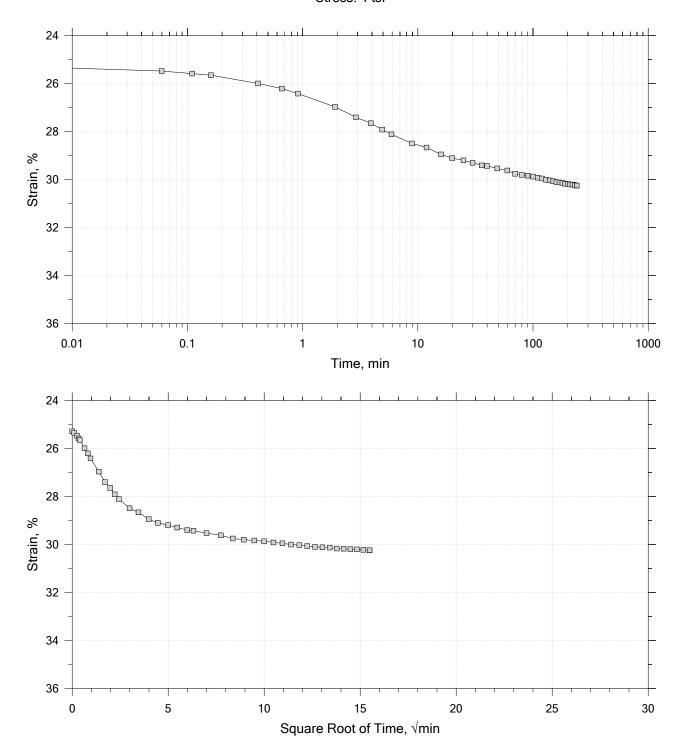
Time Curve 6 of 15 Constant Load Step Stress: 2 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:
Test No.: IP-3B	Sample Type: intact	Elevation:
Description: Wet, olive gray silt		
Remarks: System JJ, Swell Pressure = 0.067 tsf		

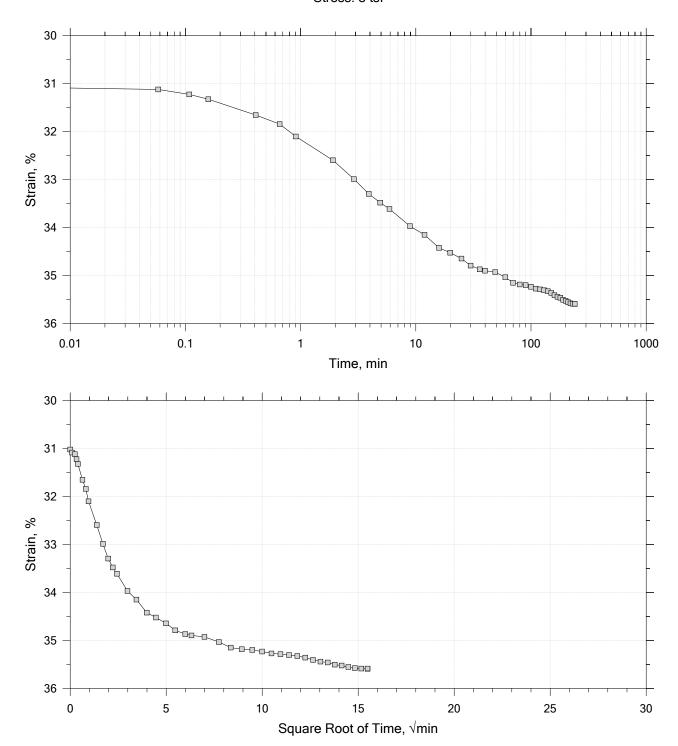
Time Curve 7 of 15 Constant Load Step Stress: 4 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:
Test No.: IP-3B	Sample Type: intact	Elevation:
Description: Wet, olive gray silt		
Remarks: System JJ, Swell Pressure = 0.067 tsf		

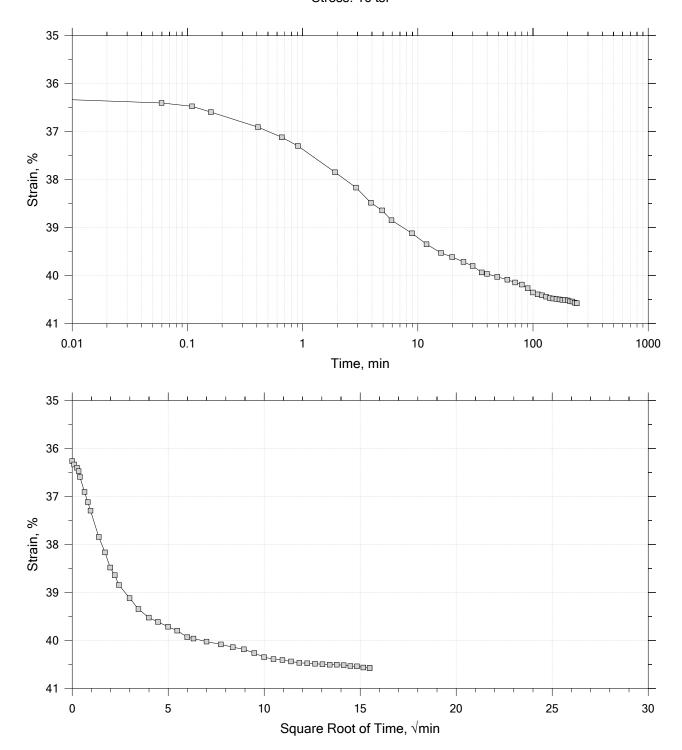
Time Curve 8 of 15 Constant Load Step Stress: 8 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:
Test No.: IP-3B	Sample Type: intact	Elevation:
Description: Wet, olive gray silt		
Remarks: System JJ, Swell Pressure = 0.067 tsf		

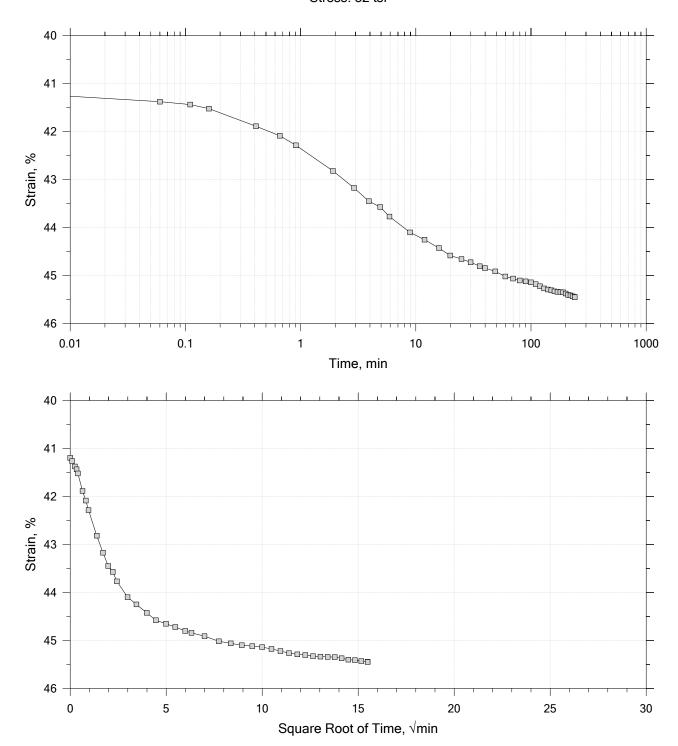
Time Curve 9 of 15 Constant Load Step Stress: 16 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:			
Test No.: IP-3B	Sample Type: intact	Elevation:			
Description: Wet, olive gray silt					
Remarks: System JJ, Swell Pressure = 0.067 tsf					

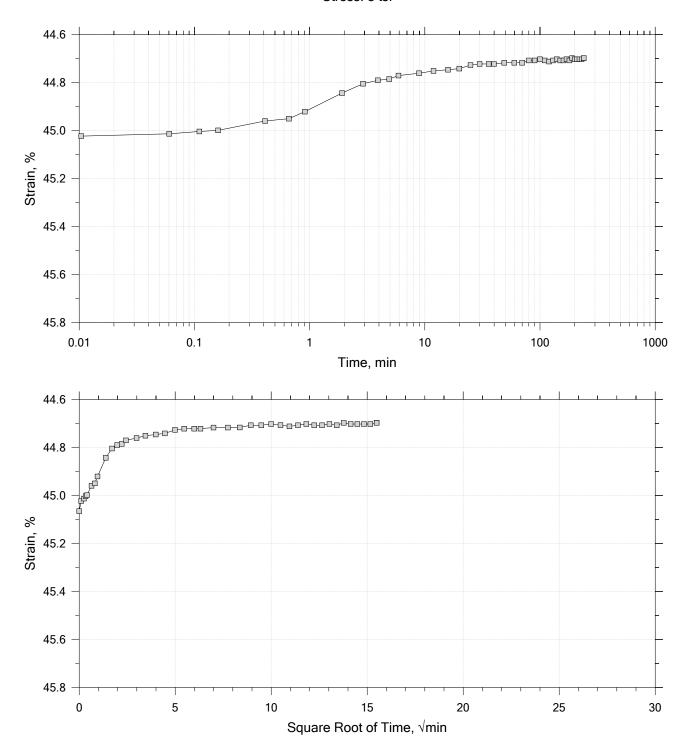
Time Curve 10 of 15 Constant Load Step Stress: 32 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:			
Test No.: IP-3B	Sample Type: intact	Elevation:			
Description: Wet, olive gray silt					
Remarks: System JJ, Swell Pressure = 0.067 tsf					

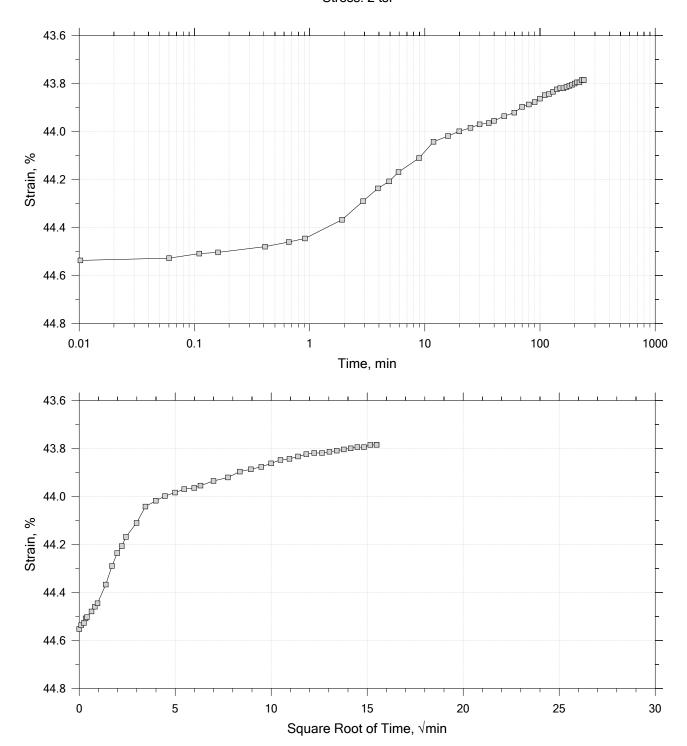
Time Curve 11 of 15 Constant Load Step Stress: 8 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:			
Test No.: IP-3B	Sample Type: intact	Elevation:			
Description: Wet, olive gray silt					
Remarks: System JJ, Swell Pressure = 0.067 tsf					

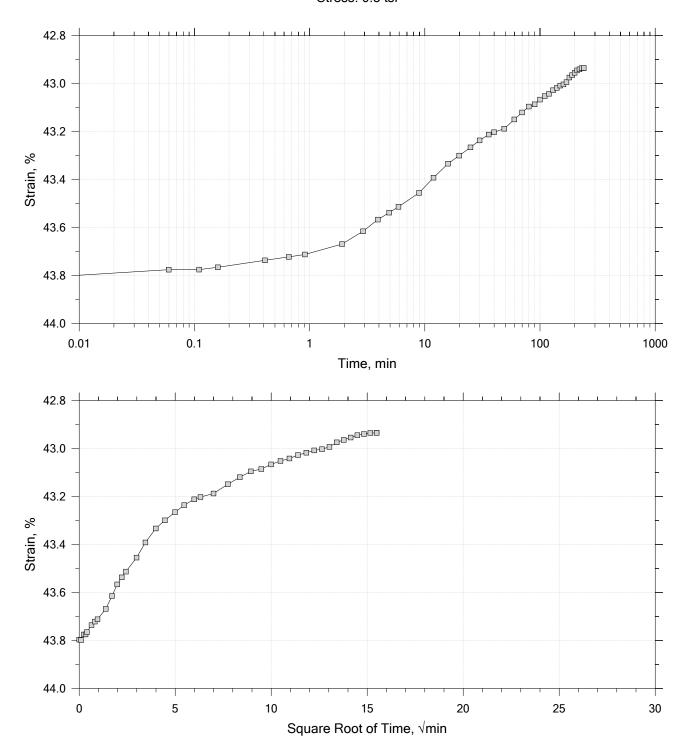
Time Curve 12 of 15 Constant Load Step Stress: 2 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:			
Test No.: IP-3B	Sample Type: intact	Elevation:			
Description: Wet, olive gray silt					
Remarks: System JJ, Swell Pressure = 0.067 tsf					

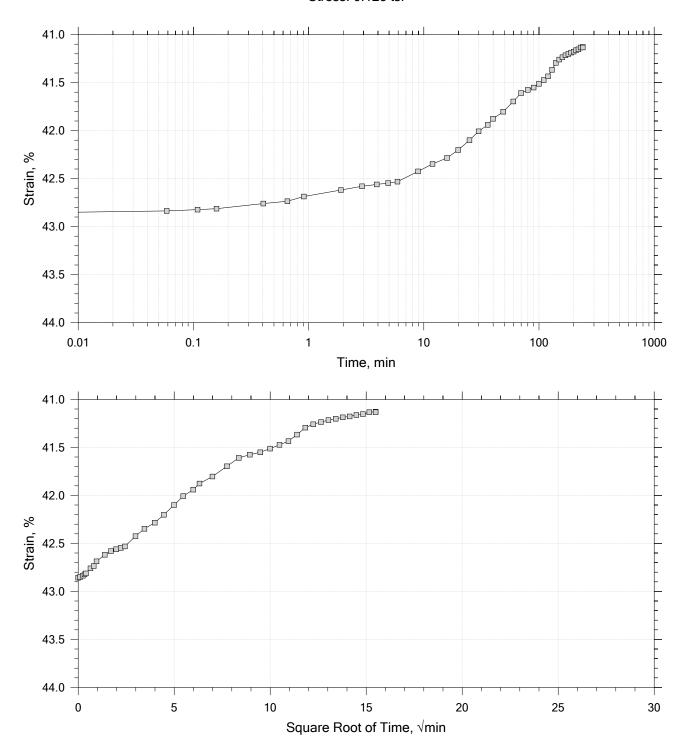
Time Curve 13 of 15 Constant Load Step Stress: 0.5 tsf





Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:			
Test No.: IP-3B	Sample Type: intact	Elevation:			
Description: Wet, olive gray silt					
Remarks: System JJ, Swell Pressure = 0.067 tsf					

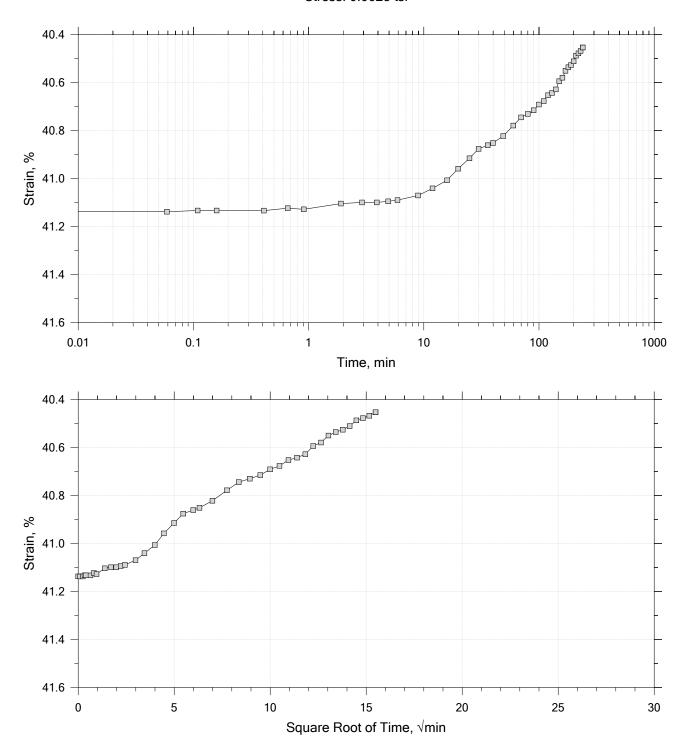
Time Curve 14 of 15 Constant Load Step Stress: 0.125 tsf

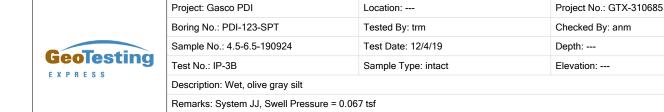




Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:			
Test No.: IP-3B	Sample Type: intact	Elevation:			
Description: Wet, olive gray silt					
Remarks: System JJ, Swell Pressure = 0.067 tsf					

Time Curve 15 of 15 Constant Load Step Stress: 0.0625 tsf





Specimen Diameter: 2.50 in	Estimated Specific Gravity: 2.69	Liquid Limit: 50	
Initial Height: 1.00 in	Initial Void Ratio: 2.04	Plastic Limit: 33	
Final Height: 0.60 in	Final Void Ratio: 0.821	Plasticity Index: 17	

	Before Test Trimmings	Before Test Specimen	After Test Specimen	After Test Trimmings
Container ID	D891	RING		B-2399
Mass Container, gm	8.37	112.4	112.4	9.31
Mass Container + Wet Soil, gm	196.24	236.54	205.38	101.76
Mass Container + Dry Soil, gm	116.71	183.62	183.62	80.12
Mass Dry Soil, gm	108.34	71.216	71.216	70.81
Water Content, %	73.41	74.31	30.56	30.56
Void Ratio		2.04	0.82	
Degree of Saturation, %		98.12	100.00	
Dry Unit Weight, pcf		55.269	92.116	

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.



Project: Gasco PDI	Location:	Project No.: GTX-310685					
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm					
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:					
Test No.: IP-3B	Sample Type: intact	Elevation:					
Description: Wet, olive gray silt	Description: Wet, olive gray silt						
Remarks: System JJ, Swell Pressure = 0.067 tsf							

#### Log of Time Coefficients

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft²/s	Mv 1/tsf	k ft/day	Ca %
1	0.0670	0.02107	1.97	2.11	5.467	1.02e-06	3.14e-01	8.66e-04	0.00e+00
2	0.125	0.07188	1.82	7.19	31.574	1.64e-07	8.76e-01	3.88e-04	0.00e+00
3	0.250	0.1039	1.72	10.4	0.000	0.00e+00	2.56e-01	0.00e+00	0.00e+00
4	0.500	0.1360	1.62	13.6	0.000	0.00e+00	1.28e-01	0.00e+00	0.00e+00
5	1.00	0.1919	1.45	19.2	3.725	1.07e-06	1.12e-01	3.22e-04	0.00e+00
6	2.00	0.2468	1.29	24.7	3.773	9.21e-07	5.49e-02	1.36e-04	0.00e+00
7	4.00	0.3025	1.12	30.2	2.692	1.11e-06	2.78e-02	8.36e-05	0.00e+00
8	8.00	0.3559	0.955	35.6	2.615	9.81e-07	1.34e-02	3.53e-05	0.00e+00
9	16.0	0.4057	0.804	40.6	2.286	9.56e-07	6.23e-03	1.61e-05	0.00e+00
10	32.0	0.4545	0.656	45.5	2.134	8.68e-07	3.05e-03	7.13e-06	0.00e+00
11	8.00	0.4470	0.679	44.7	0.000	0.00e+00	3.14e-04	0.00e+00	0.00e+00
12	2.00	0.4379	0.706	43.8	4.047	4.38e-07	1.52e-03	1.80e-06	0.00e+00
13	0.500	0.4294	0.732	42.9	0.000	0.00e+00	5.66e-03	0.00e+00	0.00e+00
14	0.125	0.4113	0.787	41.1	0.000	0.00e+00	4.80e-02	0.00e+00	0.00e+00
15	0.0625	0.4045	0.808	40.5	0.000	0.00e+00	1.09e-01	0.00e+00	0.00e+00



Project: Gasco PDI	Location:	Project No.: GTX-310685			
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm			
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:			
Test No.: IP-3B	Sample Type: intact	Elevation:			
Description: Wet, olive gray silt					
Remarks: System JJ, Swell Pressure = 0.067 tsf					
Displacement at End of Increment					

#### **Square Root of Time Coefficients**

Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0670	0.02107	1.97	2.11	31.257	7.69e-07	3.14e-01	6.52e-04
2	0.125	0.07188	1.82	7.19	120.733	1.85e-07	8.76e-01	4.37e-04
3	0.250	0.1039	1.72	10.4	21.662	9.42e-07	2.56e-01	6.52e-04
4	0.500	0.1360	1.62	13.6	34.061	5.58e-07	1.28e-01	1.93e-04
5	1.00	0.1919	1.45	19.2	22.369	7.67e-07	1.12e-01	2.31e-04
6	2.00	0.2468	1.29	24.7	16.263	9.20e-07	5.49e-02	1.36e-04
7	4.00	0.3025	1.12	30.2	16.588	7.78e-07	2.78e-02	5.84e-05
8	8.00	0.3559	0.955	35.6	16.801	6.57e-07	1.34e-02	2.37e-05
9	16.0	0.4057	0.804	40.6	12.123	7.76e-07	6.23e-03	1.30e-05
10	32.0	0.4545	0.656	45.5	11.467	6.95e-07	3.05e-03	5.71e-06
11	8.00	0.4470	0.679	44.7	8.666	8.54e-07	3.14e-04	7.22e-07
12	2.00	0.4379	0.706	43.8	20.035	3.81e-07	1.52e-03	1.56e-06
13	0.500	0.4294	0.732	42.9	42.100	1.87e-07	5.66e-03	2.86e-06
14	0.125	0.4113	0.787	41.1	149.871	5.50e-08	4.80e-02	7.13e-06
15	0.0625	0.4045	0.808	40.5	178.907	4.81e-08	1.09e-01	1.41e-05



Project: Gasco PDI	Location:	Project No.: GTX-310685		
Boring No.: PDI-123-SPT	Tested By: trm	Checked By: anm		
Sample No.: 4.5-6.5-190924	Test Date: 12/4/19	Depth:		
Test No.: IP-3B	Sample Type: intact	Elevation:		
Description: Wet, olive gray silt				
Remarks: System JJ, Swell Pressure = 0.067 tsf				
Displacement at End of Increment				



Project: Gasco PDI

Location:Project No:GTX-310685Boring ID:---Tested By:mdSample ID:---Test Date:12/20/19Checked By:bfs

Depth: --- Test Id: 530868

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-108SPT	1.5- 3.5-19107		Wet, olive gray silt	86.6
PDI-109SPT	6.5- 8.5-191004		Wet, dark olive gray silt	96.1
PDI-112SPT	6.5- 8.5-191003		Moist, olive gray silt	87.7
PDI-113SPT	47- 49-191011		Moist, dark grayish brown silty sand	32.1
PDI-114SPT	17.5- 19.5-191008		Wet, gray clay	65.6
PDI-114SPT	7.5- 9.5-191008		Wet, gray silt	63.9
PDI-115SPT	41.5- 43.5-191009		Moist, dark gray sandy silt	48.6
PDI-116SPT	30- 32-190927		Moist, gray sand with silt	31.0
PDI-116SPT	9.5- 11.5-191002		Wet, gray silt with sand	55.2



Project: Gasco PDI Location:

Location:Project No:GTX-310685Boring ID: ---Sample Type: ---Tested By:mdSample ID: ---Test Date:12/19/19Checked By:bfs

Depth: --- Test Id: 530876

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-118SPT	4.5- 6.5-191014		Wet, olive gray silt	83.2
PDI-119SPT	36.5- 38.5-191001		Moist, dark gray sandy clay	41.7
PDI-121SPT	06- 08-190930		Wet, olive gray silt	84.5
PDI-122SPT	44- 46-190926		Moist, dark gray sand	31.0
PDI-123SPT	4.5- 6.5-190924		Wet, olive gray silt	69.2



Project: Gasco PDI

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: md

Sample ID: --- Test Date: 12/26/19 Checked By: n/a

Depth: --- Test Id: 531126

# Laboratory Determination of Density (Unit Weight) of Soil Specimens by ASTM D7263

Boring ID	Sample ID	Depth	Visual Description	Bulk Density pcf	Moisture Content %	Dry Density pcf	*
PDI- 108SPT	1.5-3.5- 19107		Wet, olive gray silt	92.16	86.65	49.38	(1)
PDI- 112SPT	6.5-8.5- 191003		Moist, olive gray silt	86.71	87.70	46.20	(2)
PDI- 114SPT	17.5-19.5- 191008		Wet, gray clay	100.3	65.59	60.60	(3)
PDI- 116SPT	9.5-11.5- 191002		Wet, gray silt with sand	94.24	55.15	60.74	(4)
PDI- 119SPT	36.5-38.5- 191001		Moist, dark gray sandy clay	106.9	41.68	75.45	(5)
PDI- 121SPT	06-08- 190930		Wet, olive gray silt	75.75	84.53	41.05	(6)
PDI- 123SPT	(")!6.5- 190924		Wet, olive gray silt	96.54	69.18	57.06	(7)

#### \* Sample Comments

- (1): Method B-Cylinder, Intact
- (2): Sample contains organics

Method B-Cylinder, Intact

- (3): Method B-Cylinder, Intact
- (4): Method B-Cylinder, Intact
- (5): Method B-Cylinder, Intact
- (6): Method B-Cylinder, Intact
- (7): Method B-Cylinder, Intact

Notes: Moisture Content determined by ASTM D2216.



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: PDI-112SPT Sample Type: tube Tested By: ckg

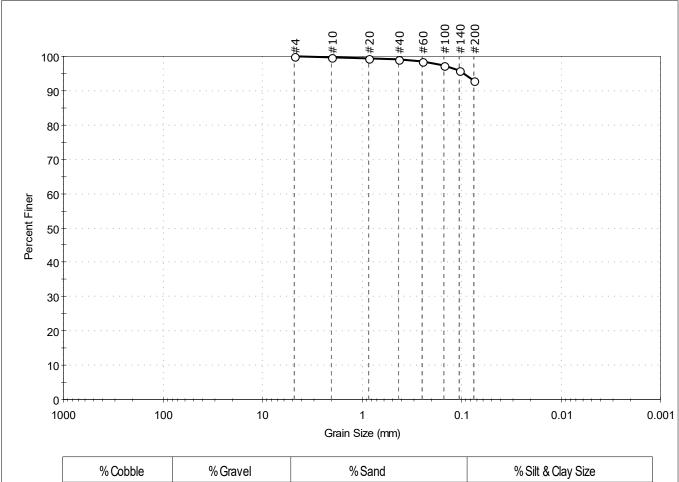
Sample ID: 6.5-8.5-191003 Test Date: 12/16/19 Checked By: bfs

Depth: Test Id: 531045

Test Comment:

Visual Description: Moist, olive gray silt Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	6.9	93.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	99		
#100	0.15	97		
#140	0.11	96		
#200	0.075	93		

<u>Coefficients</u>				
$D_{85} = N/A$	$D_{30} = N/A$			
$D_{60} = N/A$	$D_{15} = N/A$			
D <sub>50</sub> = N/A	$D_{10} = N/A$			
$C_u = N/A$	C <sub>c</sub> =N/A			

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: PDI-113SPT Sample Type: tube Tested By: ckg

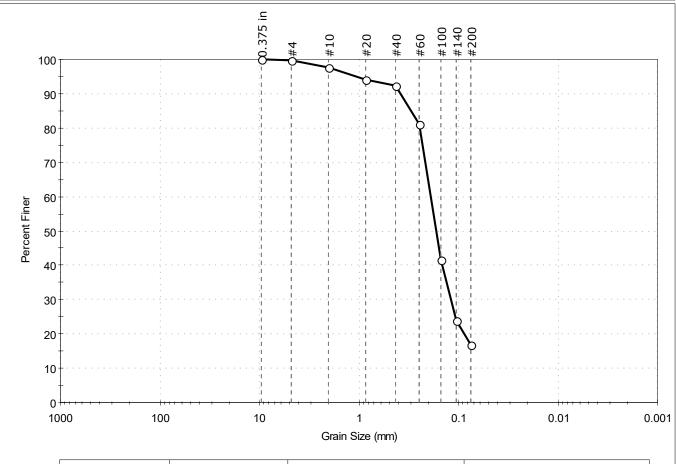
Sample ID: 47-49-191011 Test Date: 12/23/19 Checked By: bfs Test Id: 531046

Depth: Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.4	82.7	16.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	98		
#20	0.85	94		
#40	0.42	92		
#60	0.25	81		
#100	0.15	42		
#140	0.11	24		
#200	0.075	17		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2993 mm	$D_{30} = 0.1197 \text{ mm}$			
D <sub>60</sub> = 0.1902 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.1672 mm	$D_{10} = N/A$			
C <sub>u</sub> =N/A	C <sub>c</sub> =N/A			

Classification N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

<u>ASTM</u>



Location:Project No:GTX-310685Boring ID: PDI-115SPTSample Type: tubeTested By:ckgSample ID: 41.5-43.5-191009Test Date:12/04/19Checked By:bfs

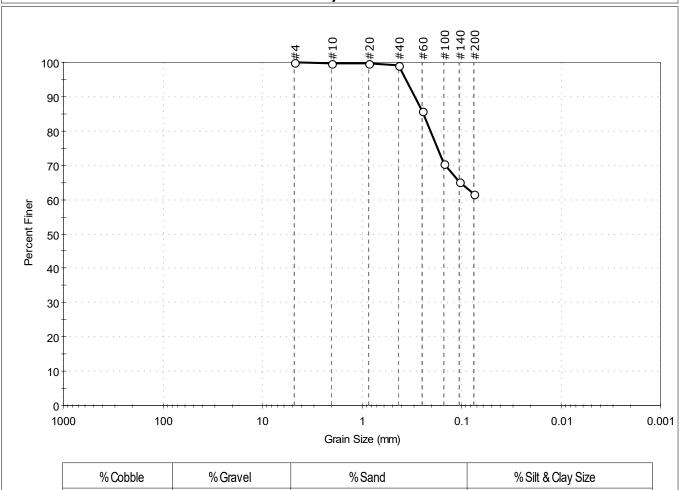
Sample ID: 41.5-43.5-191009 Test Date: 12/04/19
Depth: --- Test Id: 531047

Test Comment: ---

Visual Description: Moist, dark gray sandy silt

Sample Comment: ---

#### Particle Size Analysis - ASTM D6913



38.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	86		
#100	0.15	71		
#140	0.11	65		
#200	0.075	62		

0.0

	<u>Coefficients</u>
D <sub>85</sub> = 0.2425 mm	$D_{30} = N/A$
$D_{60} = N/A$	$D_{15} = N/A$
D <sub>50</sub> = N/A	$D_{10} = N/A$
C <sub>u</sub> =N/A	$C_c = N/A$

61.8

ASTM N/A Classification

AASHTO Silty Soils (A-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape: --Sand/Gravel Hardness: ---

Sand/Graver Hardness . ---



Location:Project No:GTX-310685Boring ID:PDI-116SPTSample Type: tubeTested By:ckg

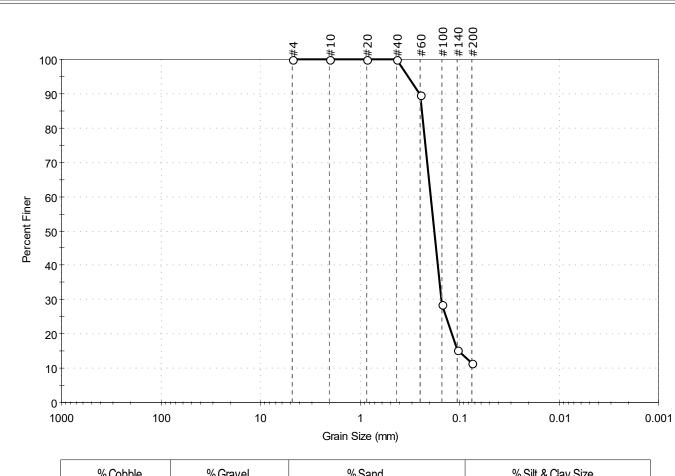
Sample ID: 30-32-190927 Test Date: 12/16/19 Checked By: bfs
Depth: --- Test Id: 531048

Test Comment: ---

Visual Description: Moist, gray sand with silt

Sample Comment: ---

## Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size		
_	0.0	88.4	11.6		

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	90		
#100	0.15	29		
#140	0.11	15		
#200	0.075	12		

<u>Coefficients</u>									
D <sub>85</sub> = 0.2403 mm	$D_{30} = 0.1516 \text{ mm}$								
D <sub>60</sub> = 0.1949 mm	$D_{15} = 0.1019 \text{ mm}$								
D <sub>50</sub> = 0.1792 mm	$D_{10} = N/A$								
C <sub>u</sub> =N/A	$C_C = N/A$								

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape: --Sand/Gravel Hardness: ---



Location: Project No: GTX-310685

Boring ID: PDI-117SPT Sample Type: tube Tested By: ckg

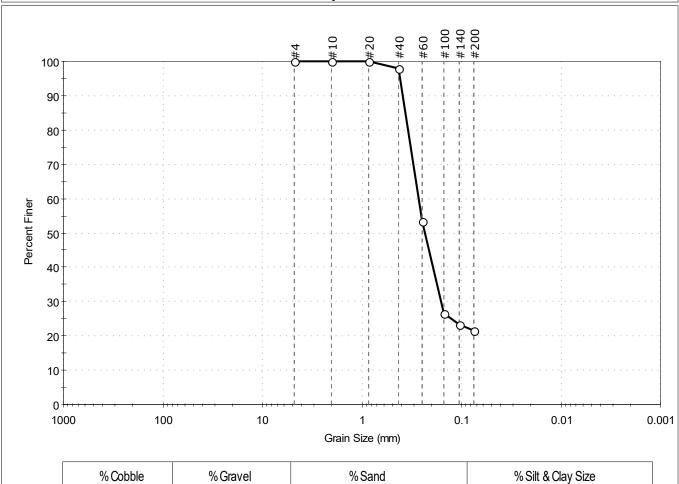
Boring ID: PDI-117SPT Sample Type: tube Tested By: ckg Sample ID: 58.5-60.5-191002 Test Date: 12/13/19 Checked By: bfs

Depth: --- Test Id: 531049
Test Comment: ---

Visual Description: Moist, dark brownish gray silty sand

Sample Comment: ----

## Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size		
_	0.0	78.6	21.4		

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies	
#4	4.75	100			
#10	2.00	100			
#20	0.85	100			
#40	0.42	98			
#60	0.25	53			
#100	0.15	27			
#140	0.11	23			
#200	0.075	21			

<u>Coefficients</u>									
D <sub>85</sub> = 0.3641 mm	$D_{30} = 0.1598 \text{ mm}$								
D <sub>60</sub> = 0.2703 mm	$D_{15} = N/A$								
D <sub>50</sub> = 0.2340 mm	$D_{10} = N/A$								
C <sub>u</sub> =N/A	$C_C = N/A$								

ASTM N/A Classification

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape: --Sand/Gravel Hardness: ---



Location: Project No: GTX-310685

Boring ID: PDI-108SPT Sample Type: tube Tested By: cam

Sample ID: 1.5-3.5-19107 Test Date: 12/12/19 Checked By: bfs

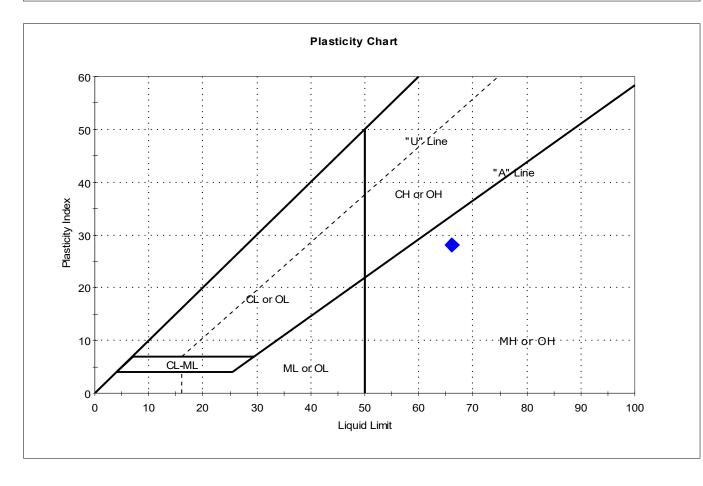
Depth: --- Test Id: 531039

Test Comment: ---

Visual Description: Wet, olive gray silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	1.5-3.5-19107	DI-108SP		87	66	38	28	1.7	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



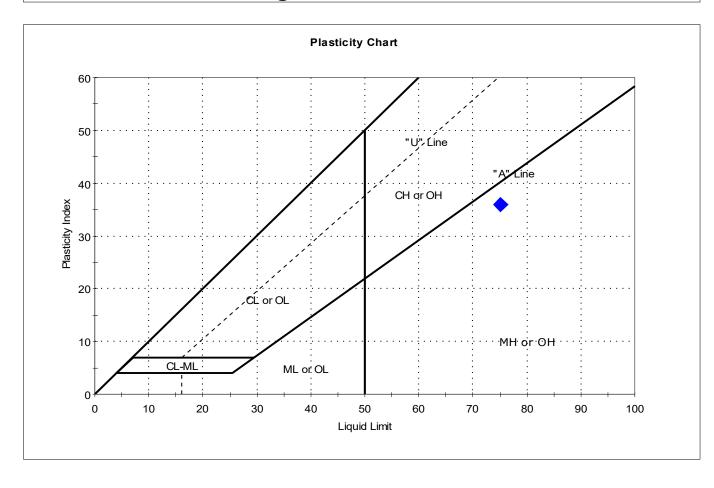
Location:Project No:GTX-310685Boring ID: PDI-109SPTSample Type: tubeTested By: camSample ID: 6.5-8.5-191004Test Date:12/11/19Checked By: bfs

Sample ID: 6.5-8.5-191004 Test Date: 12/11/19
Depth: --- Test Id: 531040

Test Comment: ---

Visual Description: Wet, dark olive gray silt Sample Comment: Sample contains organics

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	6.5-8.5-191004	DI-109SP		96	75	39	36	1.6	

Sample Prepared using the WET method



Location:Project No:GTX-310685Boring ID: PDI-114SPTSample Type: tubeTested By: camSample ID: 7.5-9.5-191008Test Date:12/13/19Checked By: bfs

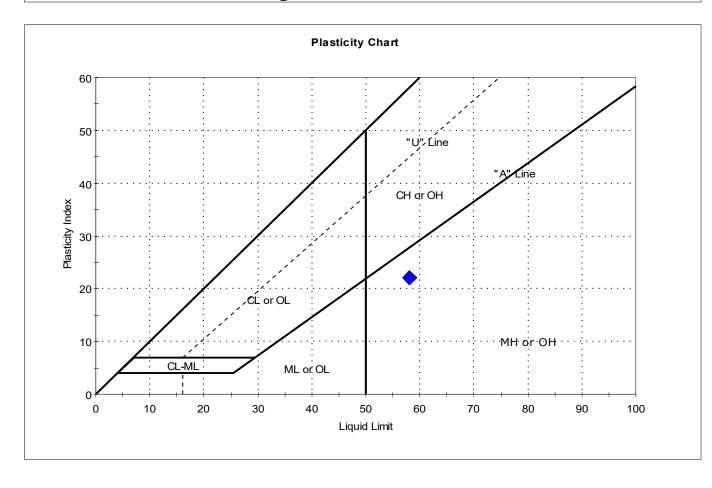
Depth: --- Test Id: 531041

Test Comment: ---

Visual Description: Wet, gray silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	7.5-9.5-191008	DI-114SP		64	58	36	22	1.3	

Sample Prepared using the WET method



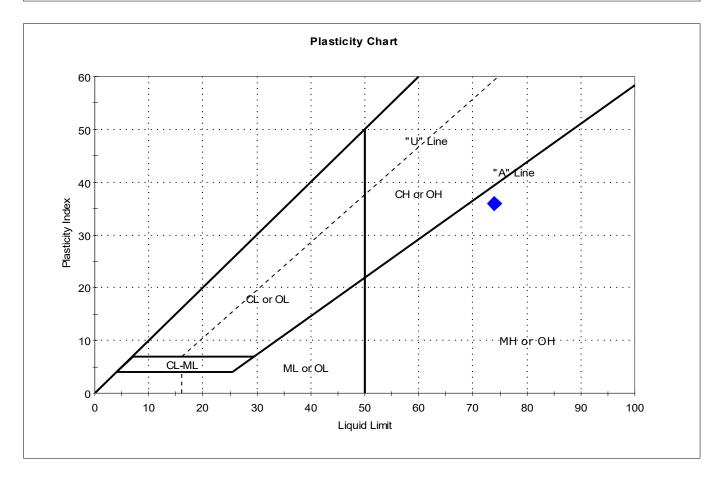
Location:Project No:GTX-310685Boring ID:PDI-118SPTSample Type: tubeTested By:cam

Test Comment: ---

Visual Description: Wet, olive gray silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	4.5-6.5-191014	DI-118SP		83	74	38	36	1.3	

Sample Prepared using the WET method



Location: Project No: GTX-310685

Boring ID: PDI-121SPT Sample Type: tube Tested By: cam

Sample ID: 06-08-190930 Test Date: 12/13/19 Checked By: bfs

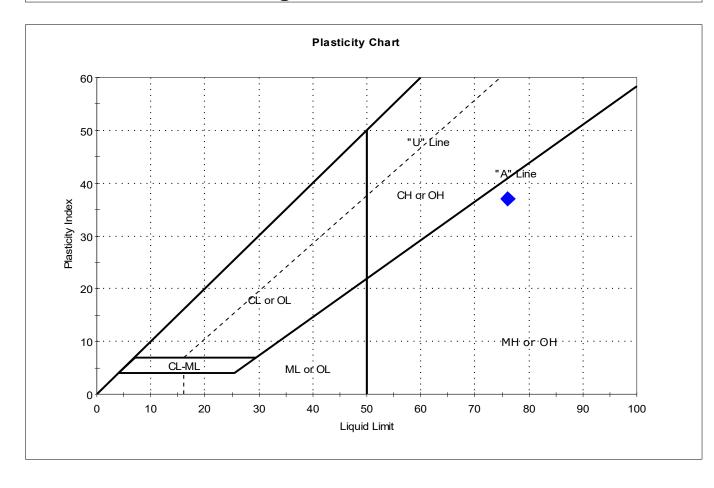
Depth: --- Test Id: 531043

Test Comment: ---

Visual Description: Wet, olive gray silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbo	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	06-08-190930	DI-121SP		85	76	39	37	1.2	

Sample Prepared using the WET method



Location:Project No:GTX-310685Boring ID: PDI-123SPTSample Type: tubeTested By: camSample ID: 4.5-6.5-190924Test Date:12/11/19Checked By: bfs

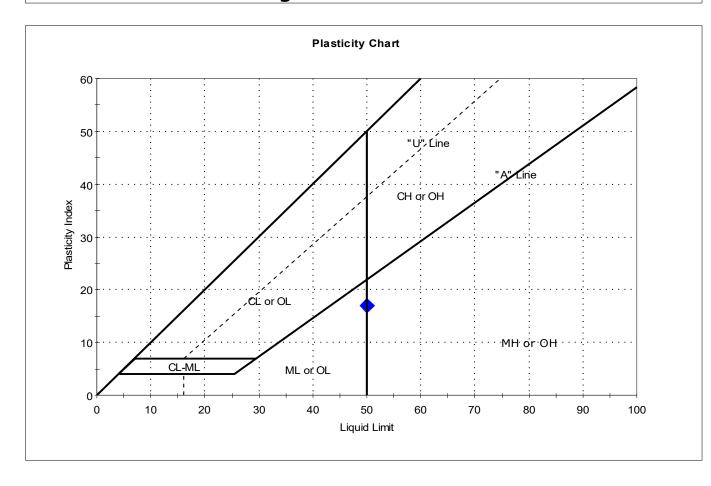
Depth: --- Test Id: 531044

Test Comment: ---

Visual Description: Wet, olive gray silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	4.5-6.5-190924	DI-123SP		69	50	33	17	2.1	

Sample Prepared using the WET method



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ransm	nittal			
O:				
Delaney Pete	erson		DATE: 11/20/2019	GTX NO: 310685
Anchor QEA, LLC			RE: Gasco PDI	<u> </u>
720 Olive Wa	ay, Suite 1900			
Seattle, WA	98101			
		_		
COPIES	DATE		DESCRIPTION	
	11/20/2019	November 2019 Laboratory	Test Report	
_				
EMARKS:				
				·
		SIGNED:	Bulsh	
CC:			Barbara Sanchez, Assistant	Laboratory Manager
		APPROVED BY	Jon Tu	m
			Jonathan Campbell, Labora	ntory Manager



Technologies to manage risk for infrastructure

Boston Atlanta Chicago Los Angeles New York www.geotesting.com

November 20, 2019

Delaney Peterson Anchor QEA, LLC 720 Olive Way, Suite 1900 Seattle, WA 98101

RE: Gasco PDI (GTX-310685)

Dear Delaney:

Enclosed are the test results you requested for the above referenced project. GeoTesting Express, Inc. (GTX) received 90 samples from you between 9/26/2019 and 10/18/2019.

GTX performed the following tests on these samples:

81 ASTM D2216 - Moisture Content

81 ASTM D854 - Specific Gravity

9 ASTM D6913 - Sieve Analysis

81 ASTM D6913/D7928 - Grain Size Analysis - Sieve and Hydrometer

81 ASTM D4318 - Atterberg Limits

A copy of your test request is attached.

The results presented in this report apply only to the items tested. This report shall not be reproduced except in full, without written approval from GeoTesting Express. The remainder of these samples will be retained for a period of sixty (60) days and will then be discarded unless otherwise notified by you. Please call me if you have any questions or require additional information. Thank you for allowing GeoTesting Express the opportunity of providing you with testing services. We look forward to working with you again in the future.

Respectfully yours,

Barbara Sanchez

**Assistant Laboratory Manager** 

GeoTesting Express, Inc. 125 Nagog Park Acton, MA 01720 Toll Free 800 434 1062 Fax 978 635 0266



Technologies to manage risk for infrastructure

Boston Atlanta Chicago Los Angeles New York www.geotesting.com

## **Geotechnical Test Report**

11/20/2019

## GTX-310685 Gasco PDI

Prepared for:

Anchor QEA, LLC



Project: Gasco PDI

Location: Project No: GTX-310685
Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/07/19 Checked By: bfs
Depth: --- Test Id: 525985

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 18SC-A-06-07 -19092		Moist, very dark gray silt	77.1
	PDI- 8SC-A-08-09 -1909		Moist, very dark gray sand	23.3
	PDI- 1SC-B-7.7-9.7 -1909		Moist, very dark gray sand with silt	13.0
	PDI- 4SC-B-10-12. 1-1909		Moist, very dark gray sand with silt	38.1
	PDI- 6SC-B-4.2-6.2 -1909		Moist, very dark gray sand	14.3
	PDI- 64SC-B-04-06 -19092		Moist, very dark gray silt with sand	66.1



Project: Gasco PDI Location:

Location:Project No:GTX-310685Boring ID:---Tested By:ckgSample ID:---Test Date:10/11/19Checked By:bfs

Depth: --- Test Id: 526423

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 6SC-B-9.8-11.8 -1910		Moist, very dark gray silty sand	23.8
	PDI- 71SC-B-08-10 -19100		Wet, very dark gray silty sand	42.8
	PDI- 9SC-B-7.8-9.8 -1909		Moist, very dark gray sand with silt	40.3
	PDI- 8SC-10.7-12.7 -1910		Moist, very dark gray sand	14.7
	PDI- 81SC-B-08-10 -19100		Wet, dark grayish olive silt with sand	64.1



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg 10/23/19 Checked By: bfs Sample ID: ---Test Date:

Test Id: Depth: 527613

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 16SC-B-06 -08-19100		Moist, dark grayish brown silty sand	34.6
	PDI- 7SC-B-11 -13.5-1910		Moist, dark gray sand	19.1
	PDI- 3SC-B-8.7 -10.7-1910		Moist, dark grayish brown sand	17.8
	PDI- 8SC-B-7.1 -9.1-1910		Moist, dark gray sand with silt	20.4
	PDI- SC-B-8.2 -10.2-1910		Moist, dark grayish brown sand	28.6
	PDI- 49SC-B-06 -08-19101		Moist, dark grayish brown silty sand	31.8
	PDI- (2SC-B-06-08-1910)		Moist, dark grayish brown silty sand	45.4
	PDI- 66SC-B-06 -08-19101		Moist, dark olive brown silt	67.8
	PDI- 67SC-B-02 -04-19101		Wet, dark olive brown silt	74.4
	PDI- 77SC-B-04 -06-19101		Wet, dark olive brown silt	81.4



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Depth: --- Test Id: 527633

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 79SC-B-06 -08-19101		Wet, dark grayish brown silt	114.7
	PDI- 90SC-B-06 -08-19101		Moist, dark olive brown silt	81.9
	PDI- 07SPT-00 -04-19092		Wet, dark olive brown silt	107.7
	PDI- 07SPT-04 -09-19092		Wet, dark olive brown silt	84.4
	PDI- 07SPT-17 -18-19092		Moist, dark gray silty sand	42.3
	PDI- 07SPT-62 -64-19092		Moist, dark olive brown silty sand	27.3
	PDI- 08SPT-00 -6.4-19100		Wet, olive brown silt with sand	94.8
	PDI- 8SPT-14 -33.5-1910		Moist, dark olive brown sand	39.5
	PDI- 8SPT-33.5 -66.5-1910		Moist, dark gray sand with silt	29.8
	PDI- 09SPT-00 -6.5-19100		Wet, very dark olive silt	92.7



Location:

Boring ID: --- Sample Type: ---

Boring ID: --- Sample Type: --- Tested By: ckg
Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527643

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 9SPT-16.5 -18.1-1910		Moist, dark olive brown silt	80.2
	PDI- 09SPT-22 -30-19100		Moist, olive brown sand with silt	34.5
	PDI- 9SPT-35.5 -48.3-1910		Moist, olive brown sand with silt	25.9
	PDI- 9SPT-48.3 -51-1910		Moist, dark olive brown silt with sand	47.9
	PDI- 110 B-54-64.5 -191015		Moist, black sand with silt	18.0
	PDI- 10SPT-21 -32-19101		Moist, dark gray sand	23.5
	PDI- 10SPT-32 -45-19101		Moist, black sand	28.2
	PDI- 12SPT-00 -6.5-19100		Moist, dark brown silt	76.7
	PDI- 2SPT-07 -11.5-1910		Moist, dark gray sandy silt	53.2
	PDI- 2SPT-11.5 -26.5-1910		Moist, dark gray silty sand	36.6



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No:

GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg Sample ID: ---Test Date: 10/23/19 Checked By: bfs

Test Id: Depth: 527653

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 2SPT-37.5 -58-1910		Moist, very dark olive gray silty sand	19.1
	PDI- 13SPT-06 -16-19101		Wet, dark grayish brown silt	42.8
	PDI- 13SPT-16 -22-19101		Moist, dark grayish brown sand with silt	36.9
	PDI- 3SPT-22 -25.2-1910		Wet, dark grayish brown silt with sand	61.0
	PDI- 3SPT-31.9 -39.4-1910		Moist, dark gray silty sand	33.2
	PDI- 14SPT-00 -7.5-19100		Wet, olive brown silt	72.9
	PDI- 4SPT-25.5 -28-1910		Moist, dark olive brown silty sand	30.9
	PDI- 4SPT-42 -50.5-1910		Wet, olive brown sandy silt	49.6
	PDI- 4SPT-50.5 -55-1910		Moist, dark gray silty sand	37.2
	PDI- 4SPT-7.5 -12.5-1910		Moist, olive brown silt with sand	64.8



Location:

Boring ID: --- Sample Type: ---

Boring ID: --- Sample Type: --- Tested By: ckg
Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527663

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 15SPT-06 -11-19100		Moist, very dark gray silty sand	17.4
	PDI- 5SPT-18.6 -20.6-1910		Moist, dark olive brown silt with sand	71.7
	PDI- 5SPT-23 -28.1-1910		Moist, very dark olive brown sand with silt	27.8
	PDI- 5SPT-41.5 -49.3-1910		Moist, olive brown silty sand	38.8
	PDI- 16SPT-00 -4.5-19092		Wet, olive brown silt	82.8
	PDI- 6SPT-20 -26.7-1909		Moist, dark gray silty sand	26.2
	PDI- 6SPT-26.7 -28.6-1909		Wet, grayish brown silt	64.0
	PDI- 6SPT-51.5 -54.2-1909		Moist, olive brown silty sand	27.4
	PDI- 7SPT-11 -29.1-1910		Moist, dark gray sand	37.6
	PDI- 7SPT-29.1 -32-1910		Moist, dark gray silty sand	45.0



Location:

Boring ID: --- Sample Type: ---

Boring ID: --- Sample Type: --- Tested By: ckg
Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527673

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 7SPT-44.1 -53.5-1910		Moist, dark gray silty sand	45.6
	PDI- 7SPT-53.5 -63.5-1910		Wet, dark grayish brown silt with sand	83.1
	PDI- 18SPT-00 -4.5-19101		Wet, dark grayish brown silt	112.9
	PDI- 18SPT-4.5 -15-19101		Moist, dark grayish brown silt with sand	70.1
	PDI- 8SPT-46.5 -61-1910		Wet, dark grayish brown silty sand	62.1
	PDI- 19SPT-00 -4.5-19100		Moist, dark grayish brown silt with sand	76.8
	PDI- 9SPT-18.3 -31-1910		Moist, dark gray silty sand	30.4
	PDI- 19SPT-47 -52-19100		Moist, dark grayish brown silty sand	33.5
	PDI- 9SPT-9.5 -18.3-1910		Moist, dark grayish brown sand with silt	37.5
	PDI- 21SPT-00 -06-19093		Moist, olive brown silt	75.8



Sample ID: ---

Location:
Boring ID: --- Sample Type

Sample Type: --- Tested By: ckg Test Date: 10/23/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527619

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 1SPT-11 -20.7-1909		Moist, dark olive brown silt	59.6
	PDI- 21SPT-21 -38-19093		Moist, dark olive gray silty sand	43.0
	PDI- 1SPT-49.4 -54-1909		Moist, dark grayish brown silty sand	44.7
	PDI- 22SPT-04 -09-19092		Wet, olive brown silt	79.7
	PDI- 2SPT-16.6 -24-1909		Moist, dark olive brown silty sand	48.8
	PDI- 22SPT-61 -66-19092		Wet, olive brown silty sand	41.8
	PDI- 23SPT-00 -4.5-19092		Wet, dark olive silt with sand	71.5
	PDI- 3SPT-25.5 -30.5-1909		Moist, dark gray silty sand	18.8
	PDI- 3SPT-63.2 -65.5-1909		Moist, dark olive brown silt with sand	48.0
	PDI- 9SC-B-05 -07-19100		Moist, dark olive brown sandy silt	60.6



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/10/19 Checked By: bfs

Depth: --- Test Id: 525994

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- SC-A-06-07 -190		Moist, very dark gray silt	2.53	
	PDI- SC-A-08-09 -190		Moist, very dark gray sand	2.73	
	PDI- SC-B-7.7-9. 7-190		Moist, very dark gray sand with silt	2.73	
	PDI- SC-B-10-12.1 -19		Moist, very dark gray sand with silt	2.76	
	PDI- SC-B-4.2-6.2 -190		Moist, very dark gray sand	2.76	
	PDI- SC-B-04-06 -190		Moist, very dark gray silt with sand	2.63	



Client: Anchor QEA, LLC

Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg Sample ID: ---Test Date: 10/14/19 Checked By: bfs

Test Id: Depth: 526425

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- C-B-9.8-11.8 -19		Moist, very dark gray silty sand	2.77	
	PDI- SC-B-08-10 -191		Wet, very dark gray silty sand	2.67	
	PDI- SC-B-7.8-9.8 -190		Moist, very dark gray sand with silt	2.72	
	PDI- SC-10.7-12.7 -19		Moist, very dark gray sand	2.79	
	PDI- SC-B-08-10 -191		Wet, dark grayish olive silt with sand	2.72	



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg Sample ID: ---Test Date: 11/08/19 Checked By: bfs

Test Id: Depth: 527683

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- SC-B-06 -08-191		Moist, dark grayish brown silty sand	2.71	
	PDI- SC-B-1 1-13.5-19		Moist, dark gray sand	2.74	
	PDI- C-B-8.7 -10.7-19		Moist, dark grayish brown sand	2.73	
	PDI- SC-B-7.1 -9.1-191		Moist, dark gray sand with silt	2.69	
	PDI- C-B-8.2 -10.2-19		Moist, dark grayish brown sand 2.77		
	PDI- SC-B-06 -08-191		Moist, dark grayish brown silty sand	2.75	
	PDI- SC-B-06 -08-191		Moist, dark grayish brown silty sand	2.68	
	PDI- SC-B-06 -08-191		Moist, dark olive brown silt 2.56		
	PDI- SC-B-02 -04-191		Wet, dark olive brown silt 2.65		
	PDI- SC-B-04 -06-191		Wet, dark olive brown silt 2.68		



Client: Anchor QEA, LLC

Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 11/07/19 Checked By: bfs

Depth: --- Test Id: 527704

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- SC-B-06 -08-191		Moist, dark olive brown silt	2.60	
	PDI- 7SPT-00 -04-1909		Wet, dark olive brown silt	2.65	
	PDI- 7SPT-04 -09-1909		Wet, dark olive brown silt	2.58	
	PDI- 7SPT-17 -18-1909		Moist, dark gray silty sand	2.76	
	PDI- 7SPT-62 -64-1909		Moist, dark olive brown silty sand	2.76	
	PDI- SPT-00 -6.4-191		Wet, olive brown silt with sand	2.55	
	PDI- SPT-14 -33.5-191		Moist, dark olive brown sand	2.74	
	PDI- PT-33.5 -66.5-19		Moist, dark gray sand with silt 2.75		
	PDI- SPT-00 -6.5-191		Wet, very dark olive silt 2.54		
	PDI- PT-16.5 -18.1-19		Moist, dark olive brown silt 2.55		



Client: Anchor QEA, LLC

Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/30/19 Checked By: bfs

Depth: --- Test Id: 527714

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- 9SPT-22 -30-1910		Moist, olive brown sand with silt	2.72	
	PDI- PT-35.5 -48.3-19		Moist, olive brown sand with silt	2.75	
	PDI- SPT-48.3 -51-191		Moist, dark olive brown silt with sand	2.62	
	PDI- 110 -54-64.5 -19101		Moist, black sand with silt		
	PDI- 0SPT-21 -32-1910		Moist, dark gray sand 2.79		
	PDI- 0SPT-32 -45-1910		Moist, black sand		
	PDI- SPT-00 -6.5-191		Moist, dark brown silt	2.60	
	PDI- SPT-07 -11.5-191		Moist, dark gray sandy silt 2.64		
	PDI- PT-11.5 -26.5-19		Moist, dark gray silty sand 2.75		
	PDI- SPT-37.5 -58-191		Moist, very dark olive gray silty 2.75 sand		



Sample ID: ---

Location:

Boring ID: --- Sample Type

Sample Type: --- Tested By: ckg
Test Date: 11/07/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527724

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- 3SPT-06 -16-1910		Wet, dark grayish brown silt	2.73	
	PDI- 3SPT-16 -22-1910		Moist, dark grayish brown sand with silt	2.77	
	PDI- SPT-22 -25.2-191		Wet, dark grayish brown silt with sand	2.66	
	PDI- PT-31.9 -39.4-19		Moist, dark gray silty sand	2.44	
	PDI- SPT-00 -7.5-191		Wet, olive brown silt 2.62		
	PDI- SPT-25.5 -28-191		Moist, dark olive brown silty sand	2.75	
	PDI- SPT-42 -50.5-191		Wet, olive brown sandy silt	2.77	
	PDI- SPT-50.5 -55-191		Moist, dark gray silty sand 2.77		
	PDI- SPT-7.5 -12.5-191		Moist, olive brown silt with sand 2.66		
	PDI- 5SPT-06 -11-1910		Moist, very dark gray silty sand 2.77		



Client: Anchor QEA, LLC

Project: Gasco PDI

Location: Project No: GTX-310685
Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 11/08/19 Checked By: bfs

Depth: --- Test Id: 527734

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- PT-18.6 -20.6-19		Moist, dark olive brown silt with sand	2.54	
	PDI- SPT-23 -28.1-191		Moist, very dark olive brown sand with silt	2.75	
	PDI- PT-41.5 -49.3-19		Moist, olive brown silty sand	2.76	
	PDI- SPT-00 -4.5-190		Wet, olive brown silt	2.67	
	PDI- SPT-20 -26.7-190		Moist, dark gray silty sand 2.77		
	PDI- PT-26.7 -28.6-19		Wet, grayish brown silt 2		
	PDI- PT-51.5 -54.2-19		Moist, olive brown silty sand	2.76	
	PDI- SPT-11 -29.1-191		Moist, dark gray sand 2.75		
	PDI- SPT-29.1 -32-191		Moist, dark gray silty sand 2.73		
	PDI- PT-44.1 -53.5-19		Moist, dark gray silty sand 2.71		



Client: Anchor QEA, LLC

Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/30/19 Checked By: bfs

Depth: --- Test Id: 527744

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- PT-53.5 -63.5-19		Wet, dark grayish brown silt with sand	2.66	
	PDI- SPT-00 -4.5-191		Wet, dark grayish brown silt 2.65		
	PDI- SPT-4.5 -15-191		Moist, dark grayish brown silt 2.53 with sand		
	PDI- SPT-46.5 -61-191		Wet, dark grayish brown silty sand	2.71	
	PDI- SPT-00 -4.5-191		Moist, dark grayish brown silt with sand 2.62		
	PDI- SPT-18.3 -31-191		Moist, dark gray silty sand 2.70		
	PDI- 9SPT-47 -52-1910		Moist, dark grayish brown silty sand	2.78	
	PDI- SPT-9.5 -18.3-191		Moist, dark grayish brown sand 2.73 with silt		
	PDI- 1SPT-00 -06-1909		Moist, olive brown silt 2.59		
	PDI- SPT-11 -20.7-190		Moist, dark olive brown silt 2.67		



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg Sample ID: ---Test Date: 11/08/19 Checked By: bfs

Test Id: Depth: 527689

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- 1SPT-21 -38-1909		Moist, dark olive gray silty sand	2.73	
	PDI- SPT-49.4 -54-190		Moist, dark grayish brown silty sand	2.70	
	PDI- 2SPT-04 -09-1909		Wet, olive brown silt	2.71	
	PDI- SPT-16.6 -24-190		Moist, dark olive brown silty sand	2.71	
	PDI- 2SPT-61 -66-1909		Wet, olive brown silty sand 2.74		
	PDI- SPT-00 -4.5-190		Wet, dark olive silt with sand	2.66	
	PDI- PT-25.5 -30.5-19		Moist, dark gray silty sand 2.77		
	PDI- PT-63.2 -65.5-19		Moist, dark olive brown silt with sand		
	PDI- SC-B-05 -07-1910		Moist, dark olive brown sandy silt	2.67	



Client: Anchor QEA, LLC Gasco PDI

Project: Location:

Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-014SG-00-0.99-1909Test Date: 10/02/19 Checked By: jsc

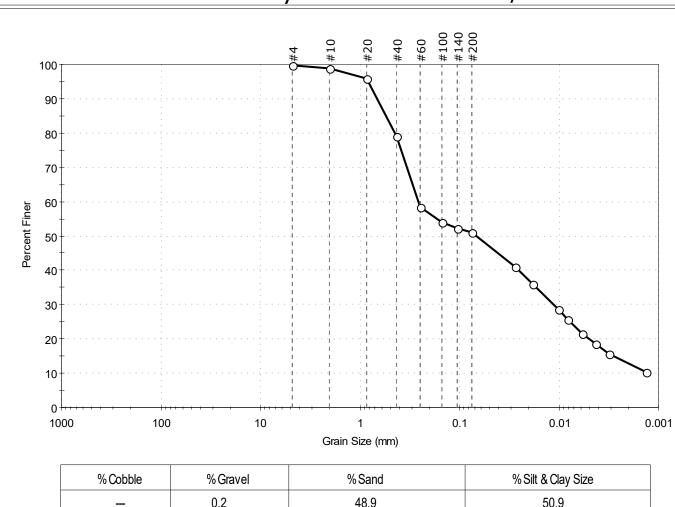
Test Id: Depth: 525297

Test Comment:

Visual Description: Moist, very dark gray sandy silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.2	48.9	50.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	96		
#40	0.42	79		
#60	0.25	58		
#100	0.15	54		
#140	0.11	52		
#200	0.075	51		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0276	41		
	0.0182	36		
	0.0101	29		
	0.0081	26		
	0.0059	22		
	0.0043	19		
	0.0032	16		
	0.0013	10		

<u>Coefficients</u>				
D <sub>85</sub> = 0.5444 mm	$D_{30} = 0.0112 \text{ mm}$			
D <sub>60</sub> = 0.2601 mm	$D_{15} = 0.0029 \text{ mm}$			
D <sub>50</sub> = 0.0681 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_C = N/A$			

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Sample Type: bag Tested By: ckg

Boring ID: ---Sample ID: PDI-015SG-00-0.87-1909Test Date: 10/02/19 Checked By: jsc

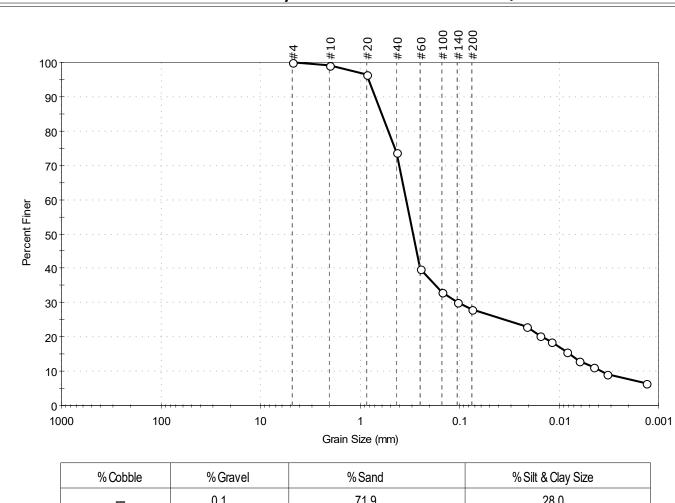
525298 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	71.9	28.0

				•
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	74		
#60	0.25	40		
#100	0.15	33		
#140	0.11	30		
#200	0.075	28		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0210	23		
	0.0157	20		
	0.0120	18		
	0.0084	16		
	0.0063	13		
	0.0045	11		
	0.0033	9		
	0.0013	6		

<u>Coefficients</u>			
D <sub>85</sub> = 0.5984 mm	$D_{30} = 0.1051 \text{ mm}$		
D <sub>60</sub> = 0.3429 mm	$D_{15} = 0.0078 \text{ mm}$		
D <sub>50</sub> = 0.2934 mm	$D_{10} = 0.0037 \text{ mm}$		
Cu =92.676	$C_c = 8.706$		

**Classification** N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

<u>ASTM</u>

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-016SC-B-06-08-1910Test Date: 10/29/19 Checked By: bfs

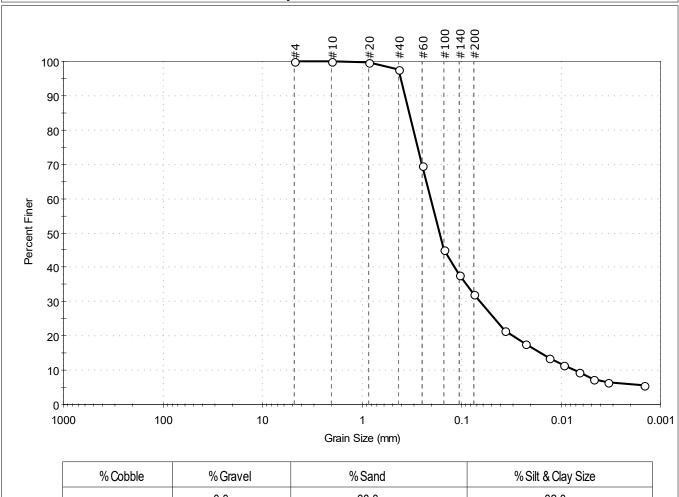
527547 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	68.0	32.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	70		
#100	0.15	45		
#140	0.11	38		
#200	0.075	32		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0364	22		
	0.0229	18		
	0.0132	14		
	0.0094	12		
	0.0066	10		
	0.0047	7		
	0.0034	6		
	0.0015	5		

<u>Coefficients</u>					
$D_{85} = 0.3339 \text{ mm}$	$D_{30} = 0.0651 \text{ mm}$				
$D_{60} = 0.2042 \text{ mm}$	$D_{15} = 0.0161 \text{ mm}$				
$D_{50} = 0.1659 \text{ mm}$	$D_{10} = 0.0072 \text{ mm}$				
$C_{11} = 28.361$	$C_c = 2.883$				

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-018SC-A-06-07-1909Test Date: 10/08/19 Checked By: bfs

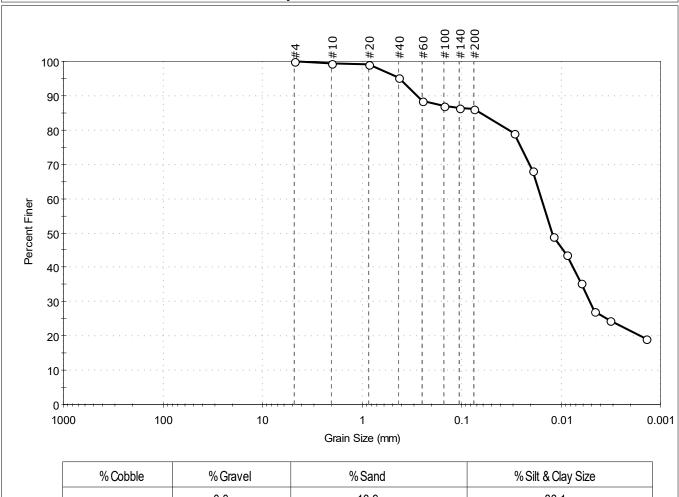
Depth: Test Id: 525971

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	13.9	86.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	95		
#60	0.25	89		
#100	0.15	87		
#140	0.11	87		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0294	79		
	0.0194	68		
	0.0120	49		
	0.0088	44		
	0.0063	35		
	0.0046	27		
	0.0032	25		
	0.0014	19		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0652 mm	$D_{30} = 0.0051 \text{ mm}$			
D <sub>60</sub> = 0.0158 mm	$D_{15} = N/A$			
$D_{50} = 0.0123 \text{ mm}$	$D_{10} = N/A$			
$C_u = N/A$	$C_c = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (47))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Boring ID: --- Sample Type: bag Tested By: ckg Sample ID: PDI-018SC-A-08-09-1909Test Date: 10/08/19 Checked By: bfs

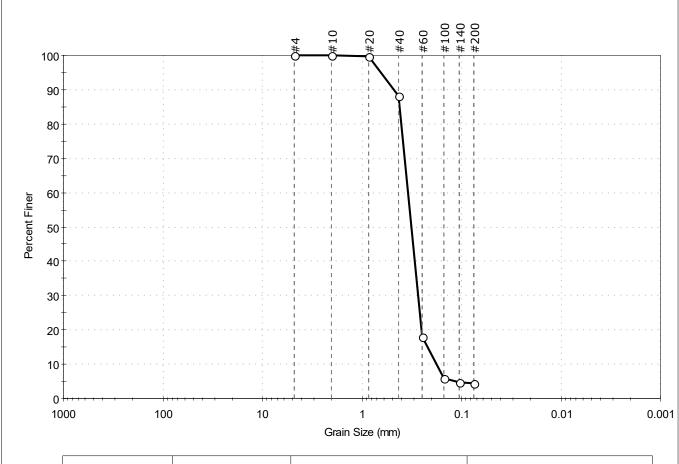
Depth: --- Test Id: 525972

Test Comment: ---

Visual Description: Moist, very dark gray sand

Sample Comment: ---

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	95.7	4.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	88		
#60	0.25	18		
#100	0.15	6		
#140	0.11	5		
#200	0.075	4.3		

COCII	ICICIICO
D <sub>85</sub> = 0.4149 mm	$D_{30} = 0.2738 \text{ mm}$
D <sub>60</sub> = 0.3434 mm	$D_{15} = 0.2203 \text{ mm}$
D <sub>50</sub> = 0.3184 mm	$D_{10} = 0.1781 \text{ mm}$
C <sub>u</sub> =1.928	C <sub>c</sub> =1.226

Coefficients

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description
Sand/Gravel Particle Shape: --Sand/Gravel Hardness: ---



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-021SC-B-7.7-9.7-190Test Date: 10/08/19 Checked By: bfs

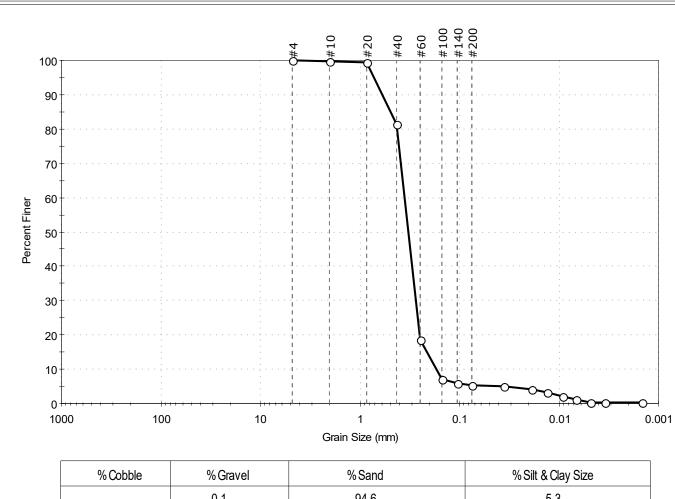
Depth: Test Id: 525973

Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	94.6	5.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	82		
#60	0.25	18		
#100	0.15	7		
#140	0.11	6		
#200	0.075	5.3		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0360	5		
	0.0190	4		
	0.0132	3		
	0.0092	2		
	0.0067	1		
	0.0049	0		
	0.0034	0		
	0.0015	0		

<u>Coefficients</u>				
D <sub>85</sub> = 0.4863 mm	$D_{30} = 0.2754 \text{ mm}$			
D <sub>60</sub> = 0.3546 mm	D <sub>15</sub> =0.2140 mm			
D <sub>50</sub> = 0.3260 mm	$D_{10} = 0.1714 \text{ mm}$			
C <sub>11</sub> =2.069	$C_c = 1.248$			

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-022SG-00-01-190924Test Date: 10/02/19 Checked By: jsc

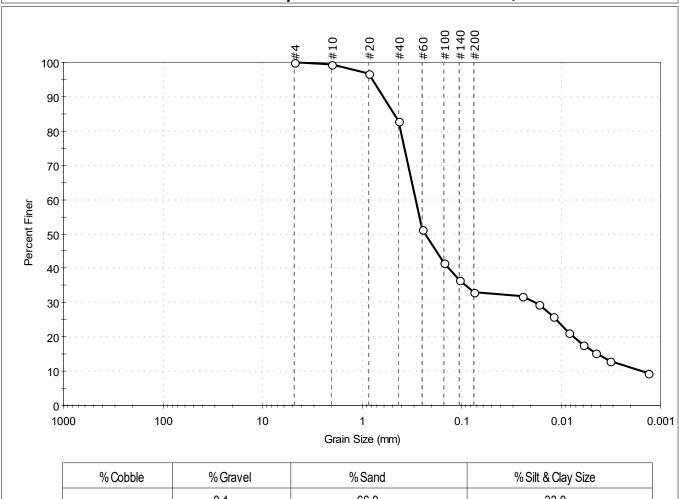
525299 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.1	66.9	33.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	83		
#60	0.25	51		
#100	0.15	42		
#140	0.11	37		
#200	0.075	33		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0242	32		
	0.0168	29		
	0.0119	26		
	0.0084	21		
	0.0060	18		
	0.0045	15		
	0.0032	13		
	0.0013	9		

<u>Coefficients</u>				
D <sub>85</sub> = 0.4712 mm	$D_{30} = 0.0185 \text{ mm}$			
D <sub>60</sub> = 0.2896 mm	$D_{15} = 0.0043 \text{ mm}$			
D <sub>50</sub> = 0.2342 mm	$D_{10} = 0.0016 \text{ mm}$			
C <sub>11</sub> =181.000	$C_c = 0.739$			

**Classification** <u>ASTM</u> N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-024SC-B-10-12.1-19(Test Date: 10/08/19 Checked By: bfs

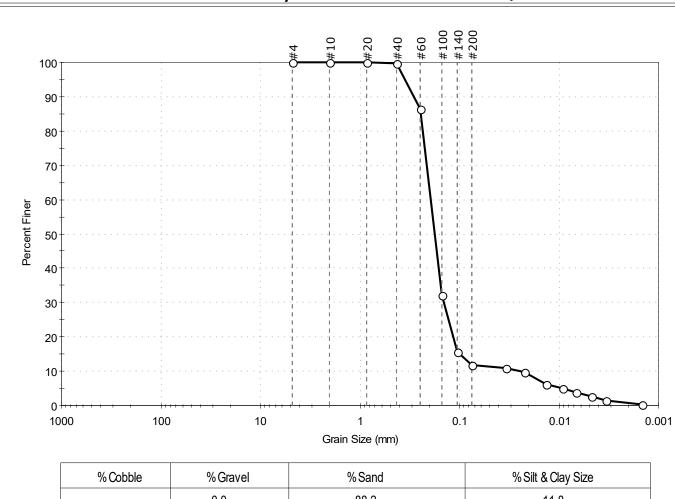
Depth: Test Id: 525974

Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	88.2	11.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
	,			
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	86		
#100	0.15	32		
#140	0.11	16		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0344	11		
	0.0222	10		
	0.0134	6		
	0.0091	5		
	0.0067	4		
	0.0047	3		
	0.0034	2		
	0.0015	0		

<u>Coet</u>	<u>Coefficients</u>					
D <sub>85</sub> = 0.2465 mm	$D_{30} = 0.1434 \text{ mm}$					
D <sub>60</sub> = 0.1949 mm	$D_{15} = 0.0998 \text{ mm}$					
D <sub>50</sub> = 0.1774 mm	$D_{10} = 0.0234 \text{ mm}$					
C <sub>11</sub> =8.329	$C_c = 4.509$					

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Boring ID: --- Sample Type: bag Tested By: ckg Sample ID: PDI-027SC-B-11-13.5-19 Test Date: 10/25/19 Checked By: bfs

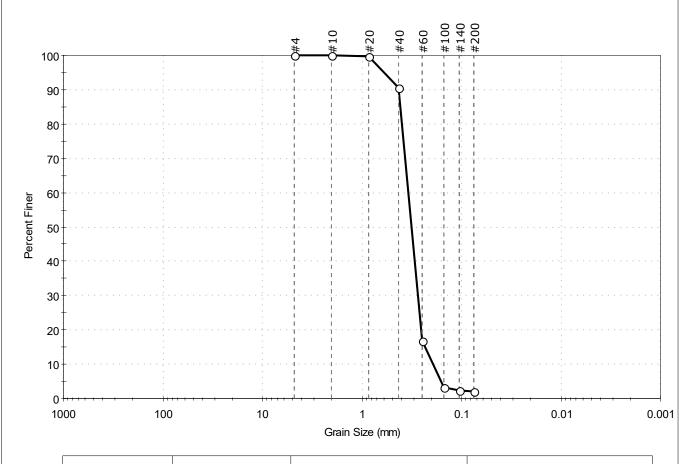
Depth: --- Test Id: 527551

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	97.9	2.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	91		
#60	0.25	17		
#100	0.15	3		
#140	0.11	2		
#200	0.075	2.0		

<u>Coefficients</u>				
D <sub>85</sub> = 0.4084 mm	$D_{30} = 0.2747 \text{ mm}$			
D <sub>60</sub> = 0.3411 mm	$D_{15} = 0.2327 \text{ mm}$			
D <sub>50</sub> = 0.3173 mm	$D_{10} = 0.1931 \text{ mm}$			
C <sub>u</sub> =1.766	C <sub>c</sub> =1.146			

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Boring ID: --- Sample Type: bag Tested By: ckg Sample ID: PDI-028SC-10.7-12.7-191Test Date: 10/14/19 Checked By: bfs

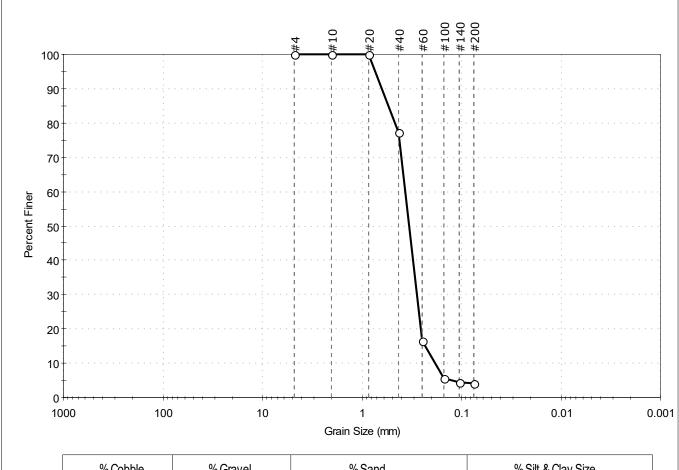
Depth: --- Test Id: 526420

Test Comment: ---

Visual Description: Moist, very dark gray sand

Sample Comment: ---

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	96.0	4.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	77		
#60	0.25	17		
#100	0.15	6		
#140	0.11	5		
#200	0.075	4.0		

<u>Coefficients</u>		
D <sub>85</sub> = 0.5384 mm	$D_{30} = 0.2810 \text{ mm}$	
D <sub>60</sub> = 0.3654 mm	$D_{15} = 0.2321 \text{ mm}$	
D <sub>50</sub> = 0.3348 mm	$D_{10} = 0.1843 \text{ mm}$	
C <sub>u</sub> =1.983	$C_c = 1.173$	

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description
Sand/Gravel Particle Shape: --Sand/Gravel Hardness: ---



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Boring ID: --- Sample Type: bag Tested By: ckg Sample ID: PDI-033SC-B-8.7-10.7-19Test Date: 11/05/19 Checked By: bfs

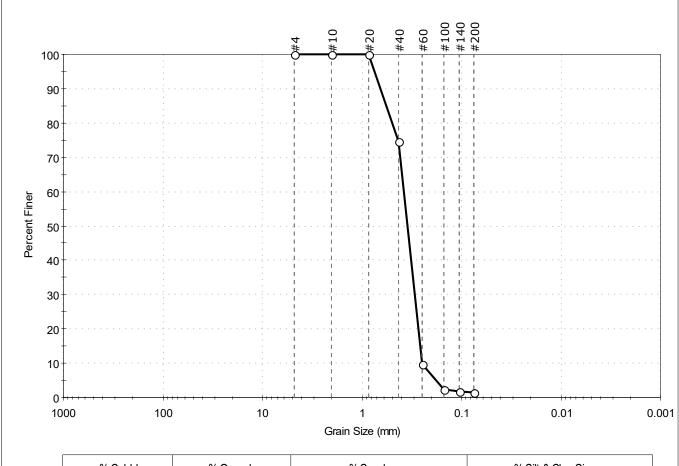
Depth: --- Test Id: 527550

Test Comment: ---

Visual Description: Moist, dark grayish brown sand

Sample Comment: ---

### Particle Size Analysis - ASTM D6913/D7928



ıе	Sieve Size, mm Percen	t Finer Spec. Percent 0	Complies	Coefficients
		0.0	98.5	1.5
	% Cobble	% Gravel	% Sand	% Silt & Clay Size

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	75		
#60	0.25	10		
#100	0.15	2		
#140	0.11	2		
#200	0.075	1.5		

<u> </u>	ocificients
D <sub>85</sub> = 0.5635 mm	$D_{30} = 0.2948 \text{ mm}$
D <sub>60</sub> = 0.3767 mm	$D_{15} = 0.2608 \text{ mm}$
D <sub>50</sub> = 0.3471 mm	$D_{10} = 0.2503 \text{ mm}$
C <sub>u</sub> =1.505	$C_c = 0.922$

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-036SC-B-4.2-6.2-190Test Date: 10/08/19 Checked By: bfs

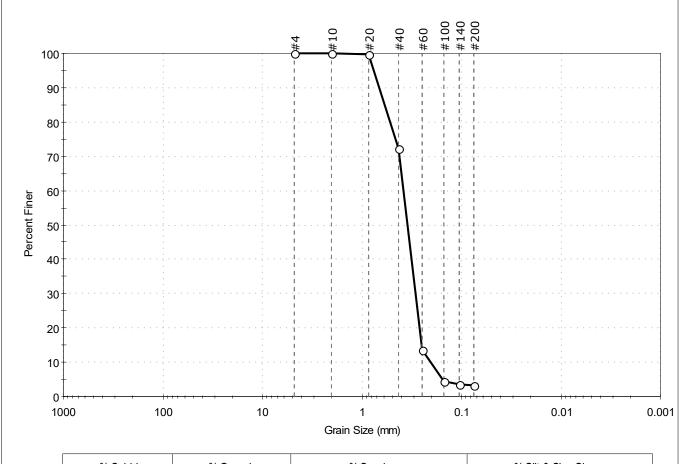
Test Id: 525975 Depth:

Test Comment:

Visual Description: Moist, very dark gray sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	96.8	3.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	72		
#60	0.25	13		
#100	0.15	4		
#140	0.11	4		
#200	0.075	3.2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.5876 mm	$D_{30} = 0.2903 \text{ mm}$	
D <sub>60</sub> = 0.3806 mm	D <sub>15</sub> =0.2536 mm	
D <sub>50</sub> = 0.3478 mm	$D_{10} = 0.2060 \text{ mm}$	
C <sub>u</sub> =1.848	$C_c = 1.075$	

Classification
Poorly graded SAND (SP) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

#### Sample/Test Description



Location: GTX-310685 Project No: ckg

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-039SC-B-7.8-9.8-190Test Date: 10/08/19 Checked By: bfs

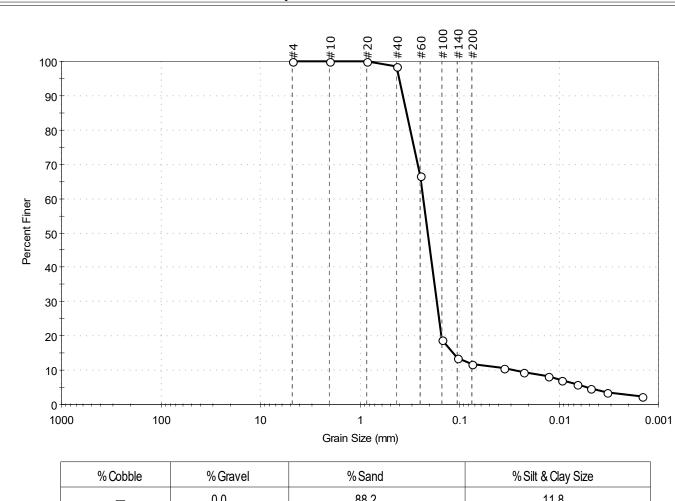
525979 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	88.2	11.8

Sieve Size, mm	Percent Finer	Spec. Percent	Complies
4.75	100		
2.00	100		
0.85	100		
0.42	99		
0.25	67		
0.15	19		
0.11	13		
0.075	12		
Particle Size (mm)	Percent Finer	Spec. Percent	Complies
0.0361	11		
0.0226	9		
0.0130	8		
0.0094	7		
0.0066	6		
0.0048	5		
0.0033	4		
0.0014	2		
	2.00 0.85 0.42 0.25 0.15 0.11 0.075 Particle Size (mm) 0.0361 0.0226 0.0130 0.0094 0.0066 0.0048 0.0033	2.00 100 0.85 100 0.42 99 0.25 67 0.15 19 0.11 13 0.075 12 Particle Size (mm) Percent Finer 0.0361 11 0.0226 9 0.0130 8 0.0094 7 0.0066 6 0.0048 5	2.00 100 0.85 100 0.42 99 0.25 67 0.15 19 0.11 13 0.075 12 Particle Size (mm) Percent Finer Spec. Percent 0.0361 11 0.0226 9 0.0130 8 0.0094 7 0.0066 6 0.0048 5 0.0033 4

	<u>Coefficients</u>		
D <sub>85</sub> = 0.3391 mm		$D_{30} = 0.1688 \text{ mm}$	
	D <sub>60</sub> = 0.2326 mm	D <sub>15</sub> =0.1169 mm	
	D <sub>50</sub> = 0.2090 mm	$D_{10} = 0.0286 \text{ mm}$	
	$C_u = 8.133$	$C_c = 4.283$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-041SC-B-8.2-10.2-19Test Date: 10/30/19 Checked By: bfs

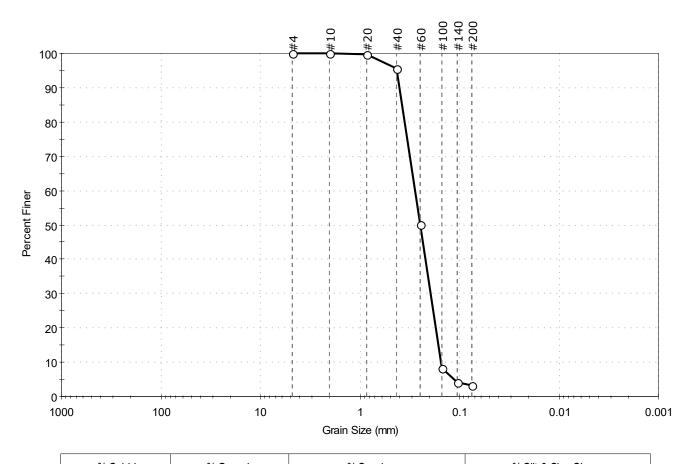
Test Id: 527545 Depth:

Test Comment:

Moist, dark grayish brown sand Visual Description:

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	96.6	3.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	96		
#60	0.25	50		
#100	0.15	8		
#140	0.11	4		
#200	0.075	3.4		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3758 mm	$D_{30} = 0.1957 \text{ mm}$	
D <sub>60</sub> = 0.2808 mm	D <sub>15</sub> = 0.1629 mm	
D <sub>50</sub> = 0.2500 mm	$D_{10} = 0.1532 \text{ mm}$	
C <sub>u</sub> =1.833	$C_c = 0.890$	

<u>Classification</u> Poorly graded SAND (SP) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---Sand/Gravel Hardness: ---



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-046SC-B-9.8-11.8-19Test Date: 10/08/19 Checked By: bfs

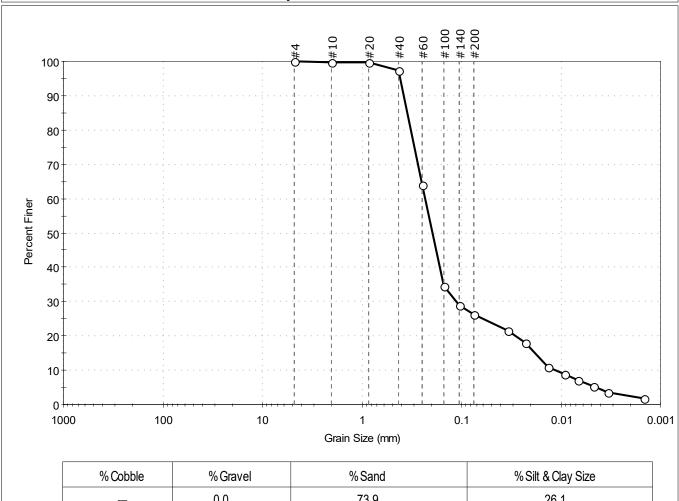
Test Id: 525977 Depth:

Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size	
	0.0	73.9	26.1	

		•		
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	64		
#100	0.15	34		
#140	0.11	29		
#200	0.075	26		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0340	22		
	0.0227	18		
	0.0134	11		
	0.0093	9		
	0.0067	7		
	0.0048	5		
	0.0034	4		
	0.0015	2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3497 mm	$D_{30} = 0.1135 \text{ mm}$	
D <sub>60</sub> = 0.2334 mm	$D_{15} = 0.0182 \text{ mm}$	
D <sub>50</sub> = 0.1963 mm	$D_{10} = 0.0114 \text{ mm}$	
C <sub>u</sub> =20.474	$C_c = 4.842$	

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-049SC-B-06-08-1910Test Date: 10/24/19 Checked By: bfs

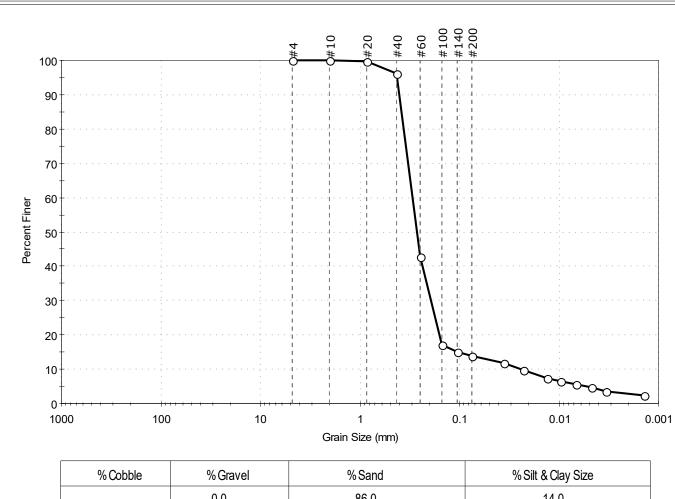
527554 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	86.0	14.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	96		
#60	0.25	43		
#100	0.15	17		
#140	0.11	15		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0361	12		
	0.0230	10		
	0.0131	7		
	0.0095	6		
	0.0068	5		
	0.0048	5		
	0.0034	4		
	0.0014	2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3801 mm	$D_{30} = 0.1941 \text{ mm}$	
D <sub>60</sub> = 0.2968 mm	$D_{15} = 0.1066 \text{ mm}$	
D <sub>50</sub> = 0.2688 mm	$D_{10} = 0.0249 \text{ mm}$	
C <sub>11</sub> =11.920	$C_c = 5.098$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-052SC-B-06-08-1910Test Date: 10/24/19 Checked By: bfs

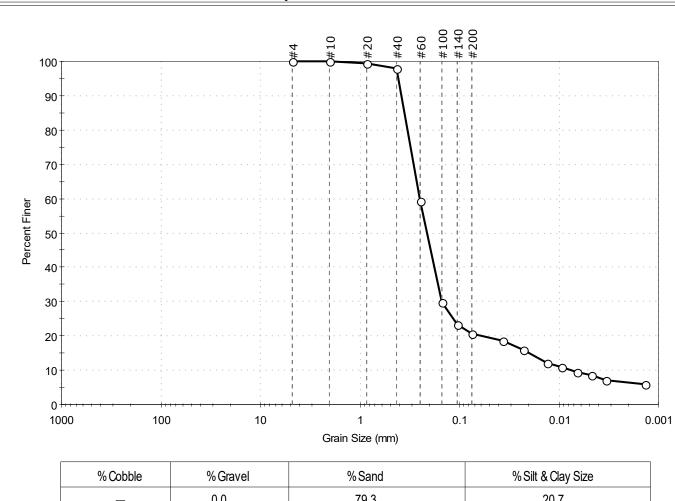
527555 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	79.3	20.7

		_		
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	59		
#100	0.15	30		
#140	0.11	23		
#200	0.075	21		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0365	19		
	0.0229	16		
	0.0131	12		
	0.0094	11		
	0.0067	10		
	0.0047	8		
	0.0034	7		
	0.0014	6		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3554 mm	$D_{30} = 0.1505 \text{ mm}$	
D <sub>60</sub> = 0.2521 mm	$D_{15} = 0.0198 \text{ mm}$	
D <sub>50</sub> = 0.2126 mm	$D_{10} = 0.0075 \text{ mm}$	
Cu =33.613	$C_c = 11.980$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-064SC-B-04-06-1909Test Date: 10/08/19 Checked By: bfs

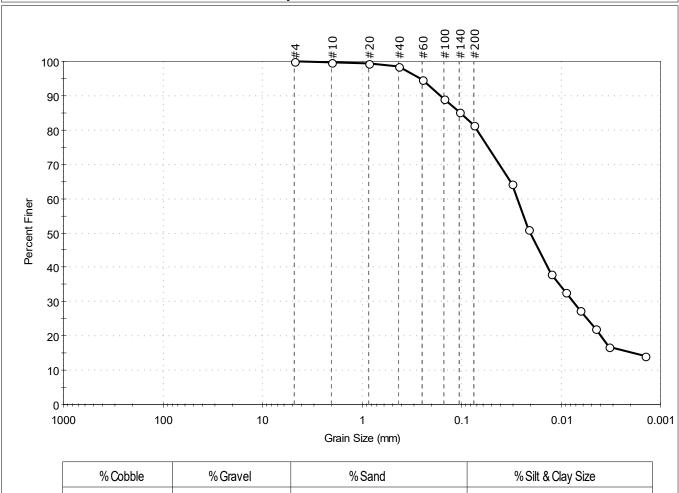
525976 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray silt with sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	18.5	81.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	95		
#100	0.15	89		
#140	0.11	85		
#200	0.075	81		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0313	64		
	0.0212	51		
	0.0124	38		
	0.0090	33		
	0.0065	27		
	0.0045	22		
	0.0033	17		
	0.0014	14		

<u>Coefficients</u>		
$D_{85} = 0.1044 \text{ mm}$	$D_{30} = 0.0076 \text{ mm}$	
$D_{60} = 0.0275 \text{ mm}$	$D_{15} = 0.0019 \text{ mm}$	
$D_{50} = 0.0202 \text{ mm}$	$D_{10} = N/A$	
$C_{ij} = N/A$	$C_c = N/A$	

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (29))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

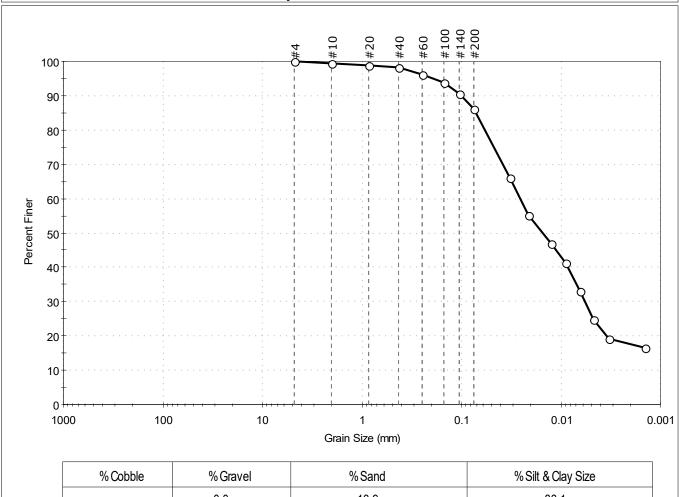
Sample ID: PDI-066SC-B-06-08-1910Test Date: 10/29/19 Checked By: bfs

527552 Test Id: Depth:

Test Comment:

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	13.9	86.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	94		
#140	0.11	90		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0324	66		
	0.0213	55		
	0.0126	47		
	0.0090	41		
	0.0065	33		
	0.0047	25		
	0.0033	19		
	0.0014	17		

<u>Coe</u>	<u>fficients</u>
D <sub>85</sub> = 0.0716 mm	$D_{30} = 0.0057 \text{ mm}$
D <sub>60</sub> = 0.0257 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0155 mm	$D_{10} = N/A$
C <sub>u</sub> =N/A	C <sub>c</sub> =N/A

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (42))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Separation of Sample: #200 Sieve

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-067SC-B-02-04-1910Test Date: 10/29/19 Checked By: bfs

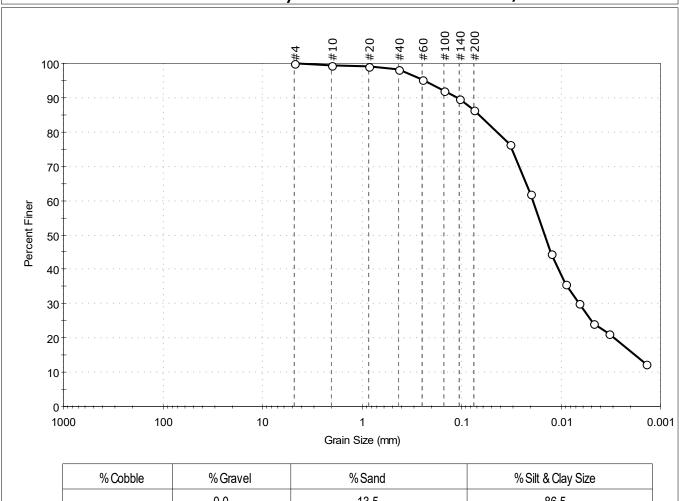
527546 Depth: Test Id:

Test Comment:

Visual Description: Wet, dark olive brown silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



	% Cobbl	e	% Gravel		% Sand		% Silt 8	k Clay Size
			0.0		13.5		3	36.5
G: N	Name   Sieve Size, mm   Percent Finer   Spec. Percent		C	1				
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies			<u>Coeffic</u>	<u>cients</u>
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies		D <sub>85</sub> = 0.06		<u>cients</u> D <sub>30</sub> =0.0065 mm
#4	4.75	100	Spec. Percent	Compiles		$D_{85} = 0.06$ $D_{60} = 0.01$	63 mm	

#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	95		
#100	0.15	92		
#140	0.11	90		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0328	76		
	0.0328 0.0202	76 62		
	0.0202	62		
	0.0202 0.0126	62 44		
	0.0202 0.0126 0.0091	62 44 36		
	0.0202 0.0126 0.0091 0.0065	62 44 36 30		
	0.0202 0.0126 0.0091 0.0065 0.0047	62 44 36 30 24		

$D_{50} = 0.03$	146 mm	$D_{10} =$	N/A
$C_u = N/A$		C <sub>c</sub> =	N/A
ASTM	<u>Class</u> Elastic SILT	ification (MH)	1

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

AASHTO Clayey Soils (A-7-5 (32))

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-071SC-B-08-10-1910Test Date: 10/08/19 Checked By: bfs

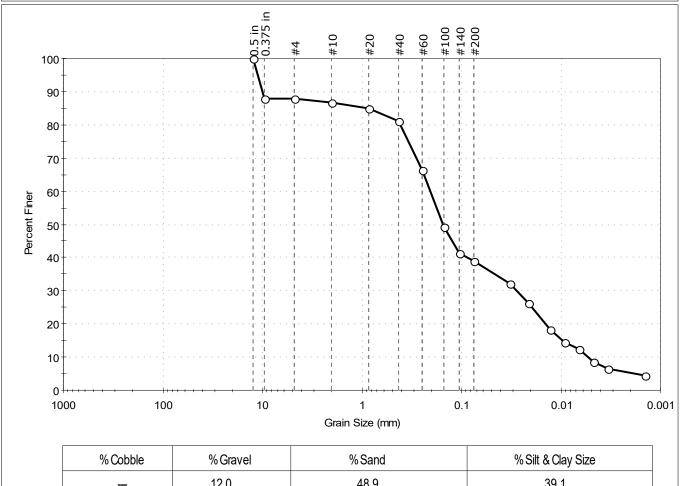
Test Id: 525978 Depth:

Test Comment:

Visual Description: Wet, very dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	12.0	48.9	39.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	88		
#4	4.75	88		
#10	2.00	87		
#20	0.85	85		
#40	0.42	81		
#60	0.25	66		
#100	0.15	49		
#140	0.11	41		
#200	0.075	39		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0328	32		
	0.0212	26		
	0.0129	18		
	0.0093	14		
	0.0067	12		
	0.0047	9		
	0.0033	7		
	0.0014	5		

<u>Coefficients</u>			
D <sub>85</sub> = 0.8858 mm	$D_{30} = 0.0279 \text{ mm}$		
D <sub>60</sub> = 0.2068 mm	$D_{15} = 0.0097 \text{ mm}$		
D <sub>50</sub> = 0.1534 mm	$D_{10} = 0.0054 \text{ mm}$		
C <sub>11</sub> = 38 296	$C_c = 0.697$		

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

<u>AASHTO</u> Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness: HARD

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-077SC-B-04-06-1910Test Date: 10/29/19 Checked By: bfs

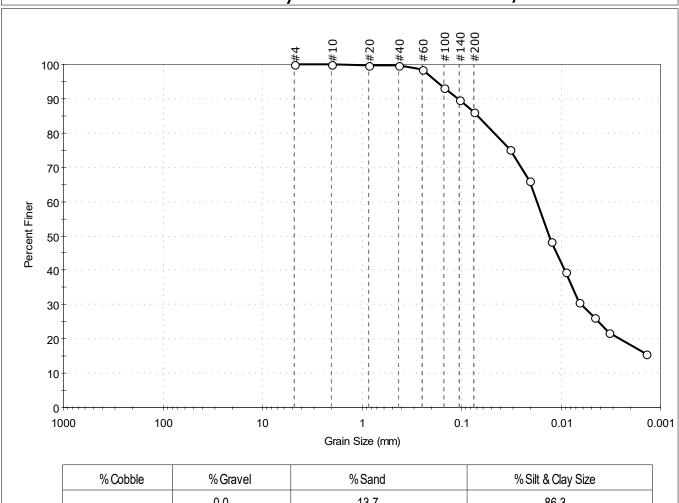
527543 Depth: Test Id:

Test Comment:

Visual Description: Wet, dark olive brown silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	13.7	86.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	93		
#140	0.11	90		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0326	75		
	0.0208	66		
	0.0126	48		
	0.0090	39		
	0.0065	31		
	0.0046	26		
	0.0033	22		
	0.0014	16		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0682 mm	$D_{30} = 0.0062 \text{ mm}$			
D <sub>60</sub> = 0.0175 mm	$D_{15} = N/A$			
$D_{50} = 0.0132 \text{ mm}$	$D_{10} = N/A$			
$C_u = N/A$	$C_c = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (29))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-079SC-B-06-08-1910Test Date: 10/24/19 Checked By: bfs

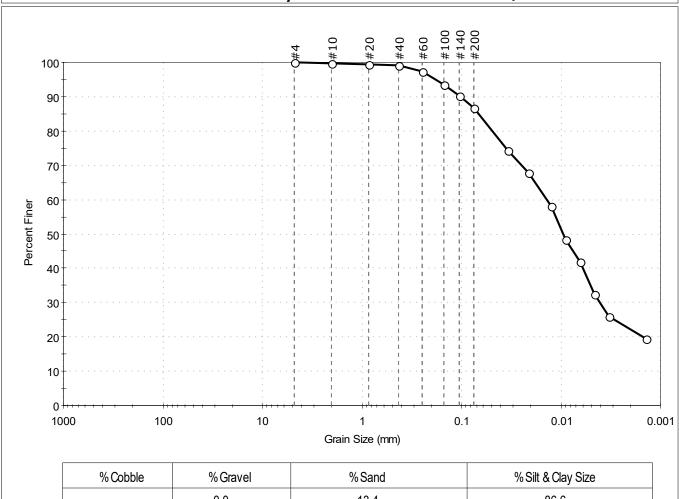
Test Id: 527544 Depth:

Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	13.4	86.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	97		
#100	0.15	94		
#140	0.11	90		
#200	0.075	87		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0341	74		
	0.0213	68		
	0.0125	58		
	0.0090	48		
	0.0064	42		
	0.0046	32		
	0.0033	26		
	0.0014	19		

<u>Coefficients</u>				
D <sub>85</sub> =0.0677 mm	$D_{30} = 0.0041 \text{ mm}$			
D <sub>60</sub> = 0.0138 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0095 mm	$D_{10} = N/A$			
C <sub>II</sub> =N/A	$C_C = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (24))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-081SC-B-08-10-1910Test Date: 10/14/19 Checked By: bfs

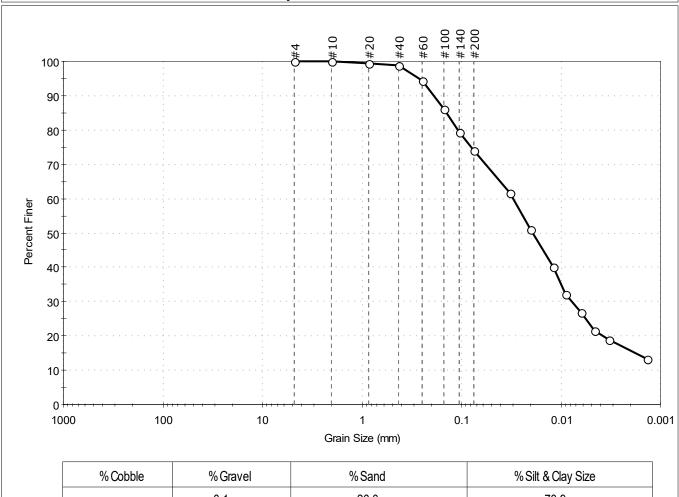
Test Id: Depth: 526421

Test Comment:

Visual Description: Wet, dark grayish olive silt with sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	26.0	73.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	94		
#100	0.15	86		
#140	0.11	79		
#200	0.075	74		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0325	62		
	0.0204	51		
	0.0121	40		
	0.0089	32		
	0.0063	27		
	0.0046	21		
	0.0033	19		
	0.0014	13		

<u>Coefficients</u>				
D <sub>85</sub> =0.1414 mm	$D_{30} = 0.0078 \text{ mm}$			
D <sub>60</sub> = 0.0301 mm	$D_{15} = 0.0018 \text{ mm}$			
D <sub>50</sub> = 0.0194 mm	$D_{10} = N/A$			
Cu =N/A	$C_{c} = N/A$			

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (17))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

printed 11/20/2019 9:37:00 AM



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

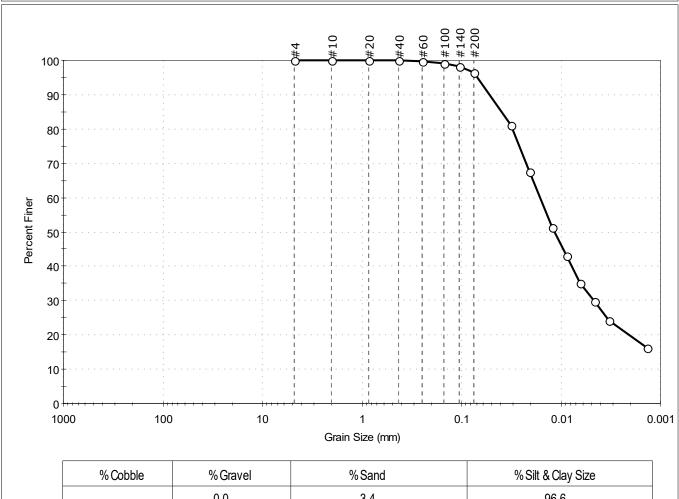
Sample ID: PDI-090SC-B-06-08-1910Test Date: 10/29/19 Checked By: bfs

Test Id: 527553 Depth:

Test Comment:

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	3.4	96.6

				_
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#140	0.11	98		
#200	0.075	97		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0322	81		
	0.0207	68		
	0.0123	51		
	0.0089	43		
	0.0064	35		
	0.0046	30		
	0.0033	24		
	0.0014	16		

<u>Coefficients</u>			
D <sub>85</sub> =0.0400 mm	$D_{30} = 0.0047 \text{ mm}$		
D <sub>60</sub> = 0.0163 mm	$D_{15} = N/A$		
D <sub>50</sub> = 0.0117 mm	$D_{10} = N/A$		
C <sub>II</sub> =N/A	$C_C = N/A$		

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (51))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

printed 11/20/2019 9:37:00 AM



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-101SG-00-01-190924Test Date: 10/02/19 Checked By: jsc

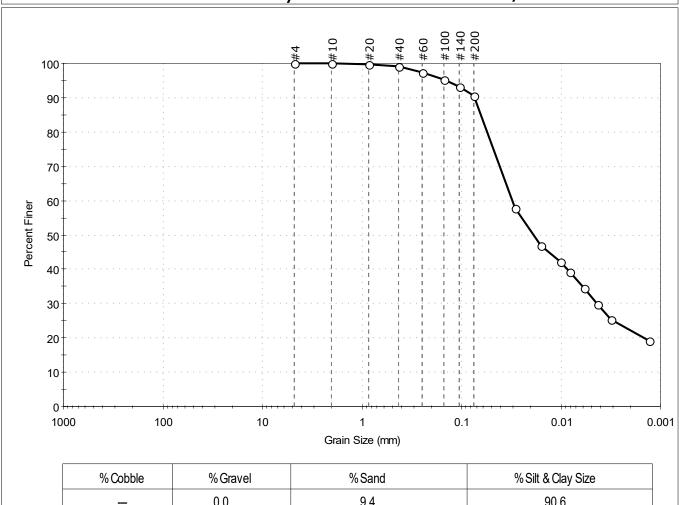
Test Id: 525300 Depth:

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	9.4	90.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	97		
#100	0.15	95		
#140	0.11	93		
#200	0.075	91		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0289	58		
	0.0160	47		
	0.0101	42		
	0.0082	39		
	0.0058	35		
	0.0043	30		
	0.0031	25		
	0.0013	19		

<u>Coefficients</u>		
D <sub>85</sub> =0.0637 mm	$D_{30} = 0.0043 \text{ mm}$	
D <sub>60</sub> = 0.0308 mm	$D_{15} = N/A$	
D <sub>50</sub> = 0.0189 mm	$D_{10} = N/A$	
C <sub>u</sub> =N/A	$C_C = N/A$	

**Classification** <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-102SG-00-01-190924Test Date: 10/02/19 Checked By: jsc

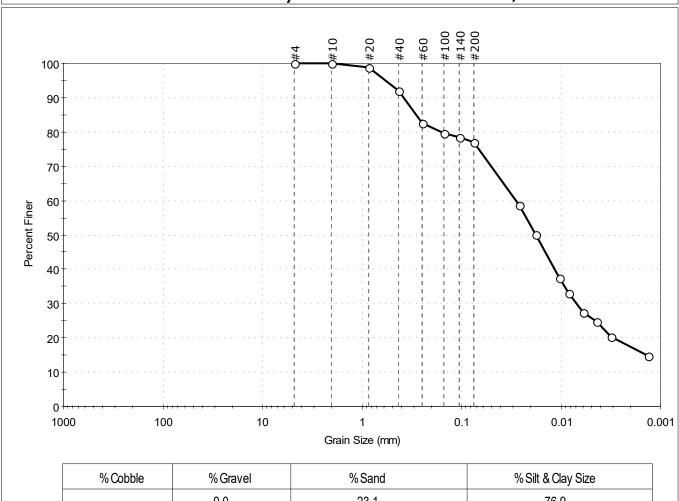
525301 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray silt with sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
-	0.0	23.1	76.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	92		
#60	0.25	83		
#100	0.15	80		
#140	0.11	78		
#200	0.075	77		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0264	59		
	0.0179	50		
	0.0104	37		
	0.0083	33		
	0.0059	27		
	0.0044	25		
	0.0032	20		
	0.0013	15		

<u>Coefficients</u>		
D <sub>85</sub> = 0.2852 mm	$D_{30} = 0.0069 \text{ mm}$	
D <sub>60</sub> = 0.0283 mm	$D_{15} = 0.0014 \text{ mm}$	
D <sub>50</sub> = 0.0177 mm	$D_{10} = N/A$	
C <sub>u</sub> =N/A	C <sub>C</sub> =N/A	

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Sample Type: bag Tested By: ckg

Boring ID: ---Sample ID: PDI-103SG-00-01-190924Test Date: 10/02/19 Checked By: jsc

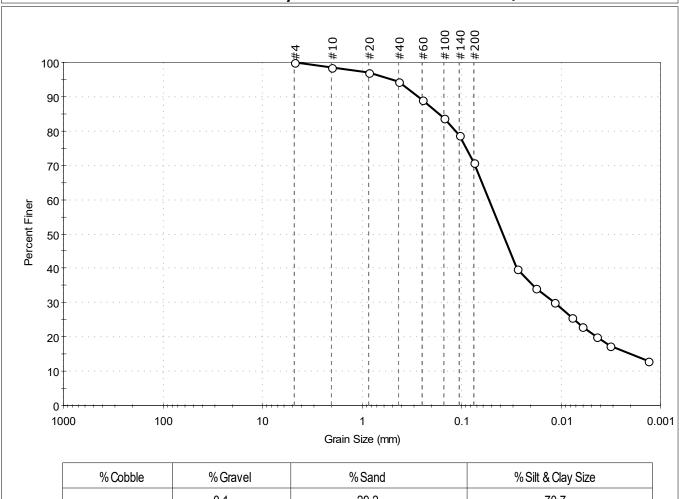
Depth: Test Id: 525302

Test Comment:

Visual Description: Moist, very dark gray silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	29.2	70.7

		•		
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	94		
#60	0.25	89		
#100	0.15	84		
#140	0.11	79		
#200	0.075	71		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0277	40		
	0.0179	34		
	0.0117	30		
	0.0078	26		
	0.0061	23		
	0.0044	20		
	0.0032	17		
	0.0013	13		

<u>Coefficients</u>			
D <sub>85</sub> =0.1678 mm	$D_{30} = 0.0116 \text{ mm}$		
D <sub>60</sub> = 0.0531 mm	D <sub>15</sub> =0.0020 mm		
D <sub>50</sub> = 0.0384 mm	$D_{10} = N/A$		
C <sub>u</sub> =N/A	$C_c = N/A$		

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-104SG-00-01-190924Test Date: 10/02/19 Checked By: jsc

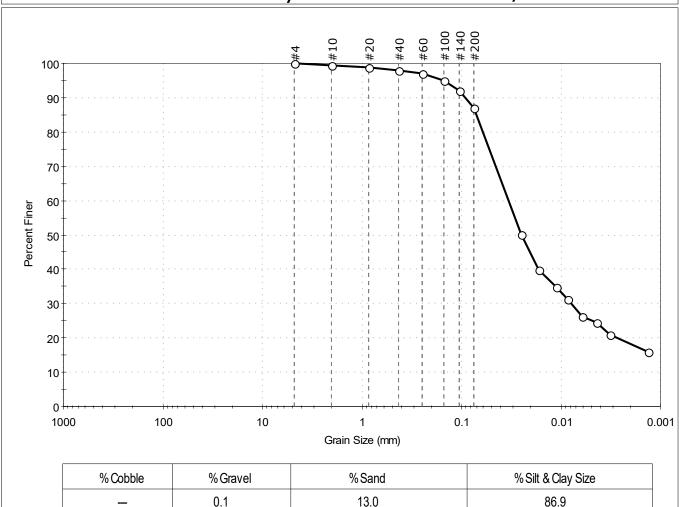
Test Id: 525303 Depth:

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	95		
#140	0.11	92		
#200	0.075	87		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0253	50		
	0.0167	40		
	0.0111	35		
	0.0086	31		
	0.0061	26		
	0.0044	24		
	0.0032	21		
	0.0013	16		

<u>Coefficients</u>					
D <sub>85</sub> = 0.0709 mm	$D_{30} = 0.0079 \text{ mm}$				
D <sub>60</sub> = 0.0339 mm	$D_{15} = N/A$				
D <sub>50</sub> = 0.0252 mm	$D_{10} = N/A$				
$C_u = N/A$	$C_c = N/A$				

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-105SG-00-0.99-1909Test Date: 10/02/19 Checked By: jsc

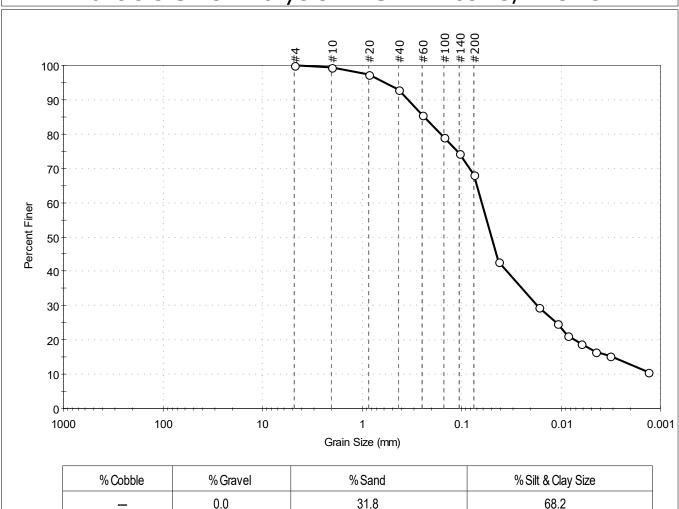
Test Id: Depth: 525304

Test Comment:

Visual Description: Moist, very dark gray sandy silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	93		
#60	0.25	85		
#100	0.15	79		
#140	0.11	74		
#200	0.075	68		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0425	43		
	0.0169	30		
	0.0109	25		
	0.0085	21		
	0.0062	19		
	0.0045	17		
	0.0032	15		
	0.0013	11		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2406 mm	$D_{30} = 0.0174 \text{ mm}$			
D <sub>60</sub> = 0.0625 mm	$D_{15} = 0.0030 \text{ mm}$			
D <sub>50</sub> = 0.0501 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_C = N/A$			

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Client: Anchor QEA, LLC Gasco PDI

Project: Location:

Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-106SG-00-01-190924Test Date: 10/02/19 Checked By: jsc

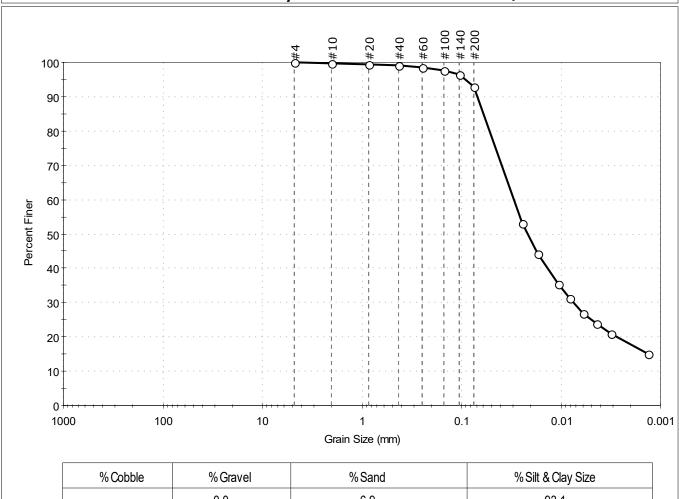
525305 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	6.9	93.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies	
#4	4.75	100			
#10	2.00	100			
#20	0.85	99			
#40	0.42	99			
#60	0.25	98			
#100	0.15	98			
#140	0.11	96			
#200	0.075	93			
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies	
	0.0243	53			
	0.0173	44			
	0.0106	36			
	0.0082	31			
	0.0060	27			
	0.0044	24			
	0.0032	21			
	0.0013	15			

<u>Coefficients</u>				
D <sub>85</sub> =0.0598 mm	$D_{30} = 0.0075 \text{ mm}$			
D <sub>60</sub> = 0.0295 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0216 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_c = N/A$			

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No:

Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-107SPT-00-04-19092Test Date: 11/06/19 Checked By: bfs

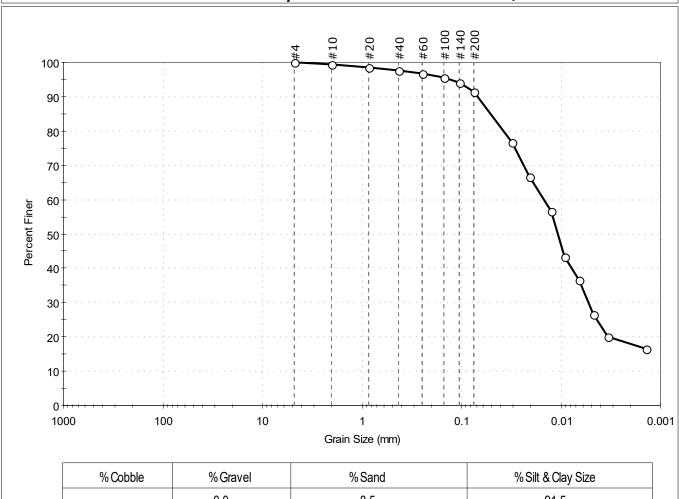
527556 Depth: Test Id:

Test Comment:

Visual Description: Wet, dark olive brown silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	8.5	91.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	96		
#140	0.11	94		
#200	0.075	91		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0308	77		
	0.0208	67		
	0.0125	57		
	0.0091	43		
	0.0065	37		
	0.0047	27		
	0.0033	20		
	0.0014	17		

<u>Coefficients</u>			
D <sub>85</sub> =0.0509 mm	$D_{30} = 0.0052 \text{ mm}$		
D <sub>60</sub> = 0.0149 mm	$D_{15} = N/A$		
D <sub>50</sub> = 0.0107 mm	$D_{10} = N/A$		
C <sub>II</sub> =N/A	$C_C = N/A$		

GTX-310685

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (53))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

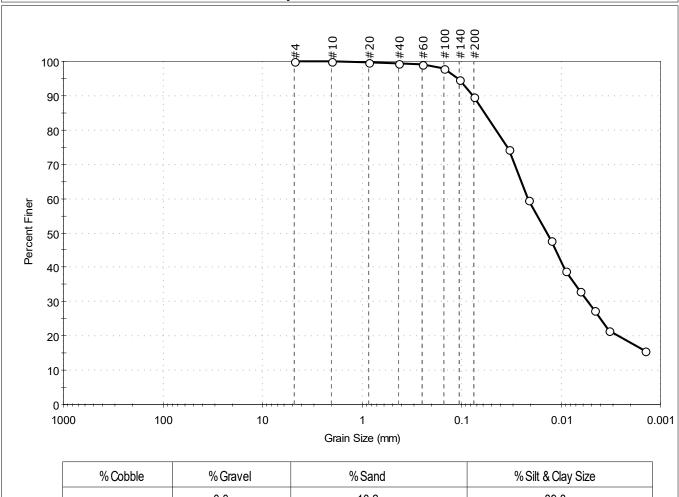
Sample ID: PDI-107SPT-04-09-19092Test Date: 11/06/19 Checked By: bfs

527557 Depth: Test Id:

Test Comment:

Visual Description: Wet, dark olive brown silt Sample Comment: Sample contains organics

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	10.2	89.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#140	0.11	95		
#200	0.075	90		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0330	74		
	0.0213	60		
	0.0126	48		
	0.0091	39		
	0.0065	33		
	0.0046	27		
	0.0033	21		
	0.0014	16		

<u>Coefficients</u>			
D <sub>85</sub> = 0.0583 mm	$D_{30} = 0.0054 \text{ mm}$		
D <sub>60</sub> = 0.0216 mm	$D_{15} = N/A$		
D <sub>50</sub> = 0.0138 mm	$D_{10} = N/A$		
C <sub>II</sub> =N/A	$C_C = N/A$		

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (30))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-107SPT-17-18-19092Test Date: 11/06/19 Checked By: bfs

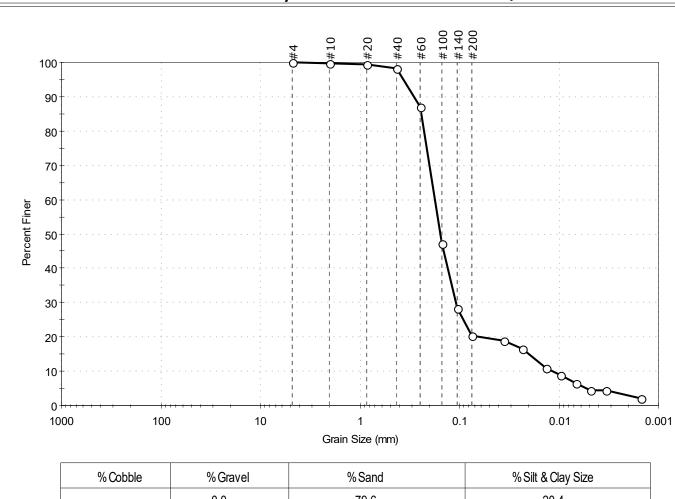
527558 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	79.6	20.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	87		
#100	0.15	47		
#140	0.11	28		
#200	0.075	20		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0355	19		
	0.0233	17		
	0.0135	11		
	0.0096	9		
	0.0068	7		
	0.0048	4		
	0.0034	4		
	0.0015	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2437 mm	$D_{30} = 0.1094 \text{ mm}$			
D <sub>60</sub> = 0.1767 mm	$D_{15} = 0.0199 \text{ mm}$			
D <sub>50</sub> = 0.1554 mm	$D_{10} = 0.0114 \text{ mm}$			
C <sub>11</sub> =15.500	$C_c = 5.941$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Sample Type: bag Tested By: ckg

Boring ID: ---Sample ID: PDI-107SPT-62-64-19092Test Date: 11/06/19 Checked By: bfs

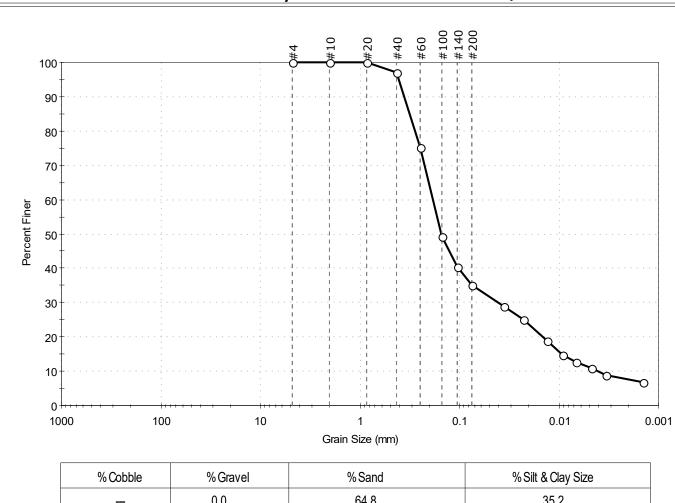
527559 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	64.8	35.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	75		
#100	0.15	49		
#140	0.11	40		
#200	0.075	35		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0357	29		
	0.0225	25		
	0.0131	19		
	0.0093	15		
	0.0067	13		
	0.0047	11		
	0.0034	9		
	0.0014	7		

<u>Coefficients</u>			
D <sub>85</sub> = 0.3165 mm	$D_{30} = 0.0401 \text{ mm}$		
D <sub>60</sub> = 0.1854 mm	$D_{15} = 0.0094 \text{ mm}$		
D <sub>50</sub> = 0.1524 mm	$D_{10} = 0.0042 \text{ mm}$		
C <sub>11</sub> =44.143	$C_c = 2.065$		

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-108SPT-00-6.4-1910CTest Date: 11/01/19 Checked By: bfs

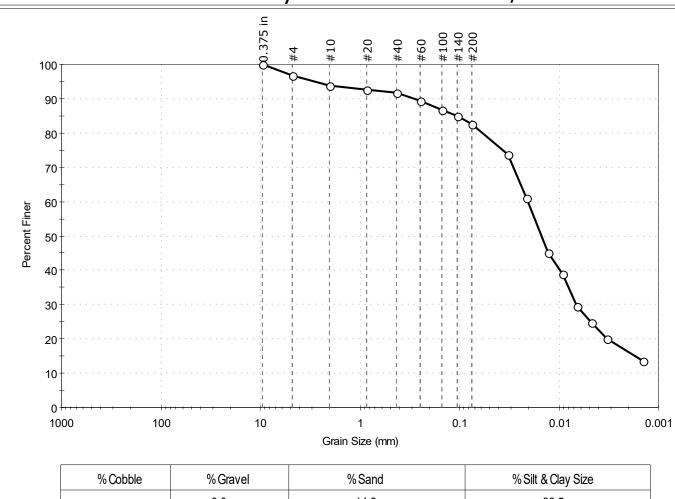
527560 Depth: Test Id:

Test Comment:

Visual Description: Wet, olive brown silt with sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



3.3 14.2 82.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	97		
#10	2.00	94		
#20	0.85	93		
#40	0.42	92		
#60	0.25	89		
#100	0.15	87		
#140	0.11	85		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0328	74		
	0.0213	61		
	0.0127	45		
	0.0091	39		
	0.0066	29		
	0.0047	25		
	0.0033	20		
	0.0014	14		

<u>Coefficients</u>			
D <sub>85</sub> = 0.1081 mm	$D_{30} = 0.0067 \text{ mm}$		
D <sub>60</sub> = 0.0206 mm	$D_{15} = 0.0017 \text{ mm}$		
D <sub>50</sub> = 0.0149 mm	$D_{10} = N/A$		
C <sub>II</sub> =N/A	$C_c = N/A$		

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (41))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness: HARD

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Boring ID: --- Sample Type: bag Tested By: ckg Sample ID: PDI-108SPT-14-33.5-191(Test Date: 11/01/19 Checked By: bfs

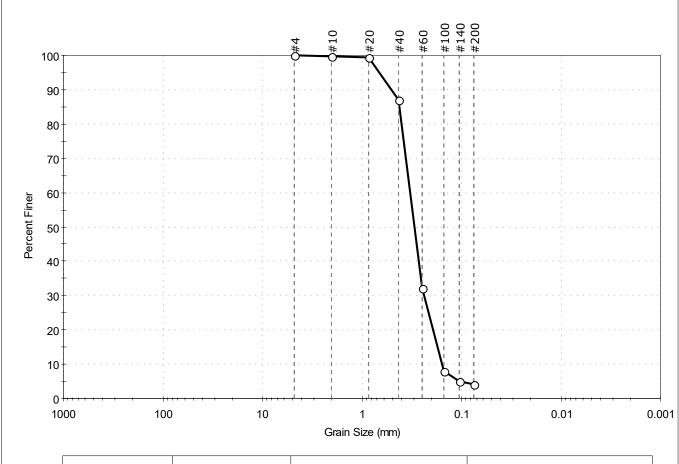
Depth: --- Test Id: 527561

Test Comment: ---

Visual Description: Moist, dark olive brown sand

Sample Comment: ---

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	95.9	4.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	87		
#60	0.25	32		
#100	0.15	8		
#140	0.11	5		
#200	0.075	4.1		

<u>Coe</u>	<u>fficients</u>
D <sub>85</sub> = 0.4167 mm	$D_{30} = 0.2394 \text{ mm}$
D <sub>60</sub> = 0.3274 mm	$D_{15} = 0.1743 \text{ mm}$
D <sub>50</sub> = 0.2973 mm	$D_{10} = 0.1568 \text{ mm}$
C <sub>u</sub> =2.088	C <sub>c</sub> =1.116

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---



Location:

GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-108SPT-33.5-66.5-19Test Date: 11/01/19 Checked By: bfs

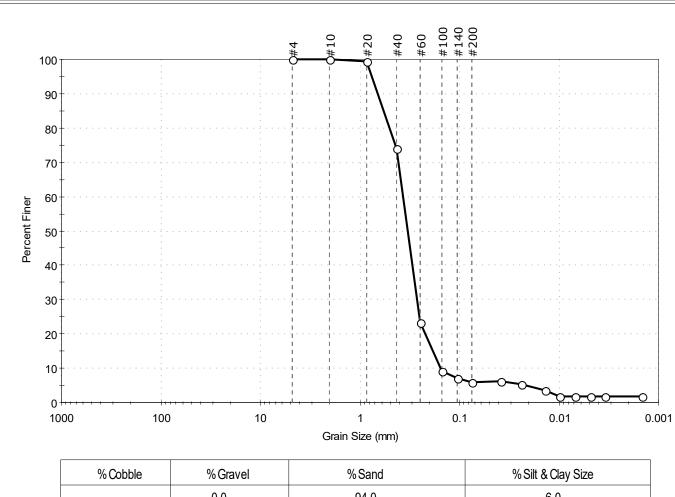
Depth: Test Id: 527562

Test Comment:

Visual Description: Moist, dark gray sand with silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	94.0	6.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	74		
#60	0.25	23		
#100	0.15	9		
#140	0.11	7		
#200	0.075	6.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0385	6		
	0.0237	5		
	0.0137	4		
	0.0098	2		
	0.0069	2		
	0.0049	2		
	0.0034	2		
	0.0015	2		

<u>Coeff</u>	<u>icients</u>
D <sub>85</sub> = 0.5740 mm	$D_{30} = 0.2682 \text{ mm}$
D <sub>60</sub> = 0.3670 mm	$D_{15} = 0.1849 \text{ mm}$
D <sub>50</sub> = 0.3306 mm	$D_{10} = 0.1541 \text{ mm}$
C <sub>11</sub> =2.382	$C_{c} = 1.272$

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

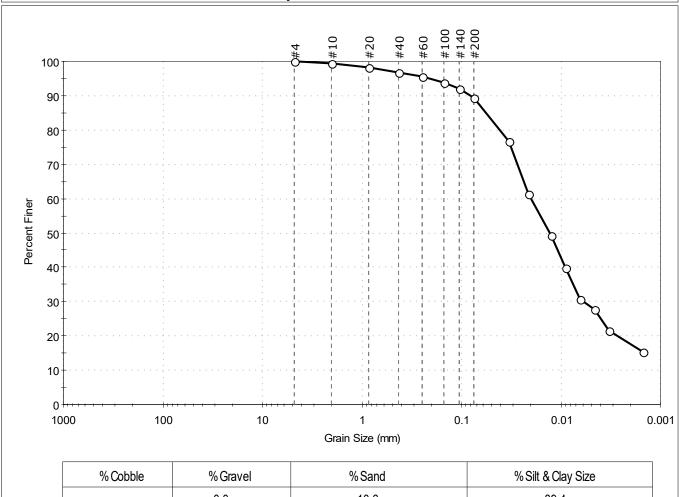
Sample ID: PDI-109SPT-00-6.5-1910(Test Date: 10/29/19 Checked By: bfs

527563 Depth: Test Id:

Test Comment:

Visual Description: Wet, very dark olive silt Sample Comment: Sample contains organics

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	10.6	89.4

		<del>'</del>		<u>'</u>
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	97		
#60	0.25	96		
#100	0.15	94		
#140	0.11	92		
#200	0.075	89		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0332	77		
	0.0211	61		
	0.0125	49		
	0.0090	40		
	0.0065	31		
	0.0046	28		
	0.0033	22		
	0.0015	15		

<u>Coefficients</u>			
D <sub>85</sub> = 0.0563 mm	$D_{30} = 0.0060 \text{ mm}$		
D <sub>60</sub> = 0.0199 mm	$D_{15} = N/A$		
D <sub>50</sub> = 0.0130 mm	$D_{10} = N/A$		
C <sub>u</sub> =N/A	$C_c = N/A$		

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (48))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 ckg

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-109SPT-16.5-18.1-19Test Date: 10/29/19 Checked By: bfs

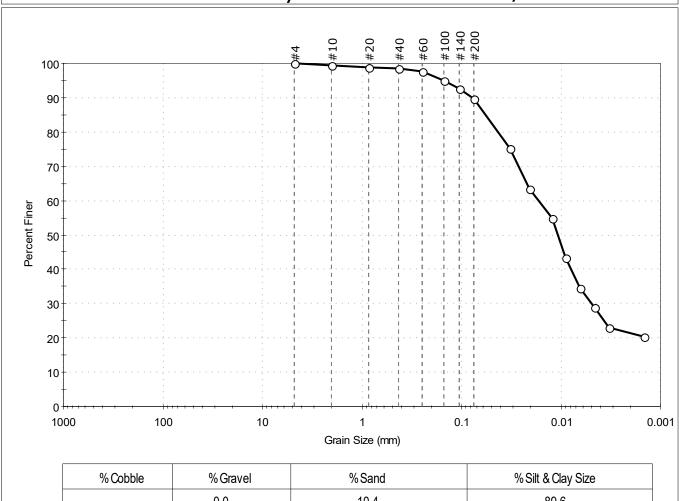
527564 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark olive brown silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



Name	Sieve Size, mm Percen	t Finer Spec. Percent	Complies		<u>Coefficients</u>	
		0.0		10.4	89.6	
	% Cobble	% Gravel		% Sand	% Silt & Clay Size	

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	98		
#100	0.15	95		
#140	0.11	93		
#200	0.075	90		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0329	75		
	0.0209	64		
	0.0123	55		
	0.0089	43		
	0.0064	35		
	0.0046	29		
	0.0033	23		
	0.0015	20		

	111010110
D <sub>85</sub> = 0.0578 mm	$D_{30} = 0.0049 \text{ mm}$
D <sub>60</sub> = 0.0168 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0107 mm	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (38))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

Sieve



Location: GTX-310685 Project No: Sample Type: bag Tested By: ckg

Boring ID: ---Sample ID: PDI-109SPT-22-30-19100Test Date: 10/29/19 Checked By: bfs

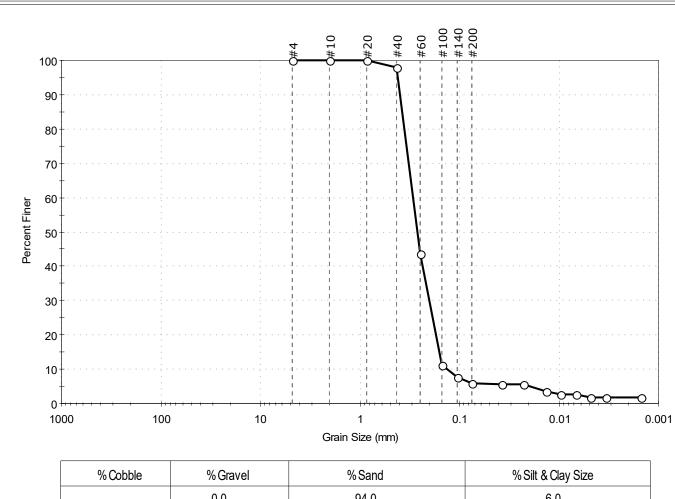
527565 Depth: Test Id:

Test Comment:

Visual Description: Moist, olive brown sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	94.0	6.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	44		
#100	0.15	11		
#140	0.11	8		
#200	0.075	6.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0374	5		
	0.0229	5		
	0.0134	4		
	0.0095	3		
	0.0067	3		
	0.0048	2		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3747 mm	$D_{30} = 0.2015 \text{ mm}$			
D <sub>60</sub> = 0.2933 mm	D <sub>15</sub> =0.1592 mm			
D <sub>50</sub> = 0.2659 mm	$D_{10} = 0.1336 \text{ mm}$			
C <sub>u</sub> =2.195	$C_c = 1.036$			

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-109SPT-35.5-48.3-19Test Date: 10/29/19 Checked By: bfs

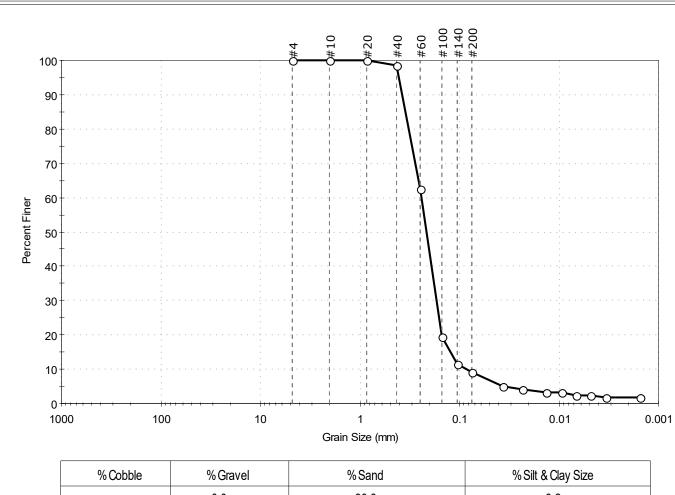
527566 Depth: Test Id:

Test Comment:

Visual Description: Moist, olive brown sand with silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	90.8	9.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	63		
#100	0.15	20		
#140	0.11	11		
#200	0.075	9.2		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0365	5		
	0.0233	4		
	0.0133	3		
	0.0095	3		
	0.0067	2		
	0.0048	2		
	0.0034	2		
	0.0015	2		

<u>Coeffic</u>	<u>cients</u>
D <sub>85</sub> = 0.3483 mm	$D_{30} = 0.1699 \text{ mm}$
D <sub>60</sub> = 0.2426 mm	D <sub>15</sub> =0.1233 mm
D <sub>50</sub> = 0.2154 mm	$D_{10} = 0.0849 \text{ mm}$
Cu =2.857	$C_c = 1.401$

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-109SPT-48.3-51-191(Test Date: 10/29/19 Checked By: bfs

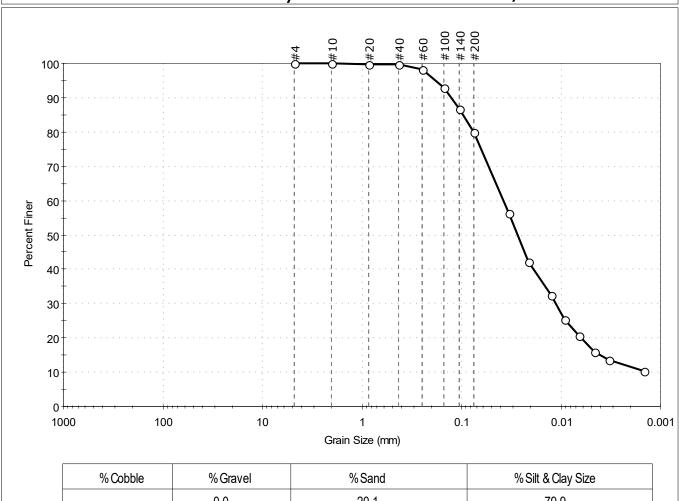
527567 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark olive brown silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



ve Name	Sieve Size, mm Per	cent Finer	Spec. Percent	Complies		<u>C</u>	<u>oefficients</u>	
			0.0		20.1		79.9	
	% Cobble		% Gravel		% Sand	0	% Silt & Clay Size	

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	98		
#100	0.15	93		
#140	0.11	87		
#200	0.075	80		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0335	56		
	0.0210	42		
	0.0126	33		
	0.0091	25		
	0.0065	21		
	0.0046	16		
	0.0033	14		
	0.0015	10		

	Coefficients
D <sub>85</sub> = 0.0976 mm	$D_{30} = 0.0112 \text{ mm}$
$D_{60} = 0.0380 \text{ mm}$	$D_{15} = 0.0041 \text{ mm}$
D <sub>50</sub> = 0.0273 mm	$D_{10} = N/A$
C <sub>u</sub> =N/A	$C_C = N/A$

<u>Classification</u> SILT with Sand (ML) **ASTM** 

AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-110 B-54-64.5-19101Test Date: 10/29/19 Checked By: bfs

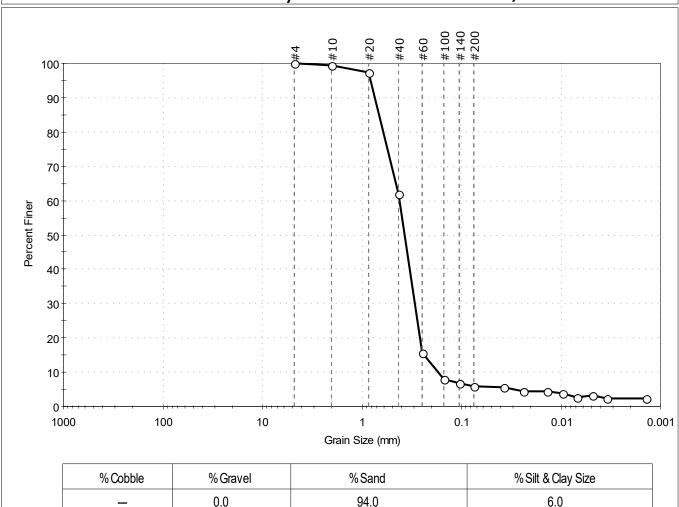
527568 Depth: Test Id:

Test Comment:

Visual Description: Moist, black sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
	D. C.		Special Careent	
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	62		
#60	0.25	16		
#100	0.15	8		
#140	0.11	7		
#200	0.075	6.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0375	6		
	0.0237	4		
	0.0137	4		
	0.0096	4		
	0.0068	3		
	0.0048	3		
	0.0034	2		
	0.0014	2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.6681 mm	$D_{30} = 0.2948 \text{ mm}$	
D <sub>60</sub> = 0.4158 mm	D <sub>15</sub> =0.2399 mm	
D <sub>50</sub> = 0.3707 mm	$D_{10} = 0.1717 \text{ mm}$	
C <sub>u</sub> =2.422	$C_c = 1.217$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-110SPT-21-32-19101Test Date: 10/29/19 Checked By: bfs

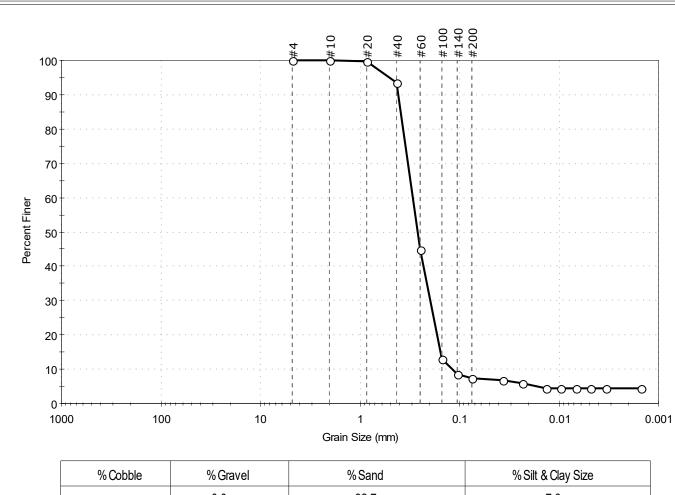
527569 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	92.7	7.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	94		
#60	0.25	45		
#100	0.15	13		
#140	0.11	9		
#200	0.075	7.3		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0368	7		
	0.0232	6		
	0.0135	5		
	0.0096	5		
	0.0068	5		
	0.0048	5		
	0.0034	5		
	0.0015	5		

	<u>Coefficients</u>			
D <sub>85</sub> = 0.3872 mm		$D_{30} = 0.1973 \text{ mm}$		
	D <sub>60</sub> = 0.2950 mm	$D_{15} = 0.1552 \text{ mm}$		
D <sub>50</sub> = 0.2646 mm		$D_{10} = 0.1184 \text{ mm}$		
	C <sub>11</sub> =2.492	$C_{c} = 1.115$		

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Boring ID: --- Sample Type: bag Tested By: ckg Sample ID: PDI-110SPT-32-45-19101Test Date: 10/30/19 Checked By: bfs

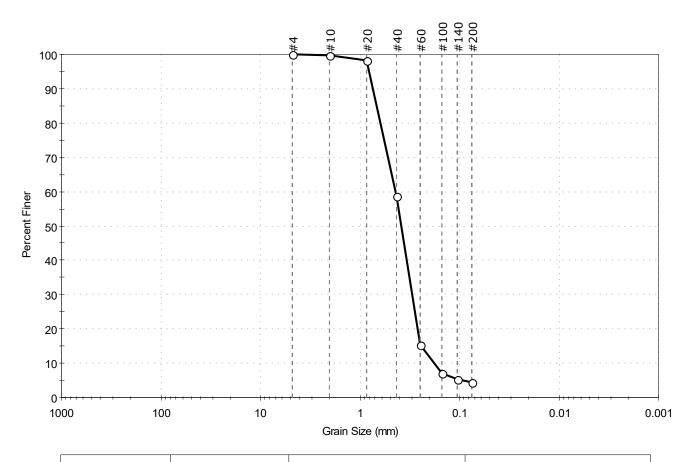
Depth: --- Test Id: 527570

Test Comment: ---

Visual Description: Moist, black sand

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	95.6	4.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	59		
#60	0.25	15		
#100	0.15	7		
#140	0.11	5		
#200	0.075	4.3		

<u>Coefficients</u>		
D <sub>85</sub> = 0.6746 mm	$D_{30} = 0.2994 \text{ mm}$	
D <sub>60</sub> = 0.4347 mm	D <sub>15</sub> =0.2464 mm	
D <sub>50</sub> = 0.3821 mm	$D_{10} = 0.1799 \text{ mm}$	
C <sub>u</sub> =2.416	C <sub>c</sub> =1.146	

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-112SPT-00-6.5-1910(Test Date: 11/05/19 Checked By: bfs

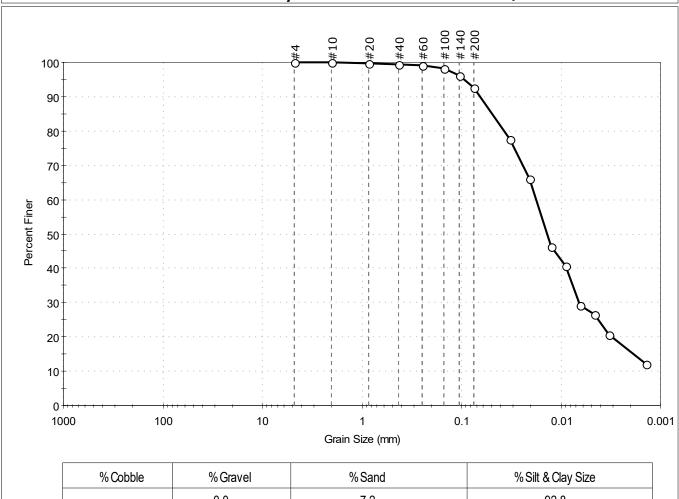
527571 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	7.2	92.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0323	78		
	0.0208	66		
	0.0126	46		
	0.0090	41		
	0.0065	29		
	0.0046	26		
	0.0033	21		
	0.0014	12		

<u>Coefficients</u>		
D <sub>85</sub> = 0.0488 mm	$D_{30} = 0.0066 \text{ mm}$	
D <sub>60</sub> = 0.0178 mm	$D_{15} = 0.0018 \text{ mm}$	
D <sub>50</sub> = 0.0138 mm	$D_{10} = N/A$	
C <sub>II</sub> =N/A	$C_C = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (45))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-112SPT-07-11.5-191(Test Date: 11/01/19 Checked By: bfs

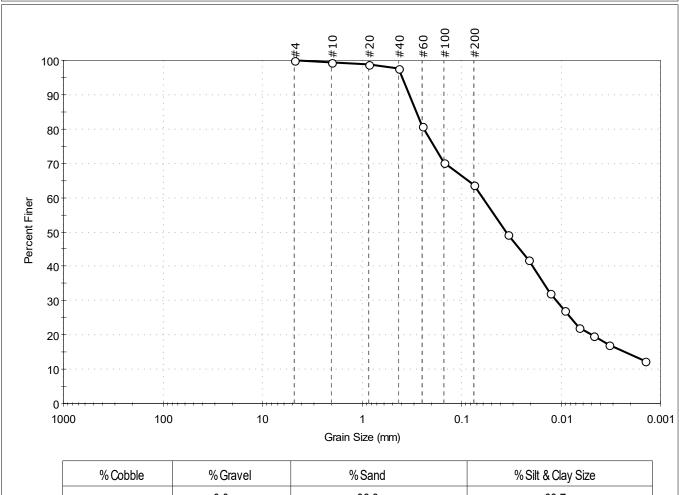
527572 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark gray sandy silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	36.3	63.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	81		
#100	0.15	70		
#200	0.075	64		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0344	49		
	0.0211	42		
	0.0129	32		
	0.0092	27		
	0.0066	22		
	0.0047	20		
	0.0033	17		
	0.0014	12		

	<u>Coefficients</u>			
D <sub>85</sub> = 0.2849 mm		$D_{30} = 0.0112 \text{ mm}$		
	D <sub>60</sub> = 0.0615 mm	$D_{15} = 0.0023 \text{ mm}$		
	D <sub>50</sub> = 0.0357 mm	$D_{10} = N/A$		
	$C_u = N/A$	$C_C = N/A$		

<u>Classification</u> Sandy Elastic SILT (MH) **ASTM** 

AASHTO Clayey Soils (A-7-5 (11))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 ckg

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-112SPT-11.5-26.5-19Test Date: 10/31/19 Checked By: bfs

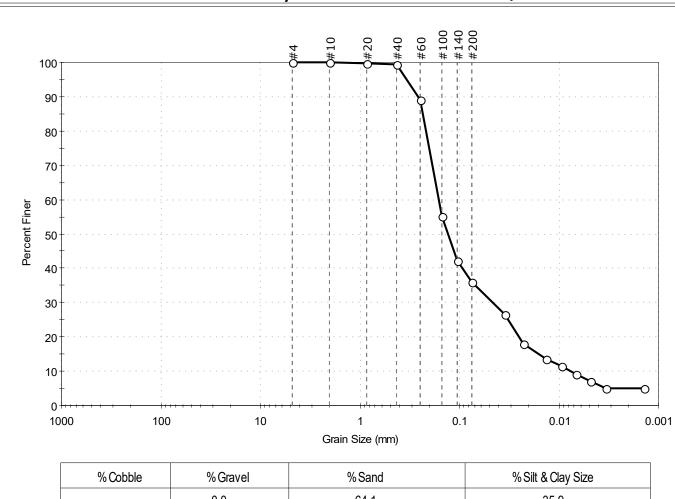
527573 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	64.1	35.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	89		
#100	0.15	55		
#140	0.11	42		
#200	0.075	36		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0351	27		
	0.0225	18		
	0.0134	14		
	0.0094	11		
	0.0067	9		
	0.0048	7		
	0.0034	5		
	0.0014	5		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2350 mm	$D_{30} = 0.0465 \text{ mm}$			
D <sub>60</sub> = 0.1614 mm	$D_{15} = 0.0159 \text{ mm}$			
D <sub>50</sub> = 0.1309 mm	$D_{10} = 0.0075 \text{ mm}$			
$C_{II} = 21.520$	$C_c = 1.786$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-112SPT-37.5-58-191(Test Date: 10/29/19 Checked By: bfs

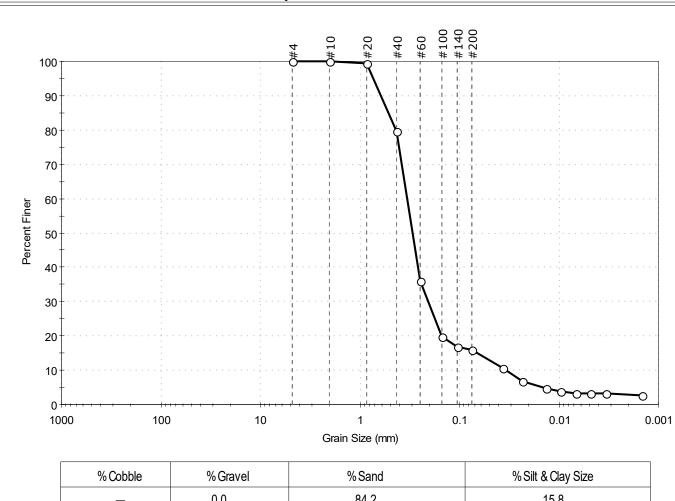
527574 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark olive gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	84.2	15.8

	L			
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	80		
#60	0.25	36		
#100	0.15	20		
#140	0.11	17		
#200	0.075	16		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0367	11		
	0.0234	7		
	0.0136	5		
	0.0096	4		
	0.0068	3		
	0.0048	3		
	0.0034	3		
	0.0014	3		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.5121 mm D <sub>30</sub> = 0.2062 mm		$D_{30} = 0.2062 \text{ mm}$	
	D <sub>60</sub> = 0.3344 mm	$D_{15} = 0.0671 \text{ mm}$	
	D <sub>50</sub> = 0.2961 mm	$D_{10} = 0.0339 \text{ mm}$	
	C <sub>11</sub> =9.864	$C_c = 3.751$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 ckg

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-113SPT-06-16-19101Test Date: 11/05/19 Checked By: bfs

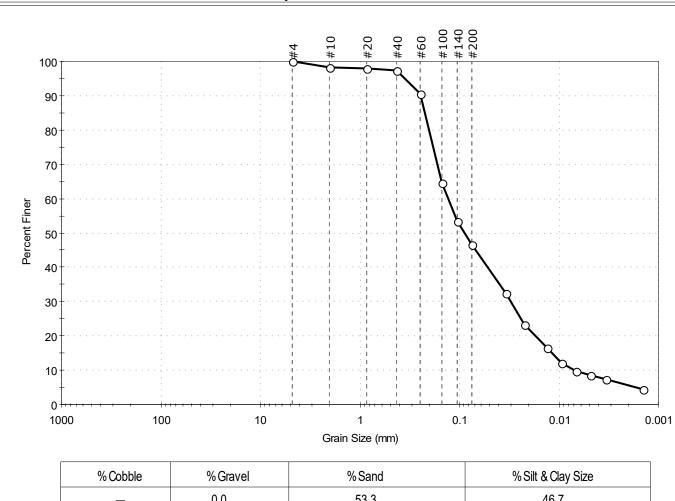
527575 Depth: Test Id:

Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	53.3	46.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	98		
#20	0.85	98		
#40	0.42	97		
#60	0.25	90		
#100	0.15	65		
#140	0.11	53		
#200	0.075	47		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0341	32		
	0.0224	23		
	0.0130	17		
	0.0095	12		
	0.0067	10		
	0.0048	9		
	0.0034	7		
	0.0014	5		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2243 mm	$D_{30} = 0.0305 \text{ mm}$			
D <sub>60</sub> = 0.1298 mm	$D_{15} = 0.0117 \text{ mm}$			
D <sub>50</sub> = 0.0888 mm	$D_{10} = 0.0070 \text{ mm}$			
C <sub>11</sub> =18.543	$C_c = 1.024$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-113SPT-16-22-19101Test Date: 10/31/19 Checked By: bfs

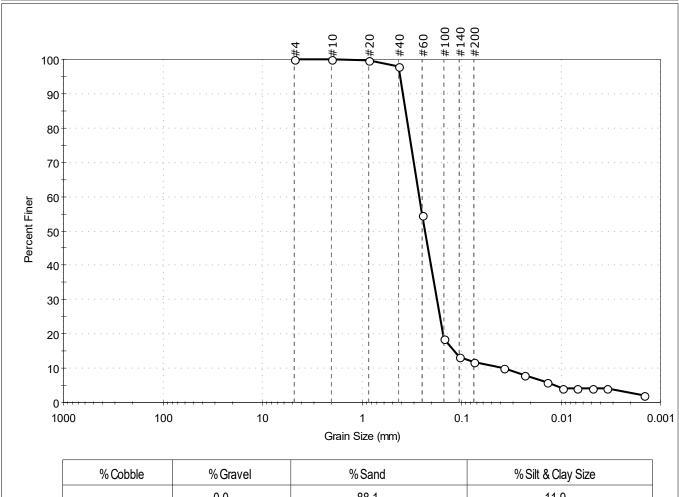
527576 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	88.1	11.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	54		
#100	0.15	19		
#140	0.11	13		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0379	10		
	0.0232	8		
	0.0137	6		
	0.0097	4		
	0.0069	4		
	0.0048	4		
	0.0034	4		
	0.0015	2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3627 mm	$D_{30} = 0.1766 \text{ mm}$	
D <sub>60</sub> = 0.2675 mm	$D_{15} = 0.1182 \text{ mm}$	
D <sub>50</sub> = 0.2347 mm	$D_{10} = 0.0377 \text{ mm}$	
Cu =7.095	$C_c = 3.093$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By:

ckg Sample ID: PDI-113SPT-22-25.2-191(Test Date: 10/24/19 Checked By: bfs

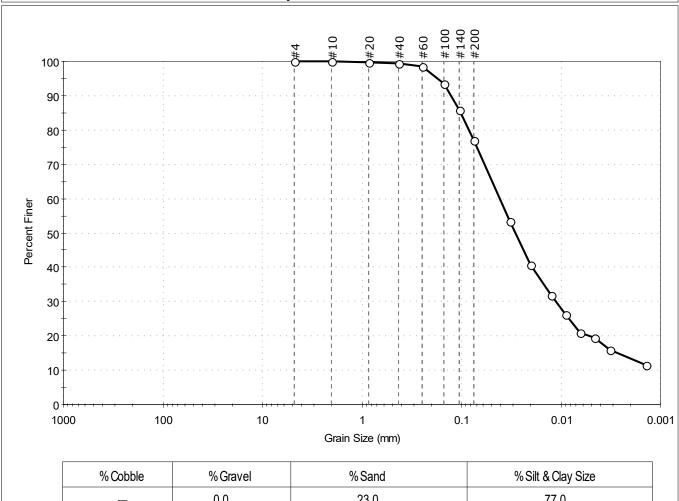
527577 Depth: Test Id:

Test Comment:

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	23.0	77.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	94		
#140	0.11	86		
#200	0.075	77		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0322	54		
	0.0201	41		
	0.0124	32		
	0.0089	26		
	0.0064	21		
	0.0046	19		
	0.0033	16		
	0.0014	11		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.1025 mm		$D_{30} = 0.0111 \text{ mm}$	
	D <sub>60</sub> = 0.0407 mm	$D_{15} = 0.0028 \text{ mm}$	
	D <sub>50</sub> = 0.0283 mm	$D_{10} = N/A$	
	Cu =N/A	$C_{c} = N/A$	

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (18))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-113SPT-31.9-39.4-19Test Date: 11/01/19 Checked By: bfs

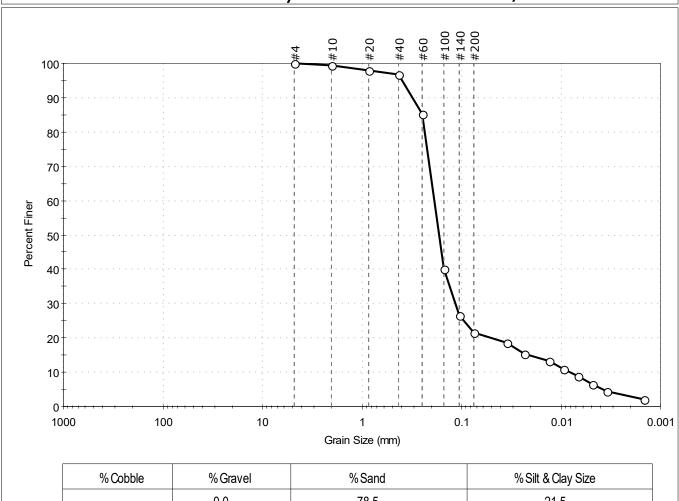
527578 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



Name	Sieve Size, mm Percen	t Finer Spec. Percent	Complies		<u>Coefficients</u>	
	-	0.0		78.5	21.5	
	% Cobble	% Gravel		% Sand	% Silt & Clay Size	

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	97		
#60	0.25	85		
#100	0.15	40		
#140	0.11	27		
#200	0.075	21		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0353	19		
	0.0231	15		
	0.0133	13		
	0.0095	11		
	0.0068	9		
	0.0048	7		
	0.0034	4		
	0.0015	2		

Cocincients		
D <sub>85</sub> = 0.2492 mm	$D_{30} = 0.1158 \text{ mm}$	
D <sub>60</sub> = 0.1879 mm	$D_{15} = 0.0208 \text{ mm}$	
D <sub>50</sub> = 0.1679 mm	$D_{10} = 0.0081 \text{ mm}$	
C <sub>u</sub> =23.198	C <sub>c</sub> =8.811	

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

Ciovo



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-114SPT-00-7.5-1910(Test Date: 11/01/19 Checked By: bfs

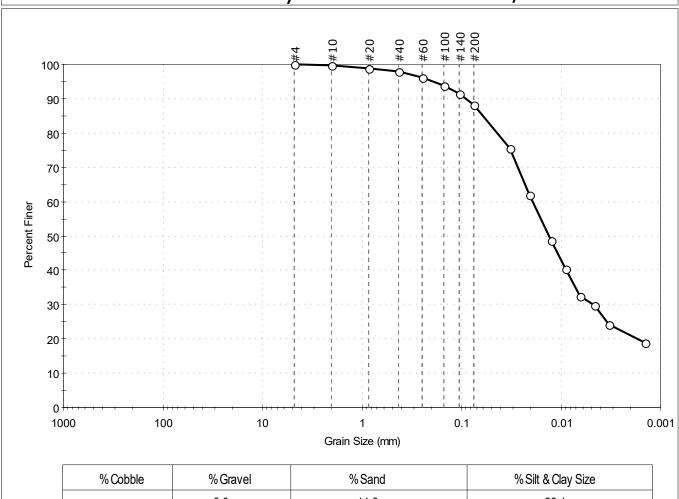
527579 Depth: Test Id:

Test Comment:

Visual Description: Wet, olive brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	11.9	88.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	94		
#140	0.11	92		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0324	76		
	0.0208	62		
	0.0125	49		
	0.0090	40		
	0.0065	32		
	0.0046	30		
	0.0033	24		
	0.0014	19		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.0610 mm		$D_{30} = 0.0048 \text{ mm}$	
	D <sub>60</sub> = 0.0193 mm	$D_{15} = N/A$	
	D <sub>50</sub> = 0.0132 mm	$D_{10} = N/A$	
	C <sub>II</sub> =N/A	$C_C = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (29))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-114SPT-25.5-28-191(Test Date: 11/01/19 Checked By: bfs

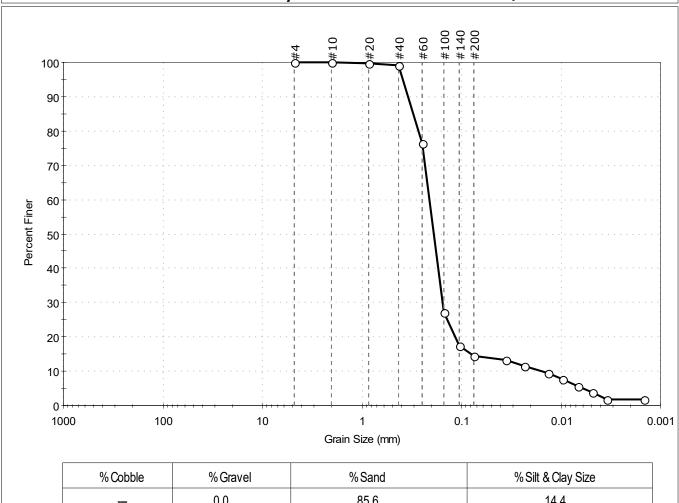
527580 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	85.6	14.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	76		
#100	0.15	27		
#140	0.11	17		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0359	13		
	0.0236	11		
	0.0135	9		
	0.0096	8		
	0.0068	6		
	0.0048	4		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3059 mm	$D_{30} = 0.1547 \text{ mm}$	
D <sub>60</sub> = 0.2111 mm	$D_{15} = 0.0809 \text{ mm}$	
D <sub>50</sub> = 0.1903 mm	$D_{10} = 0.0157 \text{ mm}$	
Cu =13.446	$C_c = 7.221$	

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 ckg

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-114SPT-42-50.5-191(Test Date: 11/01/19 Checked By: bfs

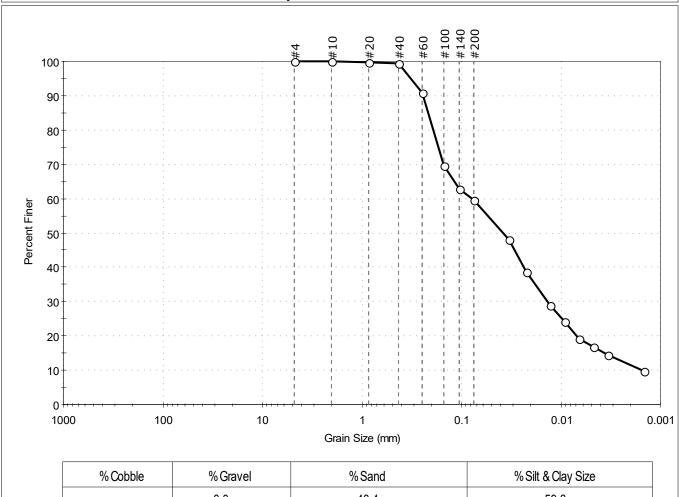
527581 Depth: Test Id:

Test Comment:

Visual Description: Wet, olive brown sandy silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	40.4	59.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	#4 4.75			
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	91		
#100	0.15	70		
#140	0.11	63		
#200	0.075	60		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0337	48		
	0.0221	39		
	0.0130	29		
	0.0093	24		
	0.0066	19		
	0.0047	17		
	0.0034	14		
	0.0014	10		

<u>Coefficients</u>					
D <sub>85</sub> = 0.2166 mm	$D_{30} = 0.0138 \text{ mm}$				
D <sub>60</sub> = 0.0786 mm	$D_{15} = 0.0036 \text{ mm}$				
D <sub>50</sub> = 0.0384 mm	$D_{10} = 0.0015 \text{ mm}$				
C <sub>11</sub> =52.400	$C_c = 1.615$				

<u>Classification</u> Sandy SILT (ML) <u>ASTM</u>

AASHTO Silty Soils (A-5 (5))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-114SPT-7.5-12.5-191Test Date: 11/01/19 Checked By: bfs

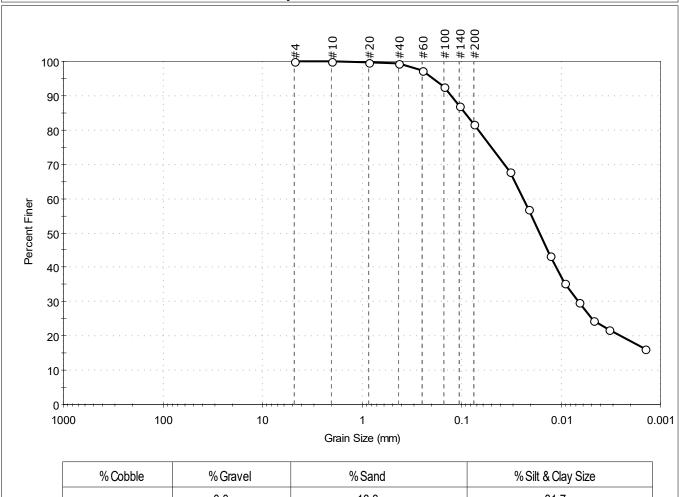
527583 Depth: Test Id:

Test Comment:

Visual Description: Moist, olive brown silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size	
-	0.0	18.3	81.7	

				_
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	97		
#100	0.15	93		
#140	0.11	87		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0324	68		
	0.0213	57		
	0.0127	43		
	0.0091	35		
	0.0065	30		
	0.0047	24		
	0.0033	22		
	0.0014	16		

<u>Coeffic</u>	<u>cients</u>
D <sub>85</sub> =0.0928 mm	$D_{30} = 0.0066 \text{ mm}$
D <sub>60</sub> = 0.0239 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0163 mm	$D_{10} = N/A$
Cu =N/A	$C_C = N/A$

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (24))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Sample Type: bag Tested By: ckg

Boring ID: ---Sample ID: PDI-114SPT-50.5-55-191(Test Date: 11/01/19 Checked By: bfs

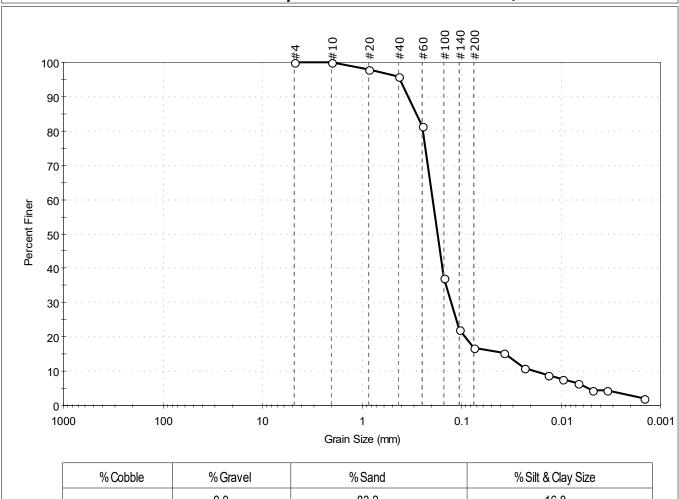
527582 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



	% Cobble	% Gravel	% Sand	% Silt & Clay Size
Ī		0.0	83.2	16.8

Sieve Name	Sieve Size, mm	Dercent Finer	Snec Percent	Complies
Sieve ivanie	Sieve Size, iiiii	r ci cent i mei	Speci refeelie	Compiles
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	96		
#60	0.25	81		
#100	0.15	37		
#140	0.11	22		
#200	0.075	17		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0377	15		
	0.0236	11		
	0.0136	9		
	0.0096	8		
	0.0068	7		
	0.0048	4		
	0.0034	4		
	0.0015	2		

Coe	<u>ficients</u>	
D <sub>85</sub> = 0.2851 mm	$D_{30} = 0.1275 \text{ mm}$	
D <sub>60</sub> = 0.1953 mm	$D_{15} = 0.0358 \text{ mm}$	
D <sub>50</sub> = 0.1741 mm	$D_{10} = 0.0181 \text{ mm}$	
$C_{11} = 10.790$	$C_c = 4.599$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-115SPT-06-11-19100Test Date: 11/07/19 Checked By: bfs

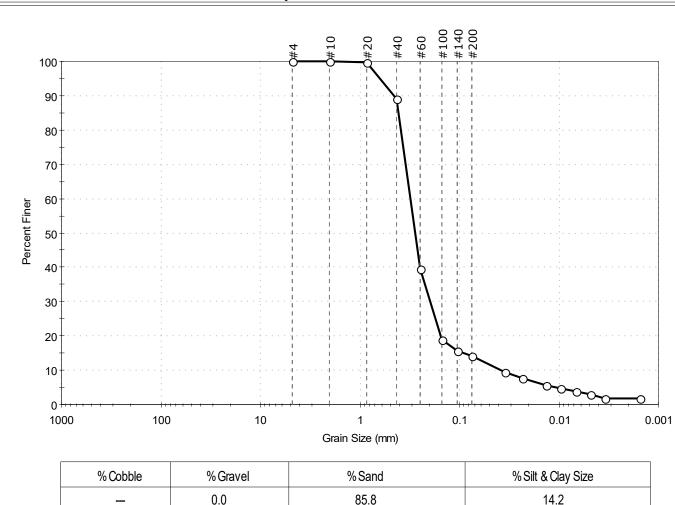
Test Id: 527584 Depth:

Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
-	0.0	85.8	14.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	89		
#60	0.25	40		
#100	0.15	19		
#140	0.11	16		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0349	9		
	0.0235	8		
	0.0135	6		
	0.0096	5		
	0.0068	4		
	0.0048	3		
	0.0034	2		
	0.0015	2		

Coeff	<u>icients</u>
D <sub>85</sub> = 0.4072 mm	$D_{30} = 0.1974 \text{ mm}$
D <sub>60</sub> = 0.3113 mm	D <sub>15</sub> =0.0918 mm
D <sub>50</sub> = 0.2796 mm	$D_{10} = 0.0380 \text{ mm}$
C <sub>11</sub> =8.192	$C_c = 3.294$

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-115SPT-18.6-20.6-19Test Date: 10/29/19 Checked By: bfs

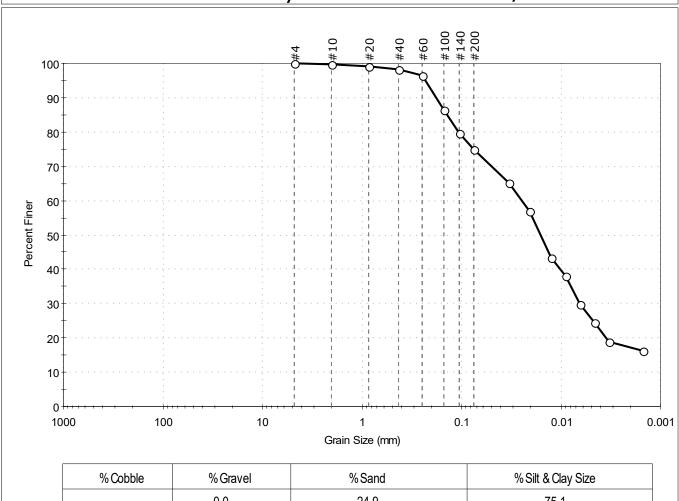
Test Id: 527585 Depth:

Test Comment:

Visual Description: Moist, dark olive brown silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



	% Copple % Gravei			% Sand			% Silt & Clay Size	
	_		0.0		24.9			75.1
Sieve Name	Sieve Size, mm	Percent Fir	ner Spec. Percent	Complies	1	<u>Coefficients</u>		<u>fficients</u>
						$D_{85} = 0.13$	87 mm	$D_{30} = 0.0065 \text{ mm}$
#4	4.75	100				$D_{60} = 0.0249 \text{ mm}$ $D_{15} = N/A$		$D_{15} = N/A$
#10	2.00	100				15 ,		,
#20	0.85	99				$D_{50} = 0.0160 \text{ mm}$ $D_{10} = N/A$		$D_{10} = N/A$

#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	87		
#140	0.11	80		
#200	0.075	75		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0335	65		
	0.0209	57		
	0.0125	43		
	0.0089	38		
	0.0064	30		
	0.0046	24		
	0.0033	19		
	0.0015	16		

$C_u = N/A$	$C_c = N/A$
<u>ASTM</u>	<u>Classification</u> Elastic SILT with Sand (MH)
<u>AASHTO</u>	Clayey Soils (A-7-5 (22))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-115SPT-23-28.1-191(Test Date: 10/29/19 Checked By: bfs

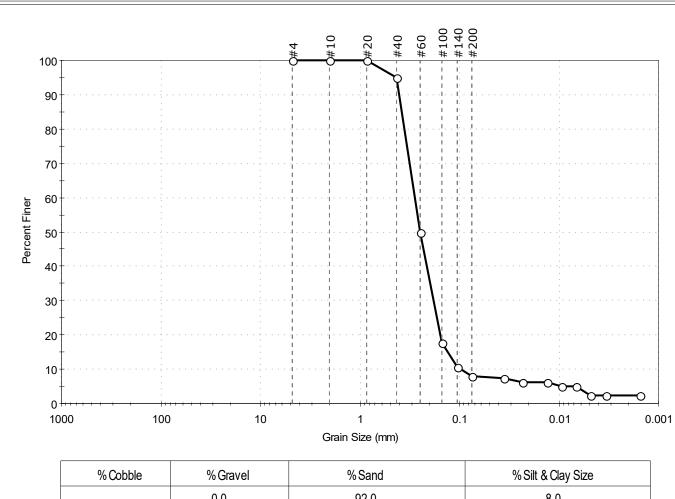
527586 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark olive brown sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	92.0	8.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	95		
#60	0.25	50		
#100	0.15	18		
#140	0.11	11		
#200	0.075	8.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0360	7		
	0.0233	6		
	0.0133	6		
	0.0095	5		
	0.0067	5		
	0.0048	2		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3780 mm	$D_{30} = 0.1827 \text{ mm}$	
D <sub>60</sub> = 0.2820 mm	$D_{15} = 0.1316 \text{ mm}$	
D <sub>50</sub> = 0.2508 mm	$D_{10} = 0.0970 \text{ mm}$	
C <sub>11</sub> = 2.907	$C_c = 1.220$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-115SPT-41.5-49.3-19Test Date: 10/29/19 Checked By: bfs

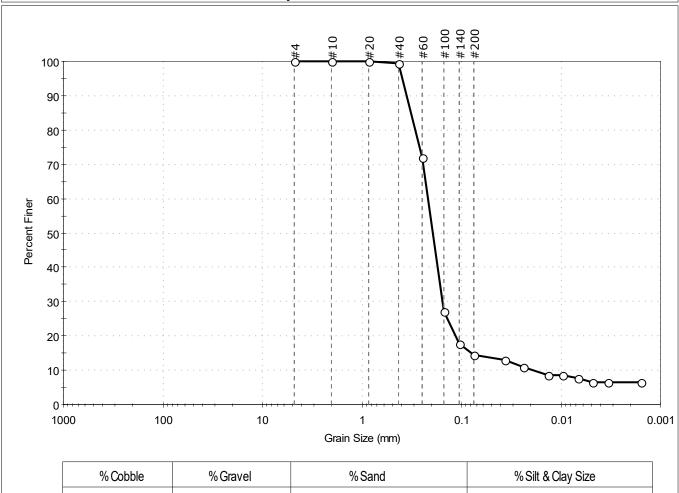
527587 Depth: Test Id:

Test Comment:

Visual Description: Moist, olive brown silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	85.6	14.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	72		
#100	0.15	27		
#140	0.11	18		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0370	13		
	0.0237	11		
	0.0136	9		
	0.0096	9		
	0.0068	8		
	0.0048	6		
	0.0034	6		
	0.0016	6		

<u>Coefficients</u>			
$D_{85} = 0.3216 \text{ mm}$	$D_{30} = 0.1552 \text{ mm}$		
$D_{60} = 0.2181 \text{ mm}$	$D_{15} = 0.0799 \text{ mm}$		
$D_{50} = 0.1947 \text{ mm}$	$D_{10} = 0.0193 \text{ mm}$		
$C_{II} = 11.301$	$C_c = 5.722$		

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-116SPT-00-4.5-1909ZTest Date: 10/30/19 Checked By: bfs

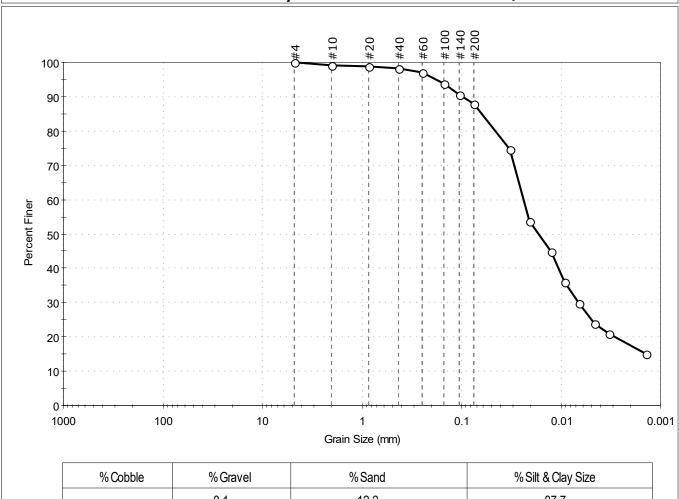
527588 Depth: Test Id:

Test Comment:

Visual Description: Wet, olive brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.1	12.2	87.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	94		
#140	0.11	91		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0322	75		
	0.0209	54		
	0.0127	45		
	0.0091	36		
	0.0065	30		
	0.0047	24		
	0.0033	21		
	0.0014	15		

<u>Coefficients</u>						
D <sub>85</sub> = 0.0627 mm	$D_{30} = 0.0066 \text{ mm}$					
D <sub>60</sub> = 0.0238 mm	$D_{15} = 0.0014 \text{ mm}$					
D <sub>50</sub> = 0.0169 mm	$D_{10} = N/A$					
C <sub>II</sub> =N/A	$C_c = N/A$					

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (40))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-116SPT-20-26.7-190STest Date: 10/30/19 Checked By: bfs

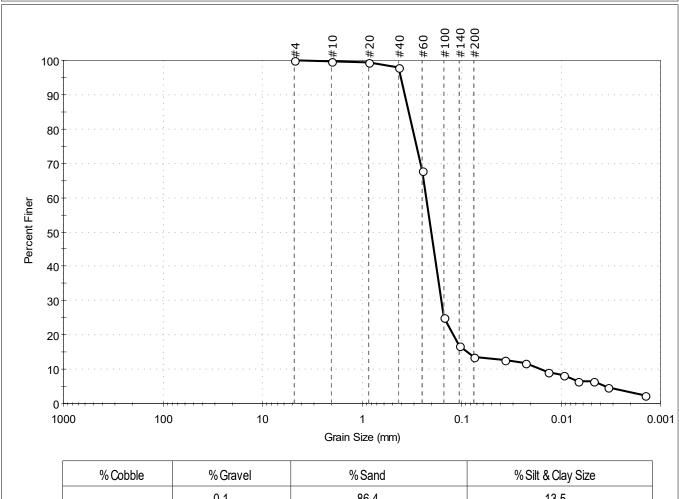
527589 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	86.4	13.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	68		
#100	0.15	25		
#140	0.11	17		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0368	13		
	0.0227	12		
	0.0134	9		
	0.0095	8		
	0.0067	6		
	0.0048	6		
	0.0034	5		
	0.0014	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3380 mm	$D_{30} = 0.1591 \text{ mm}$			
D <sub>60</sub> = 0.2276 mm	$D_{15} = 0.0881 \text{ mm}$			
D <sub>50</sub> = 0.2020 mm	$D_{10} = 0.0157 \text{ mm}$			
C <sub>11</sub> =14.497	$C_c = 7.084$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-116SPT-26.7-28.6-19Test Date: 10/30/19 Checked By: bfs

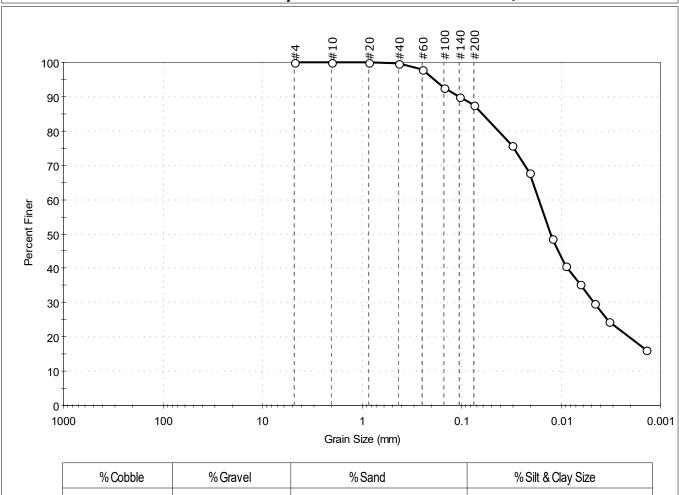
527590 Depth: Test Id:

Test Comment:

Visual Description: Wet, grayish brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	12.5	87.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	98		
#100	0.15	93		
#140	0.11	90		
#200	0.075	87		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0310	76		
	0.0206	68		
	0.0124	49		
	0.0090	41		
	0.0064	35		
	0.0046	30		
	0.0033	24		
	0.0014	16		

<u>Coefficients</u>				
D <sub>85</sub> =0.0620 mm	$D_{30} = 0.0046 \text{ mm}$			
D <sub>60</sub> = 0.0167 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0128 mm	$D_{10} = N/A$			
C <sub>II</sub> =N/A	$C_C = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (15))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

printed 11/20/2019 9:37:43 AM



Location: Project No: GTX-310685 ckg

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-116SPT-51.5-54.2-19Test Date: 10/30/19 Checked By: bfs

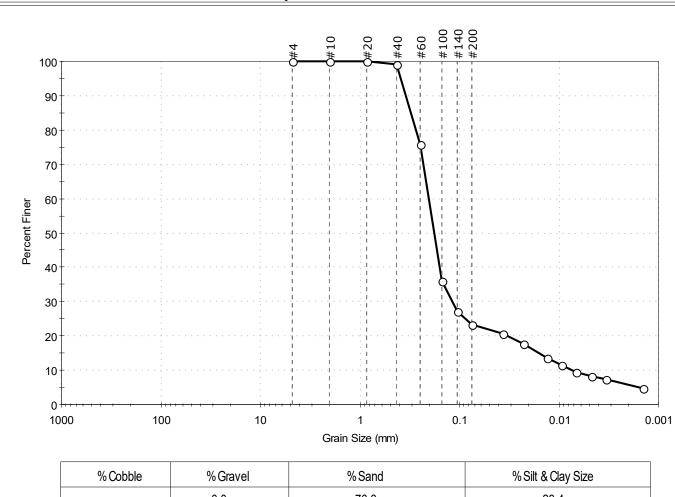
527591 Depth: Test Id:

Test Comment:

Visual Description: Moist, olive brown silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	76.6	23.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
	,			
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	76		
#100	0.15	36		
#140	0.11	27		
#200	0.075	23		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0368	21		
	0.0228	18		
	0.0133	13		
	0.0094	11		
	0.0067	9		
	0.0048	8		
	0.0034	7		
	0.0014	5		

<u>Coefficients</u>						
D <sub>85</sub> = 0.3086 mm	$D_{30} = 0.1182 \text{ mm}$					
D <sub>60</sub> = 0.2041 mm	$D_{15} = 0.0163 \text{ mm}$					
D <sub>50</sub> = 0.1794 mm	$D_{10} = 0.0075 \text{ mm}$					
C <sub>11</sub> =27.213	$C_c = 9.127$					

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Boring ID: --- Sample Type: bag Tested By: ckg Sample ID: PDI-117SPT-11-29.1-191(Test Date: 10/31/19 Checked By: bfs

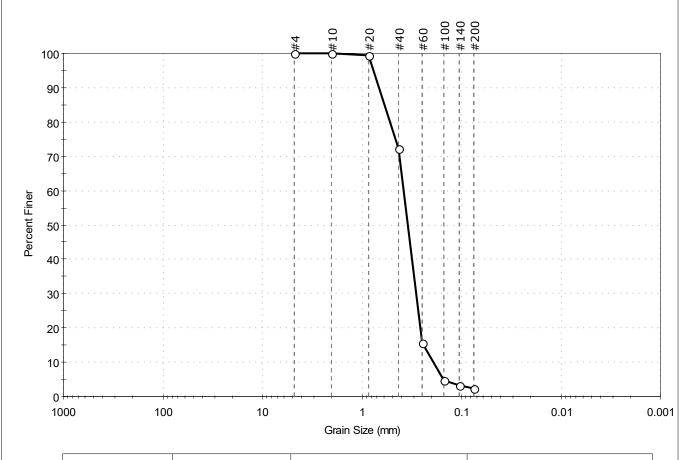
Depth: --- Test Id: 527592

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	%Sand	% Silt & Clay Size
_	0.0	97.6	2.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	72		
#60	0.25	16		
#100	0.15	5		
#140	0.11	3		
#200	0.075	2.4		

<u>Coefficients</u>		
D <sub>85</sub> = 0.5889 mm	$D_{30} = 0.2860 \text{ mm}$	
D <sub>60</sub> = 0.3791 mm	$D_{15} = 0.2421 \text{ mm}$	
D <sub>50</sub> = 0.3451 mm	$D_{10} = 0.1922 \text{ mm}$	
C <sub>u</sub> =1.972	C <sub>c</sub> =1.123	

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By:

ckg Sample ID: PDI-117SPT-29.1-32-191(Test Date: 10/24/19 Checked By: bfs

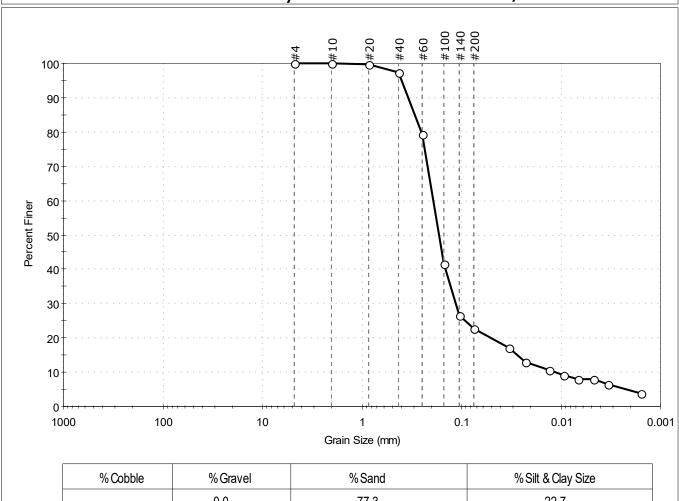
527593 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	77.3	22.7

		•		•
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	79		
#100	0.15	42		
#140	0.11	27		
#200	0.075	23		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0331	17		
	0.0225	13		
	0.0132	10		
	0.0094	9		
	0.0067	8		
	0.0047	8		
	0.0034	7		
	0.0016	4		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2955 mm	$D_{30} = 0.1146 \text{ mm}$			
D <sub>60</sub> = 0.1923 mm	$D_{15} = 0.0271 \text{ mm}$			
D <sub>50</sub> = 0.1680 mm	$D_{10} = 0.0117 \text{ mm}$			
C <sub>u</sub> =16.436	$C_c = 5.837$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-117SPT-44.1-53.5-19Test Date: 10/31/19 Checked By: bfs

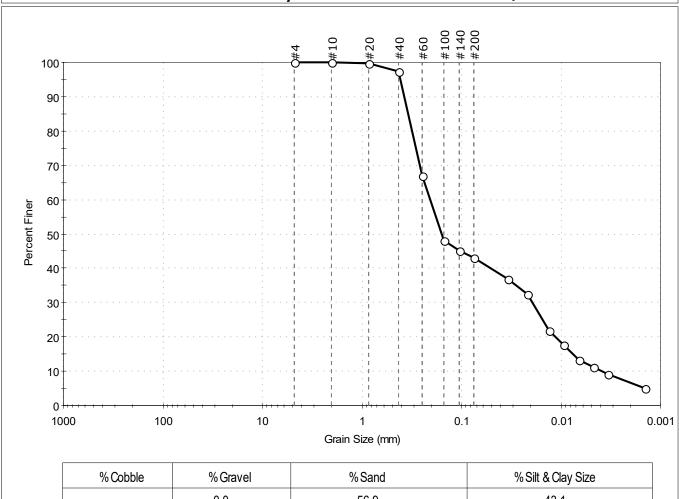
527594 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	56.9	43.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	67		
#100	0.15	48		
#140	0.11	45		
#200	0.075	43		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0340	37		
	0.0218	33		
	0.0131	22		
	0.0093	18		
	0.0067	13		
	0.0047	11		
	0.0034	9		
	0.0014	5		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3430 mm	$D_{30} = 0.0193 \text{ mm}$			
D <sub>60</sub> = 0.2072 mm	$D_{15} = 0.0076 \text{ mm}$			
D <sub>50</sub> = 0.1576 mm	$D_{10} = 0.0039 \text{ mm}$			
C <sub>11</sub> =53.128	$C_c = 0.461$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Clayey Soils (A-7-6 (3))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 ckg

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-117SPT-53.5-63.5-19Test Date: 10/24/19 Checked By: bfs

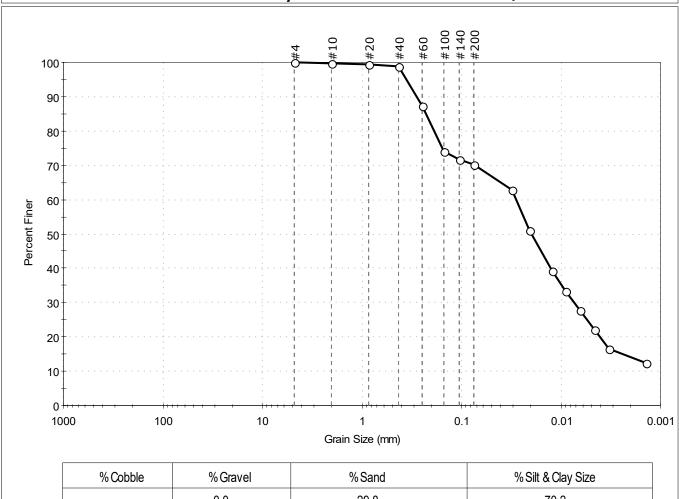
527595 Depth: Test Id:

Test Comment:

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	29.8	70.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	87		
#100	0.15	74		
#140	0.11	72		
#200	0.075	70		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0310	63		
	0.0205	51		
	0.0123	39		
	0.0089	33		
	0.0064	28		
	0.0046	22		
	0.0033	17		
	0.0014	12		

<u>Coefficients</u>		
D <sub>85</sub> = 0.2293 mm	$D_{30} = 0.0073 \text{ mm}$	
D <sub>60</sub> = 0.0281 mm	D <sub>15</sub> =0.0024 mm	
D <sub>50</sub> = 0.0196 mm	$D_{10} = N/A$	
C <sub>u</sub> =N/A	C <sub>c</sub> =N/A	

<u>Classification</u> SILT with Sand (ML) **ASTM** AASHTO Clayey Soils (A-7-5 (9))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-118SPT-00-4.5-1910 Test Date: 10/24/19 Checked By: bfs

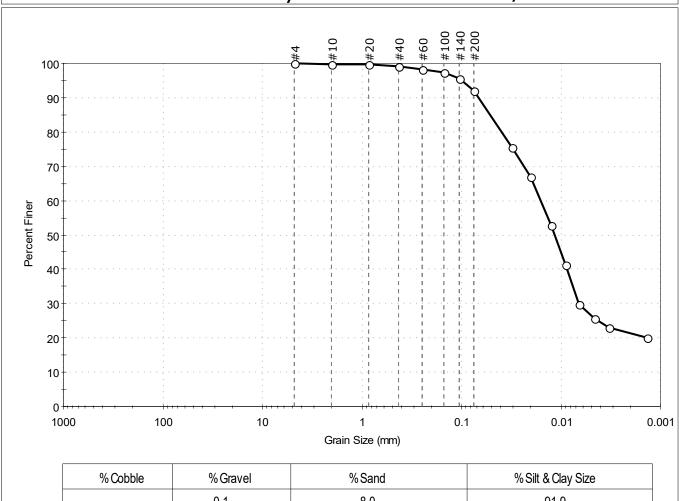
527596 Depth: Test Id:

Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.1	8.0	91.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	98		
#100	0.15	97		
#140	0.11	95		
#200	0.075	92		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0313	76		
	0.0204	67		
	0.0125	53		
	0.0091	41		
	0.0065	30		
	0.0047	26		
	0.0033	23		
	0.0014	20		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0518 mm	$D_{30} = 0.0066 \text{ mm}$			
D <sub>60</sub> = 0.0161 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0116 mm	$D_{10} = N/A$			
C <sub>II</sub> =N/A	$C_C = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (37))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-118SPT-4.5-15-1910 Test Date: 10/24/19 Checked By: bfs

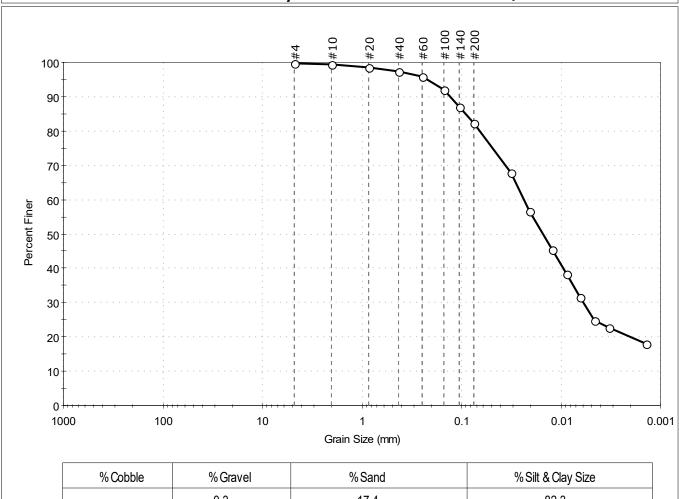
527597 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.3	17.4	82.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	97		
#60	0.25	96		
#100	0.15	92		
#140	0.11	87		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0316	68		
	0.0206	57		
	0.0123	45		
	0.0088	38		
	0.0064	32		
	0.0046	25		
	0.0033	23		
	0.0014	18		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0914 mm	$D_{30} = 0.0059 \text{ mm}$			
D <sub>60</sub> = 0.0234 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0152 mm	$D_{10} = N/A$			
C <sub>u</sub> =N/A	$C_c = N/A$			

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (34))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-118SPT-46.5-61-191(Test Date: 10/24/19 Checked By: bfs

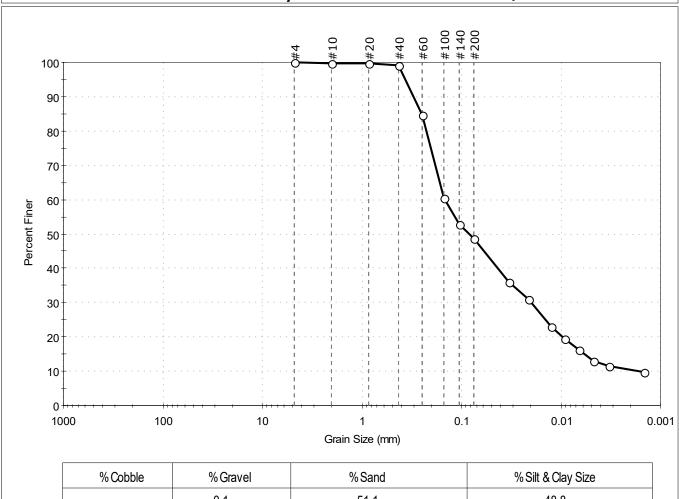
527598 Depth: Test Id:

Test Comment:

Visual Description: Wet, dark grayish brown silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	51.1	48.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	85		
#100	0.15	60		
#140	0.11	53		
#200	0.075	49		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0337	36		
	0.0210	31		
	0.0127	23		
	0.0092	20		
	0.0065	16		
	0.0047	13		
	0.0033	11		
	0.0015	10		

<u>Coefficients</u>					
D <sub>85</sub> = 0.2537 mm	$D_{30} = 0.0197 \text{ mm}$				
D <sub>60</sub> = 0.1474 mm	$D_{15} = 0.0057 \text{ mm}$				
D <sub>50</sub> = 0.0832 mm	$D_{10} = 0.0016 \text{ mm}$				
C <sub>11</sub> =92.125	$C_c = 1.646$				

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Soils (A-4 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-119SPT-00-4.5-1910(Test Date: 10/25/19 Checked By: bfs

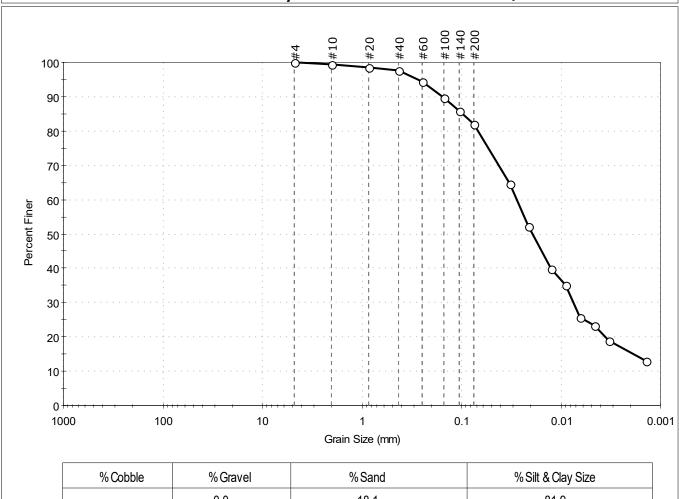
527599 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	18.1	81.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	95		
#100	0.15	90		
#140	0.11	86		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0329	64		
	0.0210	52		
	0.0126	40		
	0.0090	35		
	0.0065	26		
	0.0046	23		
	0.0033	19		
	0.0014	13		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0981 mm	$D_{30} = 0.0075 \text{ mm}$			
D <sub>60</sub> = 0.0279 mm	$D_{15} = 0.0019 \text{ mm}$			
D <sub>50</sub> = 0.0191 mm	$D_{10} = N/A$			
C <sub>u</sub> =N/A	$C_c = N/A$			

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (37))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-119SPT-18.3-31-191(Test Date: 10/29/19 Checked By: bfs

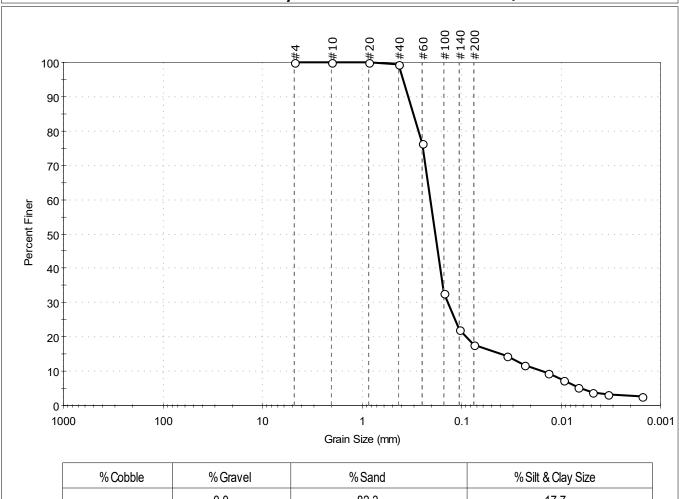
527600 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
-	0.0	82.3	17.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
	,			
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	76		
#100	0.15	33		
#140	0.11	22		
#200	0.075	18		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0350	15		
	0.0231	12		
	0.0134	10		
	0.0095	7		
	0.0067	5		
	0.0048	4		
	0.0034	3		
	0.0015	3		

<u>Coefficients</u>					
D <sub>85</sub> = 0.3051 mm	$D_{30} = 0.1369 \text{ mm}$				
D <sub>60</sub> = 0.2063 mm	$D_{15} = 0.0393 \text{ mm}$				
D <sub>50</sub> = 0.1835 mm	$D_{10} = 0.0149 \text{ mm}$				
C <sub>11</sub> =13.846	$C_c = 6.097$				

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 ckg

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-119SPT-47-52-19100Test Date: 10/25/19 Checked By: bfs

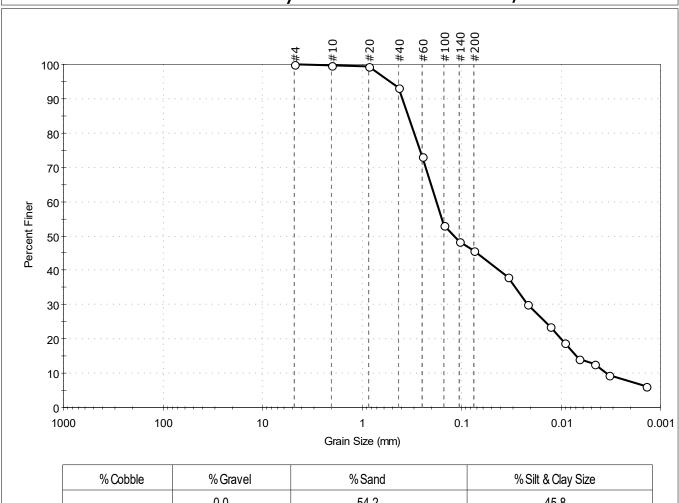
Test Id: Depth: 527601

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	54.2	45.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	93		
#60	0.25	73		
#100	0.15	53		
#140	0.11	48		
#200	0.075	46		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0339	38		
	0.0216	30		
	0.0127	24		
	0.0092	19		
	0.0066	14		
	0.0047	13		
	0.0033	9		
	0.0014	6		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3420 mm	$D_{30} = 0.0214 \text{ mm}$			
D <sub>60</sub> = 0.1784 mm	$D_{15} = 0.0069 \text{ mm}$			
D <sub>50</sub> = 0.1186 mm	$D_{10} = 0.0035 \text{ mm}$			
C <sub>11</sub> =50.971	$C_c = 0.733$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Soils (A-4 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Tested By: ckg

Boring ID: ---Sample Type: bag Sample ID: PDI-119SPT-9.5-18.3-191Test Date: 10/25/19 Checked By: bfs

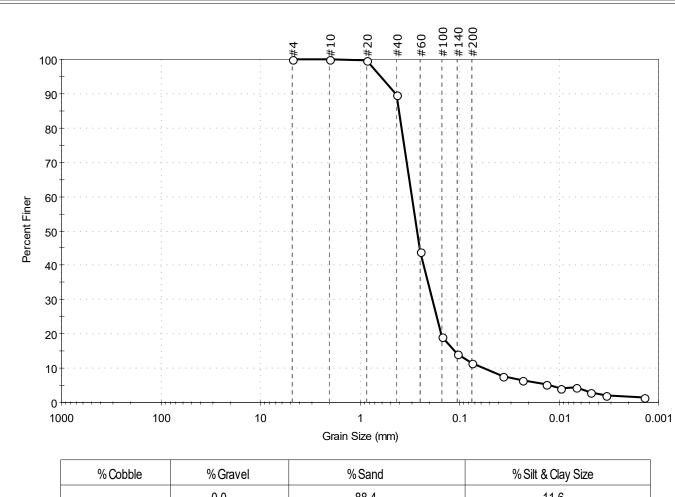
Depth: Test Id: 527602

Test Comment:

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	88.4	11.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
	,			·
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	90		
#60	0.25	44		
#100	0.15	19		
#140	0.11	14		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0370	8		
	0.0233	7		
	0.0135	5		
	0.0096	4		
	0.0067	4		
	0.0048	3		
	0.0034	2		
	0.0014	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.4029 mm	$D_{30} = 0.1875 \text{ mm}$			
D <sub>60</sub> = 0.3010 mm	$D_{15} = 0.1128 \text{ mm}$			
D <sub>50</sub> = 0.2679 mm	$D_{10} = 0.0555 \text{ mm}$			
C <sub>u</sub> =5.423	$C_c = 2.104$			

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 ckg

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-121SPT-00-06-19093Test Date: 10/29/19 Checked By: bfs

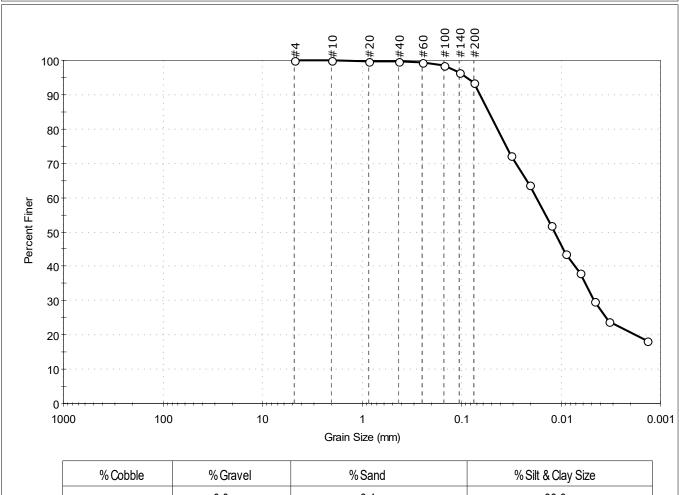
527603 Depth: Test Id:

Test Comment:

Visual Description: Moist, olive brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	6.4	93.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	99		
#140	0.11	97		
#200	0.075	94		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0319	72		
	0.0209	64		
	0.0125	52		
	0.0090	44		
	0.0064	38		
	0.0046	30		
	0.0033	24		
	0.0014	18		

<u>Coefficients</u>			
D <sub>85</sub> = 0.0532 mm	$D_{30} = 0.0046 \text{ mm}$		
D <sub>60</sub> = 0.0178 mm	$D_{15} = N/A$		
D <sub>50</sub> = 0.0115 mm	$D_{10} = N/A$		
C <sub>II</sub> =N/A	$C_C = N/A$		

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (38))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-121SPT-11-20.7-190sTest Date: 10/30/19 Checked By: bfs

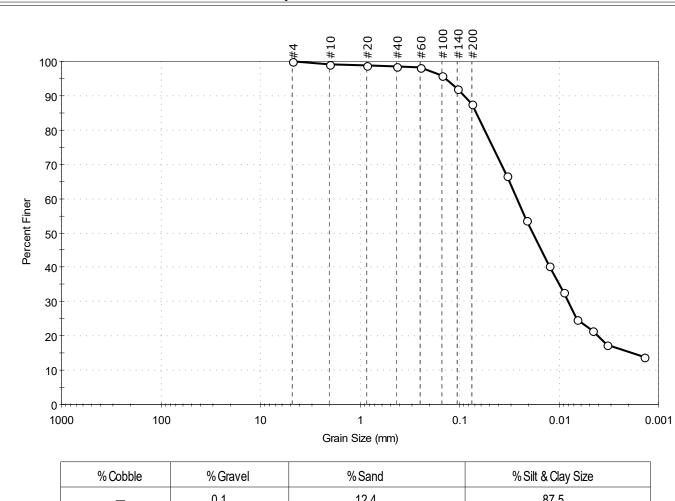
Depth: Test Id: 527604

Test Comment:

Visual Description: Moist, dark olive brown silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	12.4	87.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	96		
#140	0.11	92		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0331	67		
	0.0212	54		
	0.0126	41		
	0.0091	33		
	0.0065	25		
	0.0046	21		
	0.0033	18		
	0.0014	14		

<u>coemeients</u>						
D <sub>85</sub> = 0.0679 mm	$D_{30} = 0.0081 \text{ mm}$					
D <sub>60</sub> = 0.0264 mm	$D_{15} = 0.0018 \text{ mm}$					
D <sub>50</sub> = 0.0184 mm	$D_{10} = N/A$					
$C_u = N/A$	$C_c = N/A$					

Coefficients

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (26))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 ckg

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-121SPT-21-38-19093Test Date: 10/29/19 Checked By: bfs

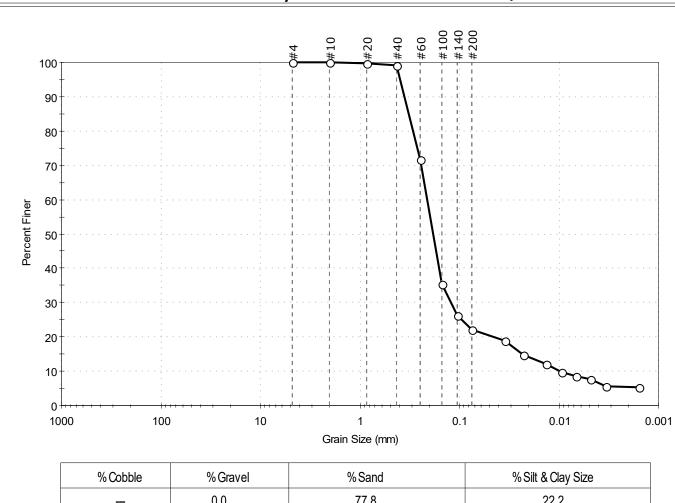
527605 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark olive gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	77.8	22.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	72		
#100	0.15	35		
#140	0.11	26		
#200	0.075	22		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0352	19		
	0.0226	15		
	0.0135	12		
	0.0095	10		
	0.0068	9		
	0.0048	8		
	0.0034	6		
	0.0016	5		

<u>Coefficients</u>					
D <sub>85</sub> = 0.3231 mm	$D_{30} = 0.1227 \text{ mm}$				
D <sub>60</sub> = 0.2122 mm	D <sub>15</sub> =0.0231 mm				
D <sub>50</sub> = 0.1844 mm	$D_{10} = 0.0098 \text{ mm}$				
C <sub>11</sub> =21.653	$C_c = 7.240$				

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-121SPT-49.4-54-190sTest Date: 10/25/19 Checked By: bfs

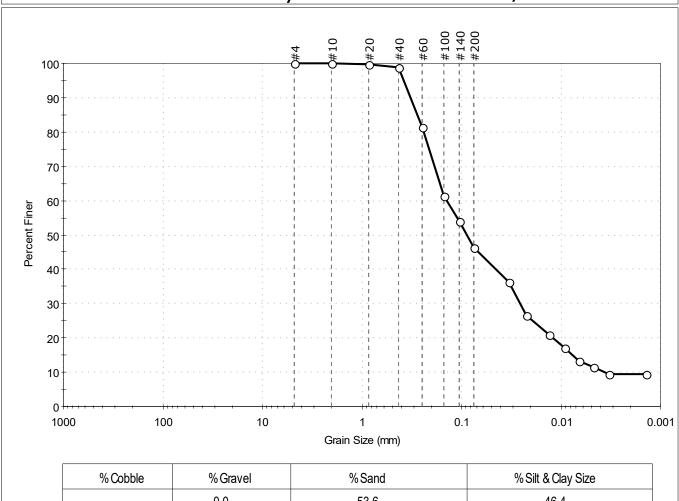
527606 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



	% Cobbl	e	% Gravel		% Sand		% Silt 8	& Clay Size
	-		0.0		53.6			46.4
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies			<u>Coeffi</u>	<u>cients</u>
						$D_{85} = 0.27$	88 mm	$D_{30} = 0.0256 \text{ mm}$
#4	1 75	100						

				·
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	81		
#100	0.15	61		
#140	0.11	54		
#200	0.075	46		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0337	36		
	0.0337 0.0220	36 27		
	0.0220	27		
	0.0220 0.0131	27 21		
	0.0220 0.0131 0.0093	27 21 17		
	0.0220 0.0131 0.0093 0.0066	27 21 17 13		
	0.0220 0.0131 0.0093 0.0066 0.0047	27 21 17 13 11		

D <sub>85</sub> = 0.2788 mm	$D_{30} = 0.0256 \text{ mm}$
D <sub>60</sub> = 0.1404 mm	$D_{15} = 0.0077 \text{ mm}$
D <sub>50</sub> = 0.0886 mm	$D_{10} = 0.0036 \text{ mm}$
$C_u = 39.000$	C <sub>c</sub> =1.297

<u>Classification</u> Silty SAND (SM) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (3))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

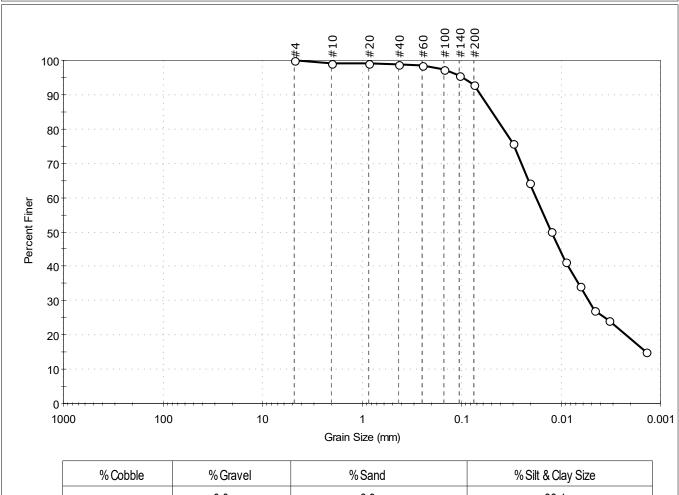
Sample ID: PDI-122SPT-04-09-19092Test Date: 11/07/19 Checked By: bfs

527607 Depth: Test Id:

Test Comment:

Visual Description: Wet, olive brown silt Sample Comment: Sample contains organics

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	6.9	93.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	97		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0306	76		
	0.0209	64		
	0.0124	50		
	0.0089	41		
	0.0064	34		
	0.0046	27		
	0.0033	24		
	0.0014	15		

<u>Coefficients</u>					
D <sub>85</sub> = 0.0494 mm	$D_{30} = 0.0053 \text{ mm}$				
D <sub>60</sub> = 0.0178 mm	$D_{15} = N/A$				
D <sub>50</sub> = 0.0124 mm	$D_{10} = N/A$				
C <sub>u</sub> =N/A	$C_c = N/A$				

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (40))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Separation of Sample: #200 Sieve

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-122SPT-16.6-24-190STest Date: 11/07/19 Checked By: bfs

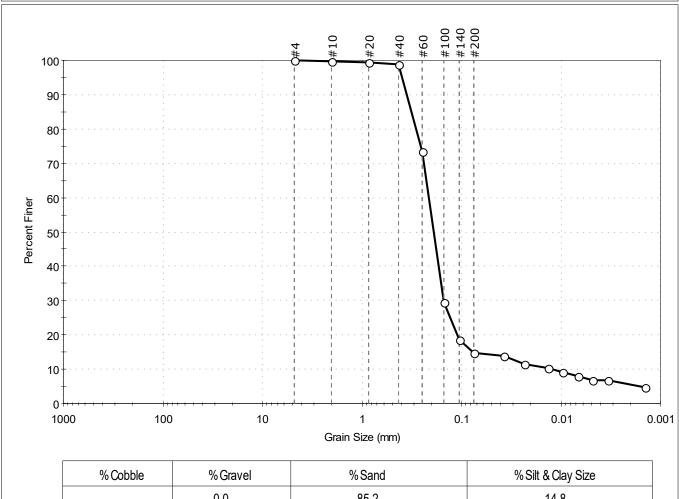
527608 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	85.2	14.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	74		
#100	0.15	30		
#140	0.11	19		
#200	0.075	15		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0377	14		
	0.0232	12		
	0.0135	10		
	0.0095	9		
	0.0068	8		
	0.0048	7		
	0.0034	7		
	0.0014	5		

<u>Coefficients</u>					
D <sub>85</sub> = 0.3182 mm	$D_{30} = 0.1506 \text{ mm}$				
D <sub>60</sub> = 0.2136 mm	D <sub>15</sub> = 0.0767 mm				
D <sub>50</sub> = 0.1901 mm	$D_{10} = 0.0120 \text{ mm}$				
$C_{II} = 17.800$	$C_c = 8.848$				

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-122SPT-61-66-19092Test Date: 10/30/19 Checked By: bfs

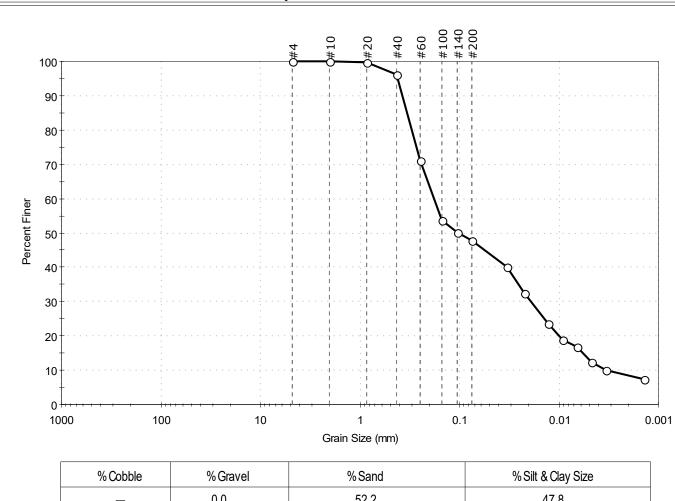
527609 Depth: Test Id:

Test Comment:

Visual Description: Wet, olive brown silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	52.2	47.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	96		
#60	0.25	71		
#100	0.15	54		
#140	0.11	50		
#200	0.075	48		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0332	40		
	0.0222	32		
	0.0130	23		
	0.0093	19		
	0.0066	17		
	0.0047	12		
	0.0034	10		
	0.0014	7		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3352 mm	$D_{30} = 0.0192 \text{ mm}$			
D <sub>60</sub> = 0.1803 mm	$D_{15} = 0.0058 \text{ mm}$			
D <sub>50</sub> = 0.1049 mm	$D_{10} = 0.0033 \text{ mm}$			
Cu =54.636	$C_c = 0.620$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Clayey Soils (A-6 (3))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Sample Type: bag Tested By: ckg

Boring ID: ---Sample ID: PDI-123SPT-00-4.5-1909ZTest Date: 10/29/19 Checked By: bfs

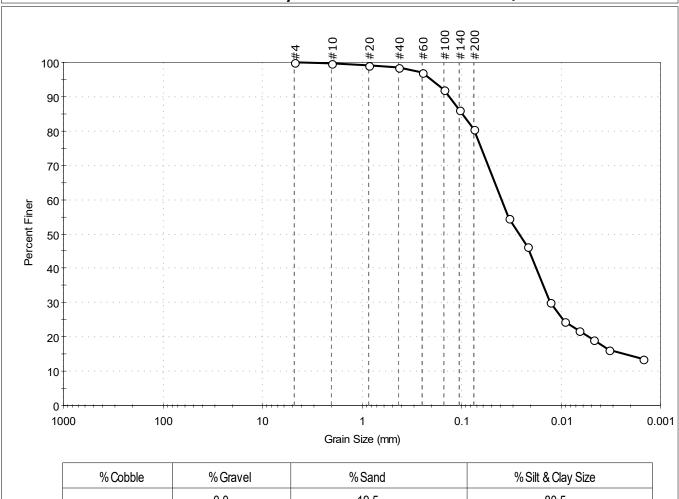
Depth: Test Id: 527610

Test Comment:

Visual Description: Wet, dark olive silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	19.5	80.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	97		
#100	0.15	92		
#140	0.11	86		
#200	0.075	80		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0335	54		
	0.0217	46		
	0.0129	30		
	0.0092	25		
	0.0066	22		
	0.0047	19		
	0.0033	16		
	0.0015	14		

<u>Coefficients</u>				
D <sub>85</sub> =0.0992 mm	$D_{30} = 0.0129 \text{ mm}$			
D <sub>60</sub> = 0.0398 mm	D <sub>15</sub> =0.0022 mm			
D <sub>50</sub> = 0.0264 mm	$D_{10} = N/A$			
C <sub>u</sub> =N/A	$C_c = N/A$			

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (23))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-123SPT-25.5-30.5-19Test Date: 11/11/19 Checked By: bfs

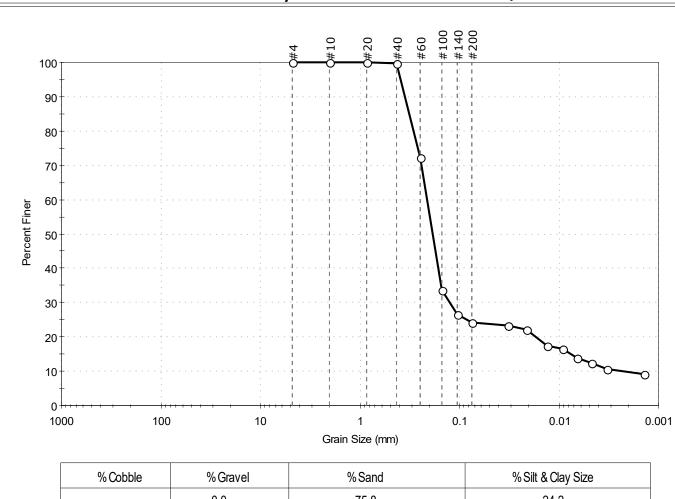
Depth: Test Id: 527611

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	75.8	24.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	72		
#100	0.15	34		
#140	0.11	27		
#200	0.075	24		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0326	23		
	0.0211	22		
	0.0131	17		
	0.0093	16		
	0.0066	14		
	0.0047	12		
	0.0033	11		
	0.0014	9		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3204 mm	$D_{30} = 0.1255 \text{ mm}$			
D <sub>60</sub> = 0.2128 mm	D <sub>15</sub> = 0.0076 mm			
D <sub>50</sub> = 0.1865 mm	$D_{10} = 0.0023 \text{ mm}$			
C <sub>11</sub> =92.522	$C_c = 32.180$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No:

Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-123SPT-63.2-65.5-19Test Date: 11/05/19 Checked By: bfs

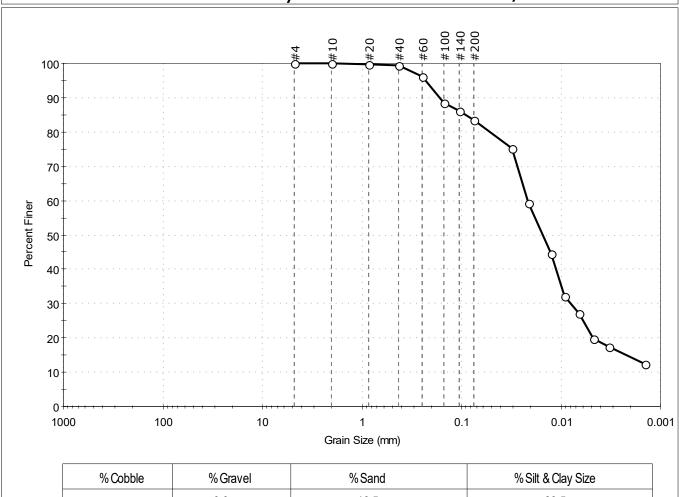
Depth: Test Id: 527612

Test Comment:

Visual Description: Moist, dark olive brown silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size		
_	0.0	16.5	83.5		

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	96		
#100	0.15	89		
#140	0.11	86		
#200	0.075	83		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0313	75		
	0.0210	59		
	0.0125	44		
	0.0091	32		
	0.0065	27		
	0.0047	20		
	0.0033	17		
	0.0014	12		

<u>Coe</u> t	<u>fficients</u>
D <sub>85</sub> = 0.0911 mm	$D_{30} = 0.0079 \text{ mm}$
D <sub>60</sub> = 0.0214 mm	$D_{15} = 0.0022 \text{ mm}$
D <sub>50</sub> = 0.0152 mm	$D_{10} = N/A$
Cu =N/A	$C_c = N/A$

GTX-310685

<u>Classification</u> SILT with Sand (ML) **ASTM** 

AASHTO Clayey Soils (A-7-5 (13))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-19SC-B-05-07-19100Test Date: 10/29/19 Checked By: bfs

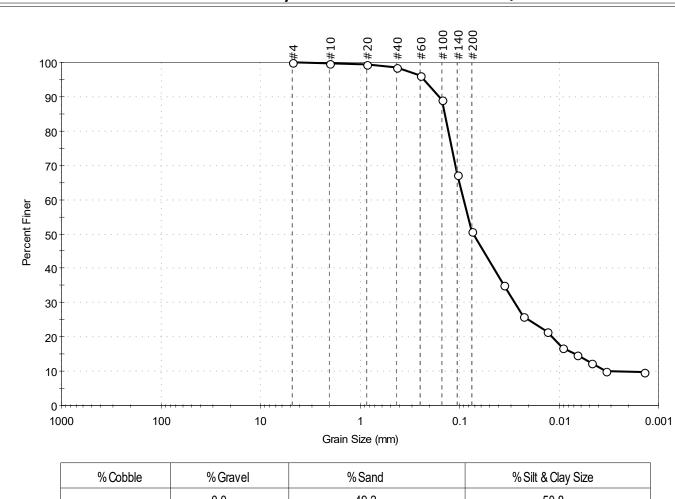
527549 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark olive brown sandy silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size		
_	0.0	49.2	50.8		

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	#4 4.75			
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	96		
#100	0.15	89		
#140	0.11	67		
#200	0.075	51		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0357	35		
	0.0226	26		
	0.0130	21		
	0.0093	17		
	0.0066	15		
	0.0047	12		
	0.0033	10		
	0.0014	10		

<u>Co</u>	<u>oefficients</u>	
D <sub>85</sub> = 0.1405 mm	$D_{30} = 0.0277 \text{ mm}$	
D <sub>60</sub> = 0.0909 mm	$D_{15} = 0.0070 \text{ mm}$	
D <sub>50</sub> = 0.0722 mm	$D_{10} = 0.0024 \text{ mm}$	
C <sub>11</sub> =37.875	$C_c = 3.517$	

<u>Classification</u> Sandy SILT (ML) **ASTM** 

AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-018SC-A-06-07-1909Test Date: 10/08/19 Checked By: bfs

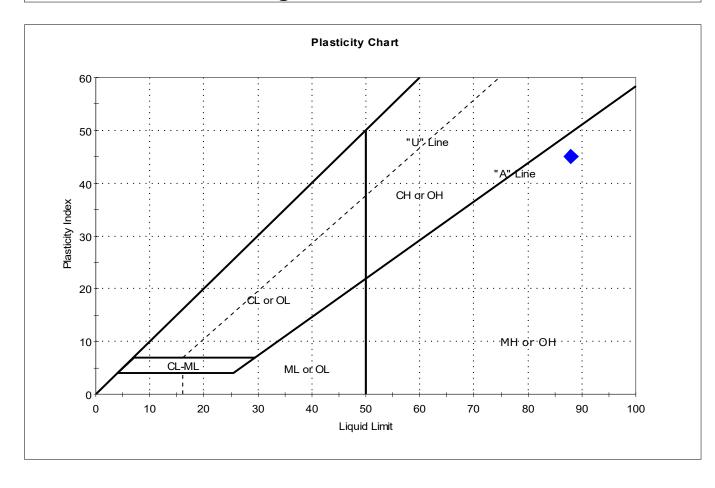
Depth: --- Test Id: 525962

Test Comment: ---

Visual Description: Moist, very dark gray silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	D18SC-A-06-07-19			77	88	43	45	0.8	Elastic SILT (MH)

Sample Prepared using the WET method

5% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

525963

Sample ID: PDI-018SC-A-08-09-1909Test Date: 10/09/19 Checked By: bfs

Test Id: Depth: Test Comment:

Visual Description: Moist, very dark gray sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)18SCA-08-09-19			23	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

12% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-021SC-B-7.7-9.7-190Test Date: 10/09/19 Checked By: bfs Depth: --- Test Id: 525964

Test Comment: ---

Visual Description: Moist, very dark gray sand with silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	21SC-B-7.7-9.7-19			13	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

18% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-024SC-B-10-12.1-19(Test Date: 10/09/19 Checked By: bfs

Depth: --- Test Id: 525965

Test Comment: ---

Visual Description: Moist, very dark gray sand with silt Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	24SC-B-10-12.1-19			38	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

0% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

526418

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-028SC-10.7-12.7-191Test Date: 10/14/19 Checked By: bfs

Depth: --- Test Id:
Test Comment: ---

Visual Description: Moist, very dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	28SC-10.7-12.7-19			15	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

23% Retained on #40 Sieve

Dry Strength: NONE Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-036SC-B-4.2-6.2-190Test Date: 10/09/19 Checked By: bfs

Depth: --- Test Id: 525966

Test Comment: ---

Visual Description: Moist, very dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	36SC-B-4.2-6.2-19			14	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

28% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-039SC-B-7.8-9.8-190Test Date: 10/09/19 Checked By: bfs

Depth: --- Test Id: 525970

Visual Description: Moist, very dark gray sand with silt

Sample Comment: ---

Test Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	39SC-B-7.8-9.8-19			40	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-046SC-B-9.8-11.8-19Test Date: 10/09/19 Checked By: bfs

Depth: --- Test Id: 525968

Test Comment: --Visual Description: Moist, very dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	\$6SC-B-9.8-11.8-1			24	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: --- Sample Type: bag Tested By: can Sample ID: PDI-064SC-B-04-06-1909Test Date: 10/11/19 Checked By: bfs

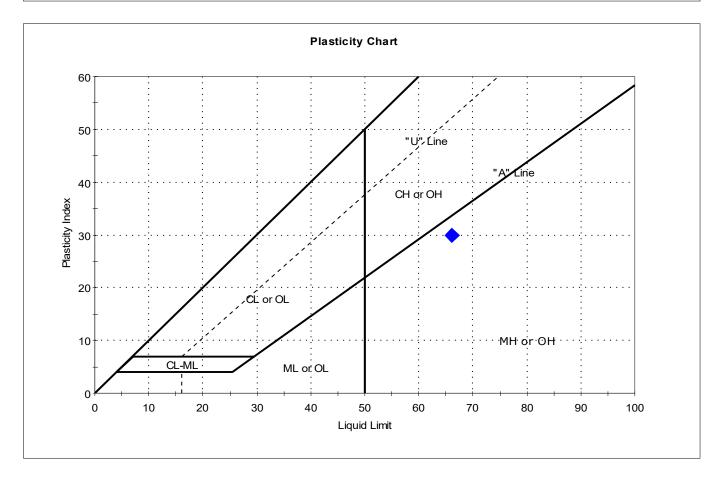
Depth: --- Test Id: 525967

Test Comment: ---

Visual Description: Moist, very dark gray silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	064SC-B-04-06-19			66	66	36	30	1	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: Sample Type: bag

Boring ID: ---Tested By: cam Sample ID: PDI-071SC-B-08-10-1910Test Date: 10/15/19 Checked By: bfs

GTX-310685

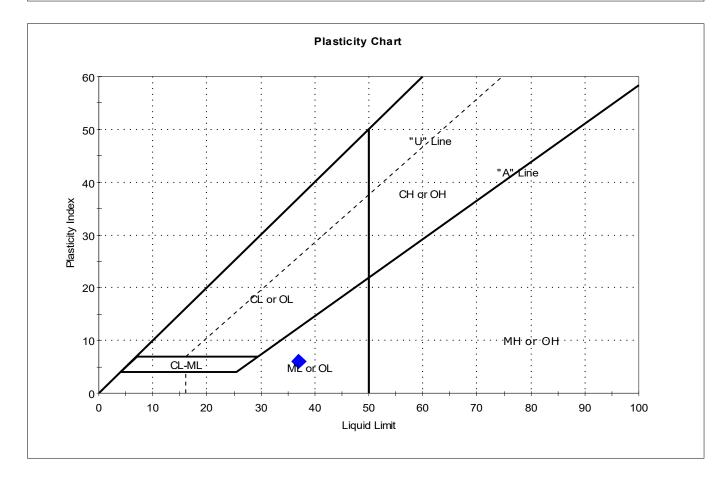
525969 Depth: Test Id:

Test Comment:

Visual Description: Wet, very dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	071SC-B-08-10-19			43	37	31	6	2	Silty SAND (SM)

Sample Prepared using the WET method

19% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-081SC-B-08-10-1910Test Date: 10/14/19 Checked By: bfs

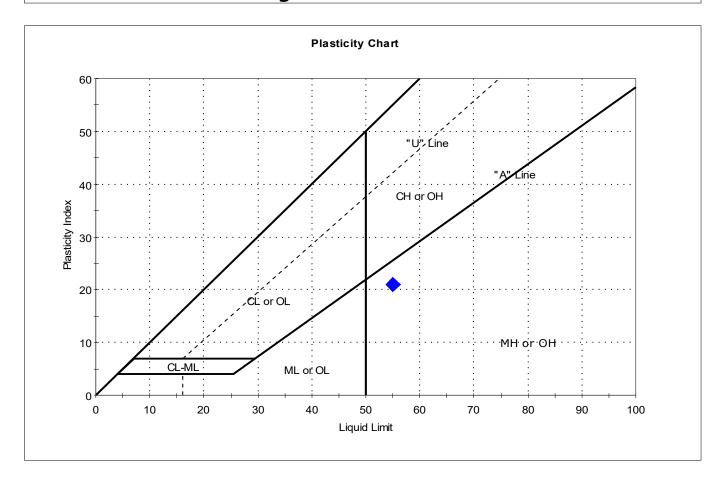
Depth: --- Test Id: 526419

Test Comment: ---

Visual Description: Wet, dark grayish olive silt with sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Syn	nbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
	<b>•</b>	081SC-B-08-10-19			64	55	34	21	1.4	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location:

Boring ID: --- Sample Type: bag

bag Tested By: cam 11/06/19 Checked By: bfs

GTX-310685

Sample ID: PDI-016SC-B-06-08-1910Test Date: 11/06/19

Depth: --- Test Id: 527477

Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	016SC-B-06-08-19			35	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-027SC-B-11-13.5-19ffest Date: 11/12/19 Checked By: bfs

Depth: --- Test Id: 527481

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	27SC-B-11-13.5-19			19	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

9% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-033SC-B-8.7-10.7-19Test Date: 11/01/19 Checked By: bfs

Depth: --- Test Id: 527480

Visual Description: Moist, dark grayish brown sand

Sample Comment: ---

Test Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	33SC-B-8.7-10.7-1			18	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

25% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-038SC-B-7.1-9.1-191Test Date: 10/25/19 Checked By: bfs Depth: --- Test Id: 527478

Test Comment: ---

Visual Description: Moist, dark gray sand with silt

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	38SC-B-7.1-9.1-19			20	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

35% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-041SC-B-8.2-10.2-19Test Date: 10/30/19 Checked By: bfs

Depth: --- Test Id: 527475
Test Comment: ---

Visual Description: Moist, dark grayish brown sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	\$1SC-B-8.2-10.2-1			29	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

4% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-049SC-B-06-08-1910Test Date: 11/05/19 Checked By: bfs

Depth: --- Test Id: 527484
Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	049SC-B-06-08-19			32	n/a	n/a	n/a	n/a	Silty SAND (SM)

4% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Sample ID: PDI-052SC-B-06-08-1910Test Date: 11/06/19 Checked By: bfs

Test Id: 527485 Depth:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

Test Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)52SC-B-06-08-19			45	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

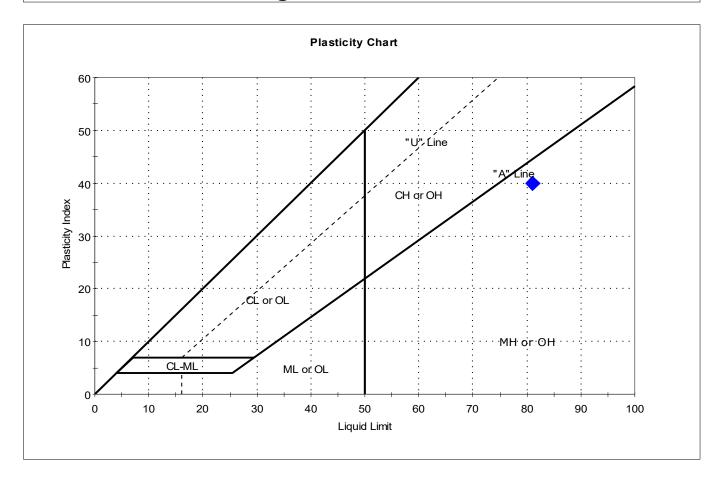
527482

Sample ID: PDI-066SC-B-06-08-1910Test Date: 11/13/19 Checked By: bfs

Depth: Test Id: Test Comment:

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	066SC-B-06-08-19			68	81	41	40	0.7	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: MEDIUM



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

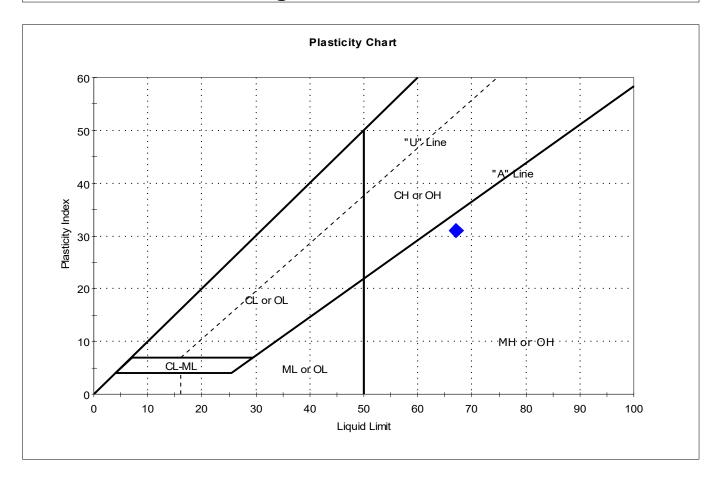
Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-067SC-B-02-04-1910Test Date: 11/11/19 Checked By: bfs Depth: --- Test Id: 527476

Depth: ---Test Comment: ---

Visual Description: Wet, dark olive brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	067SC-B-02-04-19			74	67	36	31	1.2	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-077SC-B-04-06-1910Test Date: 10/25/19 Checked By: bfs

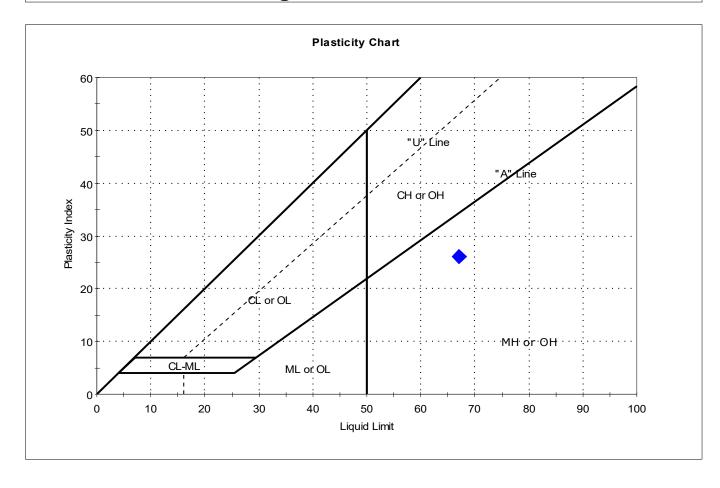
Depth: --- Test Id: 527473

Test Comment: ---

Visual Description: Wet, dark olive brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)77SC-B-04-06-19			81	67	41	26	1.6	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

527474

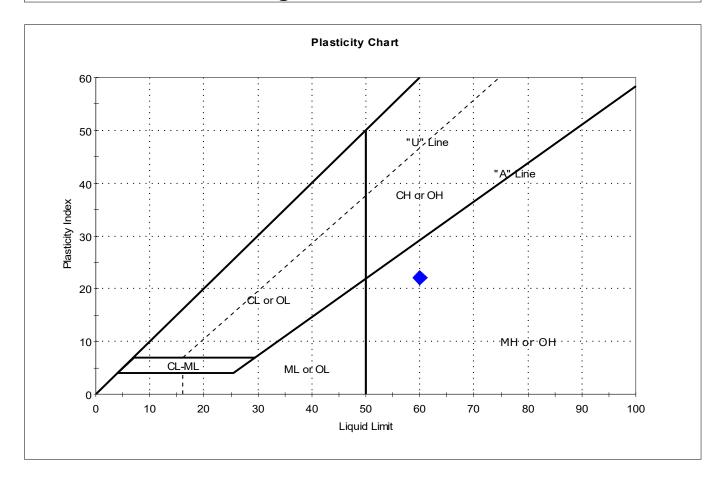
Sample ID: PDI-079SC-B-06-08-1910Test Date: 11/18/19 Checked By: bfs

Depth: Test Id: Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)79SC-B-06-08-19			115	60	38	22	3.5	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: MEDIUM



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

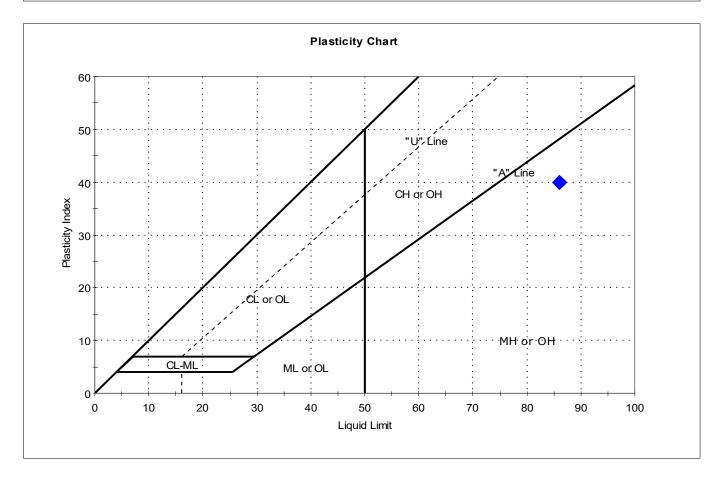
Sample ID: PDI-090SC-B-06-08-1910Test Date: 11/11/19 Checked By: bfs

527483 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)90SC-B-06-08-19			82	86	46	40	0.9	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-107SPT-00-04-19092Test Date: 11/12/19 Checked By: bfs

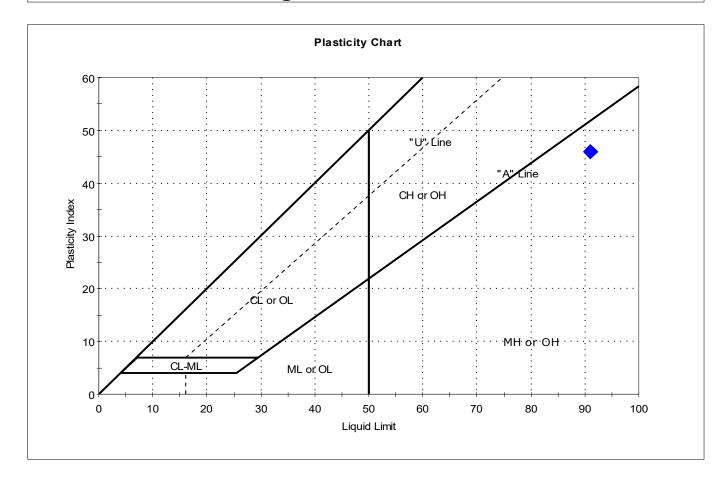
Depth: --- Test Id: 527486

Test Comment: ---

Visual Description: Wet, dark olive brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbo	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	107SPT-00-04-190			108	91	45	46	1.4	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: SLOW Toughness: MEDIUM



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

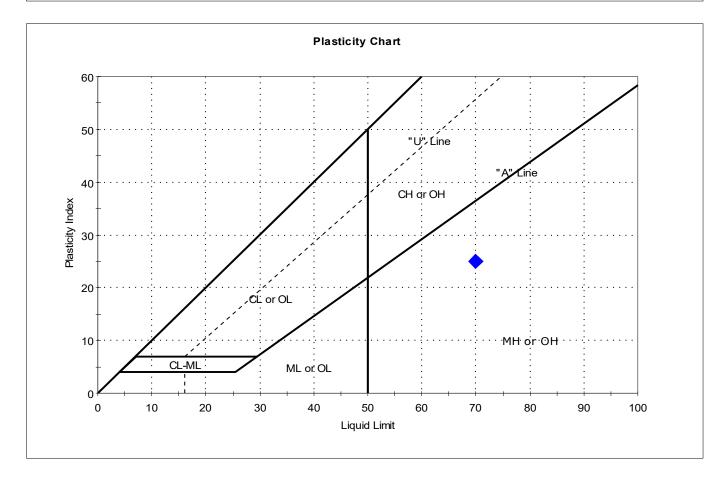
Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-107SPT-04-09-19092Test Date: 11/18/19 Checked By: bfs

Depth: --- Test Id: 527487

Test Comment: ---

Visual Description: Wet, dark olive brown silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	107SPT-04-09-190			84	70	45	25	1.6	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Sample ID: PDI-107SPT-17-18-19092Test Date: 11/11/19 Checked By: bfs

527488 Test Id: Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	107SPT-17-18-190			42	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-107SPT-62-64-19092Test Date: 10/28/19 Checked By: bfs

Depth: --- Test Id: 527489

Visual Description: Moist, dark olive brown silty sand

Sample Comment: ---

Test Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	107SPT-62-64-190			27	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Sample ID: PDI-108SPT-00-6.4-1910CTest Date: 11/11/19 Checked By: bfs

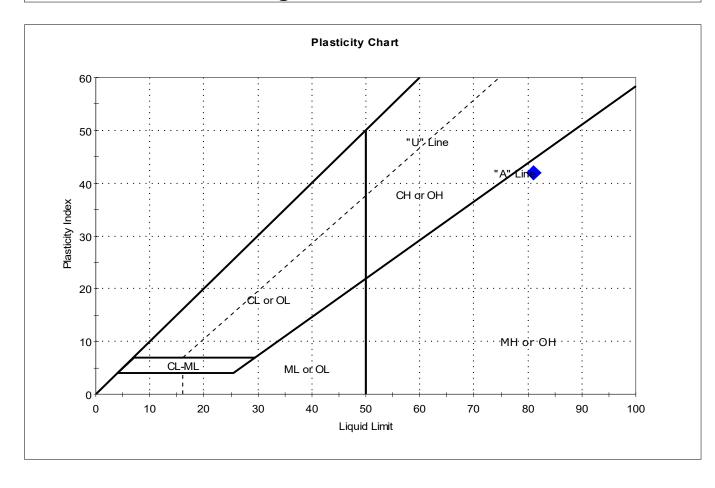
527490 Depth: Test Id:

Test Comment:

Visual Description: Wet, olive brown silt with sand

Sample Comment:

# Atterberg Limits - ASTM D4318



Syn	nbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
	•	108SPT-00-6.4-19:			95	81	39	42	1.3	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

8% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-108SPT-14-33.5-191(Test Date: 10/23/19 Checked By: bfs

Sample ID: PDI-108SPT-14-33.5-191(Test Date: 10/23/1 Depth: -- Test Id: 527491

Test Comment: ---

Visual Description: Moist, dark olive brown sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.08SPT-14-33.5-19			39	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

13% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

527492

Sample ID: PDI-108SPT-33.5-66.5-19Test Date: 10/28/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray sand with silt

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	08SPT-33.5-66.5-1			30	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

26% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

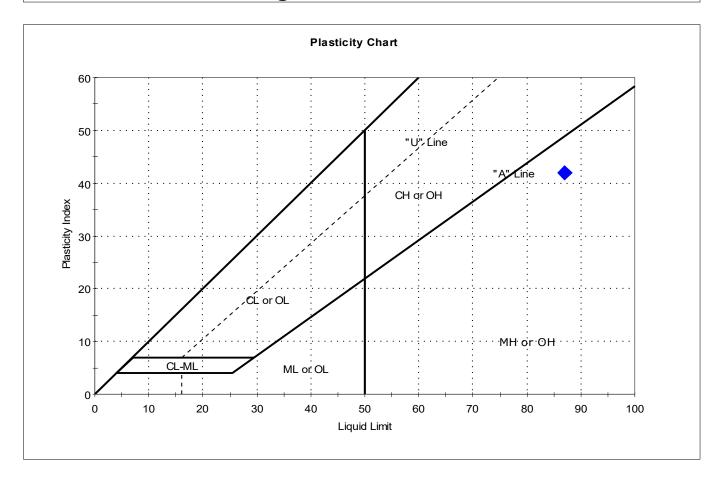
Sample ID: PDI-109SPT-00-6.5-1910CTest Date: 11/18/19 Checked By: n/a

Sample ID: PDI-109SPT-00-6.5-1910(Test Date: 11/18/19 C)
Depth: --- Test Id: 527493

Test Comment: ---

Visual Description: Wet, very dark olive silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	109SPT-00-6.5-19			93	87	45	42	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

3% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Anchor QEA, LLC Client: Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Sample ID: PDI-109SPT-16.5-18.1-19Test Date: 11/18/19 Checked By: bfs

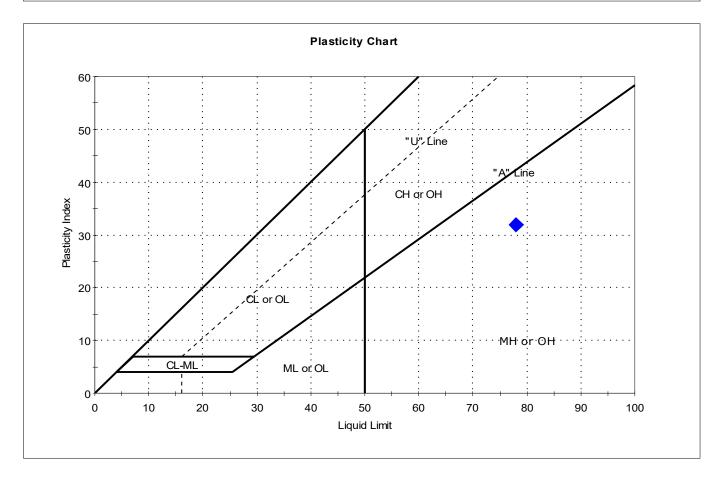
Depth: Test Id: 527494

Test Comment:

Visual Description: Moist, dark olive brown silt

Sample Comment:

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	D9SPT-16.5-18.1-1			80	78	46	32	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: MEDIUM



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-109SPT-22-30-19100Test Date: 10/25/19 Checked By: bfs

Depth: --- Test Id: 527495

Visual Description: Moist, olive brown sand with silt

Sample Comment: ---

Test Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	109SPT-22-30-191			35	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-109SPT-35.5-48.3-19Test Date: 10/24/19 Checked By: bfs

Depth: --- Test Id: 527496

Test Comment: --Visual Description: Moist, olive brown sand with silt

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	D9SPT-35.5-48.3-1			26	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-109SPT-48.3-51-191(Test Date: 11/12/19 Checked By: bfs

Depth: --- Test Id: 527497

Visual Description: Moist, dark olive brown silt with sand

Sample Comment: ---

Test Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	.09SPT-48.3-51-19			48	n/a	n/a	n/a	n/a	SILT with Sand (ML)

0% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-110 B-54-64.5-19101Test Date: 10/24/19 Checked By: bfs

Depth: --- Test Id: 527498

Test Comment: ---

Visual Description: Moist, black sand with silt

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	PDI-110 B-54-64.5-191015			18	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

38% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-110SPT-21-32-19101Test Date: 10/24/19 Checked By: bfs

Depth: --- Test Id: 527499

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	110SPT-21-32-191			24	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

6% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Sample ID: PDI-110SPT-32-45-19101Test Date: 10/24/19 Checked By: bfs Test Id: 527500

Test Comment:

Depth:

Visual Description: Moist, black sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	110SPT-32-45-191			28	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

41% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

Sample ID: PDI-112SPT-00-6.5-1910CTest Date: 11/11/19 Checked By: bfs 527501

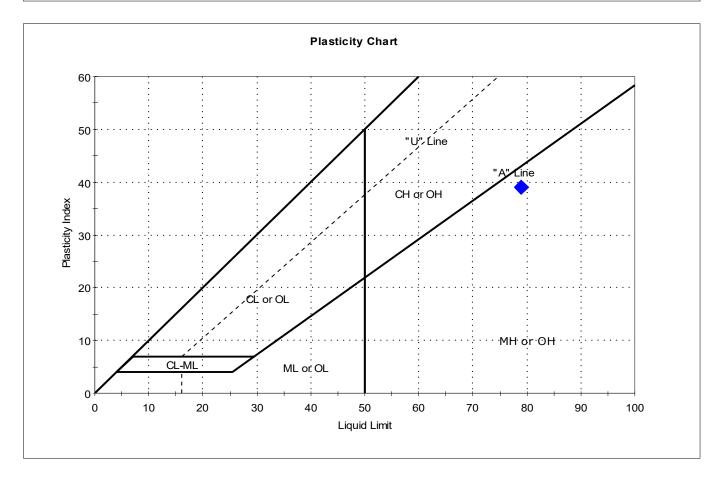
Depth: Test Id:

Test Comment:

Visual Description: Moist, dark brown silt

Sample Comment:

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	112SPT-00-6.5-19			77	79	40	39	0.9	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685
Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-112SPT-07-11.5-191(Test Date: 11/15/19 Checked By: bfs

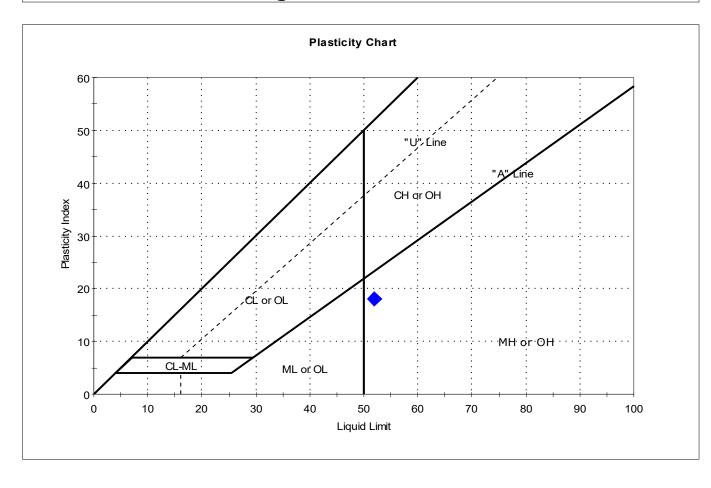
Depth: --- Test Id: 527502

Test Comment: ---

Visual Description: Moist, dark gray sandy silt

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	12SPT-07-11.5-19			53	52	34	18	1.1	Sandy Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-112SPT-11.5-26.5-19Test Date: 11/12/19 Checked By: bfs

Depth: --- Test Id: 527503

Test Comment: --Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	12SPT-11.5-26.5-1			37	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No:

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-112SPT-37.5-58-191(Test Date: 10/28/19 Checked By: bfs

GTX-310685

Depth: --- Test Id: 527504
Test Comment: ---

Visual Description: Moist, very dark olive gray silty sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.12SPT-37.5-58-19			19	n/a	n/a	n/a	n/a	Silty SAND (SM)

20% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-113SPT-06-16-19101Test Date: 11/13/19 Checked By: bfs

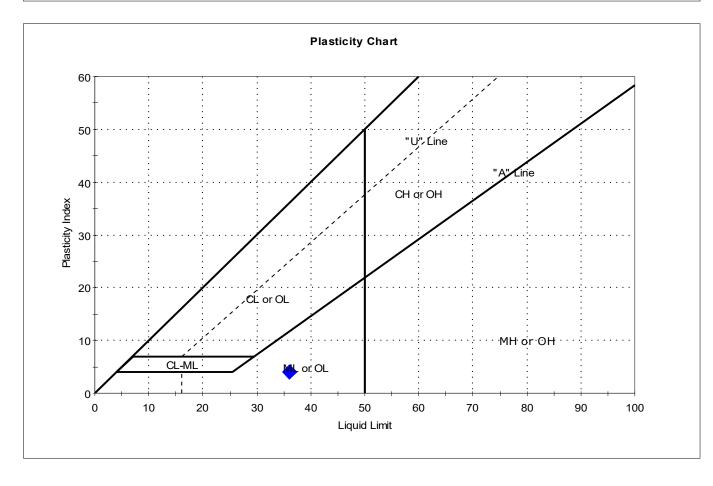
Sample ID: PDI-113SPT-06-16-19101Test Date: 11/13/19
Depth: --- Test Id: 527505

Test Comment: ---

Visual Description: Wet, dark grayish brown silt

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	113SPT-06-16-191			43	36	32	4	2.7	Silty SAND (SM)

Sample Prepared using the WET method

3% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685

527506

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-113SPT-16-22-19101Test Date: 10/23/19 Checked By: bfs

Depth: --- Test Id:
Test Comment: ---

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	113SPT-16-22-191			37	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

527507

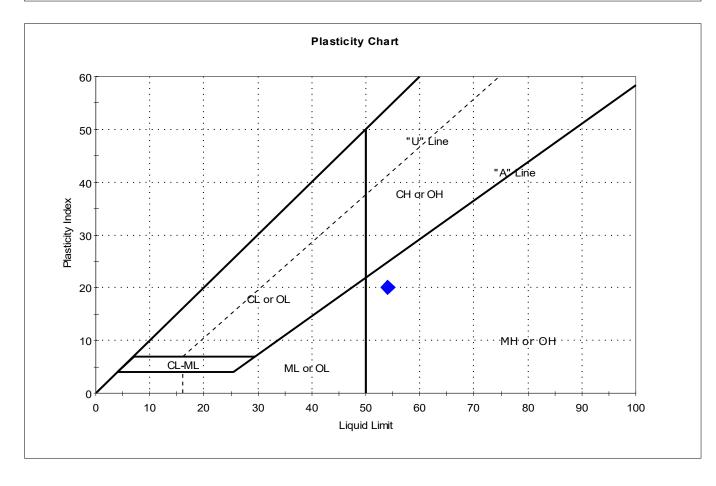
Sample ID: PDI-113SPT-22-25.2-191(Test Date: 11/12/19 Checked By: bfs

Depth: Test Id: Test Comment:

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment:

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.13SPT-22-25.2-19			61	54	34	20	1.3	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Project: Gasco PD: Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-113SPT-31.9-39.4-19Test Date: 10/23/19 Checked By: bfs

Depth: --- Test Id: 527508

Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	13SPT-31.9-39.4-1			33	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

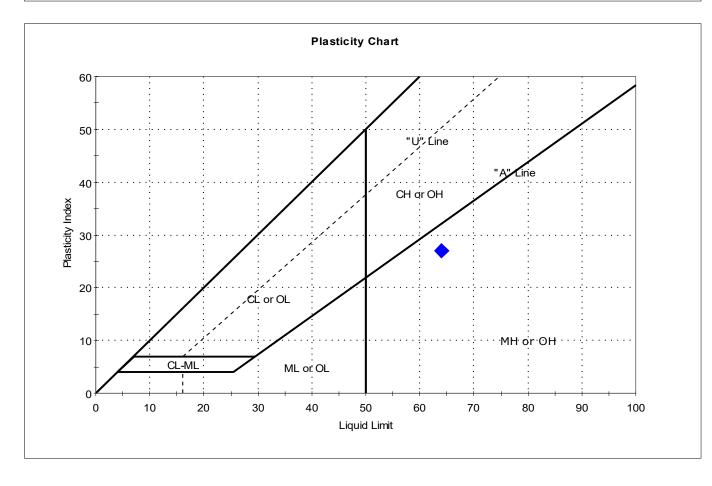
Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-114SPT-00-7.5-1910(Test Date: 11/11/19 Checked By: bfs Depth: --- Test Id: 527509

Depth: --- Test Id:
Test Comment: ---

Visual Description: Wet, olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	114SPT-00-7.5-19			73	64	37	27	1.3	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

527510

Sample ID: PDI-114SPT-25.5-28-191(Test Date: 10/30/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.14SPT-25.5-28-19			31	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-114SPT-42-50.5-191(Test Date: 11/15/19 Checked By: bfs

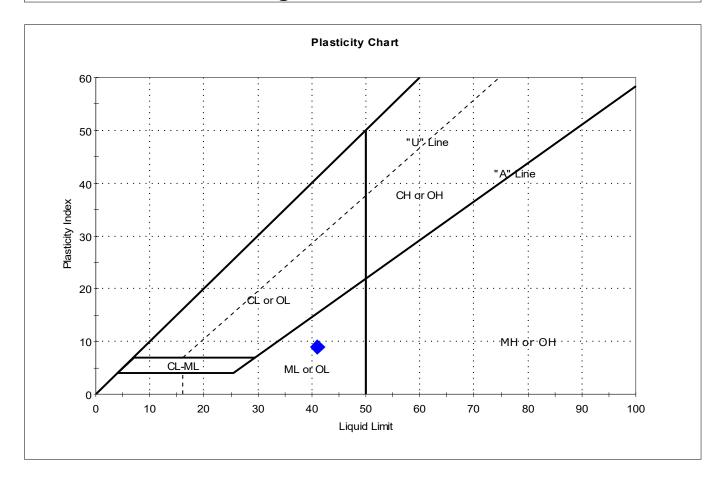
Depth: --- Test Id: 527511

Test Comment: ---

Visual Description: Wet, olive brown sandy silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.14SPT-42-50.5-19			50	41	32	9	2	Sandy SILT (ML)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-114SPT-50.5-55-191(Test Date: 10/28/19 Checked By: bfs

Depth: --- Test Id: 527512

Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	14SPT-50.5-55-19			37	n/a	n/a	n/a	n/a	Silty SAND (SM)

4% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-114SPT-7.5-12.5-191Test Date: 11/18/19 Checked By: bfs

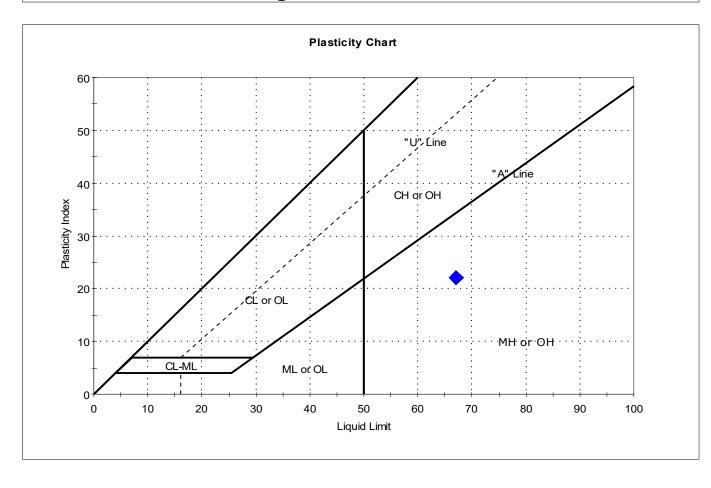
Depth: --- Test Id: 527513

Test Comment: ---

Visual Description: Moist, olive brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbo	I Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	14SPT-7.5-12.5-19			65	67	45	22	0.9	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

527514

Sample ID: PDI-115SPT-06-11-19100Test Date: 10/24/19 Checked By: bfs Test Id:

Test Comment:

Depth:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	115SPT-06-11-191			17	n/a	n/a	n/a	n/a	Silty SAND (SM)

11% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-115SPT-18.6-20.6-19Test Date: 11/13/19 Checked By: bfs

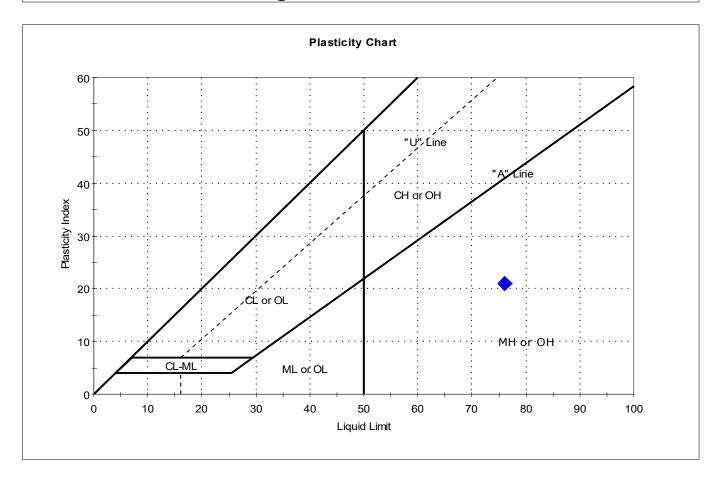
Depth: --- Test Id: 527515

Test Comment: ---

Visual Description: Moist, dark olive brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Sym	bol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
		15SPT-18.6-20.6-1			72	76	55	21	0.8	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: Sample Type: hag Tested By:

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-115SPT-23-28.1-191(Test Date: 10/24/19 Checked By: bfs

GTX-310685

Depth: --- Test Id: 527516

Visual Description: Moist, very dark olive brown sand with silt

Sample Comment: ---

Test Comment:

### Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	15SPT-23-28.1-19			28	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

5% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-115SPT-41.5-49.3-19Test Date: 10/25/19 Checked By: bfs

Depth: --- Test Id: 527517

Test Comment: --Visual Description: Moist, olive brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	15SPT-41.5-49.3-1			39	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Anchor QEA, LLC Client: Gasco PDI Project:

Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

Sample ID: PDI-116SPT-00-4.5-1909ZTest Date: 11/11/19 Checked By: bfs

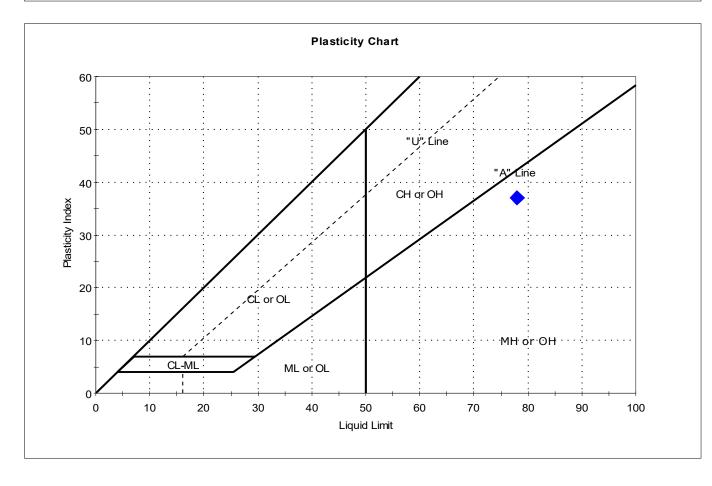
527518 Depth: Test Id:

Test Comment:

Visual Description: Wet, olive brown silt

Sample Comment:

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	116SPT-00-4.5-190			83	78	41	37	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Sample ID: PDI-116SPT-20-26.7-190STest Date: 11/01/19 Checked By: bfs

Test Id: 527519 Depth:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	16SPT-20-26.7-19			26	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-116SPT-26.7-28.6-19Test Date: 11/11/19 Checked By: bfs

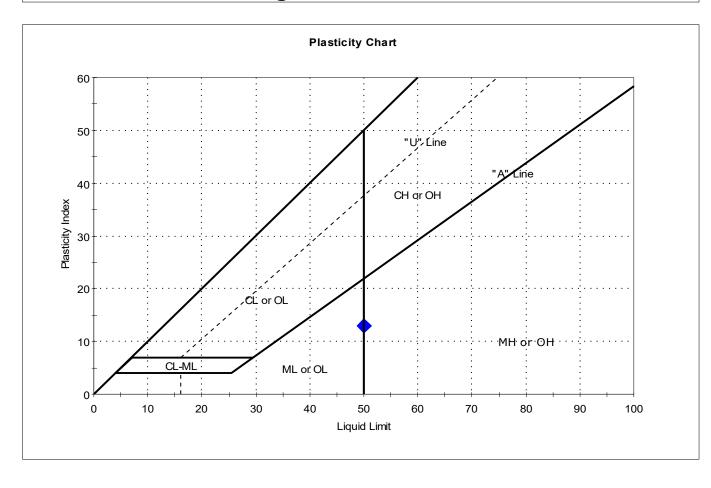
Sample ID: PDI-116SPT-26.7-28.6-19Test Date: 11/11/19
Depth: --- Test Id: 527520

Test Comment: ---

Visual Description: Wet, grayish brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	16SPT-26.7-28.6-1			64	50	37	13	2.1	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-116SPT-51.5-54.2-19Test Date: 10/25/19 Checked By: bfs

Depth: --- Test Id: 527521

Test Comment: ---

Visual Description: Moist, olive brown silty sand Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	16SPT-51.5-54.2-1			27	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-117SPT-11-29.1-191(Test Date: 10/28/19 Checked By: bfs

Depth: --- Test Id: 527522

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.17SPT-11-29.1-19			38	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

28% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

527523

Sample ID: PDI-117SPT-29.1-32-191(Test Date: 11/05/19 Checked By: bfs

Test Id: Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	17SPT-29.1-32-19			45	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685
Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-117SPT-44.1-53.5-19Test Date: 11/11/19 Checked By: bfs

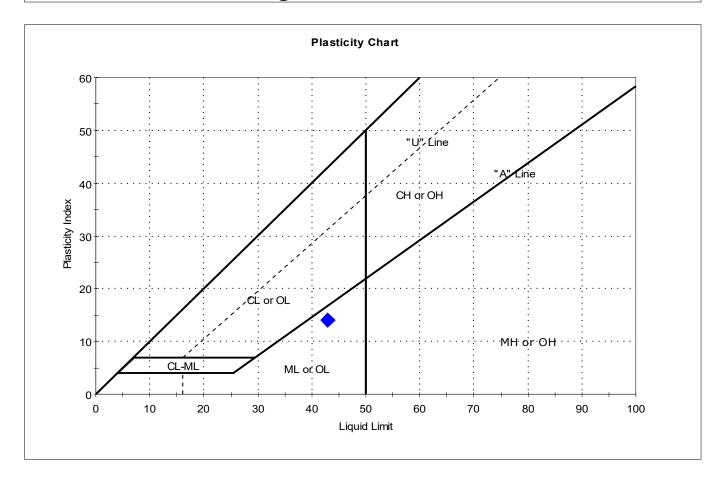
Depth: --- Test Id: 527524

Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	L7SPT-44.1-53.5-1			46	43	29	14	1.2	Silty SAND (SM)

Sample Prepared using the WET method

3% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-117SPT-53.5-63.5-19Test Date: 11/12/19 Checked By: bfs

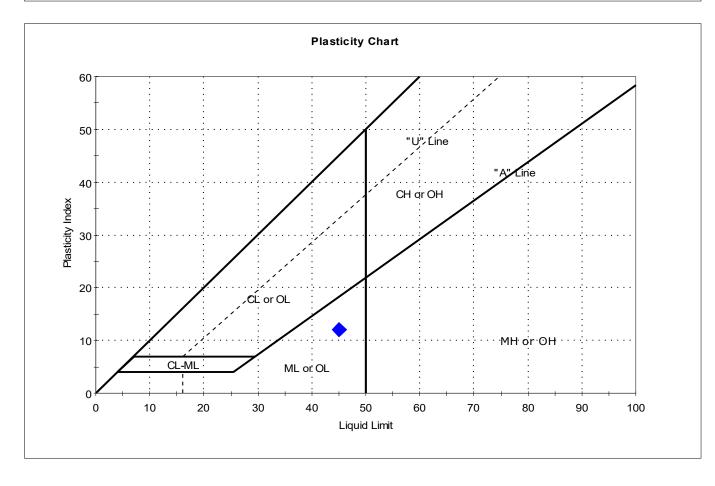
Sample ID: PDI-117SPT-53.5-63.5-19Test Date: 11/12/19
Depth: --- Test Id: 527525

Test Comment: ---

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	17SPT-53.5-63.5-1			83	45	33	12	4.2	SILT with Sand (ML)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

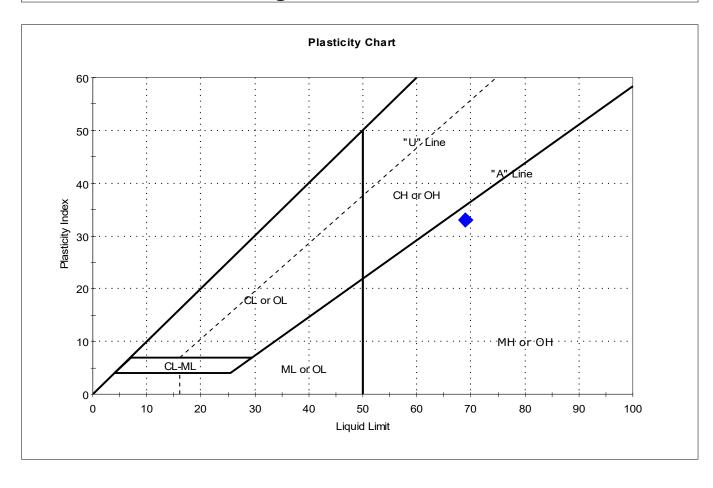
Sample ID: PDI-118SPT-00-4.5-1910fTest Date: 11/18/19 Checked By: bfs

Depth: Test Id: 527526 Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	118SPT-00-4.5-19			113	69	36	33	2.3	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: MEDIUM



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

527527

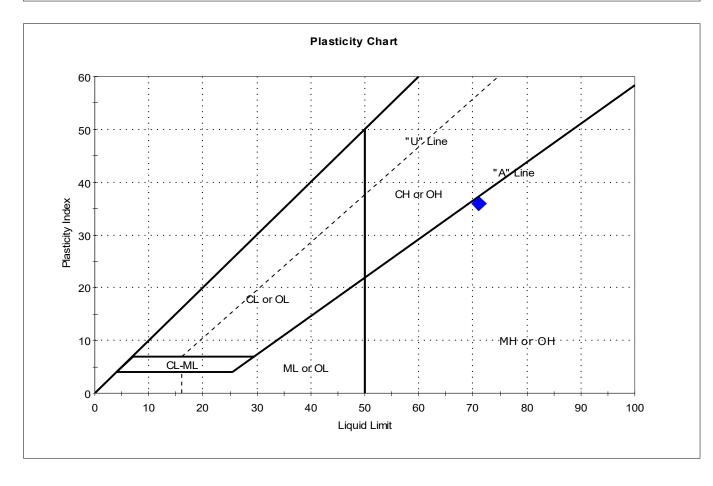
Sample ID: PDI-118SPT-4.5-15-1910fTest Date: 11/12/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment:

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	118SPT-4.5-15-19:			70	71	35	36	1	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

3% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-118SPT-46.5-61-191(Test Date: 11/11/19 Checked By: bfs

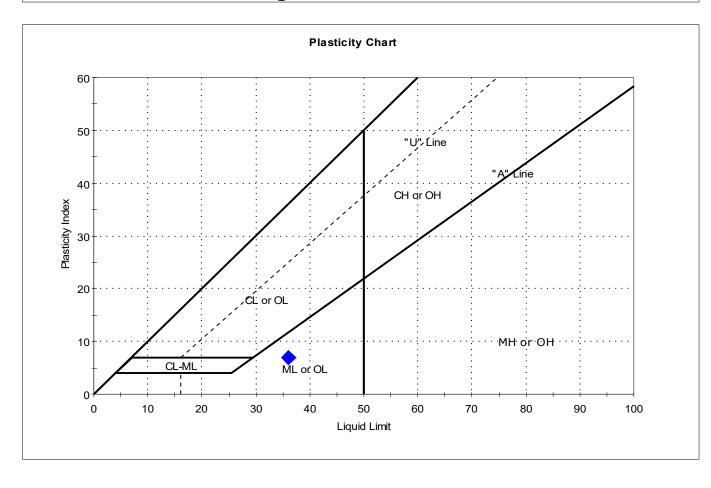
Depth: --- Test Id: 527528

Test Comment: ---

Visual Description: Wet, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbo	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.18SPT-46.5-61-19			62	36	29	7	4.7	Silty SAND (SM)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Sample ID: PDI-119SPT-00-4.5-1910CTest Date: 11/12/19 Checked By: bfs

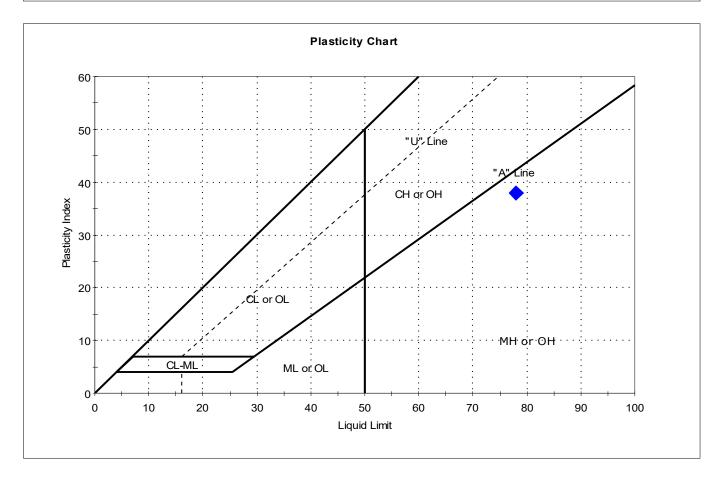
527529 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment:

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	119SPT-00-4.5-19:			77	78	40	38	1	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-119SPT-18.3-31-191(Test Date: 10/25/19 Checked By: bfs

Depth: --- Test Id: 527530

Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	19SPT-18.3-31-19			30	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-119SPT-47-52-19100Test Date: 11/11/19 Checked By: bfs

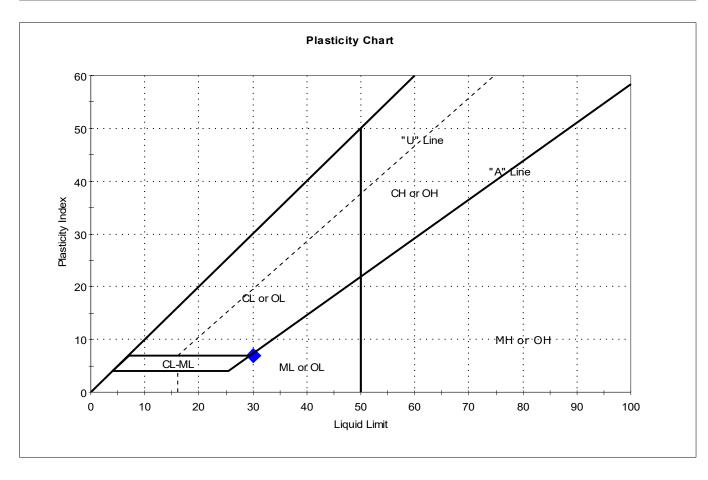
Depth: --- Test Id: 527531

Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	119SPT-47-52-191			33	30	23	7	1.5	Silty SAND (SM)

Sample Prepared using the WET method

7% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-119SPT-9.5-18.3-191Test Date: 11/12/19 Checked By: bfs

Depth: --- Test Id: 527532

Test Comment: --Visual Description: Moist, dark grayish brown sand with silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	19SPT-9.5-18.3-19			37	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

10% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

The sample was determined to be Non-Plastic

Toughness: n/a



Anchor QEA, LLC Client: Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Sample ID: PDI-121SPT-00-06-19093Test Date: 11/15/19 Checked By: bfs

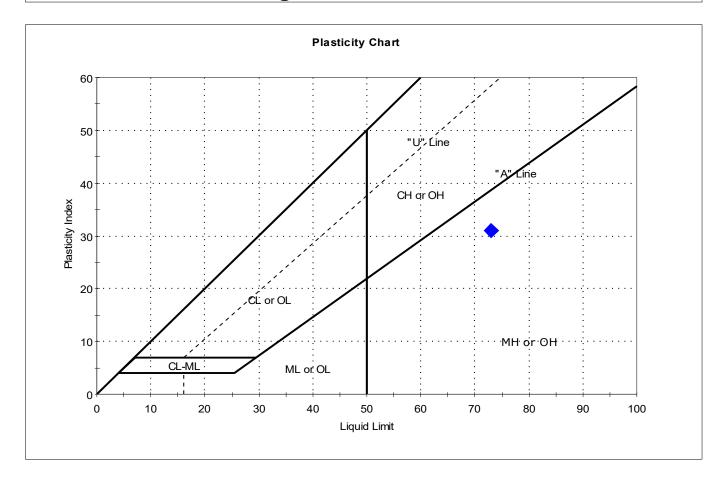
527533 Depth: Test Id:

Test Comment:

Visual Description: Moist, olive brown silt

Sample Comment:

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	121SPT-00-06-190			76	73	42	31	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-121SPT-11-20.7-190STest Date: 11/11/19 Checked By: bfs

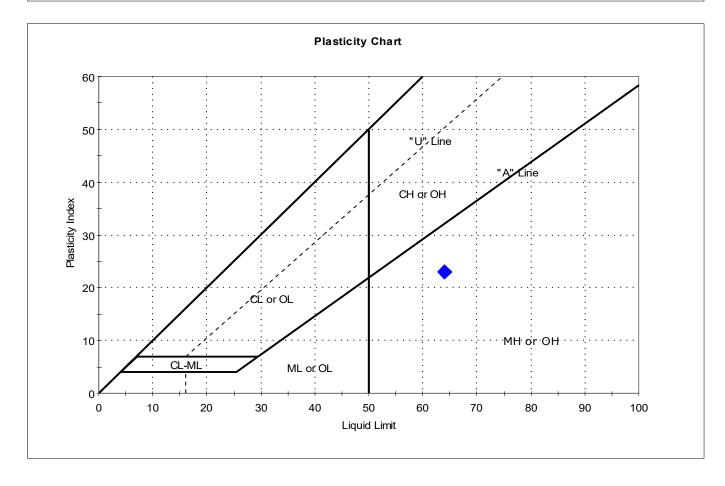
Depth: --- Test Id: 527534

Test Comment: ---

Visual Description: Moist, dark olive brown silt

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.21SPT-11-20.7-19			60	64	41	23	0.8	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-121SPT-21-38-19093 Test Date: 10/28/19 Checked By: bfs

Depth: --- Test Id: 527535
Test Comment: ---

Visual Description: Moist, dark olive gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	121SPT-21-38-190			43	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-121SPT-49.4-54-190STest Date: 11/18/19 Checked By: bfs

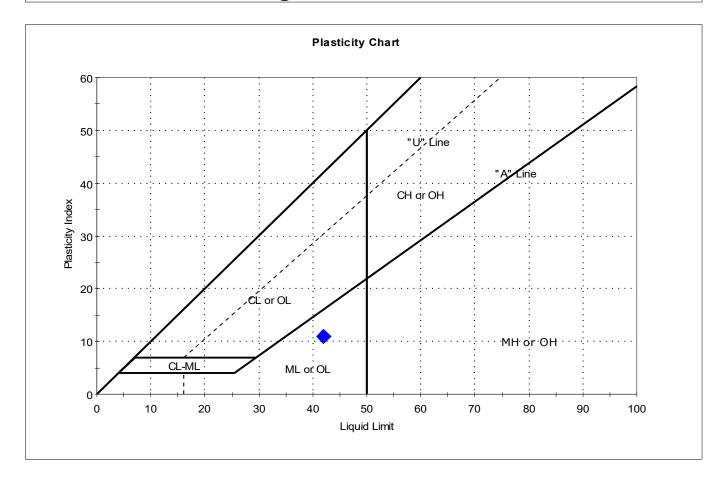
Depth: --- Test Id: 527536

Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.21SPT-49.4-54-19			45	42	31	11	1.2	Silty SAND (SM)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: MEDIUM



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

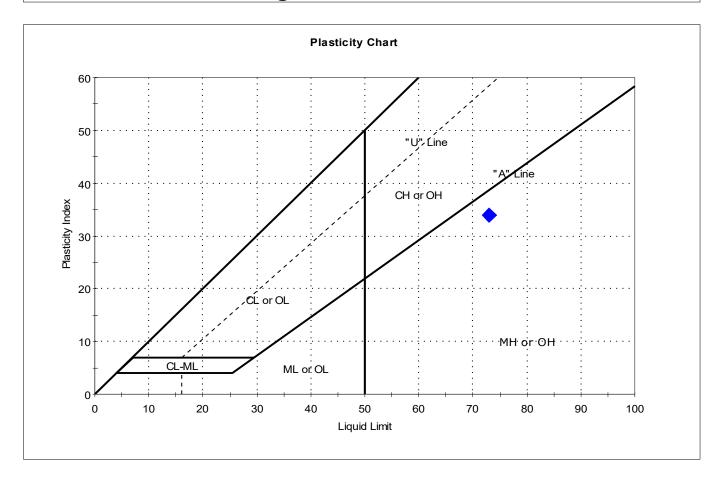
Sample ID: PDI-122SPT-04-09-19092Test Date: 11/12/19 Checked By: bfs

Depth: --- Test Id: 527537

Test Comment: ---

Visual Description: Wet, olive brown silt
Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	122SPT-04-09-190			80	73	39	34	1.2	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-122SPT-16.6-24-190STest Date: 11/11/19 Checked By: bfs

Depth: --- Test Id: 527538
Test Comment: ---

Visual Description: Moist, dark olive brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.22SPT-16.6-24-19			49	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

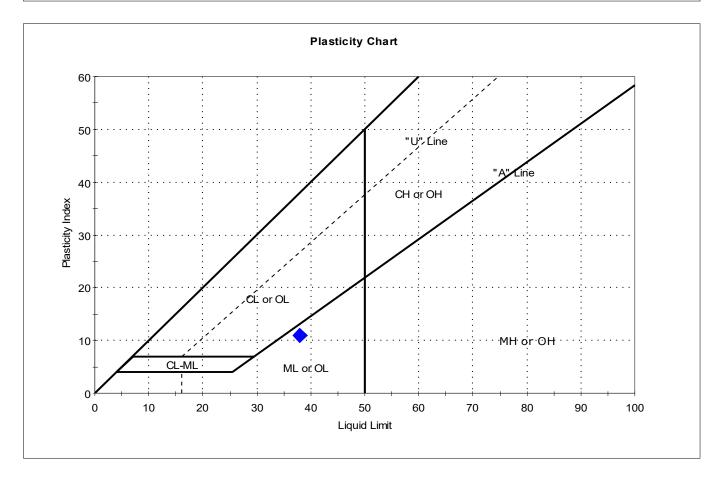
Sample ID: PDI-122SPT-61-66-19092Test Date: 11/08/19 Checked By: bfs Depth: --- Test Id: 527539

Test Comment: ---

Visual Description: Wet, olive brown silty sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	122SPT-61-66-190			42	38	27	11	1.3	Silty SAND (SM)

Sample Prepared using the WET method

4% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-123SPT-00-4.5-19092Test Date: 11/11/19 Checked By: bfs

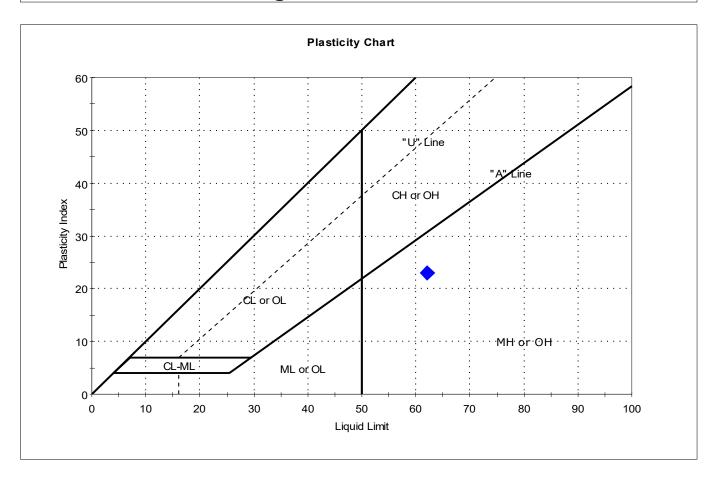
Depth: --- Test Id: 527540

Test Comment: ---

Visual Description: Wet, dark olive silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Syn	mbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
	<b>•</b>	123SPT-00-4.5-190			72	62	39	23	1.4	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-123SPT-25.5-30.5-19Test Date: 10/25/19 Checked By: bfs

Depth: --- Test Id: 527541

Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	23SPT-25.5-30.5-1			19	n/a	n/a	n/a	n/a	Silty SAND (SM)

0% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No:
Boring ID: --- Sample Type: bag Tested By:

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-123SPT-63.2-65.5-19Test Date: 11/13/19 Checked By: bfs

GTX-310685

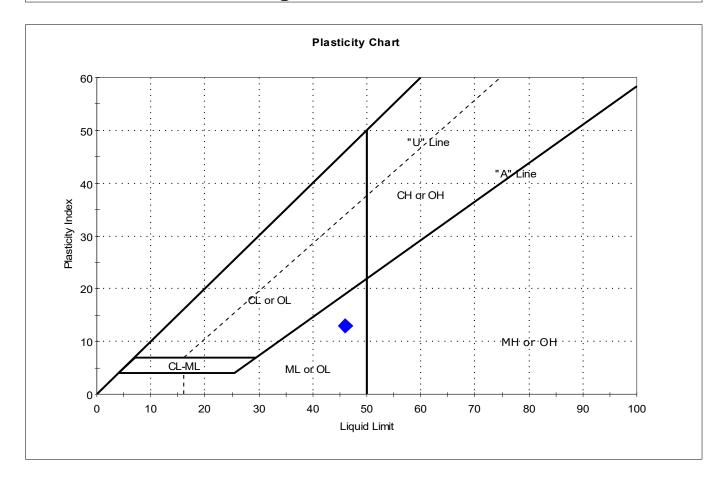
Depth: --- Test Id: 527542

Test Comment: ---

Visual Description: Moist, dark olive brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	23SPT-63.2-65.5-1			48	46	33	13	1.2	SILT with Sand (ML)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-19SC-B-05-07-19100Test Date: 11/05/19 Checked By: bfs

Depth: --- Test Id: 527479
Test Comment: ---

Visual Description: Moist, dark olive brown sandy silt

Sample Comment: ----

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	19SC-B-05-07-191			61	n/a	n/a	n/a	n/a	Sandy SILT (ML)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



# ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

Gasco PDI Project:

**NW Natural** 

Client:

1605 Cornwall Avenue, Bellingham, WA 98225

POC: \* Delaney Peterson (360-715-2707)

Sample Custodian: COC ID:

NWGEO-20190924-170421

Lab:

Northwest Geotech CATX B

-					-					
COC	Field Sample ID	Samp Type	Matrix	Collected	Contain	Lab QC*	Test Request	Method	TAT**	Preservative
Number		le		Date Ti	Time	2				
001	PDI-014SG-00-0.78-190923	z	SE	09/23/2019 17:0	1 20:					
							Grain Size	D6913/D7928	30	4°C
005	PDI-015SG-00-0.87-190924	z	SE	09/24/2019 11:1	19 1					
							Grain Size	D6913/D7928	30	4°C
003	PDI-022SG-00-01-190924	z	SE	09/24/2019 13:	13:00 1					
							Grain Size	D6913/D7923	30	4°C
004	PDI-101SG-00-01-190923	z	SE	09/23/2019 13:3	35 1					
							Grain Size	D6913/D7928	30	4°C
900	PDI-102SG-00-01-190923	z	SE	09/23/2019 15:0	1 20	×				
							Grain Size	D6913/D7928	30	4°C
900	PDI-103SG-00-01-190924	z	SE	09/24/2019 14:	14:30 1					
							Grain Size	D6913/D7928	30	4°C
200	PDI-104SG-00-01-190924	Z	SE	09/24/2019 14:4:	45 1					
							Grain Size	D6913/D7928	30	4°C
800	PDI-105SG-00-0.99-190924	Z	SE	09/24/2019 14:	14:00 1					
							Grain Size	D6913/D7928	30	4°C
600	PDI-106SG-00-01-190924	Z	SE	09/24/2019 15:0	15:05					
							Grain Size	D6913/D7928	30	4°C

Comment:					
Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	Signature Run	Signature	Signature	Signature	Signature
Print Name JEterson	recuch	Print Name	Print Name	Print Name	Print Name
Company AQ		Company	Company	Company	Company
Date/Time 9. 25. 19 1000	Date Time 19 11 am	Date/Time	Date/Time	Date/Time	Date/Time

Date Printed: 9/24/2019

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**POC:** \* Delaney Peterson (360-715-2707)

## ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

COC ID:

NWGEO-20190926-165106

			.000	NVGEO-20180820-10
Delaney Peterson (360-715-2707)	Project:	Gasco PDI	Sample Custodian:	deb
1605 Cornwall Avenue, Bellingham, WA 98225	Client:	NW Natural	Lab:	Northwest Geotech

Comment: All Charges DP 10.2.19

Received By:	Signature	Print Name	Company	Date/Time
Relinguished By:	Signature	Print Name	Сотрапу	Date/Time
Received By:	Signature	Print Name	Company	Date/Time
Relinquished By:	Signature	Print Name	Company	Date/Time
Received By:	Signature mm	Shannon Piccueh		Date/Time/ 10:30
Relinquished By:	SURANGE REF	Printlang Lers a	Company AQ	Date/Time . 2, 14 (000)

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COC ID:

NWGEO-20190926-165106

Sample Custodian:

deb

Northwest Geotech

Lab:

**NW Natural** Gasco PDI

1605 Cornwall Avenue, Bellingham, WA 98225

**POC:** \* Delaney Peterson (360-715-2707)

Sample Type

Field Sample ID

COC Sample Number

PDI-024SC-B-10-12.1-190927

004

PDI-036SC-B-4.2-6.2-190929

900

PDI-064SC-B-04-06-190929

900

Project: Client:

Matrix	Collected	# Contain	Lab QC*	Test Reguest	Method	TAT**	Presentative
	Date Time	*********					
SE	09/27/2019 11:31	71					
				Specific gravity	D854	30	4°C
SE	09/29/2019 12:37	121					
				Atterberg Limits	D4318	30	4°C
				Bulk Density Sp. Carw. Ly	D7263	30	4°C
				Grain Size	D6913/D7928	30	4°C
				Moisture Content	D2216	30	4°C
SE	09/29/2019 8:19	21	×		2		
				Atterberg Limits	D4318	30	4°C
			,	Bulk Density	D7263	30	4°C
				Grain Size	D6913/D7928	30	4°C
				Moisture Content	D2216	30	4°C
				Specific gravity	D854	30	4°C

S.				¥	
	Received By	Signature	Print Name	Company	Date/Time
	Relinauished Bv.	Signature	Print Name	Company	Date/Time
	Received By:	Signature	Print Name	Company	Date/Time
	Relinauished By.	Signature	Print Name	Company	Date/Time Date/Time
51.2.01 ok	Received By:	Signature Pur Sign	Print ham Preciel Prin		Date/Time   10'-76   Date
commence All changes DP 10.2.17	Relinquished BV	Signature	Print Name Peters in		Date/Time /0.2. (§ 1000

COC ID:

NWGEO-20191001-164659

Sample Custodian:

deb

**NW Natural** Gasco PDI

1605 Cornwall Avenue, Bellingham, WA 98225

**POC:** \* Delaney Peterson (360-715-2707)

Sample Type

Field Sample ID

COC Sample Number

z

PDI-046SC-B-9.8-11.8-191001

00

Project: Client:

Northwest Geotech Lab:

Preservative			4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C
TAT**			30	30	30	30		30	30	30	30
Method			D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854
Test Request			Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity
Lab QC*										6	
# Containe	ers	_					-				
D.	Time	8:48					14:00				
Collected	Date	10/01/2019 8:48					10/01/2019 14:00				
Matrix		SE					SE				
Comp	10		ı				1	1			

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PDI-071SC-B-08-10-191001

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Comment:			G.		
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Date Printed: 10/1/2019



COC ID:

NWGEO-20191001-170018

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Project:	Gasc	Gasco PDI		Sam	Sample Custodian:	deb	
Client:	NN	NW Natural		Lab:		Northwest Geotech	itech
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Date	Time					<u> </u>	רופאפו אמוואפ
09/30/2019 9:17	9:17	-			General S. S. Salvania S. Salvania		
	-			Atterberg Limits	D4318	30	4°C
				Grain Size	D6913/D7928	30	4°C
				Moisture Content	D2216	30	4°C
				Specific gravity	D854	30	4°C

Sample Type

SE

z

PDI-039SC-B-7.8-9.8-190930

001

Field Sample ID

COC Sample Number

1605 Cornwall Avenue, Bellingham, WA 98225

**POC:** \* Delaney Peterson (360-715-2707)

	Relinquished By:	Signature	Print Name	Company	Date/Time
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Company Date/Time

Print Name

#### ANCHOR OEA COLO 1201 3rd Avenue, Suite 2600, Seattle, WA 98101

#### ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

Gasco PDI Project:

**NW Natural** Client:

1605 Cornwall Avenue, Bellingham, WA 98225

POC: \* Delaney Peterson (360-715-2707)

Lab QC # Containers

Collected

Sample Type

Time 8:11

Date

10/03/2019

SE

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PDI-028SC-B-10.7-12.7-191003

90

Field Sample ID

COC Sample Number

COC ID:

Sample Custodian:

deb

NWGEO-20191003-134441

Lab:

Geotesting Express TAT\*\* 888 D6913/D7928 Method D4318 Atterberg Limits Test Request Grain Size

Preservative

4°C

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04318

D2216

D854

Mashure Content Herbers Grain Size Sp. Grasity Moisture Content Specific gravity PDI-0818C-B-08-10-191002/SE/10.2.19/0903/1

82740 Cr690 589 D2216

Print Name Signature Company Received By: Signature Print Name Company Print Name Company Print Name Shannon Company

Received By: Signature

Print Name

Date Printed: 10/3/2019

\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

Date/Time Company

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Date/Time 11 am 10/8/19

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Date/Time (0.4.19

#### A ANCHOR OEA CCC 1201 3rd Avenue, Suite 2600, Seattle, WA 98101

# ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

COC ID:

NWGEO-20191014-145320

CO, SN, BJ, DL

Geotesting Express Sample Custodian:

**NW Natural** Gasco PDI

1605 Cornwall Avenue, Bellingham, WA 98225

**POC:** \* Delaney Peterson (360-715-2707)

z

PDI-077SC-B-04-06-191014

001

Field Sample ID

Sample Number

Z

PDI-079SC-B-06-08-191014

002

Project: Client:

Lab:

Preservative 4°C 4°C 4°C 4°C 4°C 4°C TAT\*\* 30 888 8888 D4318 D6913/D7928 D2216 D854 D6913/D7928 Method D2216 D854 D4318 Moisture Content Specific gravity Moisture Content Atterberg Limits Atterberg Limits Test Request Specific gravity **Grain Size** Grain Size Lab QC\* # Containers Time 13:15 8:41 Collected 10/14/2019 10/14/2019 Date Matrix SE SE Sample Type

Comment:					
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Print Name C. Old Straw	Print Name Standa Piecueh	Print Name	Print Name	Print Name	Print Name
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Date/Time   0   5   5   5   5   5	Date/Time 1/19 8:55	Date/Time	Date/Time [	Date/Time	Date/Time

AN AN OE
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COC ID:

NWGEO-20191010-175158

CO, SN, DL, BJ

Geotesting Express

Sample Custodian:

Lab:

NW Natural Gasco PDI

1605 Cornwall Avenue, Bellingham, WA 98225

Delaney Peterson (360-715-2707)

POC:

Sample Type

SE

z

PDI-041SC-B-8.2-10.2-191010

001

Field Sample ID

COC Sample Number

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PDI-067SC-B-02-04-191010

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Project: Client:

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	Preservative			4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C
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	Method			D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854
	Test Request			Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity
	Lab QC*											
	# Contain	ers	-					-				
	Þe	Time	9:42					15:48				
	Collected	Date	10/10/2019 9:42					10/10/2019 15:48				

	Received By:	Signature Signature	Print Name Print Name	Company	Date/Time Date/Time
	Received By:	Signature	Print Name	Сотрапу	Date/Time
	Relinquished By:	Signature	Print Name	Company	Date/Time
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Comment:	Relinfulshed By:	Signafure	Print Name	Company	Date/Time   535

Date Printed: 10/10/2019

COC ID:

NWGEO-20191009-171243

CO, SN, BJ, DL

Lab:

**NW Natural** Gasco PDI

1605 Cornwall Avenue, Bellingham, WA 98225

**POC:** \* Delaney Peterson (360-715-2707)

z

PDI-016SC-B-06-08-191009

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Field Sample ID

COC Sample Number

z

PDI-038SC-B-7.1-9.1-191009

005

Project: Client:

Geotesting Express Sample Custodian:

Preservative δ 2 4°C TAT\*\* 30 888 30 88 30 D4318 D6913/D7928 D2216 D854 D6913/D7928 Method D4318 D2216 D854 Moisture Content Specific gravity Moisture Content Atterberg Limits Atterberg Limits Test Request Specific gravity **Grain Size Grain Size** Lab QC\* # Containers Time 15:56 9:41 Collected 10/09/2019 10/09/2019 Date Matrix SE SE Sample Type

Comment:					
Relinguished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
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Date/Time   5   5   5   5   5   5   5   5   5	rolzvle 8:55	Date/Time	Date/Time	Date/Time	Date/Time

Project

1605 Cornwall Avenue, Bellingham, WA 98225

**POC:** \* Delaney Peterson (360-715-2707)

SE

Z

PDI-019SC-B-05-07-191008

001

Field Sample ID

COC Sample Number

SE

Z

PDI-033SC-B-8.7-10.7-191008

002

Sample Type

COC ID: NWGEO-20191008-163122
Sample Custodian:
Lab:
Test Reguest
Atterberg Limits D4318
Grain Size D6913/D7928
Moisture Content D2216
Specific gravity D854
Atterberg Limits D4318
Grain Size D6913/D7928
Moisture Content D2216

Specific gravity

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Date/Time   10   15   19   1843   535	55 Date/Time/21/19 8:55	Date/Time	Date/Time	Date/Time	Date/Time

COC ID:

NWGEO-20191011-174305

Sample Custodian:

SN

Geotesting Express

Lab:

**NW Natural** Gasco PDI

Project: Client:

Delaney Peterson (360-715-2707)

\* :DOG

COC Sample Number

001

002

Preservative 4°C 4°C 4°C 4°C 4°C 4°C TAT\*\* 8 8 30 8888 30 D6913/D7928 D6913/D7928 D2216 D854 Method D4318 D2216 D4318 D854 Atterberg Limits Grain Size Moisture Content Moisture Content Atterberg Limits Specific gravity Specific gravity Test Request Grain Size Lab QC\* # Containers Time 14:25 8:40 Collected 10/11/2019 10/11/2019 Date Matrix SE SE 1605 Cornwall Avenue, Bellingham, WA 98225 Sample Type z z PDI-027SC-B-11-13.5-191011 PDI-066SC-B-06-08-191011 Field Sample ID

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	my Bund	Signature	Signature	Signature	Signature
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SES1 67	Date/Time 10/2/101	Date/Time	Date/Time	Date/Time	Date/Time

Date Printed: 10/11/2019

COC ID:

NWGEO-20191012-174803

SN

Geotesting Express

Lab:

**NW Natural** Gasco PDI

1605 Cornwall Avenue, Bellingham, WA 98225

**POC:** \* Delaney Peterson (360-715-2707)

Sample Type

Field Sample ID

COC Sample Number

PDI-090SC-B-06-08-191012

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Project: Client:

Sample Custodian:

Matrix	Collected		# Contain	Lab QC*	Test Request	Method	TAT**	Preservative
	Date	Time	ers		-		:	
SE	SE 10/12/2019 14:22	4:22	7					May State of
					Atterberg Limits	D4318	30	4°C
					Grain Size	D6913/D7928	30	4°C
					Moisture Content	D2216	30	4°C
					Specific gravity	D854	30	4°C

Received By: Signature Print Name Company
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NWGEO-20191015-152359

CO, SN, BJ, DL

Geotesting Express

Lab:

**NW Natural** Gasco PDI

Project: Client:

Delaney Peterson (360-715-2707)

POC:

Sample Custodian: COC ID:

1605 Cornwall Avenue, Bellingham, WA 98225	WA 9	8225	Client: NW N	V Natural		Lab:		Geotesting Express	(press	
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						Atterberg Limits	D4318	30	4°C	_
						Grain Size	D6913/D7928	30	4°C	_
						Moisture Content	D2216	30	4°C	
						Specific gravity	D854	30	4°C	_
	z	SE	10/15/2019 8:54	1						40,416
						Atterberg Limits	D4318	30	4°C	_
						Grain Size	D6913/D7928	30	4°C	_
						Moisture Content	D2216	30	4°C	_
						Specific gravity	D854	30	4°C	_
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001

COC Sample Number

005

Comment:					
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Date/Time   9 (535	Date/Time 10/21/19 8:55	Date/Time	Date/Time	Date/Time	Date/Time

Date Printed: 10/15/2019

COC ID:

NWGEO-20191016-101220

	ress	Preservative			4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C		4°C .	4°C	4°C	4°C		4°C
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Sam	Lab:	Test Request		al de la companya de	Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		
					_		-													Ι
	_	Lab QC*																		4
co PDI	Natural	qe * # Contain	_																1/	*
Gasco PDI	NW Natural	# Contain	Time s	12:35					13:00					14:55					13:35	
Project: Gasco PDI	Client: NW Natural	Collected # QC*	_	09/23/2019 12:35					<del>-</del>					09/23/2019 14:55   🖍 1 🔲					<del> </del>	
	Client:	Matrix Collected	Date Time	i					13:00										13:35	┨
	Client:	Matrix Collected	Date Time	09/23/2019					09/23/2019 13:00					09/23/2019					09/23/2019 13:35	
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Date/Time 10/16/19 : 1406	Date/Time	Date/Time	Date/Time	Date/Time
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D6913/D7928 D2216

Atterberg Limits Grain Size Moisture Content Specific gravity

10/07/2019 13:25

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PDI-108SPT-00-6.4-191007

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D854

D4318

Date Printed: 10/16/2019

Page 1 of 15

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1605 Cornwall Avenue, Bellingham, WA 98225

**POC:** \* Delaney Peterson (360-715-2707)

# ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

COC ID:

NWGEO-20191016-101220

Geotesting Express ರ Sample Custodian: Lab: NW Natural Gasco PDI Project: Client:

COC Sample Number	Field Sample ID	Sample Type	Matrix	Collected	# Containers	Lab QC*	Test Request	Method	TAT**	Preservative
		·		Date	+					
900	PDI-108SPT-00-6.4-191007	z	SE	10/07/2019 13:25	F					
							Atterberg Limits	D4318	08	4°C
							Grain Size	D6913/D7928	30	4°C
		٠					Moisture Content	D2216	30	4°C
							Specific gravity	D854	30	4°C
900	PDI-108SPT-14-33.5-191007	z	SE	10/07/2019 9:15	#					
							Atterberg Limits	D4318	30	4°C
						<b></b>	Grain Size	D6913/D7928	30	4°C
						<b>.</b>	Moisture Content	D2216	30	4°C
							Specific gravity	D854	30	4°C
200	PDI-108SPT-33.5-66.5-191007	z	SE	10/07/2019 10:55	14					
							Atterberg Limits	D4318	30	4°C
							Grain Size	D6913/D7928	30	4°C
							Moisture Content	D2216	30	4°C
							Specific gravity	D854	30	4°C
800	PDI-109SPT-00-6.5-191004	z	SE	10/04/2019 9:05	A					
							Atterberg Limits	D4318	30	4°C
							Grain Size	D6913/D7928	30	4°C
							Moisture Content	D2216	30	4°C
							Specific gravity	D854	30	4°C
600	PDI-109SPT-16.5-18.1-191004	z	SE	10/04/2019 10:30	W 1					

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company Anelor 084	Company $\chi$	Company	Company	Сотрапу	Сотрапу
Date/Time / 0/1 ( / 9 / ) 1 / 0 0 Date/Time	Date/Time   5/16/19 \$ 12(00	Date/Time	Date/Time	Date/Time	Date/Time

/ / Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

Date Printed: 10/16/2019

Page 2 of 15

ANCHOR OEA ((()) 1201 3rd Avenue, Suite 2600, Seattle, WA 98101
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Gasco PDI

Project:

**POC:** \* Delaney Peterson (360-715-2707)

COC ID:

NWGEO-20191016-101220

Sample Custodian:

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SSE	Preservative		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C	
Geotesting Express	TAT**		30		30	30		30	30	30	30		30	30	30	30	in the second	30	30	30	30	
Lab: Geot	Method		D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854	
	Test Request		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity	
ıtural	Containers		`	٦		I.,			٦	<u>                                     </u>	L			٦		<u> </u>			Ľ			#1
NW Natural	ed Time	10:30					11:11					12:10					13:30					9:50
Client:	Collected	10/04/2019					10/04/2019		-			10/04/2019					10/04/2019					10/15/2019
8225	Matrix	SE					SE					SE					SE					SE
m, WA 9	Sample Type	z					z					z					z					z
1605 Cornwall Avenue, Bellingham, WA 98225	COC Sample Number Field Sample ID	PDI-109SPT-16.5-18.1-191004					PDI-109SPT-22-30-191004					PDI-109SPT-35.5-48.3-191004					PDI-109SPT-48.3-51-191004					PDI-110 B-54-64.5-191015
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\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

Date Printed: 10/16/2019

COC ID:

NWGEO-20191016-101220

ress	Preservative		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C	
CJ Geotesting Express	TAT**		30	30	30	30		30	30	30	30		30	30	30	30		30	30	30	30	
ole Custodian:	Method		D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854	
Samı Lab:	Test Request		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity	
	Lab QC*		4	10	2	ြလ		٩	Ιœ	<u> </u>	0)		٩	0	_	0)		4	<u></u>	<u> </u>	07	
Gasco PDI NW Natural	# Containers	17					7					4 1					14 (	ľ				4
Gasc	Time	9:50					11:20					13:05					8:30					9:30
Project: Client:	Collected	10/15/2019					10/10/2019					10/10/2019					10/03/2019					10/03/2019
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POC: * Delaney Peterson (360-715-2707) 1605 Cornwall Avenue, Bellingham, WA 98225	Sample	SE					SE					SE					SE					$\vdash$

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\*\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

Date Printed: 10/16/2019

Page 4 of 15

A ANCE OEA 2 1201 3rd Avenue, Suite
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Gasco PDI

Project:

Delaney Peterson (360-715-2707)

POC:

COC ID:

NWGEO-20191016-101220

Sample Custodian:

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Preservative Geotesting Express 4°C 4°C 4°C 4°C 4°C 4°C 4°C 4°C 4°C TAT\*\* 888 8888 888 8 8888 30 D4318 D6913/D7928 D4318 D6913/D7928 D6913/D7928 D6913/D7928 D2216 D854 Method D2216 D854 D2216 D4318 D2216 D4318 D854 D854 Lab: Moisture Content Moisture Content Atterberg Limits Grain Size Moisture Content Moisture Content Atterberg Limits Atterberg Limits Atterberg Limits Specific gravity Specific gravity Specific gravity Specific gravity Test Request **Grain Size** Grain Size **Grain Size** Lab QC # **NW Natural** 1 Containers Time 9:00 9:50 10/03/2019 12:50 9:40 9:30 Collected 10/03/2019 10/11/2019 10/11/2019 10/03/2019 Client: Date SE SE Matrix SE SE SE 1605 Cornwall Avenue, Bellingham, WA 98225 Sample z z z z z Туре PDI-112SPT-11.5-26.5-191003 PDI-112SPT-37.5-58-191003 PDI-112SPT-07-11.5-191003 PDI-113SPT-16-22-191011 PDI-113SPT-06-16-191011 Field Sample ID 019 020 COC Sample Number 018 017 021

Comment:					
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COC ID:

NWGEO-20191016-101220

Preservative Geotesting Express 4°C 4°C 4°C ړ. ۲ 4°C 4°C 4°C 4°C 4°C 4°C TAT\*\* 888 8888 888 888 8 စ္က  $\overline{S}$ D4318 D6913/D7928 D2216 D6913/D7928 D2216 D6913/D7928 D6913/D7928 Sample Custodian: D2216 D854 Method D4318 D4318 D2216 D4318 D854 D854 D854 Lab: Grain Size Moisture Content Specific gravity Moisture Content Specific gravity Moisture Content Moisture Content Atterberg Limits Atterberg Limits Atterberg Limits Atterberg Limits Specific gravity Specific gravity Test Request Grain Size Grain Size **Grain Size** Lab QC\* # **NW Natural** Gasco PDI 7 Containers Time 10:15 11:20 8:20 9:50 Collected 10/11/2019 10/11/2019 10/08/2019 Project: 10/11/2019 Client: Date Matrix SE SE SE 1605 Cornwall Avenue, Bellingham, WA 98225 SE Sample z z z Type Delaney Peterson (360-715-2707) PDI-113SPT-31.9-39.4-191011 PDI-113SPT-22-25.2-191011 PDI-114SPT-00-7.5-191008 PDI-113SPT-16-22-191011 Field Sample ID POC: 024 Sample Number 022 023 021

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10/08/2019 10:40

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PDI-114SPT-25.5-28-191008

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\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact Date Printed: 10/16/2019

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COC ID:

NWGEO-20191016-101220

Preservative Geotesting Express 4°C 4°C 4°C 4°C **4**°C <del>4</del>°C 4°C 4°C TAT\*\* 888 8888 888 စ္က စ္က  $\overline{\mathcal{S}}$ D6913/D7928 D6913/D7928 D6913/D7928 Sample Custodian: Method D4318 D2216 D4318 D2216 D854 D4318 D2216 D854 D854 Lab: Moisture Content Specific gravity Moisture Content Moisture Content Atterberg Limits Atterberg Limits Atterberg Limits Specific gravity Specific gravity Test Request **Grain Size** Grain Size Grain Size Lab QC # Containers 7 **NW Natural** ¥ Gasco PDI ¥ Time 10:40 12:55 13:55 9:15 Collected 10/08/2019 10/08/2019 10/08/2019 10/08/2019 Project: Client: Date Matrix SE SE SE SE 1605 Cornwall Avenue, Bellingham, WA 98225 Sample z z z z Туре Delaney Peterson (360-715-2707) PDI-114SPT-7.5-12.5-191008 PDI-114SPT-50.5-55-191008 PDI-114SPT-25.5-28-191008 PDI-114SPT-42-50.5-191008 Field Sample ID \* :DOG COC Sample Number 025 026 028 027

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Date/Time 10/16/19/19/05 Date/Time	Date/Time Date/Time		Date/Time

4°C 4°C 4°C

8888

D6913/D7928

D4318

D2216 D854

Moisture Content

Specific gravity

9:00

10/09/2019

SE

z

PDI-115SPT-06-11-191009

029

Atterberg Limits

Grain Size

\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

Date Printed: 10/16/2019

* ANCHOR	A OEA ##	1201 3rd Avenue, Suite 2600, Seattle, WA 98101
* ANC	と OEA	1201 3rd Avenue, S

COC ID:

NWGEO-20191016-101220

Delaney Peterson (360-715-2707) <b>Project:</b> Gasco PDI 1605 Cornwall Avenue, Bellingham, WA 98225 <b>Client:</b> NW Natural
Matrix Collected in # QC* Tast Beninest
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Atterberg Limits
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Atterberg Limits
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30 စ္က 8888

D6913/D7928 D2216 D854

Grain Size Moisture Content

Specific gravity

09/26/2019 16:05

SE

z

PDI-116SPT-00-4.5-190926

033

Atterberg Limits

10/09/2019 13:30

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z

PDI-115SPT-41.5-49.3-191009

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D4318

D854

Moisture Content

Specific gravity

\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

Date Printed: 10/16/2019

Page 8 of 15

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NWGEO-20191016-101220

COC ID:

Preservative 4°C 4°C 4°C 4°C **4**℃ 4°C Geotesting Express 4°C 4°C 4°C 4°C 4°C 4°C TAT\*\* 88 888 888 888 88 30 8 30  $\overline{S}$ D6913/D7928 D6913/D7928 D6913/D7928 D6913/D7928 Sample Custodian: D2216 D4318 D2216 Method D2216 D4318 D2216 D4318 D4318 D854 D854 D854 D854 Lab: Moisture Content Specific gravity Grain Size
Moisture Content
Specific gravity Moisture Content Moisture Content Atterberg Limits Atterberg Limits Atterberg Limits Atterberg Limits Specific gravity Specific gravity Test Request Grain Size Grain Size **Grain Size** Lab QC # # **NW Natural** Gasco PDI F ¥ Containers 09/27/2019 14:10 10/02/2019 10:05 Time 16:05 10:30 9:15 Collected 09/26/2019 Project: 09/26/2019 09/27/2019 Client: Date Matrix SE SE SE SE SE 1605 Cornwall Avenue, Bellingham, WA 98225 Sample z z z z Z Туре Delaney Peterson (360-715-2707) PDI-116SPT-26.7-28.6-190926 PDI-116SPT-51.5-54.2-190927 PDI-116SPT-20-26.7-190927 PDI-117SPT-11-29.1-191002 PDI-116SPT-00-4.5-190926 Field Sample ID POC: Sample Number 036 033 034 035 037

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\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

Date Printed: 10/16/2019

Page 9 of 15

Gasco PDI

Project:

**POC:** \* Delaney Peterson (360-715-2707)

COC ID:

Sample Custodian:

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NWGEO-20191016-101220

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1605 Cornwall Avenue, Bellingham, WA 98225 Clier	Sample D	SE					SE					SE					SE					SE

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\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

Date Printed: 10/16/2019

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Gasco PDI

Project:

**POC:** \* Delaney Peterson (360-715-2707)

NWGEO-20191016-101220 COC ID:

 $\overline{S}$ Sample Custodian:

	Preservative																					
cpress	Pres		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C	
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Lab:	Test Request		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity	
	Lab QC*																П					$\Box$
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Natural	# Containers					•	7/4					] 18				٠	] 18					7
NW Natural	# Containers • —	8:45				•	9:30					13:45				٠	8:40					10:05
Client: NW Natural	# Containers	_																				
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Date Printed: 10/16/2019

ANCHOR OEA EEE 1201 3rd Avenue, Suite 2600, Seattle, WA 98101
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COC ID:

NWGEO-20191016-101220

*	* Delaney Peterson (360-715-2707)			Project:	Gasco PDI	PDI		Samp	Sample Custodian: CJ	7	
		۱, ۷۷۸ و	38225	Client:	NW Natura	atural		Lab:	9	Geotesting Express	press
COC Sample Number	Field Sample ID	Sample Type	Matrix	Collected	d	# Containers	Lab QC*	Test Request	Method	TAT**	Preservative
045	PDI-119SPT-18.3-31-191001	z	SE	10/01/2019	10:05	17	П				
							-	Atterberg Limits	D4318	30	4°C
							19	Grain Size	D6913/D7928	30	4°C
							=	Moisture Content	D2216	30	4°C
					•		107	Specific gravity	D854	30	4°C
046	PDI-119SPT-47-52-191001	z	SE	10/01/2019	14:00	1 %	П				
								Atterberg Limits	D4318	30	4°C
							10	Grain Size	D6913/D7928	30	4°C
								Moisture Content	D2216	30	4°C
							107	Specific gravity	D854	30	4°C
047	PDI-119SPT-9.5-18.3-191001	z	SE	10/01/2019	9:35	17					
								Atterberg Limits	D4318	30	4°C
							10	Grain Size	D6913/D7928	30	4°C
							1	Moisture Content	D2216	30	4°C
							ارما	Specific gravity	D854	30	4°C
048	PDI-121SPT-00-06-190930	z	SE	09/30/2019	8:30	17					
2								Atterberg Limits	D4318	30	4°C
							<u> </u>	Grain Size	D6913/D7928	30	4°C
								Moisture Content	D2216	30	4°C
							٢	Specific gravity	D854	30	4°C

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Signature M.M. W. T. Signature	Signature	Signature	Signature	Signature
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049 PDI-121SPT-11-20.7-190930

r t f \* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

Date Printed: 10/16/2019

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NWGEO-20191016-101220 COC ID:

Preservative Geotesting Express 4°C 4°C TAT\*\* 8888 8888  $\overline{S}$ D6913/D7928 Sample Custodian: Method D4318 D2216 D4318 D854 Lab: Moisture Content Atterberg Limits Atterberg Limits Specific gravity Test Request Grain Size c Sc Sc # **NW Natural** Gasco PDI Containers Time 9:25 09/30/2019 10:25 Collected 09/30/2019 Project: Client: Date Matrix SE 1605 Cornwall Avenue, Bellingham, WA 98225 SE Sample z z Туре Delaney Peterson (360-715-2707) PDI-121SPT-11-20.7-190930 PDI-121SPT-21-38-190930 Field Sample ID POC: Sample Number 049 020

4°C 4°C

D6913/D7928

D2216 D854

Moisture Content Specific gravity

051

**Grain Size** 

4°C

888

D4318 D6913/D7928

D2216

D854

18

4°C 4°C 4°C

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D6913/D7928

D2216

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Moisture Content Atterberg Limits Grain Size Moisture Content Atterberg Limits Specific gravity Grain Size 09/30/2019 13:30 09/25/2019 15:35 SE SE z z PDI-121SPT-49.4-54-190930 PDI-122SPT-04-09-190925

052

Specific gravity 16:55 09/25/2019 SE z PDI-122SPT-16.6-24-190925

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\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact Date/Time (6)

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Date Printed: 10/16/2019

Page 13 of 15

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COC Sample Number

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## **ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY**

COC ID:

NWGEO-20191016-101220

Delaney Peterson (360-715-2707)			Project:	Gasco PDI	PDI		Sam	Sample Custodian:	$\overline{S}$	
1605 Cornwall Avenue, Bellingham, WA 98225	, WA	98225	Client:	NW Natural	atural		Lab:		Geotesting Express	oress
Field Sample ID	Samp Type	Matrix	Collected	70	# Contair	GE & COntain	Test Request	Method		Preservative
	e e		Date	Time	ers			1	:	
PDI-122SPT-16.6-24-190925	z	SE	N SE 09/25/2019 1	6:55	100					
							Atterberg Limits	D4318	30	4°C
							Grain Size	D6913/D7928	30	4°C
							Moisture Content	D2216	30	4°C

4°C 4°C 4°C

888

D854

Specific gravity

Atterberg Limits

09/26/2019 14:00

SE

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054 PDI-122SPT-61-66-190926

Grain Size

8888

D4318 D6913/D7928

									)	
						ø	Moisture Content	D2216	30	4°C
٠							Specific gravity	D854	30	4°C
055	PDI-123SPT-00-4.5-190924	z	SE	09/24/2019 1	15:15	$\square$ $l \neq l$				
							Atterberg Limits	D4318	30	4°C
							Grain Size	D6913/D7928	30	4°C
							Moisture Content	D2216	30	4°C
							Specific gravity	D854	30	4°C
056	PDI-123SPT-25.5-30.5-190925	z	SE	09/25/2019	9:10	□ 1 #				
							Atterberg Limits	D4318	30	4°C
							Grain Size	D6913/D7928	30	4°C
							Moisture Content	D2216	30	4°C
							Specific gravity	D854	30	4°C
057	057 PDI-123SPT-63.2-65.5-190925	z	SE	09/25/2019 13:15	13:15	$\square$  1 $\forall$				

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Date Printed: 10/16/2019

Page 14 of 15



**POC:** \* Delaney Peterson (360-715-2707)

# ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

COC ID:

NWGEO-20191016-101220

Delaney Peterson (360-715-2707)	_		Project:	Gasco PDI	) PDI		Samp	Sample Custodian:	రె	
1605 Cornwall Avenue, Bellingham, WA 98225	, WA	98225	Client:	Z N N	Natural		Lab:		Geotesting Express	xpress
Field Sample ID	Samp Type	Matrix	Collected	pe	# Contain	Lab QC*	Test Reguest	Method	TAT*	Preservative
	le e		Date	Time	ers		-			
PDI-123SPT-63.2-65.5-190925	z	SE	N SE 09/25/2019 13:15	13:15	#1					
							Atterberg Limits	D4318	30	4°C
						_	Grain Size	D6913/D7928	30	4°C
							Moisture Content	D2216	30	4°C

COC Sample Number

057

Specific gravity

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Page 15 of 15

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#### ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

**POC:** \* Delaney Peterson (360-715-2707)

1605 Cornwall Avenue, Bellingham, WA 98225

Project:

Client:

Gasco PDI

**NW Natural** 

COC ID:

NWGEO-201910.

Geotesting Express CO, SN, BJ, SS

Sample Custodian:

Lab:

	_					Т
Preservative			4°C	4°C	4°C	4°C
TAT**			30	30	30	30
Method			D4318	D6913/D7928	D2216	D854
Test Request			Atterberg Limits	Grain Size	Moisture Content	Specific gravity
Lab QC*						
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PDI-057SC-B-06-08-191023

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Field Sample ID

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Date/Time 10/19 @ 1215	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

OR	2600, Seattle, WA 98101
NA N	201 3rd Avenue, 3

Project:

Gasco PD

Client:

1605 Cornwall Avenue, Bellingham, WA 98225

**POC:** \* Delaney Peterson (360-715-2707)

NWGFO-20191022-162549

				COC ID:		NWGEO-20191022-102349	1022-102343	
Gasco PDI	PDI			Sample	Sample Custodian:	CO, SN, BJ, SS	"	
NW Natural	atural			Lab:	Ü	Geotesting Express	ress	
ō	# Contain	අ Contain	Test Request	9	Method	TAT**	Preservative	
Time	ers							
10.11	,							
14:05	_				D4318	30	4°C	
			Atterberg Limits		20010	30	4°C	
			Grain Size		D6913/D7928	9 5	J.,	
			Moisture Content		D2216	30	2	
			Mostar Controls		D854	30	4°C	
			Specific gravity					
0,00	,							
10:48	_		-		D4318	30	4°C	
			Atterberg Limits		000000000000000000000000000000000000000	ç	4°C	
			Grain Size		D6913/D7928	200	207	
			Mainting Content		D2216	30	D-4	_
			Moistal & Collicin		DSEA	30	4°C	_
			Specific gravity		+co0			_

Date

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Sample Type

14:05

10/22/2019

SE

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PDI-083SC-B-08-10-191022

001

Field Sample ID

COC Sample Number

Specific gravity

10/22/2019 10:48

SE

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PDI-099SC-B-02-04-191022

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				12	Print Name	7	Company	>	DateTime	"	* 1 sh OC Requested for st	במם לכי ייבילים
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Date Printed: 10/22/2019

ANCHOR OEA EEEE ODE 3010 Seattle, WA 98101

**POC:** \* Delaney Peterson (360-715-2707)

#### ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

Gasco PDI Project:

NW Natural

COC Sample Number

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002

COC ID:

NWGEO-20191017-123936

Sample Custodian:

SN

Geotesting Express

Lab:

Field Sample ID         Edg and Sample ID         Attended Sample ID         Indicated ID	1605 Cornwall Avenue, Bellingham, WA 98225	ham, WA	98225	Client:	NW Natural	atural		Lab:		Geotesting Express	bress
Date   Time   B   Atterberg Limits   Da516   30     N   SE   10/17/2019   10:46   1	Glad Samula II	Typ	_		Þ	# Contain	Lab QC*	Test Request	Method	TAT**	Preservative
N         SE         10/17/2019         9:06         1         Atterberg Limits         Atterberg Limits         D4318         30           Grain Size         Moisture Content         D6913/D7928         30           Specific gravity         D854         30           Atterberg Limits         D4318         30           Grain Size         Moisture Content         D6913/D7928         30           Moisture Content         D5216         30           Moisture Content         D6913/D7928         30           Moisture Content         D854         30	בפות סמוולוס וס	e e	alo.	Date	Time	ers					
N         SE         10/17/2019 10:46   1   I   I   I   I   I   I   I   I   I	DI-031SC-B-8.9-10.9-191017	z	S.	├	90:6	_					
N         SE         10/17/2019 10:46         1         Image: Transmission of the content of th		:		⊣ .				Atterberg Limits	D4318	30	4°C
Noisture Content         DD216         30           Specific gravity         DB54         30           Atterberg Limits         D4318         30           Grain Size         Moisture Content         D6913/D7928         30           Moisture Content         D2216         30           Specific gravity         D854         30	*							Grain Size	D6913/D7928	30	4°C
N SE   10/17/2019 10:46   1								Moisture Content	D2216	30	4°C
N         SE         10/17/2019 10:46         1         Image: Content Cont								Specific gravity	D854	30	4°C
Atterberg Limits         D4318         30           Grain Size         D6913/D7928         30           Moisture Content         D2216         30           Specific gravity         D854         30	1-097SC-R-02-04-191017	Z	\ \frac{\partial}{\partial}	-	10.46	<b>-</b>					
D6913/D7928     30       D2216     30       D854     30		-	3	┨				Atterbera Limits	D4318	30	4°C
D2216 30 D854 30								Grain Size	D6913/D7928	30	4°C
D854 30								Moisture Content	D2216	30	4°C
								Specific gravity	D854	30	4°C

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	* Lab QC Requested for sample when box is checked ** TAT = Turn Around Time in DAYS # POC = Project Point of Contact	un Around Time in DAYS # POC = Proj	ect Point of Contact	Page 1 of 1

#### ANCHOR OEA : OEA :

# ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

COC ID:

NWGEO-20191016-143858

CO, SN, BJ, DL

Geotesting Express

Lab:

**NW Natural** Gasco PDI

1605 Cornwall Avenue, Bellingham, WA 98225

POC: \* Delaney Peterson (360-715-2707)

PDI-022SC-B-5.5-7.5-191016

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Field Sample ID

COC Sample Number

Project: Client:

Sample Custodian:

Г												r result				$\Box$
	Preservative		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C
	TAT**		30	30	30	30		30	30	30	30		30	30	30	30
	Method		D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854
	Test Request		Atterbera Limits	Grain Size	Moisture Content	Specific gravity	2	Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity
	Lab QC*												]			
	Containers	141					57   1					38 1				
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PDI-059SC-B-06-08-191016

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003 PDI-069SC-B-10-12-191016

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Date Printed: 10/16/2019



#### **WARRANTY and LIABILITY**

GeoTesting Express (GTX) warrants that all tests it performs are run in general accordance with the specified test procedures and accepted industry practice. GTX will correct or repeat any test that does not comply with this warranty. GTX has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material

GTX may report engineering parameters that require us to interpret the test data. Such parameters are determined using accepted engineering procedures. However, GTX does not warrant that these parameters accurately reflect the true engineering properties of the *in situ* material. Responsibility for interpretation and use of the test data and these parameters for engineering and/or construction purposes rests solely with the user and not with GTX or any of its employees.

GTX's liability will be limited to correcting or repeating a test which fails our warranty. GTX's liability for damages to the Purchaser of testing services for any cause whatsoever shall be limited to the amount GTX received for the testing services. GTX will not be liable for any damages, or for any lost benefits or other consequential damages resulting from the use of these test results, even if GTX has been advised of the possibility of such damages. GTX will not be responsible for any liability of the Purchaser to any third party.

#### **Commonly Used Symbols**

B pore pressure parameter for $\Delta \circ s$ T temperature $S \circ s$ CAI CERCHAR Abrasiveness index $S \circ s$ to time of the propersion ratio for one dimensional consolidation $S \circ s$ cyclic stress ratio $S $	A	pore pressure parameter for $\Delta \sigma_1 - \Delta \sigma_3$	$S_{\rm r}$	Post cyclic undrained shear strength
CAI Use CERCHAR Abrasiveness Index CIU is or compression ratio for one dimensional consolidation cross or compression ratio for one dimensional consolidation consequence of the compression ratio for one dimensional consolidation consequence of the compression ratio for one dimensional consolidation consequence of the compression ratio for one dimensional consolidation consequence of the co	В	pore pressure parameter for $\Delta\sigma_3$		·
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	CAI	CERCHAR Abrasiveness Index		1
CR CSR         compression ratio for one dimensional consolidation         UU, Q         unconsolidated undrained triaxial test           CSR         cyclic stress ratio         u. a         excess pore water pressure           C₂         coefficient of curvature, $(D x_0)^2 / (D r_0 x D r_0)$ u. u. w         pore gas pressure           C₂         coefficient of consolidation         V total volume         volume of solids           C₂         coefficient of consolidation         V₂         volume of solids           c⟩         coefficient of consolidation         V₂         volume of solids           c⟩         coefficient of consolidation         V₂         volume of solids           c⟩         coefficient of consolidation         V₂         volume of voids           c⟩         cohesion intercept for tofal stresses         V₂         volume of voids           D         diameter at which 10% of soil is finer         V₂         volume of voids           D         diameter at which 10% of soil is finer         V₂         volume of voids           D <sub>10</sub> diameter at which 30% of soil is finer         W₂         veight of vater           D <sub>20</sub> diameter at which 30% of soil is finer         W₂         veight of vater           D <sub>30</sub> diameter at which 85% of soil is finer	CIU	isotropically consolidated undrained triaxial shear test		
CSR         cyclic stress ratio $u_a$ pore gas pressure $C_a$ coefficient of curvature, $(D \otimes)^2 / (D \log x D \otimes)$ $u_a$ excess pore water pressure $C_a$ coefficient of curvature, $(D \otimes)^2 / (D \log x D \otimes)$ $u_b$ excess pore water pressure $C_a$ coefficient of secondary compression $V_a$ volume of gas $c_b$ coefficient of secondary compression $V_a$ volume of solids $c_b$ coefficient of secondary compression $V_a$ volume of solids $c_b$ coefficient of consolidation $V_a$ volume of solids $c_b$ coefficient of consolidation $V_a$ volume of solids $c_b$ cobesion intercept for total stresses $V_a$ volume of voids $c_b$ dameter at which 10% of soil is finer $V_a$ volume of voids $c_b$ dameter at which 15% of soil is finer $V_a$ volume of voids $c_b$ diameter at which 15% of soil is finer $V_a$ weight of solids $c_b$ diameter at which 50% of soil is finer $V_a$ water content $c_b$	CR	compression ratio for one dimensional consolidation		•
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	CSR	cyclic stress ratio		
Ga         coefficient of uniformity, Don/D10         u, uw pore water pressure           Ca         compression index for one dimensional consolidation         Vg         volume of gas           Ca         coefficient of secondary compression         Vg         volume of gas           Ca         coefficient of consolidation         Vg         volume of solids           Ca         cohesion intercept for total stresses         Vy         volume of voids           D         diameter of specimen         Vw         volume of voids           D         diameter at which 10% of soil is finer         Vw         volume of water           Dis         diameter at which 15% of soil is finer         Ww         velocity           Dis         diameter at which 30% of soil is finer         Ww         weight of solids           Ds         diameter at which 50% of soil is finer         Ww         water content           Ds         diameter at which 50% of soil is finer         Ww         water content           Ds         diameter at which 50% of soil is finer         Ww         water content           Ds         diameter at which 50% of soil is finer         Ww         water content           Ds         diameter at which 50% of soil is finer         Ww         water content           D	$C_c$	coefficient of curvature, $(D_{30})^2 / (D_{10} \times D_{60})$		
Cc         compression index for one dimensional consolidation         Vg         total volume           Cs         coefficient of secondary compression         Vg         volume of gas           c cobesion intercept for total stresses         Vs         shear wave velocity           c cobesion intercept for effective stresses         Vs         volume of voids           D         diameter of specimen         Vs         volume of water           D         diameter at which 10% of soil is finer         Vs         volume of water           Dis         diameter at which 10% of soil is finer         W         total weight           Ds         diameter at which 30% of soil is finer         W         weight of solids           Ds         diameter at which 50% of soil is finer         W         water content           Ds         diameter at which 60% of soil is finer         W         water content           Ds         diameter at which 85% of soil is finer         W         water content           Ds         diameter at which 85% of soil is finer         W         water content           Ds         diameter at which 85% of soil is finer         W         water content           Ds         diameter at which 85% of soil is finer         W         water content           Ds	$C_{\mathrm{u}}$	coefficient of uniformity, D <sub>60</sub> /D <sub>10</sub>		<u> </u>
Ca         coefficient of secondary compression         Vg         volume of solids           c.         coefficient of consolidation         Vg         volume of solids           c.         coefficient of consolidation         Vg         volume of voids           d.         coefficient of consolidation         Vg         volume of voids           D.         diameter of specimen         Vg         volume of water           D.         dameter at which 15% of soil is finer         Vg         volume of water           D.         diameter at which 15% of soil is finer         Wg         weight of solids           D.         diameter at which 50% of soil is finer         Wg         weight of water           D.         diameter at which 50% of soil is finer         Wg         water content           D.         diameter at which 50% of soil is finer         Wg         water content           D.         diameter at which 50% of soil is finer         Wg         water content           D.         diameter at which 50% of soil is finer         Wg         water content           D.         diameter at which 50% of soil is finer         Wg         water content           D.         diameter at which 50% of soil is finer         Wg         water content           D.	$C_c$		,	
cv         coefficient of consolidation $V_s$ volume of solids           c         cohesion intercept for total stresses $V_s$ volume of voids           D         diameter of specimen $V_w$ volume of voids           D         damping ratio $V_w$ volume of water           D10         diameter at which 10% of soil is finer $V_w$ velocity           D15         diameter at which 15% of soil is finer $W_w$ weight of solids           D20         diameter at which 50% of soil is finer $W_w$ weight of water           D20         diameter at which 60% of soil is finer $W_w$ water content           D3         diameter at which 60% of soil is finer $W_w$ water content           D4         diameter at which 60% of soil is finer $W_w$ water content           D4         diameter at which 60% of soil is finer $W_w$ water content           D4         diameter at which 60% of soil is finer $W_w$ water content           D4         displacement for 50% consolidation $W_w$ water content           D4         displacement for 100% consolidation $W_w$ final water content	$C_{\alpha}$	coefficient of secondary compression		
c'         cohesion intercept for effective stresses $V_v$ volume of voids           D'         diameter of specimen $V_w$ volume of voids           D         diameter of specimen $V_w$ volume of voids           D         diameter of specimen $V_w$ volume of voids           D         diameter at which 10% of soil is finer $V_w$ velocity           D15         diameter at which 30% of soil is finer $W_w$ weight of solids           D80         diameter at which 50% of soil is finer $W_w$ weight of water           D81         diameter at which 85% of soil is finer $W_w$ water content           D83         diameter at which 85% of soil is finer $W_w$ water content           D84         diameter at which 85% of soil is finer $W_w$ water content           D85         diameter at which 85% of soil is finer $W_w$ water content           D85         diameter at which 85% of soil is finer $W_w$ water content           D86         diameter at which 85% of soil is finer $W_w$ water content           D85         diameter at which 85% of soil is finer $W_w$ water content	$c_{v}$	coefficient of consolidation		e e e e e e e e e e e e e e e e e e e
c'         cohesion intercept for effective stresses         V.v         volume of voids           D         diameter of specimen         V.w         volume of water           D         damping ratio         V.v         volume of water           D10         diameter at which 10% of soil is finer         V         velocity           D10         diameter at which 50% of soil is finer         W.w         weight of solids           D20         diameter at which 50% of soil is finer         W.w         weight of water           D30         diameter at which 60% of soil is finer         W.w         water content           D40         diameter at which 60% of soil is finer         W.w         water content           D40         diameter at which 60% of soil is finer         W.w         water content           D40         displacement for 90% consolidation         W.r         final water content           D40         displacement for 90% consolidation         W.r         initial water content           D4         diardia         W.v         shrinkage limit           D4         void ratio         W.v         shrinkage limit           D5         shear modulus $\alpha$ '         slope of $\alpha$ ' versus pr'           D6         shear modulus $\alpha$ '<	c	cohesion intercept for total stresses		
D         diameter of specimen         V <sub>v</sub> volume of water           D         damping ratio         V <sub>o</sub> initial volume           D <sub>10</sub> diameter at which 10% of soil is finer         V         volocity           D <sub>20</sub> diameter at which 30% of soil is finer         W         weight of solids           D <sub>20</sub> diameter at which 50% of soil is finer         W <sub>w</sub> weight of solids           D <sub>20</sub> diameter at which 50% of soil is finer         W <sub>w</sub> weight of water           D <sub>20</sub> diameter at which 60% of soil is finer         W <sub>w</sub> water content           D <sub>20</sub> diameter at which 85% of soil is finer         W <sub>w</sub> water content           D <sub>30</sub> diameter at which 85% of soil is finer         W <sub>w</sub> water content           D <sub>30</sub> diameter at which 85% of soil is finer         W <sub>w</sub> water content           D <sub>30</sub> diameter at which 85% of soil is finer         W <sub>w</sub> water content           D <sub>30</sub> diameter at which 85% of soil is finer         W <sub>w</sub> water content           D <sub>4</sub> d <sub>4</sub> d <sub>4</sub> d <sub>4</sub> d <sub>4</sub> D <sub>4</sub> void ratio         v <sub>1</sub> d <sub>4</sub> d <sub>4</sub>	c'	cohesion intercept for effective stresses	-	•
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D8s diameter at which 85% of soil is finer $w_c$ water content at consolidation $d_{00}$ displacement for 50% consolidation $w_f$ final water content $d_{00}$ displacement for 90% consolidation $d_{100}$ displacement for 100% consolidation $d_{100}$ displacement for 100% consolidation $d_{100}$ $d_{100}$ displacement for 100% consolidation $d_{100}$ $d_$				e
$ \begin{array}{c} d_{50} & displacement for 50\% consolidation \\ d_{90} & displacement for 90\% consolidation \\ d_{100} & displacement for 100\% consolidation \\ E & Young's modulus \\ e & void ratio \\ e_c & void ratio after consolidation \\ e_c & void ratio after consolidation \\ e_o & initial void ratio \\ e_o & specific gravity of soil particles \\ H & height of specimen \\ HR & Rebound Hardness number \\ i & gradient \\ Is & Uncorrected point load strength index \\ HA & Modified Taber Abrasion \\ HAT & Total hardness \\ HA & Modified Taber Abrasion \\ HIT & Total hardness \\ K_o & lateral stress ratio for one dimensional strain \\ K & permeability Index \\ mv & coefficient of volume change \\ n & porosity \\ Pc & preconsolidation pressure \\ p & (\sigma_1 + \sigma_3)/2, (\sigma_2 + \sigma_b)/2 \sigma_3 minor principal stress and possible for the first of the $				
$\begin{array}{c} d_{90} & \text{displacement for 90\% consolidation} \\ d_{100} & \text{displacement for 100\% consolidation} \\ d_{100} & \text{displacement for 100\% consolidation} \\ E & Young's modulus \\ e & \text{void ratio} \\ e & \text{void ratio} \\ e & \text{void ratio} \\ e & \text{void ratio difer consolidation} \\ e & \text{shear modulus} \\ G & \text{shear modulus} \\ G & \text{shear modulus} \\ G & \text{specific gravity of soil particles} \\ H & \text{height of specimen} \\ H & \text{Rebound Hardness number} \\ 1 & \text{gradient} \\ 1 & \text{gradient} \\ 1 & \text{gradient} \\ 1 & \text{Size corrected point load strength} \\ 1 & \text{Size corrected point load strength index} \\ 1 & \text{Size corrected point load strength index} \\ 1 & \text{Modified Taber Abrasion} \\ 1 & \text{Modified Taber Abrasion} \\ 1 & \text{Poisson's ratio, also viscosity} \\ 1 & \text{Liquidity Index} \\ 1 & \text{permeability} \\ 2 & \text{gradient} \\ 3 & \text{permeability} \\ 4 & \text{permeability} \\ 5 & \text{permeability} \\ 6 & \text{permeability} \\ 1 & \text{plasticity index} \\ 6 & \text{preconsolidation pressure} \\ 1 & \text{plasticity index} \\ 6 & \text{preconsolidation pressure} \\ 1 & \text{plasticity index} \\ 6 & \text{preconsolidation pressure} \\ 6 & \text{preconsolidation pressure} \\ 7 & \text{gradient} \\ 1 & \text{principal stress} \\ 2 & \text{principal stress} \\ 3 & \text{minor principal stress} \\ 4 & \text{principal stress} \\ 5 & \text{principal stress} \\ 6 & \text{principal stress} \\ 7 & \text{principal stress} \\ 8 & \text{principal stress} \\ 9 & $				
$\begin{array}{c} d_{100} & \mbox{displacement for } 100\% \mbox{consolidation} & \mbox{w}_n & \mbox{natural water content} \\ E & Young's modulus & \mbox{w}_p & \mbox{plastic limit} \\ e & \mbox{void ratio} & \mbox{woid ratio} & \mbox{wo, wi} & \mbox{initial water content} \\ e_o & \mbox{initial void ratio} & \mbox{a} & \mbox{slope of } q_r \mbox{versus } p_r \\ e_o & \mbox{initial void ratio} & \mbox{a} & \mbox{slope of } q_r \mbox{versus } p_r \\ e_o & \mbox{initial void ratio} & \mbox{a} & \mbox{slope of } q_r \mbox{versus } p_r \\ e_o & \mbox{slope of } q_r v$		1		
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e void ratio $w_s$ shrinkage limit $e_c$ void ratio after consolidation $w_o$ , $w_i$ initial water content $e_o$ initial void ratio $a$ slope of $q_f$ versus $p_f$ $g_s$ specific gravity of soil particles $g_s$ specific gravity of soil parti		•		
$\begin{array}{c} e_c \\ \text{o} \\ \text{initial void ratio} \\ \text{G} \\ \text{Shear modulus} \\ \text{G}_s \\ \text{Specific gravity of soil particles} \\ \text{H} \\ \text{height of specimen} \\ \text{HR} \\ \text{Rebound Hardness number} \\ \text{i} \\ \text{gradient} \\ \text{Is} \\ \text{Uncorrected point load strength} \\ \text{Is} \\ \text{Uncorrected point load strength index} \\ \text{Evol} \\ \text{Volume strain} \\ \text{HA} \\ \text{Modified Taber Abrasion} \\ \text{Eb, Ev} \\ \text{horizontal strain, vertical strain} \\ \text{HT} \\ \text{Total hardness} \\ \text{Ko} \\ \text{lateral stress ratio for one dimensional strain} \\ \text{G} \\ \text{normal stress} \\ \text{It} \\ \text{Liquidity Index} \\ \text{G}_c, \sigma^*_c \\ \text{consolidation stress in isotropic stress system} \\ \text{mv} \\ \text{coefficient of volume change} \\ \text{n} \\ \text{porosity} \\ \text{q} \\ \text{porosity} \\ \text{q} \\ \text{preconsolidation pressure} \\ \text{p} \\ \text{p} \\ \text{($\sigma_1 + \sigma_3$)/2, ($\sigma_v + \sigma_h$)/2} \\ \text{p} \\ \text{p} \\ \text{($\sigma_1 + \sigma_3$)/2, ($\sigma_v + \sigma_h$)/2} \\ \text{p} \\ \text{g} \\ \text{q} \\ \text{($\sigma_1 - \sigma_3$)/2} \\ \text{($\sigma_1 - \sigma_3$)/2} \\ \text{q} \\ \text{minimal stress} \\ \text{q} \\ \text{q} \\ \text{q} \\ \text{friction angle based on total stresses} \\ \text{q} \\ \text{q} \\ \text{q} \\ \text{friction angle based on effective stresses} \\ \text{q} \\ \text{q} \\ \text{q} \\ finitial water content with unit weight of value with total unit weight of value with total unit weight of value with total unit weight of solids unit weigh$		e		1
$\begin{array}{c} e_{0} & \text{initial void ratio} \\ G & \text{shear modulus} \\ G_{s} & \text{specific gravity of soil particles} \\ H & \text{height of specimen} \\ H_{R} & \text{Rebound Hardness number} \\ I & \text{gradient} \\ I_{S} & \text{Uncorrected point load strength} \\ I_{S} & \text{Uncorrected point load strength} \\ I_{S} & \text{Uncorrected point load strength index} \\ H_{T} & \text{Total hardness} \\ K_{O} & \text{lateral stress ratio for one dimensional strain} \\ K & \text{permeability} \\ I_{O} & \text{coefficient of volume change} \\ I_{O} & \text{possibly} \\ I_{O} & \text{preconsolidation pressure} \\ I_{O} & \text{quantity of flow} \\ I$				•
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i gradient $\gamma_{w}$ unit weight of water Is Uncorrected point load strength $\epsilon$ strain $\epsilon$ strain Is(50) Size corrected point load strength index $\epsilon$ strain $\epsilon$ volume strain HA Modified Taber Abrasion $\epsilon_{h}, \epsilon_{v}$ horizontal strain, vertical strain HT Total hardness $\epsilon$ lateral stress ratio for one dimensional strain $\epsilon$ normal stress $\epsilon$ effective normal stress LI Liquidity Index $\epsilon$ consolidation stress in isotropic stress system $\epsilon$ no porosity $\epsilon$ porosity $\epsilon$ porosity $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation $\epsilon$ price price provided in $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation $\epsilon$ provided in $\epsilon$ pro		č i	=	
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$			$\epsilon_{ m vol}$	
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$		± •	$\sigma'_{vc}$	Effective vertical consolidation stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$P_c$	•	$\sigma_1$	major principal stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			$\sigma_2$	intermediate principal stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	p'		σ3	minor principal stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	p'c	•	τ	shear stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Q	1 7	φ	friction angle based on total stresses
$q_f$ $q$ at failure $\phi'_r$ residual friction angle $q_0, q_i$ initial $q$ $\phi_{ult}$ $\phi$ for ultimate strength	q			friction angle based on effective stresses
$q_o,q_i$ initial $q$ $\phi_{ult}$ $\phi$ for ultimate strength	$q_{\mathrm{f}}$	•		
	$q_o, q_i$	•	•	
	$q_c$	q at consolidation	•	-



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ransm	nittal				
O:					
Delaney Peterson  Anchor QEA, LLC			DATE: 11/26/2019 GTX NO: 310685  RE: Gasco PDI		
Seattle, WA	98101				
COPIES	DATE		DESCRIPTION		
	11/26/2019	November 2019 Laboratory	est Report		
				_	
				_	
REMARKS:					
		SIGNED:	BullSh		
CC:			Barbara Sanchez, Assistan	t Laboratory Manager	
		APPROVED BY	Jon Ta	m	
			Jonathan Campbell, Labora	atory Manager	



Boston Atlanta Chicago Los Angeles New York www.geotesting.com

November 26, 2019

Delaney Peterson Anchor QEA, LLC 720 Olive Way, Suite 1900 Seattle, WA 98101

RE: Gasco PDI (GTX-310685)

Dear Delaney:

Enclosed are the test results you requested for the above referenced project. GeoTesting Express, Inc. (GTX) received eight samples from you on 11/1/2019. These samples were labeled as follows:

Sample Number
PDI-022SC-B-5.5-7.5-191016
PDI-031SC-B-8.9-10.9-191017
PDI-057SC-B-06-08-191023
PDI-059SC-B-06-08-191016
PDI-069SC-B-10-12-191016
PDI-083SC-B-08-10-191022
PDI-097SC-B-02-04-191017
PDI-099SC-B-02-04-191022

GTX performed the following tests on these samples:

- 8 ASTM D2216 Moisture Content
- 8 ASTM D4318 Atterberg Limits
- 2 ASTM D6913 Sieve Analysis
- 6 ASTM D6913/D7928 Grain Size Analysis Sieve and Hydrometer
- 8 ASTM D854 Specific Gravity

A copy of your test request is attached.

The results presented in this report apply only to the items tested. This report shall not be reproduced except in full, without written approval from GeoTesting Express. The remainder of these samples will be retained for a period of sixty (60) days and will then be discarded unless otherwise notified by you. Please call me if you have any questions or require additional information. Thank you for allowing GeoTesting Express the opportunity of providing you with testing services. We look forward to working with you again in the future.

GeoTesting Express, Inc. 125 Nagog Park Acton, MA 01720 Toll Free 800 434 1062 Fax 978 635 0266



Boston Atlanta Chicago Los Angeles New York www.geotesting.com

Respectfully yours,

Barbara Sanchez

Assistant Laboratory Manager

GeoTesting Express, Inc. 125 Nagog Park Acton, MA 01720 Toll Free 800 434 1062 Fax 978 635 0266



Boston Atlanta Chicago Los Angeles New York www.geotesting.com

#### **Geotechnical Test Report**

11/26/2019

#### GTX-310685 Gasco PDI

Prepared for:

Anchor QEA, LLC



Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg 11/19/19 Checked By: bfs Sample ID: ---Test Date:

Test Id: Depth: 529668

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 2SC-B-5.5 -7.5-1910		Moist, dark gray sand	10.7
	PDI- SC-B-8.9 -10.9-1910		Moist, dark gray sand	16.0
	PDI- 57SC-B-06 -08-19102		Wet, dark gray clay	77.2
	PDI- 59SC-B-06 -08-19101		Moist, dark grayish brown silty sand	38.4
	PDI- 69SC-B-10 -12-19101		Moist, very dark gray silt	67.2
	PDI- 83SC-B-08 -10-19102		Moist, dark gray clay	76.2
	PDI- 97SC-B-02 -04-19101		Wet, dark gray silt	86.8
	PDI- 99SC-B-02 -04-19102		Moist, very dark gray clay	79.6

Notes: Temperature of Drying: 110° Celsius



Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg 11/19/19 Checked By: bfs Sample ID: ---Test Date:

Test Id: Depth: 529676

## Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- 3C-B-5.5-7.5-19		Moist, dark gray sand	2.75	
	PDI- C-B-8.9-10.9-19		Moist, dark gray sand	2.75	
	PDI- SC-B-06-08-191		Wet, dark gray clay	2.71	
	PDI- SC-B-06-08-191		Moist, dark grayish brown silty sand	2.80	
	PDI- SC-B-10-12-191		Moist, very dark gray silt	2.73	
	PDI- SC-B-08-10-191		Moist, dark gray clay	2.65	
	PDI- SC-B-02-04-191		Wet, dark gray silt	2.66	
	PDI- SC-B-02-04-191		Moist, very dark gray clay	2.71	

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854 Moisture Content determined by ASTM D2216.



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-022SC-B-5.5-7.5-191Test Date: 11/19/19 Checked By: bfs

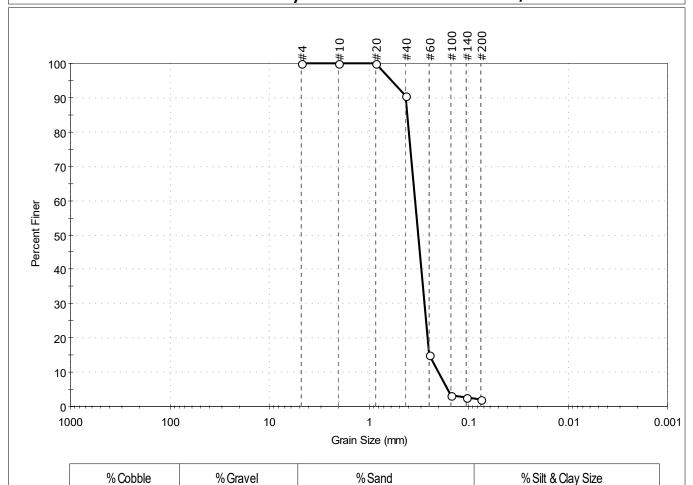
Test Id: 529663 Depth:

Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



97.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	90		
#60	0.25	15		
#100	0.15	3		
#140	0.11	3		
#200	0.075	2.2		

0.0

<u>Coeffic</u>	<u>cients</u>
D <sub>85</sub> =0.4090 mm	$D_{30} = 0.2779 \text{ mm}$
D <sub>60</sub> = 0.3431 mm	D <sub>15</sub> =0.2500 mm
D <sub>50</sub> = 0.3198 mm	$D_{10} = 0.2015 \text{ mm}$
C <sub>u</sub> =1.703	$C_c = 1.117$

2.2

Classification
Poorly graded SAND (SP) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Boring ID: --- Sample Type: bag Tested By: ckg Sample ID: PDI-031SC-B-8.9-10.9-19Test Date: 11/19/19 Checked By: bfs

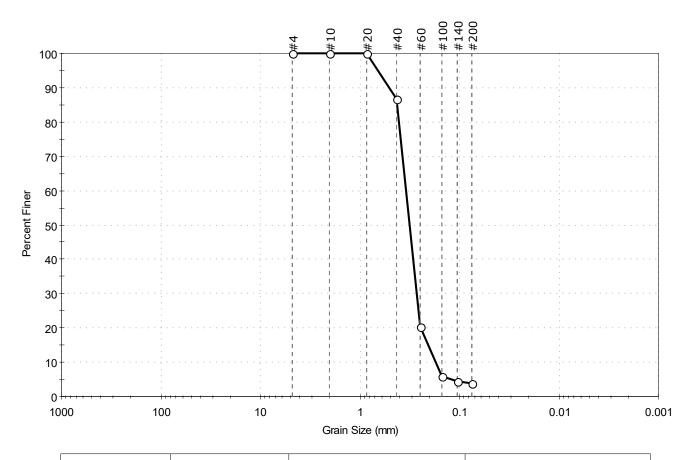
Depth: --- Test Id: 529661

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	96.1	3.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	87		
#60	0.25	20		
#100	0.15	6		
#140	0.11	4		
#200	0.075	3.9		

<u>Coefficients</u>		
D <sub>85</sub> = 0.4188 mm	$D_{30} = 0.2702 \text{ mm}$	
D <sub>60</sub> = 0.3432 mm	$D_{15} = 0.2076 \text{ mm}$	
D <sub>50</sub> = 0.3169 mm	$D_{10} = 0.1740 \text{ mm}$	
C <sub>u</sub> =1.972	$C_c = 1.223$	

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description
Sand/Gravel Particle Shape: --Sand/Gravel Hardness: ---



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

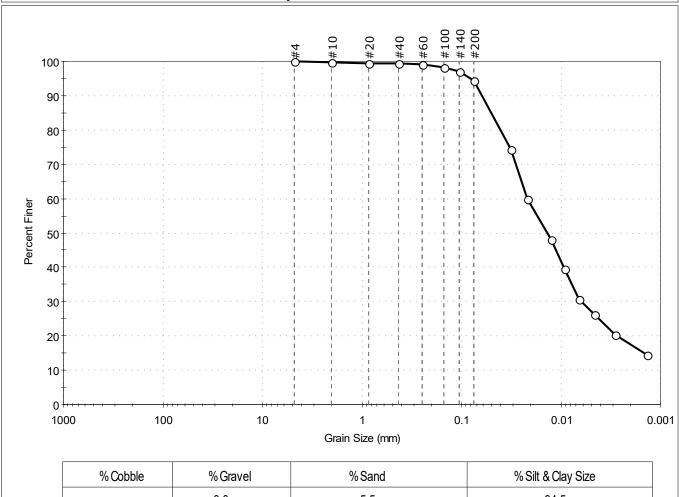
Sample ID: PDI-057SC-B-06-08-1910Test Date: 11/19/19 Checked By: bfs

Test Id: 529658 Depth:

Test Comment:

Visual Description: Wet, dark gray clay Sample Comment: Sample contains organics

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	5.5	94.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	98		
#140	0.11	97		
#200	0.075	94		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0320	74		
	0.0215	60		
	0.0126	48		
	0.0091	39		
	0.0065	31		
	0.0047	26		
	0.0029	20		
	0.0014	15		

<u>Coe</u>	<u>fficients</u>	
D <sub>85</sub> = 0.0502 mm	$D_{30} = 0.0062 \text{ mm}$	
D <sub>60</sub> = 0.0216 mm	$D_{15} = 0.0015 \text{ mm}$	
D <sub>50</sub> = 0.0137 mm	$D_{10} = N/A$	
C <sub>II</sub> =N/A	$C_c = N/A$	

<u>Classification</u> Fat CLAY (CH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-6 (49))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-059SC-B-06-08-1910Test Date: 11/19/19 Checked By: bfs

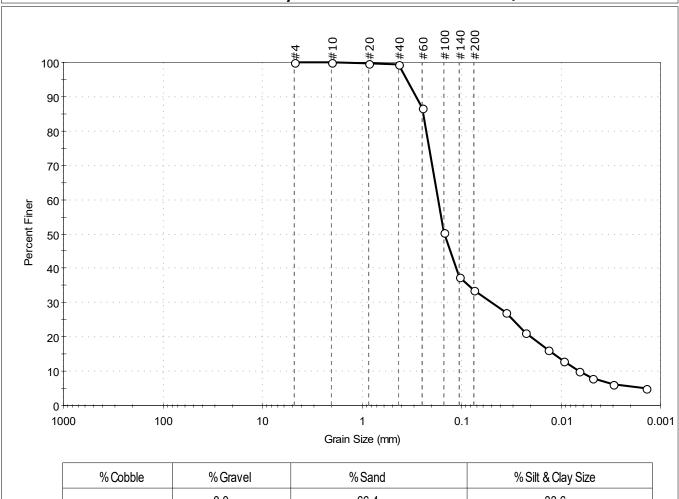
Depth: Test Id: 529664

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	66.4	33.6

		•		•
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	87		
#100	0.15	51		
#140	0.11	37		
#200	0.075	34		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0356	27		
	0.0229	21		
	0.0133	16		
	0.0095	13		
	0.0067	10		
	0.0048	8		
	0.0030	6		
	0.0014	5		

<u>Coe</u>	<u>fficients</u>	
D <sub>85</sub> = 0.2437 mm	$D_{30} = 0.0492 \text{ mm}$	
D <sub>60</sub> = 0.1713 mm	$D_{15} = 0.0117 \text{ mm}$	
D <sub>50</sub> = 0.1477 mm	$D_{10} = 0.0066 \text{ mm}$	
C <sub>11</sub> =25.955	$C_c = 2.141$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-069SC-B-10-12-1910Test Date: 11/19/19 Checked By: bfs

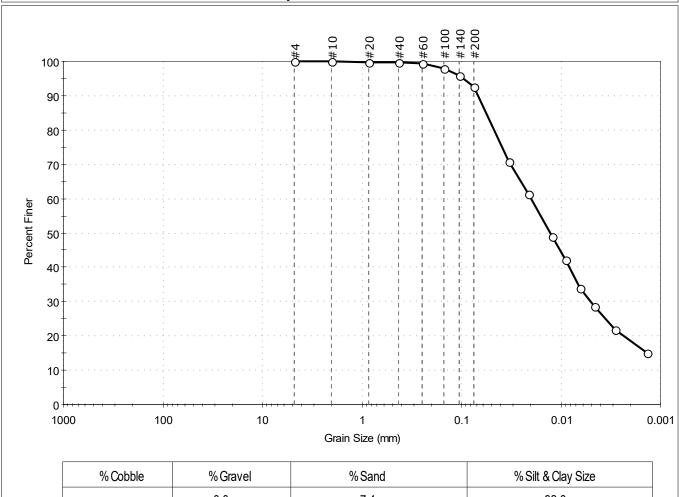
529665 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	7.4	92.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0330	71		
	0.0210	61		
	0.0124	49		
	0.0090	42		
	0.0065	34		
	0.0046	29		
	0.0029	22		
	0.0014	15		

	oci i cici co
D <sub>85</sub> = 0.0563 mm	$D_{30} = 0.0050 \text{ mm}$
D <sub>60</sub> = 0.0199 mm	$D_{15} = 0.0014 \text{ mm}$
D <sub>50</sub> = 0.0129 mm	$D_{10} = N/A$
C <sub>u</sub> =N/A	$C_{c} = N/A$

Coefficients

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (40))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No:

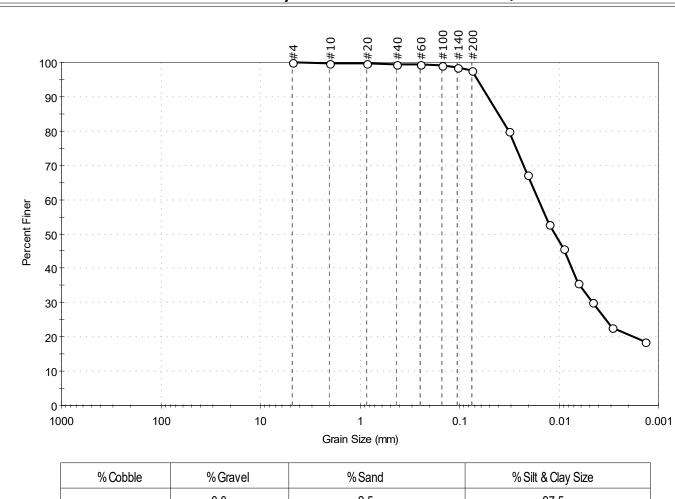
Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-083SC-B-08-10-1910Test Date: 11/19/19 Checked By: bfs

Test Id: 529659 Depth:

Test Comment:

Visual Description: Moist, dark gray clay Sample Comment: Sample contains organics

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	2.5	97.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#140	0.11	99		
#200	0.075	98		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0320	80		
	0.0208	67		
	0.0125	53		
	0.0089	46		
	0.0065	36		
	0.0046	30		
	0.0029	23		
	0.0014	19		

Coeffic	<u>cients</u>
D <sub>85</sub> =0.0408 mm	$D_{30} = 0.0046 \text{ mm}$
D <sub>60</sub> = 0.0161 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0109 mm	$D_{10} = N/A$
C <sub>II</sub> =N/A	$C_C = N/A$

GTX-310685

<u>Classification</u> Fat CLAY (CH) **ASTM** AASHTO Clayey Soils (A-7-5 (55))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 ckg

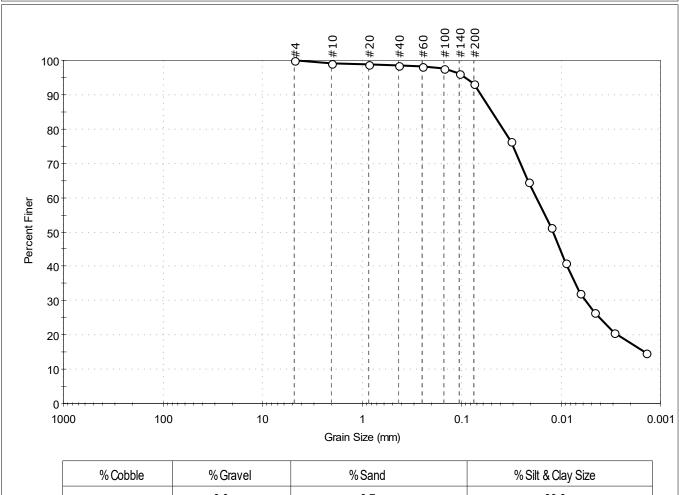
Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-097SC-B-02-04-1910Test Date: 11/19/19 Checked By: bfs

Test Id: Depth: 529662

Test Comment:

Visual Description: Wet, dark gray silt Sample Comment: Sample contains organics

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	6.7	93.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	98		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0318	76		
	0.0212	65		
	0.0125	51		
	0.0091	41		
	0.0065	32		
	0.0047	26		
	0.0030	21		
	0.0014	15		

Coeffic	<u>cients</u>
D <sub>85</sub> = 0.0493 mm	$D_{30} = 0.0057 \text{ mm}$
D <sub>60</sub> = 0.0177 mm	$D_{15} = 0.0014 \text{ mm}$
D <sub>50</sub> = 0.0120 mm	$D_{10} = N/A$
C <sub>II</sub> =N/A	$C_c = N/A$

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (39))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-099SC-B-02-04-1910Test Date: 11/19/19 Checked By: bfs

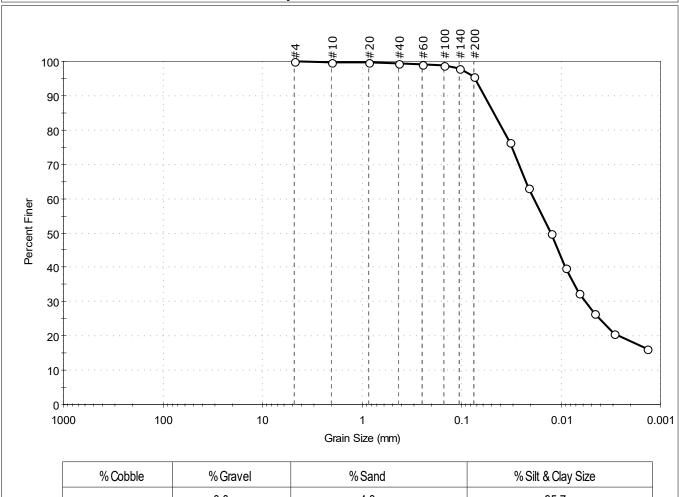
529660 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray clay

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	4.3	95.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#140	0.11	98		
#200	0.075	96		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0326	76		
	0.0214	63		
	0.0126	50		
	0.0091	40		
	0.0065	32		
	0.0047	26		
	0.0029	21		
	0.0014	16		

	CHICICHES
D <sub>85</sub> = 0.0472 mm	$D_{30} = 0.0057 \text{ mm}$
D <sub>60</sub> = 0.0188 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0126 mm	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

Coefficients

<u>Classification</u> Fat CLAY (CH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (54))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-022SC-B-5.5-7.5-191Test Date: 11/18/19 Checked By: bfs

Depth: --- Test Id: 529655

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

## **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	22SC-B-5.5-7.5-19			11	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

10% Retained on #40 Sieve

Dry Strength: NONE Dilatancy: RAPID Toughness: n/a

The sample was determined to be Non-Plastic



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-031SC-B-8.9-10.9-19Test Date: 11/18/19 Checked By: bfs

Depth: --- Test Id: 529653

Test Comment: --Visual Description: Moist, dark gray sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

## **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	31SC-B-8.9-10.9-1			16	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

13% Retained on #40 Sieve

Dry Strength: NONE Dilatancy: RAPID Toughness: n/a

The sample was determined to be Non-Plastic



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

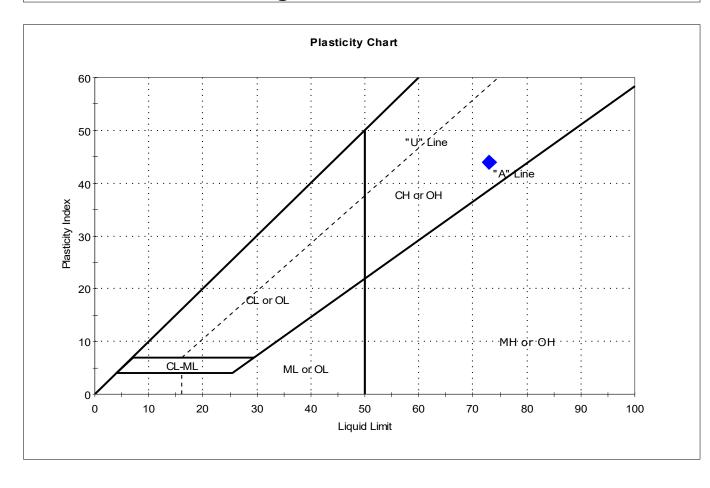
Sample ID: PDI-057SC-B-06-08-1910Test Date: 11/21/19 Checked By: bfs

Depth: --- Test Id: 529650

Test Comment: ---

Visual Description: Wet, dark gray clay
Sample Comment: Sample contains organics

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)57SC-B-06-08-19			77	73	29	44	1.1	Fat CLAY (CH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Test Id:

529656

Sample ID: PDI-059SC-B-06-08-1910Test Date: 11/19/19 Checked By: bfs

Depth: Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Atterberg Limits - ASTM D4318

## **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	059SC-B-06-08-19			38	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic



Location: Project No: GTX-310685
Boring ID: --- Sample Type: bag Tested By: cam

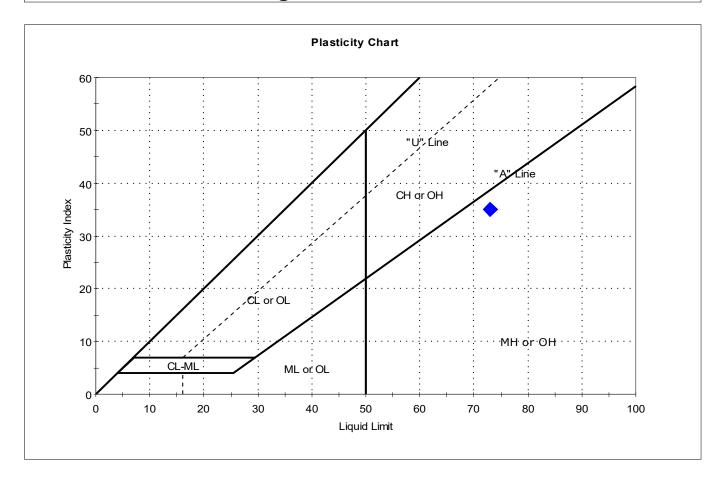
Sample ID: PDI-069SC-B-10-12-1910Test Date: 11/20/19 Checked By: bfs Depth: --- Test Id: 529657

Test Comment: ---

Visual Description: Moist, very dark gray silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	069SC-B-10-12-19			67	73	38	35	8.0	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

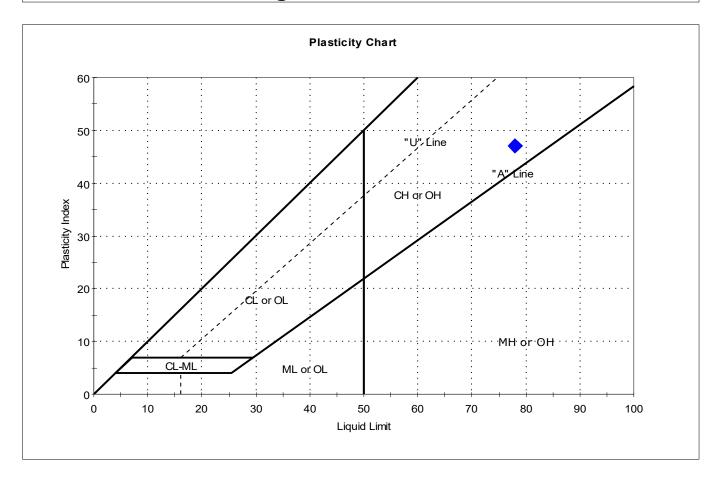
Sample ID: PDI-083SC-B-08-10-1910Test Date: 11/20/19 Checked By: bfs

Depth: Test Id: 529651

Test Comment:

Visual Description: Moist, dark gray clay Sample contains organics Sample Comment:

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	083SC-B-08-10-19			76	78	31	47	1	Fat CLAY (CH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

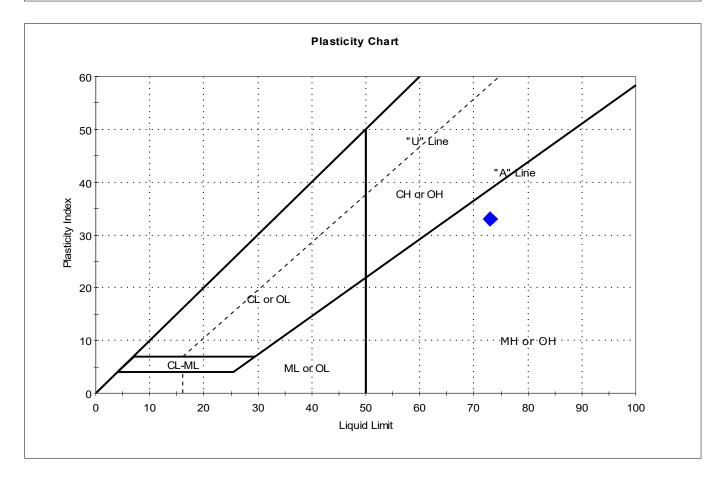
Sample ID: PDI-097SC-B-02-04-1910Test Date: 11/19/19 Checked By: bfs

Sample ID: PDI-097SC-B-02-04-1910Test Date: 11/19/19
Depth: --- Test Id: 529654

Test Comment: ---

Visual Description: Wet, dark gray silt
Sample Comment: Sample contains organics

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	D97SC-B-02-04-19			87	73	40	33	1.4	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685 Sample Type: bag Tested By: cam

Boring ID: ---Sample ID: PDI-099SC-B-02-04-1910Test Date: 11/20/19 Checked By: bfs

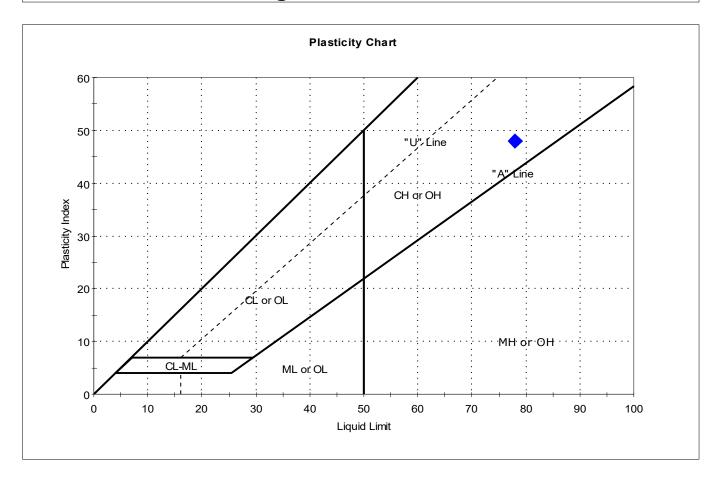
Depth: Test Id: 529652

Test Comment:

Visual Description: Moist, very dark gray clay

Sample Comment:

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	099SC-B-02-04-19			80	78	30	48	1	Fat CLAY (CH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW

## 

# ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

**POC:** \* Delaney Peterson (360-715-2707)

1605 Cornwall Avenue, Bellingham, WA 98225

Project:

Client:

Gasco PDI

**NW Natural** 

COC ID:

NWGEO-201910.

Geotesting Express CO, SN, BJ, SS

Sample Custodian:

Lab:

	_					Т
Preservative			4°C	4°C	4°C	4°C
TAT**			30	30	30	30
Method			D4318	D6913/D7928	D2216	D854
Test Request			Atterberg Limits	Grain Size	Moisture Content	Specific gravity
Lab QC*						
# Contain	ers	-				
Collected	Date Time	10/23/2019 12:46				
Matrix	21	SE				
Samp Type	le	z				
			1			

PDI-057SC-B-06-08-191023

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Field Sample ID

COC Sample Number

Comment:		/3	0 0	2	
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Print Names Ben Toli Son		Print Name	Print Name	Print Name	Print Name
Company Anchor OEH		Company	Сотрапу	Сотрапу	Company
Date/Time 10/19 @ 1215	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time

\* Lab QC Requested for sample when box is checked \*\* TAT = Turn Around Time in DAYS # POC = Project Point of Contact

OR	2600, Seattle, WA 98101
NA N	201 3rd Avenue, 3

# ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

Project:

Gasco PD

Client:

1605 Cornwall Avenue, Bellingham, WA 98225

**POC:** \* Delaney Peterson (360-715-2707)

NWGFO-20191022-162549

				COC ID:		NWGEO-20191022-102349	1022-102343	
Gasco PDI	PDI			Sample	Sample Custodian:	CO, SN, BJ, SS	"	
NW Natural	atural			Lab:	Ü	Geotesting Express	ress	
ō	# Contain	අ Contain	Test Request	9	Method	TAT**	Preservative	
Time	ers							
10.11	,							
14:05	_				D4318	30	4°C	
			Atterberg Limits		20010	30	4°C	
			Grain Size		D6913/D7928	9 5	J.,	
			Moisture Content		D2216	30	2	
			Mostar Controls		D854	30	4°C	
			Specific gravity					
0,00	,							
10:48	_				D4318	30	4°C	
			Atterberg Limits		0001010101	ç	4°C	
			Grain Size		D6913/D7928	200	207	
			Mainting Content		D2216	30	D-4	_
			Moistal & Collicin		DSEA	30	4°C	_
			Specific gravity		+co0			_

Date

Collected

Sample Type

14:05

10/22/2019

SE

z

PDI-083SC-B-08-10-191022

001

Field Sample ID

COC Sample Number

Specific gravity

10/22/2019 10:48

SE

z

PDI-099SC-B-02-04-191022

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		By.	Signature		Print Name		Company		Date/Time		* I ah OC. Requiested for sample when box is checked ** TAT = Tum Around Time in DAYS # POC = Project Point of Contact	
		Relinquished By:	Signature		Print Name		Company		Date/Time		ample when box is checked ** TAT = Tu	
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Date Printed: 10/22/2019

ANCHOR OEA EEEE ODE 3010 Seattle, WA 98101

**POC:** \* Delaney Peterson (360-715-2707)

# ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

Gasco PDI Project:

NW Natural

COC Sample Number

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002

COC ID:

NWGEO-20191017-123936

Sample Custodian:

SN

Geotesting Express

Lab:

Field Sample ID         Edg and Sample ID         Attended Sample ID         Indicated ID	1605 Cornwall Avenue, Bellingham, WA 98225	ham, WA	98225	Client:	NW Natural	atural		Lab:		Geotesting Express	bress
Date   Time   B   Atterberg Limits   Da516   30     N   SE   10/17/2019   10:46   1	Glad Samula II	Typ	_		Þ	# Contain	Lab QC*	Test Request	Method	TAT**	Preservative
N         SE         10/17/2019         9:06         1         Atterberg Limits         Atterberg Limits         D4318         30           Grain Size         Moisture Content         D6913/D7928         30           Specific gravity         D854         30           Atterberg Limits         D4318         30           Grain Size         Moisture Content         D6913/D7928         30           Moisture Content         D5216         30           Moisture Content         D6913/D7928         30           Moisture Content         D854         30	בפות סמוולוס וס	e e	alo.	Date	Time	ers					
N         SE         10/17/2019 10:46   1   I   I   I   I   I   I   I   I   I	DI-031SC-B-8.9-10.9-191017	z	S.	├	90:6	_					
N         SE         10/17/2019 10:46         1         Image: Transmission of the content of th		:		⊣ .				Atterberg Limits	D4318	30	4°C
Noisture Content         DD216         30           Specific gravity         DB54         30           Atterberg Limits         D4318         30           Grain Size         Moisture Content         D6913/D7928         30           Moisture Content         D2216         30           Specific gravity         D854         30	*							Grain Size	D6913/D7928	30	4°C
N SE   10/17/2019 10:46   1								Moisture Content	D2216	30	4°C
N         SE         10/17/2019 10:46         1         Image: Content Cont								Specific gravity	D854	30	4°C
Atterberg Limits         D4318         30           Grain Size         D6913/D7928         30           Moisture Content         D2216         30           Specific gravity         D854         30	1-097SC-R-02-04-191017	Z	\ \frac{\partial}{\partial}	-	10.46	<b>-</b>					
D6913/D7928     30       D2216     30       D854     30		-	3	┨				Atterbera Limits	D4318	30	4°C
D2216 30 D854 30								Grain Size	D6913/D7928	30	4°C
D854 30								Moisture Content	D2216	30	4°C
								Specific gravity	D854	30	4°C

	9			
Comment:				
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Print Name	Print Name	Print Name	Print Name	Print Name
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Date/Time	Date/Time	Date/Time	Date/Time	Date/Time
	* Lab QC Requested for sample when box is checked ** TAT = Turn Around Time in DAYS # POC = Project Point of Contact	un Around Time in DAYS # POC = Proj	ect Point of Contact	Page 1 of 1

## ANCHOR OEA : OEA :

# ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

COC ID:

NWGEO-20191016-143858

CO, SN, BJ, DL

Geotesting Express

Lab:

**NW Natural** Gasco PDI

1605 Cornwall Avenue, Bellingham, WA 98225

POC: \* Delaney Peterson (360-715-2707)

PDI-022SC-B-5.5-7.5-191016

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Field Sample ID

COC Sample Number

Project: Client:

Sample Custodian:

Г												r result				$\Box$
	Preservative		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C		4°C	4°C	4°C	4°C
	TAT**		30	30	30	30		30	30	30	30		30	30	30	30
	Method		D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854		D4318	D6913/D7928	D2216	D854
	Test Request		Atterbera Limits	Grain Size	Moisture Content	Specific gravity	2	Atterberg Limits	Grain Size	Moisture Content	Specific gravity		Atterberg Limits	Grain Size	Moisture Content	Specific gravity
	Lab QC*												]			
	Containers	141					57   1					38 1				
	Collected Date Ti	10/16/2019 13:41					10/16/2019 7:57					10/16/2019 10:38				
	Matrix	SE					R.					T,	100			
	Sample Type	z					z	:				z	:			
)																

PDI-059SC-B-06-08-191016

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003 PDI-069SC-B-10-12-191016

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			Signature By:	Print Name	2000 X	Kar	١
	Comment:		Relinquished By: Signature	PYT	1	V	一 (ダ) こっちご

Date Printed: 10/16/2019



### **WARRANTY and LIABILITY**

GeoTesting Express (GTX) warrants that all tests it performs are run in general accordance with the specified test procedures and accepted industry practice. GTX will correct or repeat any test that does not comply with this warranty. GTX has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material

GTX may report engineering parameters that require us to interpret the test data. Such parameters are determined using accepted engineering procedures. However, GTX does not warrant that these parameters accurately reflect the true engineering properties of the *in situ* material. Responsibility for interpretation and use of the test data and these parameters for engineering and/or construction purposes rests solely with the user and not with GTX or any of its employees.

GTX's liability will be limited to correcting or repeating a test which fails our warranty. GTX's liability for damages to the Purchaser of testing services for any cause whatsoever shall be limited to the amount GTX received for the testing services. GTX will not be liable for any damages, or for any lost benefits or other consequential damages resulting from the use of these test results, even if GTX has been advised of the possibility of such damages. GTX will not be responsible for any liability of the Purchaser to any third party.

### **Commonly Used Symbols**

B pore pressure parameter for $\Delta \circ s$ T temperature $S \circ s$ CAI CERCHAR Abrasiveness index $S \circ s$ to time of the propersion ratio for one dimensional consolidation $S \circ s$ cyclic stress ratio $S $	A	pore pressure parameter for $\Delta \sigma_1 - \Delta \sigma_3$	$S_{\rm r}$	Post cyclic undrained shear strength
CAI Use CERCHAR Abrasiveness Index CIU is or compression ratio for one dimensional consolidation cross or compression ratio for one dimensional consolidation consequence of the compression ratio for one dimensional consolidation consequence of the compression ratio for one dimensional consolidation consequence of the compression ratio for one dimensional consolidation consequence of the co	В	pore pressure parameter for $\Delta \sigma_3$		·
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	CAI	CERCHAR Abrasiveness Index		1
CR CSR         compression ratio for one dimensional consolidation         UU, Q         unconsolidated undrained triaxial test           CSR         cyclic stress ratio         u. a         excess pore water pressure           C₂         coefficient of curvature, $(D x_0)^2 / (D r_0 x D r_0)$ u. u. w         pore gas pressure           C₂         coefficient of consolidation         V total volume         volume of solids           C₂         coefficient of consolidation         V₂         volume of solids           c⟩         coefficient of consolidation         V₂         volume of solids           c⟩         coefficient of consolidation         V₂         volume of solids           c⟩         coefficient of consolidation         V₂         volume of voids           c⟩         cohesion intercept for tofal stresses         V₂         volume of voids           D         diameter at which 10% of soil is finer         V₂         volume of voids           D         diameter at which 10% of soil is finer         V₂         volume of voids           D <sub>10</sub> diameter at which 30% of soil is finer         W₂         veight of vater           D <sub>20</sub> diameter at which 30% of soil is finer         W₂         veight of vater           D <sub>30</sub> diameter at which 85% of soil is finer	CIU	isotropically consolidated undrained triaxial shear test		
CSR         cyclic stress ratio $u_a$ pore gas pressure $C_a$ coefficient of curvature, $(D \otimes)^2 / (D \log x D \otimes)$ $u_a$ excess pore water pressure $C_a$ coefficient of curvature, $(D \otimes)^2 / (D \log x D \otimes)$ $u_b$ excess pore water pressure $C_a$ coefficient of secondary compression $V_a$ volume of gas $c_b$ coefficient of secondary compression $V_a$ volume of solids $c_b$ coefficient of secondary compression $V_a$ volume of solids $c_b$ coefficient of consolidation $V_a$ volume of solids $c_b$ coefficient of consolidation $V_a$ volume of solids $c_b$ cobesion intercept for total stresses $V_a$ volume of voids $c_b$ dameter at which 10% of soil is finer $V_a$ volume of voids $c_b$ dameter at which 15% of soil is finer $V_a$ volume of voids $c_b$ diameter at which 15% of soil is finer $V_a$ weight of solids $c_b$ diameter at which 50% of soil is finer $V_a$ $V_a$ water content	CR	compression ratio for one dimensional consolidation	,	•
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	CSR	cyclic stress ratio		
Ga         coefficient of uniformity, Don/D10         u, uw pore water pressure           Ca         compression index for one dimensional consolidation         Vg         volume of gas           Ca         coefficient of secondary compression         Vg         volume of gas           Ca         coefficient of consolidation         Vg         volume of solids           C         cohesion intercept for total stresses         Vy         volume of voids           D         diameter of specimen         Vw         volume of water           D         diameter at which 10% of soil is finer         Vw         volume of water           Dis         diameter at which 15% of soil is finer         Ww         weight of solids           Ds0         diameter at which 30% of soil is finer         Ww         weight of solids           Ds0         diameter at which 50% of soil is finer         Ww         water content           Ds0         diameter at which 50% of soil is finer         Ww         water content           Ds0         diameter at which 50% of soil is finer         Ww         water content           Ds0         diameter at which 50% of soil is finer         Ww         water content           Ds0         diameter at which 50% of soil is finer         Ww         water content	$C_c$	coefficient of curvature, $(D_{30})^2 / (D_{10} \times D_{60})$		
Cc         compression index for one dimensional consolidation         Vg         total volume           Cs         coefficient of secondary compression         Vg         volume of gas           c cobesion intercept for total stresses         Vs         shear wave velocity           c cobesion intercept for effective stresses         Vs         volume of voids           D         diameter of specimen         Vs         volume of water           D         diameter at which 10% of soil is finer         Vs         volume of water           Dis         diameter at which 10% of soil is finer         W         total weight           Ds         diameter at which 30% of soil is finer         W         weight of solids           Ds         diameter at which 50% of soil is finer         W         water content           Ds         diameter at which 60% of soil is finer         W         water content           Ds         diameter at which 85% of soil is finer         W         water content           Ds         diameter at which 85% of soil is finer         W         water content           Ds         diameter at which 85% of soil is finer         W         water content           Ds         diameter at which 85% of soil is finer         W         water content           Ds	$C_{\rm u}$	coefficient of uniformity, D <sub>60</sub> /D <sub>10</sub>		<u> </u>
Ca         coefficient of secondary compression         Vg         volume of solids           c.         coefficient of consolidation         Vg         volume of solids           c.         coefficient of consolidation         Vg         volume of voids           d.         cohesion intercept for total stresses         Vg         volume of voids           D.         diameter of specimen         Vg         volume of water           D.         dameter at which 10% of soil is finer         Vg         volume of water           D.         diameter at which 15% of soil is finer         Wg         weight of solids           D.         diameter at which 50% of soil is finer         Wg         weight of solids           D.         diameter at which 50% of soil is finer         Wg         weight of water           D.         diameter at which 50% of soil is finer         Wg         water content           D.         diameter at which 50% of soil is finer         Wg         water content           D.         diameter at which 50% of soil is finer         Wg         water content           D.         diameter at which 50% of soil is finer         Wg         water content           D.         diameter at which 50% of soil is finer         Wg         water content <t< td=""><td><math>C_c</math></td><td></td><td>,</td><td></td></t<>	$C_c$		,	
cv         coefficient of consolidation $V_s$ volume of solids           c         cohesion intercept for total stresses $V_s$ volume of voids           D         diameter of specimen $V_w$ volume of voids           D         damping ratio $V_w$ volume of water           D10         diameter at which 10% of soil is finer $V_w$ velocity           D15         diameter at which 15% of soil is finer $W_w$ weight of solids           D20         diameter at which 50% of soil is finer $W_w$ weight of water           D20         diameter at which 60% of soil is finer $W_w$ water content           D3         diameter at which 60% of soil is finer $W_w$ water content           D4         diameter at which 60% of soil is finer $W_w$ water content           D4         diameter at which 60% of soil is finer $W_w$ water content           D4         diameter at which 60% of soil is finer $W_w$ water content           D4         displacement for 50% consolidation $W_w$ water content           D4         displacement for 100% consolidation $W_w$ final water content	$C_{\alpha}$	coefficient of secondary compression		
c'         cohesion intercept for effective stresses $V_v$ volume of voids           D'         diameter of specimen $V_w$ volume of voids           D         diameter of specimen $V_w$ volume of voids           D         diameter of specimen $V_w$ volume of voids           D         diameter at which 10% of soil is finer $V_w$ velocity           D15         diameter at which 30% of soil is finer $W_w$ weight of solids           D26         diameter at which 50% of soil is finer $W_w$ weight of water           D26         diameter at which 85% of soil is finer $W_w$ water content           D26         diameter at which 85% of soil is finer $W_w$ water content           D36         diameter at which 85% of soil is finer $W_w$ water content           D40         displacement for 50% consolidation $W_w$ water content at consolidation           D40         displacement for 100% consolidation $W_w$ plastic limit           D40         displacement for 90% consolidation $W_w$ plastic limit           D4         Young's modulus $W_p$ plastic limit	$c_{v}$	coefficient of consolidation		e e e e e e e e e e e e e e e e e e e
c'         cohesion intercept for effective stresses         V.v         volume of voids           D         diameter of specimen         V.w         volume of water           D         damping ratio         V.v         volume of water           D10         diameter at which 10% of soil is finer         V         velocity           D10         diameter at which 50% of soil is finer         W.w         weight of solids           D20         diameter at which 50% of soil is finer         W.w         weight of water           D30         diameter at which 60% of soil is finer         W.w         water content           D40         diameter at which 60% of soil is finer         W.w         water content           D40         diameter at which 60% of soil is finer         W.w         water content           D40         displacement for 90% consolidation         W.r         final water content           D40         displacement for 90% consolidation         W.r         initial water content           D4         diardia         W.v         shrinkage limit           D4         void ratio         W.v         shrinkage limit           D5         shear modulus $\alpha$ '         slope of $\alpha$ ' versus pr'           D6         shear modulus $\alpha$ '<	c	cohesion intercept for total stresses		
D         diameter of specimen         V <sub>v</sub> volume of water           D         damping ratio         V <sub>o</sub> initial volume           D <sub>10</sub> diameter at which 10% of soil is finer         V         volocity           D <sub>20</sub> diameter at which 30% of soil is finer         W         weight of solids           D <sub>20</sub> diameter at which 50% of soil is finer         W <sub>w</sub> weight of solids           D <sub>20</sub> diameter at which 50% of soil is finer         W <sub>w</sub> weight of water           D <sub>20</sub> diameter at which 60% of soil is finer         W <sub>w</sub> water content           D <sub>20</sub> diameter at which 85% of soil is finer         W <sub>w</sub> water content           D <sub>30</sub> diameter at which 85% of soil is finer         W <sub>w</sub> water content           D <sub>30</sub> diameter at which 85% of soil is finer         W <sub>w</sub> water content           D <sub>30</sub> diameter at which 85% of soil is finer         W <sub>w</sub> water content           D <sub>30</sub> diameter at which 85% of soil is finer         W <sub>w</sub> water content           D <sub>4</sub> d <sub>4</sub> d <sub>4</sub> d <sub>4</sub> d <sub>4</sub> D <sub>4</sub> void ratio         v <sub>1</sub> d <sub>4</sub> d <sub>4</sub>	c'	cohesion intercept for effective stresses		•
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	D	1		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	D	•		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$D_{10}$			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$				
$\begin{array}{cccccccccccccccccccccccccccccccccccc$				•
$\begin{array}{cccccccccccccccccccccccccccccccccccc$				e
D8s diameter at which 85% of soil is finer $w_c$ water content at consolidation $d_{00}$ displacement for 50% consolidation $w_f$ final water content $d_{00}$ displacement for 90% consolidation $d_{100}$ displacement for 100% consolidation $d_{100}$ displacement for 100% consolidation $d_{100}$ $d_{100}$ displacement for 100% consolidation $d_{100}$ $d_$				e
$ \begin{array}{c} d_{50} & displacement for 50\% consolidation \\ d_{90} & displacement for 90\% consolidation \\ d_{100} & displacement for 100\% consolidation \\ E & Young's modulus \\ e & void ratio \\ e_c & void ratio after consolidation \\ e_c & void ratio after consolidation \\ e_o & initial void ratio \\ e_o & specific gravity of soil particles \\ H & height of specimen \\ HR & Rebound Hardness number \\ i & gradient \\ Is & Uncorrected point load strength index \\ HA & Modified Taber Abrasion \\ HAT & Total hardness \\ HA & Modified Taber Abrasion \\ HIT & Total hardness \\ K_o & lateral stress ratio for one dimensional strain \\ K & permeability Index \\ mv & coefficient of volume change \\ n & porosity \\ Pc & preconsolidation pressure \\ p & (\sigma_1 + \sigma_3)/2, (\sigma_2 + \sigma_b)/2 \sigma_3 minor principal stress and possible for the first of the $				
$\begin{array}{c} d_{90} & \text{displacement for 90\% consolidation} \\ d_{100} & \text{displacement for 100\% consolidation} \\ d_{100} & \text{displacement for 100\% consolidation} \\ E & Young's modulus \\ e & \text{void ratio} \\ e & \text{void ratio} \\ e & \text{void ratio} \\ e & \text{void ratio difer consolidation} \\ e & \text{shear modulus} \\ G & \text{shear modulus} \\ G & \text{shear modulus} \\ G & \text{specific gravity of soil particles} \\ H & \text{height of specimen} \\ H & \text{Rebound Hardness number} \\ 1 & \text{gradient} \\ 1 & \text{gradient} \\ 1 & \text{gradient} \\ 1 & \text{Size corrected point load strength} \\ 1 & \text{Size corrected point load strength} \\ 1 & \text{Size corrected point load strength index} \\ 1 & \text{Modified Taber Abrasion} \\ 1 & \text{Modified Taber Abrasion} \\ 1 & \text{Poisson's ratio, also viscosity} \\ 1 & \text{Liquidity Index} \\ 1 & \text{permeability} \\ 2 & \text{gradient} \\ 3 & \text{permeability} \\ 4 & \text{permeability} \\ 5 & \text{permeability} \\ 6 & \text{permeability} \\ 1 & \text{plasticity index} \\ 6 & \text{preconsolidation pressure} \\ 6 & \text{prosoity} \\ 7 & \text{possiblation pressure} \\ 1 & \text{plasticity index} \\ 8 & \text{preconsolidation pressure} \\ 9 & \text{possiblation pressure} \\ 9 & \text{possiblation pressure} \\ 9 & \text{possiblation pressure} \\ 9 & \text{possiblation} \\ 0 & \text{quantity of flow} \\ 0 & \text{quantity of flow of possiblation and pressure} \\ 0 & \text{initial q} \\ 0 & \text{possiblation and pressure} \\ 0 & \text{quantity of flow} \\ 0 & \text{quantity of flow} \\ 0 & \text{quantity of flow of possiblation and pressure} \\ 0 & \text{quantity of flow} \\ 0 & \text{quantity of flow} \\ 0 & \text{quantity of flow} \\ 0 & \text{quantity of flow of possiblation and pressure} \\ 0 & \text{quantity of flow} \\ 0 & \text{quantity of flow} \\ 0 & \text{quantity of flow of possiblation} \\ 0 & quantity of$				
$\begin{array}{c} d_{100} & \mbox{displacement for } 100\% \mbox{consolidation} & \mbox{w}_n & \mbox{natural water content} \\ E & Young's modulus & \mbox{w}_p & \mbox{plastic limit} \\ e & \mbox{void ratio} & \mbox{w}_s & \mbox{shrinkage limit} \\ e_c & \mbox{void ratio} & \mbox{a} & \mbox{shrinkage limit} \\ e_o & \mbox{initial void ratio} & \mbox{a} & \mbox{slope of } q_r \mbox{versus } p_r \\ e_o & \mbox{initial void ratio} & \mbox{a} & \mbox{slope of } q_r \mbox{versus } p_r \\ G_s & \mbox{specific gravity of soil particles} & \mbox{rt total unit weight} \\ H & \mbox{height of specimen} & \mbox{yd} & \mbox{dry unit weight of solids} \\ H & \mbox{height of specimen} & \mbox{yd} & \mbox{dry unit weight of solids} \\ H_R & \mbox{Rebound Hardness number} & \mbox{ys} & \mbox{unit weight of water} \\ Is & \mbox{Uncorrected point load strength} & \mbox{gradient} & \mbox{yunit weight of water} \\ Is & \mbox{Uncorrected point load strength index} & \mbox{gradient} & gradie$		1		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		•		•
e void ratio $w_s$ shrinkage limit $e_c$ void ratio after consolidation $w_o$ , $w_i$ initial water content $e_o$ initial void ratio $a$ slope of $q_f$ versus $p_f$ $g_s$ specific gravity of soil particles $g_s$ specific gravity of soil parti		•		
$\begin{array}{c} e_c \\ \text{o} \\ \text{initial void ratio} \\ \text{G} \\ \text{Shear modulus} \\ \text{G}_s \\ \text{Specific gravity of soil particles} \\ \text{H} \\ \text{height of specimen} \\ \text{HR} \\ \text{Rebound Hardness number} \\ \text{i} \\ \text{gradient} \\ \text{Is} \\ \text{Uncorrected point load strength} \\ \text{Is} \\ \text{Uncorrected point load strength index} \\ \text{Evol} \\ \text{Volume strain} \\ \text{HA} \\ \text{Modified Taber Abrasion} \\ \text{Eb, Ev} \\ \text{horizontal strain, vertical strain} \\ \text{HT} \\ \text{Total hardness} \\ \text{Ko} \\ \text{lateral stress ratio for one dimensional strain} \\ \text{G} \\ \text{normal stress} \\ \text{It} \\ \text{Liquidity Index} \\ \text{G}_c, \sigma^*_c \\ \text{consolidation stress in isotropic stress system} \\ \text{mv} \\ \text{coefficient of volume change} \\ \text{n} \\ \text{porosity} \\ \text{q} \\ \text{porosity} \\ \text{q} \\ \text{preconsolidation pressure} \\ \text{p} \\ \text{p} \\ \text{($\sigma_1 + \sigma_3$)/2, ($\sigma_v + \sigma_h$)/2} \\ \text{p} \\ \text{p} \\ \text{($\sigma_1 + \sigma_3$)/2, ($\sigma_v + \sigma_h$)/2} \\ \text{p} \\ \text{g} \\ \text{q} \\ \text{($\sigma_1 - \sigma_3$)/2} \\ \text{($\sigma_1 - \sigma_3$)/2} \\ \text{q} \\ \text{minimal stress} \\ \text{q} \\ \text{q} \\ \text{q} \\ \text{friction angle based on total stresses} \\ \text{q} \\ \text{q} \\ \text{q} \\ \text{friction angle based on effective stresses} \\ \text{q} \\ \text{q} \\ \text{q} \\ finitial water content with unit weight of value with total unit weight of value with total unit weight of value with total unit weight of solids unit weigh$		e	•	1
$\begin{array}{c} e_{0} & \text{initial void ratio} \\ G & \text{shear modulus} \\ G_{s} & \text{specific gravity of soil particles} \\ H & \text{height of specimen} \\ H_{R} & \text{Rebound Hardness number} \\ I & \text{gradient} \\ I_{S} & \text{Uncorrected point load strength} \\ I_{S} & \text{Uncorrected point load strength} \\ I_{S} & \text{Uncorrected point load strength index} \\ H_{T} & \text{Total hardness} \\ K_{O} & \text{lateral stress ratio for one dimensional strain} \\ K & \text{permeability} \\ I_{O} & \text{coefficient of volume change} \\ I_{O} & \text{possibly} \\ I_{O} & \text{preconsolidation pressure} \\ I_{O} & \text{quantity of flow} \\ I$				e e e e e e e e e e e e e e e e e e e
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$				
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	-		•	e e e e e e e e e e e e e e e e e e e
i gradient $\gamma_{w}$ unit weight of water Is Uncorrected point load strength $\epsilon$ strain $\epsilon$ strain Is(50) Size corrected point load strength index $\epsilon$ strain $\epsilon$ volume strain HA Modified Taber Abrasion $\epsilon_{h}, \epsilon_{v}$ horizontal strain, vertical strain HT Total hardness $\epsilon$ lateral stress ratio for one dimensional strain $\epsilon$ normal stress $\epsilon$ effective normal stress LI Liquidity Index $\epsilon$ consolidation stress in isotropic stress system $\epsilon$ no porosity $\epsilon$ porosity $\epsilon$ porosity $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation $\epsilon$ price price provided in $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation pressure $\epsilon$ preconsolidation $\epsilon$ provided in $\epsilon$ pro		č i	· ·	
Is Uncorrected point load strength $ε$ strain  Is(SO) Size corrected point load strength index $ε$ volume strain  HA Modified Taber Abrasion $ε$ h, $ε$ horizontal strain, vertical strain  HT Total hardness $μ$ Poisson's ratio, also viscosity  Ko lateral stress ratio for one dimensional strain $σ$ normal stress  k permeability $σ$ effective normal stress  LI Liquidity Index $σ$ coefficient of volume change $σ$ h, $σ$ h horizontal normal stress in isotropic stress system $σ$ voertical normal stress  PI plasticity index $σ$ $σ$ effective vertical normal stress  PI plasticity index $σ$ $σ$ effective vertical normal stress  P $σ$ preconsolidation pressure $σ$ $σ$ effective vertical normal stress  P $σ$ preconsolidation pressure $σ$ $σ$ effective vertical consolidation stress  P $σ$ preconsolidation pressure $σ$ $σ$ intermediate principal stress  P $σ$ $σ$ $σ$ intermediate principal stress  P $σ$ $σ$ $σ$ intermediate principal stress  P $σ$ $σ$ $σ$ $σ$ intermediate principal stress  P $σ$ $σ$ $σ$ $σ$ intermediate principal stress  P $σ$			•	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		E	•	
HAModified Taber Abrasion $ε_h$ , $ε_v$ horizontal strain, vertical strainHTTotal hardness $μ$ Poisson's ratio, also viscosityK₀lateral stress ratio for one dimensional strain $σ$ normal stresskpermeability $σ'$ effective normal stressLILiquidity Index $σ_c$ , $σ'_c$ consolidation stress in isotropic stress system $m_v$ coefficient of volume change $σ_h$ , $σ'_h$ horizontal normal stressnporosity $σ_v$ , $σ'_v$ vertical normal stressPIplasticity index $σ'_v$ Effective vertical consolidation stressPcpreconsolidation pressure $σ_1$ major principal stressp $(σ_1 + σ_3)/2$ , $(σ_v + σ_h)/2$ $σ_2$ intermediate principal stressp' $(σ'_1 + σ'_3)/2$ , $(σ'_v + σ'_h)/2$ $σ_3$ minor principal stressp'p' at consolidation $τ$ shear stressQquantity of flow $φ$ friction angle based on total stressesq $(σ_1 - σ_3)/2$ $φ'$ friction angle based on effective stressesqfq at failure $φ'_r$ residual friction angleqo, qiinitial q $φ_{ult}$ $φ$ for ultimate strength	-		3	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			$\epsilon_{\mathrm{vol}}$	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			$\epsilon_h, \epsilon_v$	
k permeability $\sigma'$ effective normal stress $\sigma_c, \sigma'_c$ consolidation stress in isotropic stress system $\sigma_c, \sigma'_c$ consolidation normal stress $\sigma'_c, \sigma'_c$ vertical normal stress $\sigma'_c, \sigma'_c$ vertical normal stress $\sigma'_c, \sigma'_c$ effective vertical consolidation stress $\sigma'_c, \sigma'_c$ effective vertical consolidation stress $\sigma'_c, \sigma'_c$ effective vertical consolidation stress $\sigma'_c, \sigma'_c, \sigma'_c$ effective vertical consolidation stress $\sigma'_c, \sigma'_c, \sigma'_c$ effective vertical consolidation stress $\sigma'_c, \sigma'_c, \sigma'_c, \sigma'_c$ effective vertical consolidation stress $\sigma'_c, \sigma'_c, \sigma'_c, \sigma'_c, \sigma'_c$ effective vertical consolidation stress $\sigma'_c, \sigma'_c, \sigma'_c, \sigma'_c, \sigma'_c, \sigma'_c, \sigma'_c$ effective vertical consolidation stress $\sigma'_c, \sigma'_c, \sigma'_c,$	-		μ	
LI Liquidity Index $m_v$ coefficient of volume change $m_v$ consolidation remal stress $m_v$ coefficient of volume change $m_v$ coefficient of volume change $m_v$ consolidation stress $m_v$ coefficient of volume change $m_v$ coefficient of volution angle based on total stress of the vertical consolidation stress $m_v$ coefficient of volume change $m_v$ coefficient of volution angle based on effective stresses $m_v$ coefficient of volume change $m_v$ coefficient of volume change $m_v$ consolidation stress in isotropic stress system $m_v$ coefficient of volution angle stress $m_v$ coefficient of volume change $m_v$ coefficient of volution stress of the vertical consolidation stress $m_v$ coefficient of volution stress $m_v$ co	-			
mover coefficient of volume change $\sigma_h, \sigma'_h$ horizontal normal stress $\sigma_h, \sigma'_h$ vertical normal stress $\sigma'_h, \sigma'_h$ vertical consolidation stress $\sigma'_h, \sigma'_h$ major principal stress $\sigma'_h, \sigma'_h$ major principal stress $\sigma'_h, \sigma'_h$ major principal stress $\sigma'_h, \sigma'_h$ minor principal stress $\sigma'_h, \sigma'_h$ minor principal stress $\sigma'_h, \sigma'_h$ p' at consolidation $\sigma'_h, \sigma'_h$ shear stress $\sigma'_h, \sigma'_h$ p' at consolidation $\sigma'_h, \sigma'_h$ p' and $\sigma'_h, \sigma'_h$ friction angle based on total stresses $\sigma'_h, \sigma'_h, \sigma'_h$ p' friction angle based on effective stresses $\sigma'_h, \sigma'_h, \sigma'_h$ p' residual friction angle $\sigma'_h, \sigma'_h$ p' for ultimate strength		•	σ'	
n porosity $\sigma_{v}$ , $\sigma_{v}$ vertical normal stress PI plasticity index $\sigma_{v}$ , $\sigma_{v}$ vertical normal stress Effective vertical consolidation stress $\sigma_{v}$ Effective vertical consolidation stress $\sigma_{v}$ major principal stress $\sigma_{v}$ intermediate principa		1 ,	$\sigma_c, \sigma'_c$	consolidation stress in isotropic stress system
PI plasticity index $\sigma'_{vc}$ Effective vertical consolidation stress $\sigma'_{vc}$ preconsolidation pressure $\sigma_1$ major principal stress $\sigma_2$ intermediate principal stress $\sigma'_{vc}$ principal stress $\sigma'_{vc}$ $\sigma'_{vc}$ intermediate principal stress $\sigma'_{vc}$ $\sigma'_{vc$		<u> </u>	$\sigma_h, \sigma'_h$	horizontal normal stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		•	$\sigma_v, \sigma'_v$	vertical normal stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		± •	$\sigma'_{vc}$	Effective vertical consolidation stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$P_c$	•	$\sigma_1$	major principal stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			$\sigma_2$	intermediate principal stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	p'		σ3	minor principal stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	p'c	•	τ	shear stress
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Q	1 7	φ	friction angle based on total stresses
$q_f$ $q$ at failure $\phi'_r$ residual friction angle $q_0, q_i$ initial $q$ $\phi_{ult}$ $\phi$ for ultimate strength	q		•	friction angle based on effective stresses
$q_o,q_i$ initial $q$ $\phi_{ult}$ $\phi$ for ultimate strength	$q_{\mathrm{f}}$	•		e e e e e e e e e e e e e e e e e e e
	$q_o, q_i$	•		
	$q_c$	q at consolidation	•	-



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

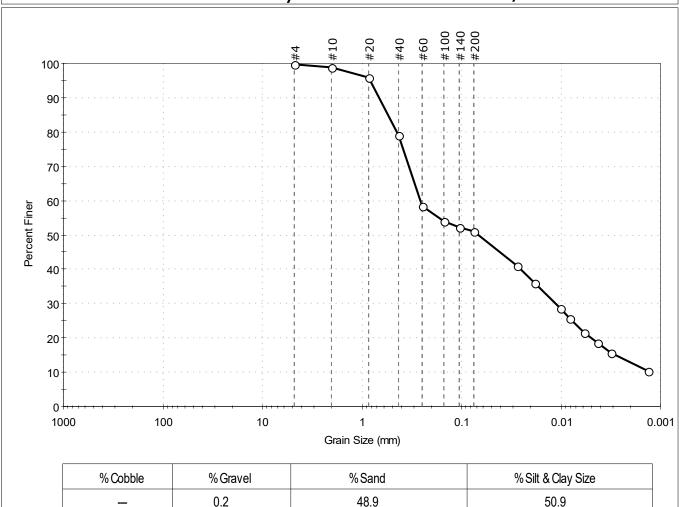
Sample Type: bag lested By: ckg
Sample ID: PDI-014SG-00-0.99 est Date: 10/02/19 Checked By: jsc
-19092T Depth: --- Test Id: 525297

-19092T Depth: ---Test Comment: ---

Visual Description: Moist, very dark gray sandy silt

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	96		
#40	0.42	79		
#60	0.25	58		
#100	0.15	54		
#140	0.11	52		
#200	0.075	51		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0276	41		
	0.0182	36		
	0.0101	29		
	0.0081	26		
	0.0059	22		
	0.0043	19		
	0.0032	16		
	0.0013	10		

<u>Coeff</u>	<u>icients</u>
$D_{85} = 0.5444 \text{ mm}$	$D_{30} = 0.0112 \text{ mm}$
D <sub>60</sub> = 0.2601 mm	D <sub>15</sub> =0.0029 mm
$D_{50} = 0.0681 \text{ mm}$	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

ASTM N/A Classification

AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Same, Sharen Farthere Shape 1

Sand/Gravel Hardness : ---

 $\label{eq:Dispersion Device: Apparatus A - Mech Mixer} \end{\mbox{\sf Dispersion Device: Apparatus A - Mech Mixer}}$ 



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

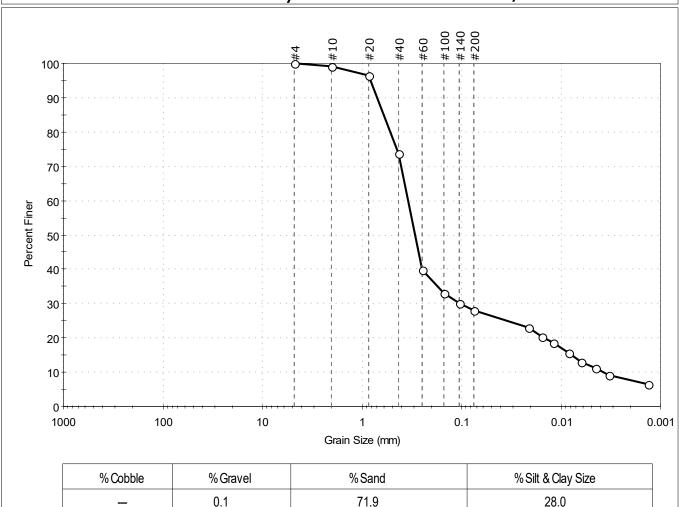
Sample ID: PDI-015SG-00-0.87 est Date: 10/02/19 Checked By: jsc Test Id: 525298

-19092T Depth: Test Comment:

Moist, very dark gray silty sand Visual Description:

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	74		
#60	0.25	40		
#100	0.15	33		
#140	0.11	30		
#200	0.075	28		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
0.0210		23		
	0.0157	20		
	0.0120	18		
	0.0084	16		
	0.0063	13		
	0.0045	11		
	0.0033	9		
	0.0013	6		

<u>Coeffic</u>	<u>cients</u>	
D <sub>85</sub> =0.5984 mm	$D_{30} = 0.1051 \text{ mm}$	
D <sub>60</sub> = 0.3429 mm	D <sub>15</sub> =0.0078 mm	
D <sub>50</sub> = 0.2934 mm	$D_{10} = 0.0037 \text{ mm}$	
C <sub>u</sub> =92.676	$C_c = 8.706$	

Classification N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

<u>ASTM</u>

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: Boring ID: ---Sample Type: bag Tested By: ckg

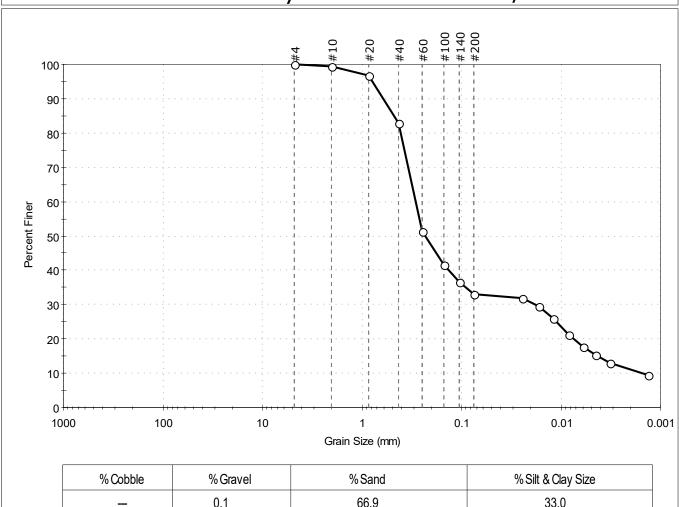
Sample ID: PDI-022SG-00-01 Test Date: 10/02/19 Checked By: jsc 525299

-190924 Depth: Test Id: Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



L	% Cobbl	le	% Gravel		% Sand		% Silt 8	Clay Size
			0.1		66.9		3	33.0
Sieve Name	Sieve Size, mm	Percent F	iner Spec. Percent	Complies			Coeffic	<u>cients</u>
						$D_{85} = 0.47$	12 mm	$D_{30} = 0.0185 \text{ mm}$
#4	4.75	100				$D_{60} = 0.28$	96 mm	$D_{15} = 0.0043 \text{ mm}$
#10	2.00	99						10
#20	0.85	97				$D_{50} = 0.23$	42 mm	$D_{10} = 0.0016 \text{ mm}$

	, , , , , , , , , , , , , , , , , , , ,			
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	83		
#60	0.25	51		
#100	0.15	42		
#140	0.11	37		
#200	0.075	33		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0242	32		
	0.0168	29		
	0.0119	26		
	0.0084	21		
	0.0060	18		
	0.0045	15		
	0.0032	13		
	0.0013	9		

 $C_c = 0.739$  $C_u = 181.000$ Classification <u>ASTM</u> N/A AASHTO Silty Gravel and Sand (A-2-4 (0))

GTX-310685

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

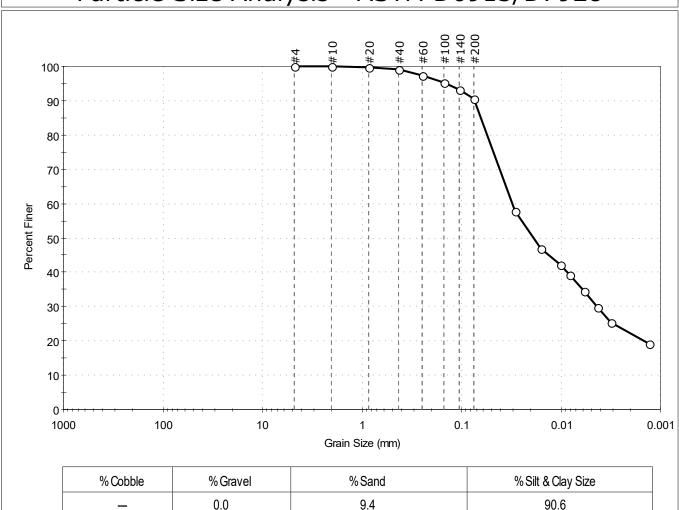
Sample ID: PDI-101SG-00-01 Test Date: 10/02/19 Checked By: jsc -190924 Depth: Test Id: 525300

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	97		
#100	0.15	95		
#140	0.11	93		
#200	0.075	91		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0289	58		
	0.0160	47		
	0.0101	42		
	0.0082	39		
	0.0058	35		
	0.0043	30		
	0.0031	25		
	0.0013	19		

<u>Coefficients</u>					
D <sub>85</sub> = 0.0637 mm	$D_{30} = 0.0043 \text{ mm}$				
D <sub>60</sub> = 0.0308 mm	$D_{15} = N/A$				
D <sub>50</sub> = 0.0189 mm	$D_{10} = N/A$				
$C_u = N/A$	$C_c = N/A$				

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: C
Boring ID: --- Sample Type: bag Tested By: ckg

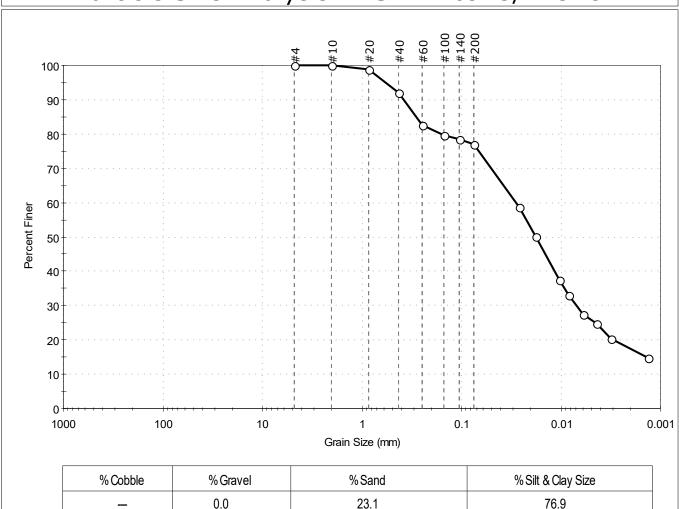
Boring ID: --- Sample Type: bag Tested By: ckg
Sample ID: PDI-102SG-00-01 Test Date: 10/02/19 Checked By: jsc
-190924 Depth: --- Test Id: 525301

-190924 Depth : ---Test Comment: ---

Visual Description: Moist, very dark gray silt with sand

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	92		
#60	0.25	83		
#100	0.15	80		
#140	0.11	78		
#200	0.075	77		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0264	59		
	0.0179	50		
	0.0104	37		
	0.0083	33		
	0.0059	27		
	0.0044	25		
	0.0032	20		
	0.0013	15		

<u>Coefficients</u>					
D <sub>85</sub> = 0.2852 mm	$D_{30} = 0.0069 \text{ mm}$				
D <sub>60</sub> = 0.0283 mm	D <sub>15</sub> =0.0014 mm				
D <sub>50</sub> = 0.0177 mm	$D_{10} = N/A$				
$C_u = N/A$	$C_c = N/A$				

GTX-310685

ASTM N/A Classification

AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

cana, craver randed chape :

Sand/Gravel Hardness : ---

 $\label{eq:Dispersion Device: Apparatus A - Mech Mixer} \end{\mbox{\sf Dispersion Device: Apparatus A - Mech Mixer}}$ 



Location: Project No: Boring ID: ---Sample Type: bag Tested By: ckg

525302

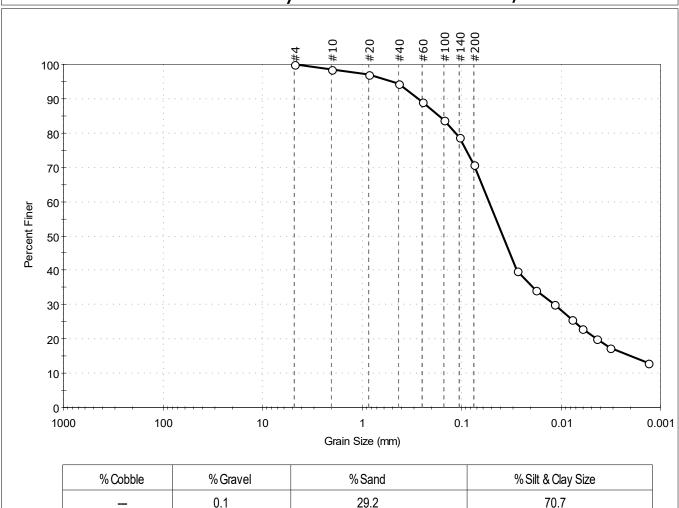
Sample ID: PDI-103SG-00-01 Test Date: 10/02/19 Checked By: jsc -190924 Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	94		
#60	0.25	89		
#100	0.15	84		
#140	0.11	79		
#200	0.075	71		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0277	40		
	0.0179	34		
	0.0117	30		
	0.0078	26		
	0.0061	23		
	0.0044	20		
	0.0032	17		
	0.0013	13		

<u>Coefficients</u>					
D <sub>85</sub> = 0.1678 mm	$D_{30} = 0.0116 \text{ mm}$				
D <sub>60</sub> = 0.0531 mm	$D_{15} = 0.0020 \text{ mm}$				
D <sub>50</sub> = 0.0384 mm	$D_{10} = N/A$				
$C_u = N/A$	$C_C = N/A$				

GTX-310685

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-104SG-00-01 Test Date: 10/02/19 Checked By: jsc Test Id:

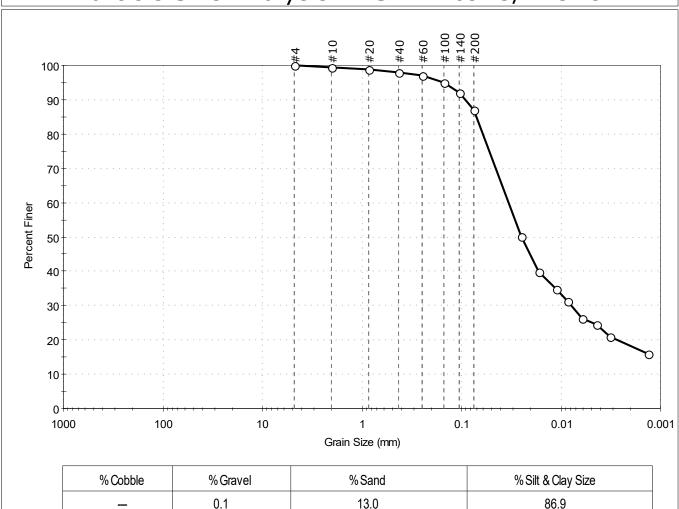
525303

-190924 Depth: Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	95		
#140	0.11	92		
#200	0.075	87		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0253	50		
	0.0167	40		
	0.0111	35		
	0.0086	31		
	0.0061	26		
	0.0044	24		
	0.0032	21		
	0.0013	16		

	<u>Coefficients</u>					
D <sub>85</sub> = 0.0709 mm		$D_{30} = 0.0079 \text{ mm}$				
	D <sub>60</sub> = 0.0339 mm	$D_{15} = N/A$				
	D <sub>50</sub> = 0.0252 mm	$D_{10} = N/A$				
	$C_u = N/A$	$C_c = N/A$				

GTX-310685

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685
Boring ID: --- Sample Type: bag Tested By: ckg

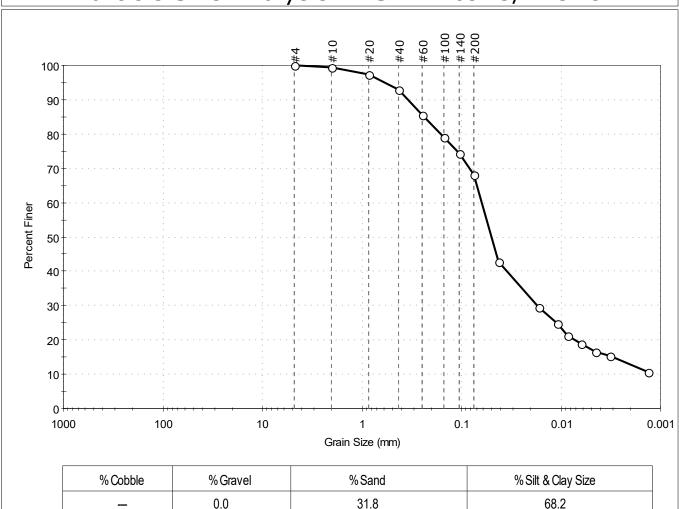
Boring ID: --- Sample Type: bag Tested By: ckg
Sample ID: PDI-105SG-00-0.99 est Date: 10/02/19 Checked By: jsc
-19092T Depth: --- Test Id: 525304

Test Comment: ---

Visual Description: Moist, very dark gray sandy silt

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	93		
#60	0.25	85		
#100	0.15	79		
#140	0.11	74		
#200	0.075	68		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0425	43		
	0.0169	30		
	0.0109	25		
	0.0085	21		
	0.0062	19		
	0.0045	17		
	0.0032	15		
	0.0013	11		

<u>Coefficients</u>					
D <sub>85</sub> =0.2406 mm	$D_{30} = 0.0174 \text{ mm}$				
D <sub>60</sub> = 0.0625 mm	D <sub>15</sub> =0.0030 mm				
D <sub>50</sub> = 0.0501 mm	$D_{10} = N/A$				
C <sub>u</sub> =N/A	$C_c = N/A$				

ASTM N/A

AASHTO Silty Soils (A-4 (0))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

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Sand/Gravel Hardness : ---

 $\label{eq:Dispersion Device: Apparatus A - Mech Mixer} \end{\mbox{\sf Dispersion Device: Apparatus A - Mech Mixer}}$ 



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

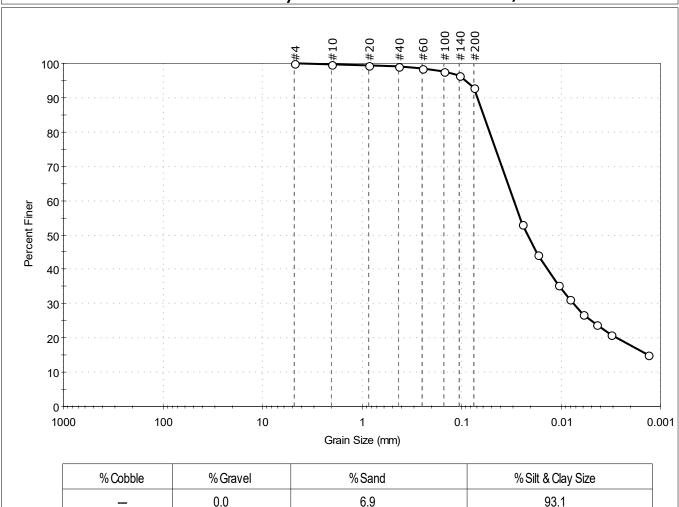
Sample ID: PDI-106SG-00-01 Test Date: 10/02/19 Checked By: jsc Test Id: 525305

-190924 Depth: Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0243	53		
	0.0173	44		
	0.0106	36		
	0.0082	31		
	0.0060	27		
	0.0044	24		
	0.0032	21		
	0.0013	15		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0598 mm	$D_{30} = 0.0075 \text{ mm}$			
D <sub>60</sub> = 0.0295 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0216 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_c = N/A$			

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Client: Anchor QEA, LLC

Project: Gasco PDI

Location: Project No: GTX-310685
Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/07/19 Checked By: bfs
Depth: --- Test Id: 525985

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 18SC-A-06-07 -19092		Moist, very dark gray silt	77.1
	PDI- 8SC-A-08-09 -1909		Moist, very dark gray sand	23.3
	PDI- 1SC-B-7.7-9.7 -1909		Moist, very dark gray sand with silt	13.0
	PDI- 4SC-B-10-12. 1-1909		Moist, very dark gray sand with silt	38.1
	PDI- 6SC-B-4.2-6.2 -1909		Moist, very dark gray sand	14.3
	PDI- 64SC-B-04-06 -19092		Moist, very dark gray silt with sand	66.1

Notes: Temperature of Drying: 110° Celsius



Client: Anchor QEA, LLC

Project: Gasco PDI Location:

Location:Project No:GTX-310685Boring ID:---Tested By:ckgSample ID:---Test Date:10/11/19Checked By:bfs

Depth: --- Test Id: 526423

## Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 6SC-B-9.8-11.8 -1910		Moist, very dark gray silty sand	23.8
	PDI- 71SC-B-08-10 -19100		Wet, very dark gray silty sand	42.8
	PDI- 9SC-B-7.8-9.8 -1909		Moist, very dark gray sand with silt	40.3
	PDI- 8SC-10.7-12.7 -1910		Moist, very dark gray sand	14.7
	PDI- 81SC-B-08-10 -19100		Wet, dark grayish olive silt with sand	64.1

Notes: Temperature of Drying: 110° Celsius



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/10/19 Checked By: bfs

Depth: --- Test Id: 525994

## Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- SC-A-06-07 -190		Moist, very dark gray silt	2.53	
	PDI- SC-A-08-09 -190		Moist, very dark gray sand	2.73	
	PDI- SC-B-7.7-9. 7-190		Moist, very dark gray sand with silt	2.73	
	PDI- SC-B-10-12.1 -19		Moist, very dark gray sand with silt	2.76	
	PDI- SC-B-4.2-6.2 -190		Moist, very dark gray sand	2.76	
	PDI- SC-B-04-06 -190		Moist, very dark gray silt with sand	2.63	

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854 Moisture Content determined by ASTM D2216.



Client: Anchor QEA, LLC

Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg Sample ID: ---Test Date: 10/14/19 Checked By: bfs

Test Id: Depth: 526425

## Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- C-B-9.8-11.8 -19		Moist, very dark gray silty sand	2.77	
	PDI- SC-B-08-10 -191		Wet, very dark gray silty sand	2.67	
	PDI- SC-B-7.8-9.8 -190		Moist, very dark gray sand with silt	2.72	
	PDI- SC-10.7-12.7 -19		Moist, very dark gray sand	2.79	
	PDI- SC-B-08-10 -191		Wet, dark grayish olive silt with sand	2.72	

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854 Moisture Content determined by ASTM D2216.



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

525971

Sample ID: PDI-018SC-A-06-07est Date: 10/08/19 Checked By: bfs

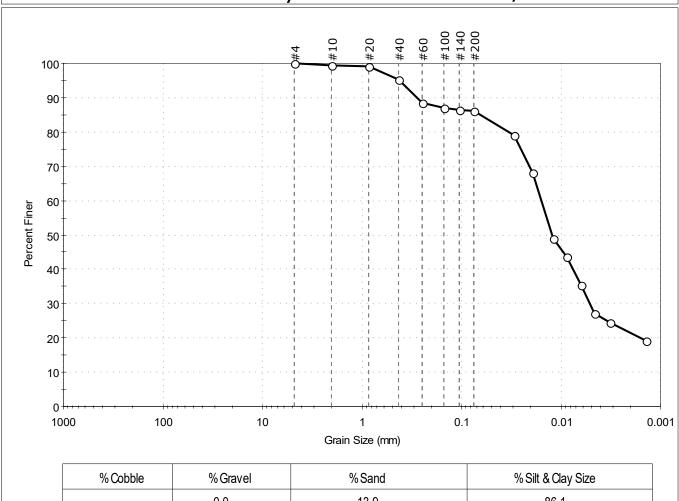
19092T Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



	% Cobbl	e	% Gravel		% Sand		% Silt 8	& Clay Size	
	_		0.0		13.9		8	36.1	
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies		D 0.00	Coeffic		
	4.75	100				$D_{85} = 0.06$	52 111111	$D_{30} = 0.0051 \text{ mm}$	ı

#4 4.75 100  #10 2.00 99  #20 0.85 99  #40 0.42 95  #60 0.25 89  #100 0.15 87  #144 0.11 87  #200 0.075 86  Hydrometer Particle Size (mm) Percent Finer Spec. Percent Complies  0.0120 49  0.0120 49  0.0088 44  0.0063 35  0.0046 27  0.0032 25  0.0014 19				-	
#10 2.00 99  #20 0.85 99  #40 0.42 95  #60 0.25 89  #100 0.15 87  #140 0.11 87  #200 0.075 86  Hydrometer Particle Size (mm) Percent Finer Spec. Percent Complies  0.0294 79  0.0194 68  0.0120 49  0.0088 44  0.0063 35  0.0046 27  0.0032 25					
#20 0.85 99  #40 0.42 95  #60 0.25 89  #100 0.15 87  #140 0.11 87  #200 0.075 86  Hydrometer Particle Size (mm) Percent Finer Spec. Percent Complies  0.0294 79  0.0194 68  0.0120 49  0.0088 44  0.0063 35  0.0046 27  0.0032 25	#4	4.75	100		
#40 0.42 95  #60 0.25 89  #100 0.15 87  #140 0.11 87  #200 0.075 86  Hydrometer Particle Size (mm) Percent Finer Spec. Percent Complies  0.0194 68  0.0120 49  0.0088 44  0.0063 35  0.0046 27  0.0032 25	#10	2.00	99		
#60 0.25 89  #100 0.15 87  #140 0.11 87  #200 0.075 86  Hydrometer Particle Size (mm) Percent Finer Spec. Percent Complies  0.0120 49  0.0088 44  0.0063 35  0.0046 27  0.0032 25	#20	0.85	99		
#100 0.15 87  #140 0.11 87  #200 0.075 86  Hydrometer Particle Size (mm) Percent Finer Spec. Percent Complies  0.0294 79  0.0194 68  0.0120 49  0.0088 44  0.0063 35  0.0046 27  0.0032 25	#40	0.42	95		
#140 0.11 87  #200 0.075 86  Hydrometer Particle Size (mm) Percent Finer Spec. Percent Complies  0.0294 79  0.0120 49  0.0088 44  0.0063 35  0.0046 27  0.0032 25	#60	0.25	89		
#200 0.075 86  Hydrometer Particle Size (mm) Percent Finer Spec. Percent Complies  0.0294 79  0.0194 68  0.0120 49  0.0088 44  0.0063 35  0.0046 27  0.0032 25	#100	0.15	87		
Hydrometer         Particle Size (mm)         Percent Finer         Spec. Percent         Complies            0.0294         79           0.0194         68            0.0120         49           0.0088         44           0.0063         35           0.0046         27           0.0032         25            0.0032         25	#140	0.11	87		
0.0294 79 0.0194 68 0.0120 49 0.0088 44 0.0063 35 0.0046 27 0.0032 25	#200	0.075	86		
0.0194 68 0.0120 49 0.0088 44 0.0063 35 0.0046 27 0.0032 25	Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
0.0120 49 0.0088 44 0.0063 35 0.0046 27 0.0032 25		0.0294	79		
0.0088 44 0.0063 35 0.0046 27 0.0032 25		0.0194	68		
0.0063 35 0.0046 27 0.0032 25		0.0120	49		
0.0046 27 0.0032 25		0.0088	44		
0.0032 25		0.0063	35		
		0.0046	27		
0.0014 19		0.0032	25		
		0.0014	19		

$D_{30} = 0.0051 \text{ mm}$
$D_{15} = N/A$
$D_{10} = N/A$
C <sub>c</sub> =N/A

Classification Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (47))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

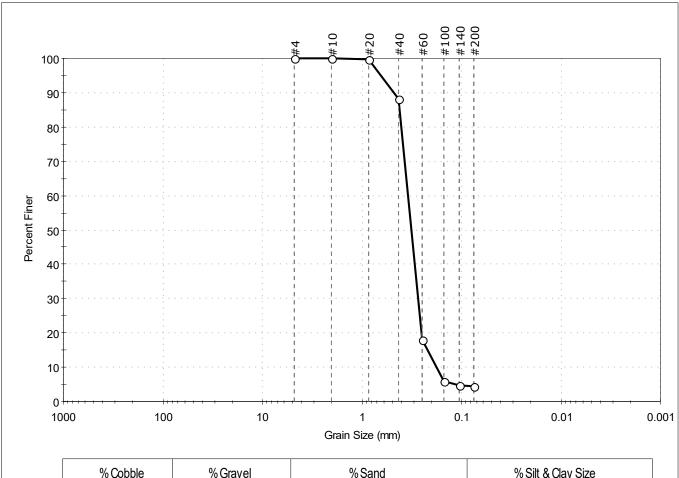
Sample ID: PDI-018SC-A-08-09 est Date: 10/08/19 Checked By: bfs 525972 Test Id:

-19092T Depth: Test Comment:

Moist, very dark gray sand Visual Description:

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



ıе	Sieve Size, mm Percen	t Finer Spec. Percent (	Complies	Coefficients
		0.0	95.7	4.3
	% Cobble	% Gravel	% Sand	% Silt & Clay Size

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	88		
#60	0.25	18		
#100	0.15	6		
#140	0.11	5		
#200	0.075	4.3		

	ocificients .
D <sub>85</sub> = 0.4149 mm	$D_{30} = 0.2738 \text{ mm}$
D <sub>60</sub> = 0.3434 mm	$D_{15} = 0.2203 \text{ mm}$
D <sub>50</sub> = 0.3184 mm	$D_{10} = 0.1781 \text{ mm}$
C <sub>u</sub> =1.928	$C_c = 1.226$

Classification
Poorly graded SAND (SP) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

525973

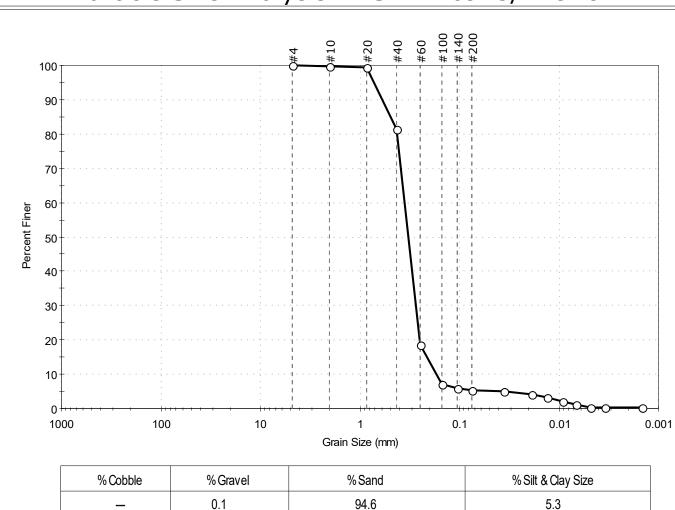
Test Date: 10/08/19 Checked By: bfs Sample ID: PDI-021SC-B-7.7-9.7-

Test Id: 190 Depth: Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	82		
#60	0.25	18		
#100	0.15	7		
#140	0.11	6		
#200	0.075	5.3		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0360	5		
	0.0190	4		
	0.0132	3		
	0.0092	2		
	0.0067	1		
	0.0049	0		
	0.0034	0		
	0.0015	0		

<u>Coefficients</u>		
D <sub>85</sub> =0.4863 mm	$D_{30} = 0.2754 \text{ mm}$	
D <sub>60</sub> = 0.3546 mm	$D_{15} = 0.2140 \text{ mm}$	
D <sub>50</sub> = 0.3260 mm	$D_{10} = 0.1714 \text{ mm}$	
C <sub>u</sub> =2.069	$C_c = 1.248$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Test Date: 10/08/19 Checked By: bfs Sample ID: PDI-024SC-B-10-12.1 Test Id:

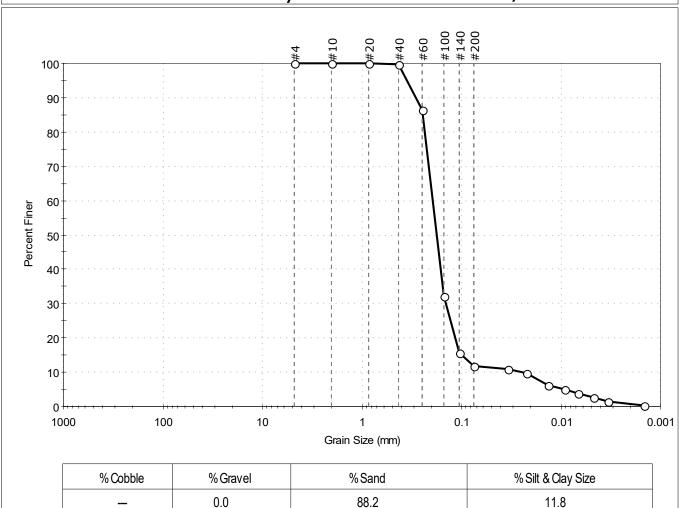
525974

-190 Depth: Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	86		
#100	0.15	32		
#140	0.11	16		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0344	11		
	0.0222	10		
	0.0134	6		
	0.0091	5		
	0.0067	4		
	0.0047	3		
	0.0034	2		
	0.0015	0		

<u>Coefficients</u>		
D <sub>85</sub> =0.2465 mm	$D_{30} = 0.1434 \text{ mm}$	
D <sub>60</sub> = 0.1949 mm	D <sub>15</sub> =0.0998 mm	
D <sub>50</sub> = 0.1774 mm	$D_{10} = 0.0234 \text{ mm}$	
Cu =8.329	$C_c = 4.509$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-028SC-10.7-12.7-Test Date: 10/14/19 Checked By: bfs Test Id:

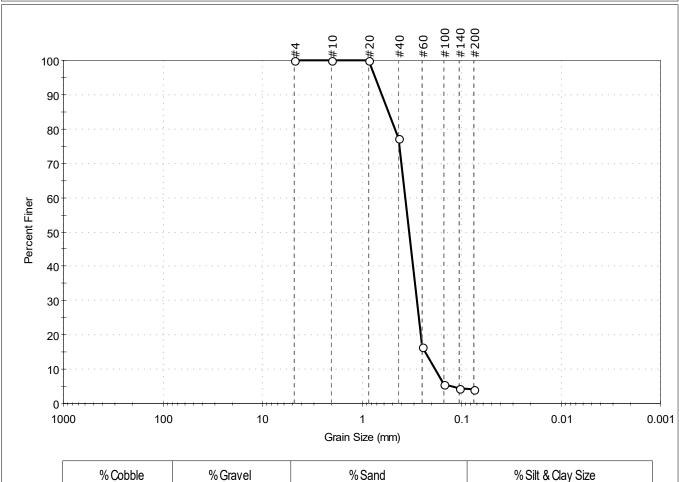
526420

191 Depth: Test Comment:

Visual Description: Moist, very dark gray sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



ıe	Sieve Size, mm Percen	t Finer Spec. Percent (	Complies		Coefficients	_
		0.0	96.0		4.0	
	% Cobble	% Gravel	% Sand		% Silt & Clay Size	

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	77		
#60	0.25	17		
#100	0.15	6		
#140	0.11	5		
#200	0.075	4.0		

<u> </u>	incicits
D <sub>85</sub> = 0.5384 mm	$D_{30} = 0.2810 \text{ mm}$
D <sub>60</sub> = 0.3654 mm	$D_{15} = 0.2321 \text{ mm}$
D <sub>50</sub> = 0.3348 mm	$D_{10} = 0.1843 \text{ mm}$
C <sub>u</sub> =1.983	$C_c = 1.173$

Classification
Poorly graded SAND (SP) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-036SC-B-4.2-6.2 Test Date: 10/08/19 Checked By: bfs Test Id:

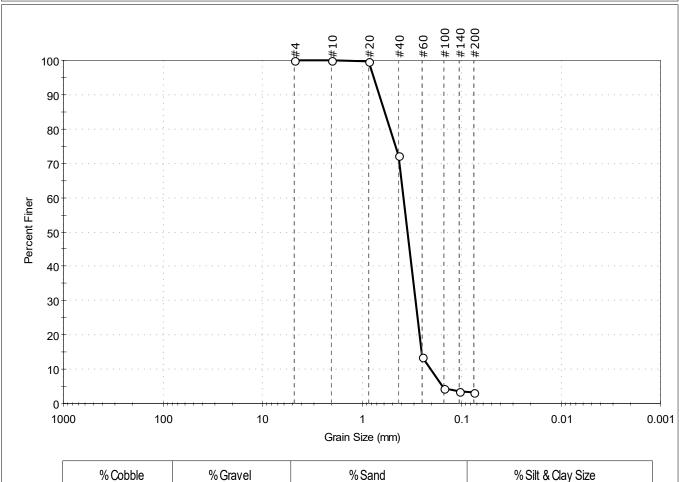
525975

-190 Depth: Test Comment:

Visual Description: Moist, very dark gray sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	96.8	3.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	72		
#60	0.25	13		
#100	0.15	4		
#140	0.11	4		
#200	0.075	3.2		

COCI	Helenes
D <sub>85</sub> = 0.5876 mm	$D_{30} = 0.2903 \text{ mm}$
D <sub>60</sub> = 0.3806 mm	$D_{15} = 0.2536 \text{ mm}$
D <sub>50</sub> = 0.3478 mm	$D_{10} = 0.2060 \text{ mm}$
C <sub>u</sub> =1.848	$C_c = 1.075$

Coefficients

Classification
Poorly graded SAND (SP) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

#### Sample/Test Description



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg Test Date: 10/08/19 Checked By: bfs Sample ID: PDI-039SC-B-7.8-9.8

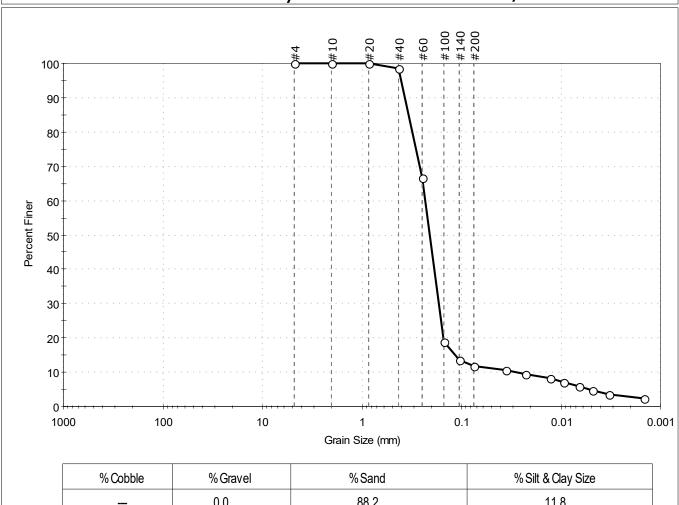
Test Id: 525979 -190 Depth:

Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



lame	Sieve Size mm Percen	t Finer Spec Percent (	Complies	Coefficients	Ξ
		0.0	88.2	11.8	
	% Cobble	% Gravel	% Sand	% Silt & Clay Size	

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	67		
#100	0.15	19		
#140	0.11	13		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0361	11		
	0.0226	9		
	0.0130	8		
	0.0094	7		
	0.0066	6		
	0.0048	5		
	0.0033	4		
	0.0014	2		

	COCITICICITES
D <sub>85</sub> = 0.3391 mm	$D_{30} = 0.1688 \text{ mm}$
D <sub>60</sub> = 0.2326 mm	$D_{15} = 0.1169 \text{ mm}$
D <sub>50</sub> = 0.2090 mm	$D_{10} = 0.0286 \text{ mm}$
C <sub>u</sub> =8.133	$C_c = 4.283$

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

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Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

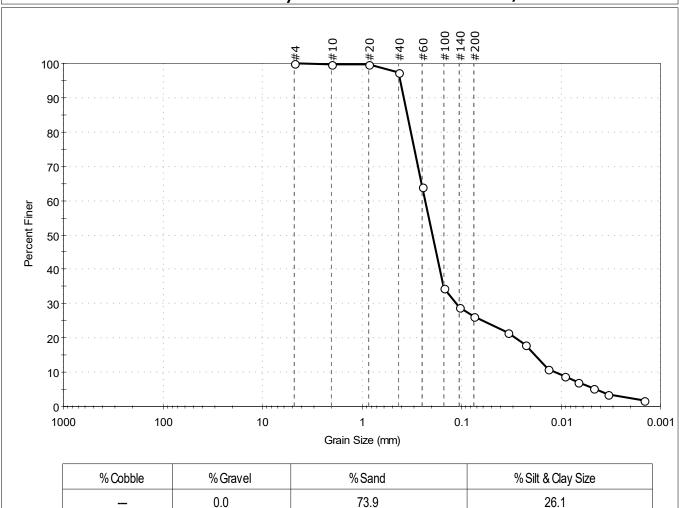
10/08/19 Checked By: bfs Test Date: Sample ID: PDI-046SC-B-9.8-11.8 Test Id: 525977

-19 Depth: Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	64		
#100	0.15	34		
#140	0.11	29		
#200	0.075	26		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0340	22		
	0.0227	18		
	0.0134	11		
	0.0093	9		
	0.0067	7		
	0.0048	5		
	0.0034	4		
	0.0015	2		

<u>Coefficients</u>		
D <sub>85</sub> =0.3497 mm	$D_{30} = 0.1135 \text{ mm}$	
D <sub>60</sub> = 0.2334 mm	$D_{15} = 0.0182 \text{ mm}$	
D <sub>50</sub> = 0.1963 mm	$D_{10} = 0.0114 \text{ mm}$	
Cu =20.474	$C_c = 4.842$	

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg 10/08/19 Checked By: bfs Sample ID: PDI-064SC-B-04-06 Test Date:

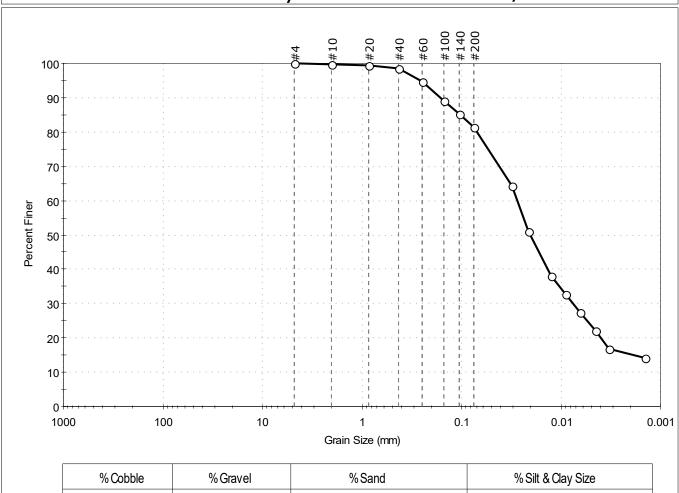
Test Id: -1909 Depth: 525976

Test Comment:

Visual Description: Moist, very dark gray silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	18.5	81.5

Sieve Name	la: a:			
	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	95		
#100	0.15	89		
#140	0.11	85		
#200	0.075	81		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0313	64		
	0.0212	51		
	0.0124	38		
	0.0090	33		
	0.0065	27		
	0.0045	22		
	0.0033	17		
	0.0014	14		

<u>Coefficients</u>		
D <sub>85</sub> = 0.1044 mm	$D_{30} = 0.0076 \text{ mm}$	
D <sub>60</sub> = 0.0275 mm	$D_{15} = 0.0019 \text{ mm}$	
D <sub>50</sub> = 0.0202 mm	$D_{10} = N/A$	
$C_u = N/A$	$C_{c} = N/A$	

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (29))

### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Sample ID: PDI-071SC-B-08-10 Test Date: 10/08/19 Checked By: bfs

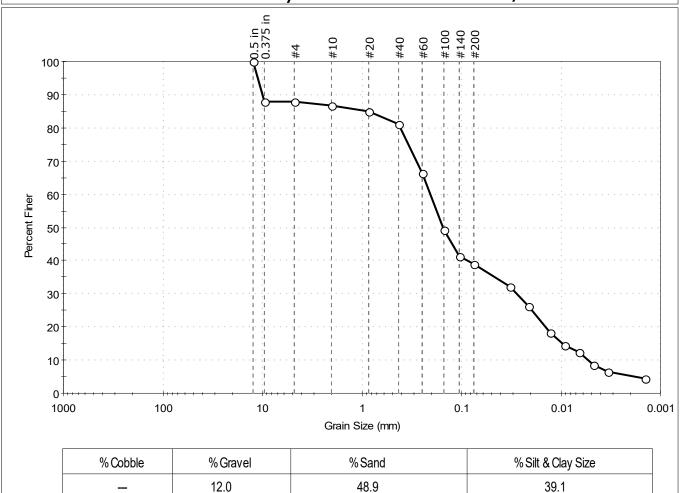
-1910 Depth: --- Test Id: 525978

Test Comment: ---

Visual Description: Wet, very dark gray silty sand

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	88		
#4	4.75	88		
#10	2.00	87		
#20	0.85	85		
#40	0.42	81		
#60	0.25	66		
#100	0.15	49		
#140	0.11	41		
#200	0.075	39		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0328	32		
	0.0212	26		
	0.0129	18		
	0.0093	14		
	0.0067	12		
	0.0047	9		
	0.0033	7		
	0.0014	5		

$D_{60} = 0.2068 \text{ mm}$ $D_{15} = 0.0097 \text{ mm}$ $D_{50} = 0.1534 \text{ mm}$ $D_{10} = 0.0054 \text{ mm}$	
D <sub>85</sub> = 0.8858 mm	$D_{30} = 0.0279 \text{ mm}$
D <sub>60</sub> = 0.2068 mm	$D_{15} = 0.0097 \text{ mm}$
D <sub>50</sub> = 0.1534 mm	$D_{10} = 0.0054 \text{ mm}$
$C_u = 38.296$	$C_c = 0.697$

<u>Classification</u> <u>ASTM</u> Silty SAND (SM)

AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-081SC-B-08-10 Test Date: 10/14/19 Checked By: bfs

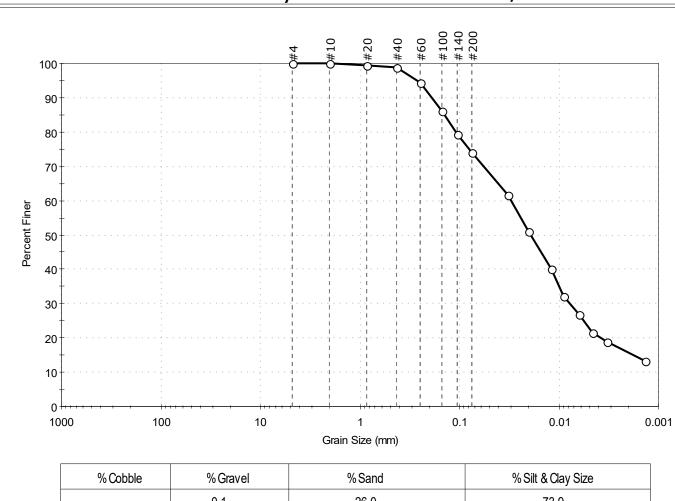
Test Id: -1910 Depth: 526421

Test Comment:

Visual Description: Wet, dark grayish olive silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size		
_	0.1	26.0	73.9		

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies	
#4	4.75	100			
#10	2.00	100			
#20	0.85	100			
#40	0.42	99			
#60	0.25	94			
#100	0.15	86			
#140	0.11	79			
#200	0.075	74			
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies	
	0.0325	62			
	0.0204	51			
	0.0121	40			
	0.0089	32			
	0.0063	27			
	0.0046	21			
	0.0033	19			
	0.0014	13			

<u>Coeffic</u>	<u>cients</u>
D <sub>85</sub> =0.1414 mm	$D_{30} = 0.0078 \text{ mm}$
D <sub>60</sub> = 0.0301 mm	$D_{15} = 0.0018 \text{ mm}$
D <sub>50</sub> = 0.0194 mm	$D_{10} = N/A$
Cu =N/A	$C_{c} = N/A$

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (17))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-018SC-A-06-07 est Date: 10/08/19 Checked By: bfs

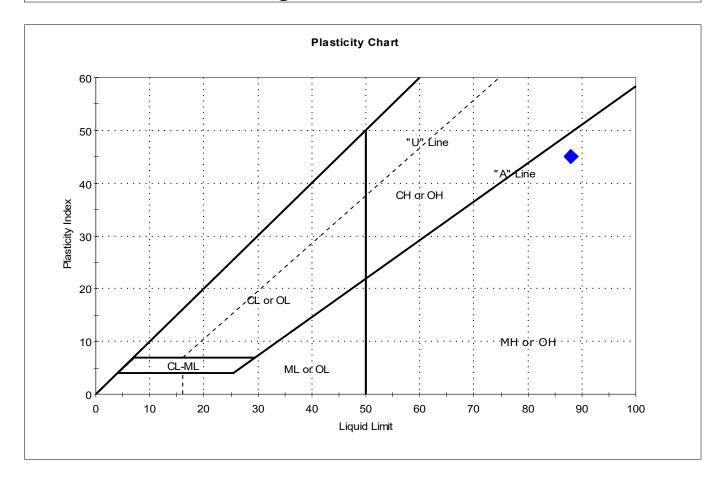
-19092T Depth: --- Test Id: 525962

Test Comment: ---

Visual Description: Moist, very dark gray silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	018SC-A-06-07-19			77	88	43	45	0.8	Elastic SILT (MH)

Sample Prepared using the WET method

5% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

525963

Sample ID: PDI-018SC-A-08-09 est Date: 10/09/19 Checked By: bfs Test Id:

-1909T Depth:

Test Comment:

Visual Description: Moist, very dark gray sand

Sample Comment:

### Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)18SCA-08-09-19			23	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

12% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

Sample ID: PDI-021SC-B-7.7-9.7 Test Date: 10/09/19 Checked By: bfs Test Id:

525964

-190 Depth: Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

### Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	21SC-B-7.7-9.7-19			13	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

18% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-024SC-B-10-12.1 Test Date: 10/09/19 Checked By: bfs -190 Depth: --- Test Id: 525965

-190 Depth: ---Test Comment: ---

Visual Description: Moist, very dark gray sand with silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	24SC-B-10-12.1-19			38	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

0% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No:

GTX-310685

Boring ID: ---Sample Type: bag Tested By: cam Sample ID: PDI-028SC-10.7-12.7 Test Date: 10/14/19 Checked By: bfs Test Id:

526418

-191 Depth:

Test Comment:

Visual Description: Moist, very dark gray sand

Sample Comment:

### Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	28SC-10.7-12.7-19			15	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

23% Retained on #40 Sieve

Dry Strength: NONE Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Sample Type: bag cam

525966

Boring ID: ---Tested By: Sample ID: PDI-036SC-B-4.2-6.2 Test Date: 10/09/19 Checked By: bfs Test Id:

-190 Depth: Test Comment:

Visual Description: Moist, very dark gray sand

Sample Comment:

### Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	36SC-B-4.2-6.2-19			14	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

28% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Test Id:

525970

Sample ID: PDI-039SC-B-7.8-9.8 Test Date: 10/09/19 Checked By: bfs

-190 Depth: Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

### Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	39SC-B-7.8-9.8-19			40	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

525968

Sample ID: PDI-046SC-B-9.8-11.8 Test Date: 10/09/19 Checked By: bfs Test Id:

-19 Depth: Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

### Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	\$6SC-B-9.8-11.8-1			24	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-064SC-B-04-06 Test Date: 10/11/19 Checked By: bfs

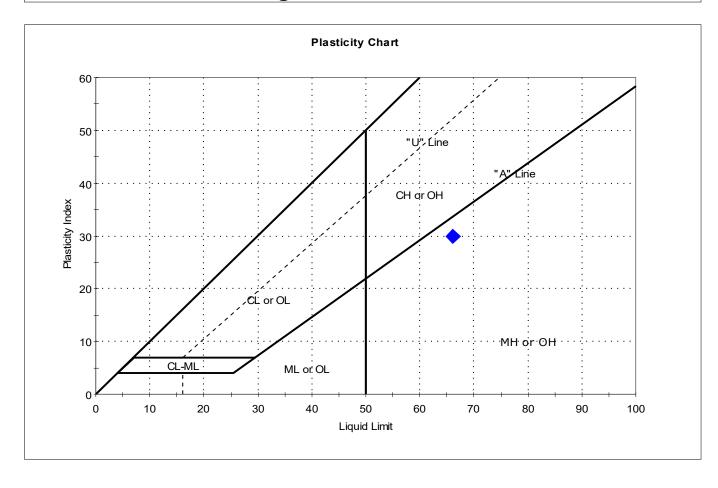
-1909 Depth : --- Test Id: 525967

Test Comment: ---

Visual Description: Moist, very dark gray silt with sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	064SC-B-04-06-19			66	66	36	30	1	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location:Project No:GTX-310685Boring ID:---Sample Type:bagTested By:camSample ID:PDI-071SC-B-08-10Test Date:10/15/19Checked By:bfs

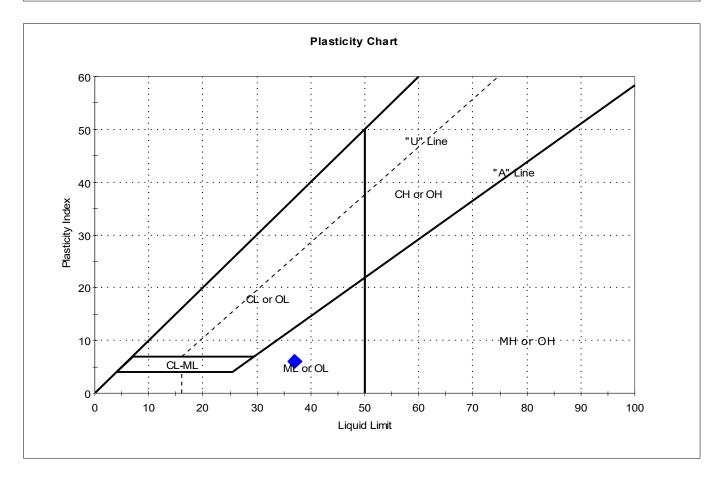
-1910 Depth: --- Test Id: 525969

Test Comment: ---

Visual Description: Wet, very dark gray silty sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	071SC-B-08-10-19			43	37	31	6	2	Silty SAND (SM)

Sample Prepared using the WET method

19% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-081SC-B-08-10 Test Date: 10/14/19 Checked By: bfs

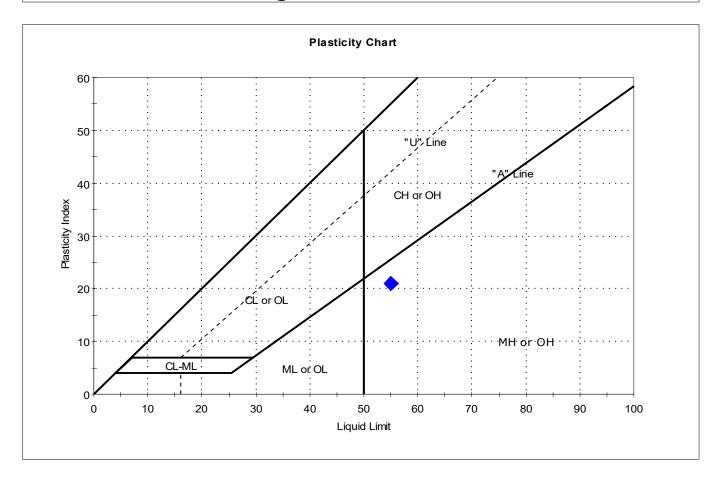
-1910 Depth: --- Test Id: 526419

Test Comment: ---

Visual Description: Wet, dark grayish olive silt with sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	081SC-B-08-10-19			64	55	34	21	1.4	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg 10/23/19 Checked By: bfs Sample ID: ---Test Date:

Test Id: Depth: 527613

### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Boring ID Sample ID		Description	Moisture Content,%
	PDI- 16SC-B-06 -08-19100		Moist, dark grayish brown silty sand	34.6
	PDI- 7SC-B-11 -13.5-1910		Moist, dark gray sand	
	PDI- 3SC-B-8.7 -10.7-1910		Moist, dark grayish brown sand	17.8
	PDI- 8SC-B-7.1 -9.1-1910		Moist, dark gray sand with silt	
	PDI- SC-B-8.2 -10.2-1910		Moist, dark grayish brown sand	28.6
	PDI- 49SC-B-06 -08-19101		Moist, dark grayish brown silty sand	31.8
	PDI- (2SC-B-06-08-1910)		Moist, dark grayish brown silty sand	45.4
	PDI- 66SC-B-06 -08-19101		Moist, dark olive brown silt	67.8
	PDI- 67SC-B-02 -04-19101		Wet, dark olive brown silt	74.4
	207		Wet, dark olive brown silt	81.4



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Depth: --- Test Id: 527633

### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 79SC-B-06 -08-19101		Wet, dark grayish brown silt	114.7
	PDI- 90SC-B-06 -08-19101		Moist, dark olive brown silt	
	PDI- 07SPT-00 -04-19092		Wet, dark olive brown silt	107.7
	PDI- 07SPT-04 -09-19092		Wet, dark olive brown silt	84.4
	PDI- 07SPT-17 -18-19092		Moist, dark gray silty sand	42.3
	PDI- 07SPT-62 -64-19092		Moist, dark olive brown silty sand	27.3
	PDI- 08SPT-00 -6.4-19100		Wet, olive brown silt with sand	94.8
	PDI- 8SPT-14 -33.5-1910		Moist, dark olive brown sand	39.5
	PDI- 8SPT-33.5 -66.5-1910		Moist, dark gray sand with silt	29.8
	PDI- 09SPT-00 -6.5-19100		Wet, very dark olive silt	92.7



Location:

Boring ID: --- Sample Type: ---

Boring ID: --- Sample Type: --- Tested By: ckg
Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527643

### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 9SPT-16.5 -18.1-1910		Moist, dark olive brown silt	80.2
	PDI- 09SPT-22 -30-19100		Moist, olive brown sand with silt	
	PDI- 9SPT-35.5 -48.3-1910		Moist, olive brown sand with silt	25.9
	PDI- 9SPT-48.3 -51-1910		Moist, dark olive brown silt with sand	47.9
	PDI- 110 B-54-64.5 -191015		Moist, black sand with silt	18.0
	PDI- 10SPT-21 -32-19101		Moist, dark gray sand	23.5
	PDI- 10SPT-32 -45-19101		Moist, black sand	28.2
	PDI- 12SPT-00 -6.5-19100		Moist, dark brown silt	76.7
	PDI- 2SPT-07 -11.5-1910		Moist, dark gray sandy silt	53.2
	PDI- 2SPT-11.5 -26.5-1910		Moist, dark gray silty sand	36.6



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No:

GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg Sample ID: ---Test Date: 10/23/19 Checked By: bfs

Test Id: Depth: 527653

### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 2SPT-37.5 -58-1910		Moist, very dark olive gray silty sand	19.1
	PDI- 13SPT-06 -16-19101		Wet, dark grayish brown silt	42.8
	PDI- 13SPT-16 -22-19101		Moist, dark grayish brown sand with silt	36.9
	PDI- 3SPT-22 -25.2-1910		Wet, dark grayish brown silt with sand	61.0
	PDI- 3SPT-31.9 -39.4-1910		Moist, dark gray silty sand	33.2
	PDI- 14SPT-00 -7.5-19100		Wet, olive brown silt	72.9
	PDI- 4SPT-25.5 -28-1910		Moist, dark olive brown silty sand	30.9
	PDI- 4SPT-42 -50.5-1910		Wet, olive brown sandy silt	49.6
	PDI- 4SPT-50.5 -55-1910		Moist, dark gray silty sand	37.2
	PDI- 4SPT-7.5 -12.5-1910		Moist, olive brown silt with sand	64.8



Location:

Boring ID: --- Sample Type: ---

Boring ID: --- Sample Type: --- Tested By: ckg
Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527663

### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 15SPT-06 -11-19100		Moist, very dark gray silty sand	17.4
	PDI- 5SPT-18.6 -20.6-1910		Moist, dark olive brown silt with sand	71.7
	PDI- 5SPT-23 -28.1-1910		Moist, very dark olive brown sand with silt	27.8
	PDI- 5SPT-41.5 -49.3-1910		Moist, olive brown silty sand	38.8
	PDI- 16SPT-00 -4.5-19092		Wet, olive brown silt	82.8
	PDI- 6SPT-20 -26.7-1909		Moist, dark gray silty sand	26.2
	PDI- 6SPT-26.7 -28.6-1909		Wet, grayish brown silt	64.0
	PDI- 6SPT-51.5 -54.2-1909		Moist, olive brown silty sand	27.4
	PDI- 7SPT-11 -29.1-1910		Moist, dark gray sand	37.6
	PDI- 7SPT-29.1 -32-1910		Moist, dark gray silty sand	45.0



Location:

Boring ID: --- Sample Type: ---

Boring ID: --- Sample Type: --- Tested By: ckg
Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527673

### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 7SPT-44.1 -53.5-1910		Moist, dark gray silty sand	45.6
	PDI- 7SPT-53.5 -63.5-1910		- Wet, dark grayish brown silt with sand	
	PDI- 18SPT-00 -4.5-19101		Wet, dark grayish brown silt	112.9
	PDI- 18SPT-4.5 -15-19101		Moist, dark grayish brown silt with sand	70.1
	PDI- 8SPT-46.5 -61-1910		Wet, dark grayish brown silty sand	62.1
	PDI- 19SPT-00 -4.5-19100		Moist, dark grayish brown silt with sand	76.8
	PDI- 9SPT-18.3 -31-1910		Moist, dark gray silty sand	30.4
	PDI- 19SPT-47 -52-19100		Moist, dark grayish brown silty sand	33.5
	PDI- 9SPT-9.5 -18.3-1910		Moist, dark grayish brown sand with silt	37.5
	PDI- 21SPT-00 -06-19093		Moist, olive brown silt	75.8



Sample ID: ---

Location:
Boring ID: --- Sample Type

Sample Type: --- Tested By: ckg Test Date: 10/23/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527619

### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 1SPT-11 -20.7-1909		Moist, dark olive brown silt	59.6
	PDI- 21SPT-21 -38-19093		Moist, dark olive gray silty sand	43.0
	PDI- 1SPT-49.4 -54-1909		Moist, dark grayish brown silty sand	44.7
	PDI- 22SPT-04 -09-19092		Wet, olive brown silt	79.7
	PDI- 2SPT-16.6 -24-1909		Moist, dark olive brown silty sand	48.8
	PDI- 22SPT-61 -66-19092		Wet, olive brown silty sand	41.8
	PDI- 23SPT-00 -4.5-19092		Wet, dark olive silt with sand	71.5
	PDI- 3SPT-25.5 -30.5-1909		Moist, dark gray silty sand	18.8
	PDI- 3SPT-63.2 -65.5-1909		Moist, dark olive brown silt with sand	48.0
	PDI- 9SC-B-05 -07-19100		Moist, dark olive brown sandy silt	60.6



Project: Gasco PDI

Location:Project No:GTX-310685Boring ID: ---Sample Type: ---Tested By:ckgSample ID: ---Test Date:11/08/19Checked By:bfs

Sample ID: --- Test Date: 11/08/1 Depth: --- Test Id: 527683

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- SC-B-06 -08-191		Moist, dark grayish brown silty sand	2.71	
	PDI- SC-B-1 1-13.5-19		Moist, dark gray sand	2.74	
	PDI- C-B-8.7 -10.7-19		Moist, dark grayish brown sand	2.73	
	PDI- SC-B-7.1 -9.1-191		Moist, dark gray sand with silt	2.69	
	PDI- C-B-8.2 -10.2-19		Moist, dark grayish brown sand	2.77	
	PDI- SC-B-06 -08-191		Moist, dark grayish brown silty sand	2.75	
	PDI- SC-B-06 -08-191		Moist, dark grayish brown silty sand	2.68	
	PDI- SC-B-06 -08-191		Moist, dark olive brown silt	2.56	
	PDI- SC-B-02 -04-191		Wet, dark olive brown silt	2.65	
	PDI- SC-B-04 -06-191		Wet, dark olive brown silt	2.68	



Project: Gasco PDI

Location: Project No: GTX-310685
Boring ID: --- Sample Type: --- Tested By: ckg

Boring ID: --- Sample Type: --- Tested By: ckg
Sample ID: --- Test Date: 11/07/19 Checked By: bfs

Depth: --- Test Id: 527704

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- SC-B-06 -08-191		Moist, dark olive brown silt	2.60	
	PDI- 7SPT-00 -04-1909		Wet, dark olive brown silt	2.65	
	PDI- 7SPT-04 -09-1909		Wet, dark olive brown silt	2.58	
	PDI- 7SPT-17 -18-1909		Moist, dark gray silty sand	2.76	
	PDI- 7SPT-62 -64-1909		Moist, dark olive brown silty sand	2.76	
	PDI- SPT-00 -6.4-191		Wet, olive brown silt with sand	2.55	
	PDI- SPT-14 -33.5-191		Moist, dark olive brown sand	2.74	
	PDI- PT-33.5 -66.5-19		Moist, dark gray sand with silt	2.75	
	PDI- SPT-00 -6.5-191		Wet, very dark olive silt	2.54	
	PDI- PT-16.5 -18.1-19		Moist, dark olive brown silt	2.55	



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/30/19 Checked By: bfs

Depth: --- Test Id: 527714

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- 9SPT-22 -30-1910		Moist, olive brown sand with silt	2.72	
	PDI- PT-35.5 -48.3-19		Moist, olive brown sand with silt	2.75	
	PDI- SPT-48.3 -51-191		Moist, dark olive brown silt with sand	2.62	
	PDI- 110 -54-64.5 -19101		Moist, black sand with silt	2.75	
	PDI- 0SPT-21 -32-1910		Moist, dark gray sand	2.79	
	PDI- 0SPT-32 -45-1910		Moist, black sand	2.76	
	PDI- SPT-00 -6.5-191		Moist, dark brown silt	2.60	
	PDI- SPT-07 -11.5-191		Moist, dark gray sandy silt	2.64	
	PDI- PT-11.5 -26.5-19		Moist, dark gray silty sand	2.75	
	PDI- SPT-37.5 -58-191		Moist, very dark olive gray silty sand	2.75	



Location:

Roring ID: --- Sample Type:

Boring ID: --- Sample Type: --- Tested By: ckg
Sample ID: --- Test Date: 11/07/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527724

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- 3SPT-06 -16-1910		Wet, dark grayish brown silt	2.73	
	PDI- 3SPT-16 -22-1910		Moist, dark grayish brown sand with silt	2.77	
	PDI- SPT-22 -25.2-191		Wet, dark grayish brown silt with sand	2.66	
	PDI- PT-31.9 -39.4-19		Moist, dark gray silty sand	2.44	
	PDI- SPT-00 -7.5-191		Wet, olive brown silt	2.62	
	PDI- SPT-25.5 -28-191		Moist, dark olive brown silty sand	2.75	
	PDI- SPT-42 -50.5-191		Wet, olive brown sandy silt	2.77	
	PDI- SPT-50.5 -55-191		Moist, dark gray silty sand	2.77	
	PDI- SPT-7.5 -12.5-191		Moist, olive brown silt with sand	2.66	
	PDI- 5SPT-06 -11-1910		Moist, very dark gray silty sand	2.77	



Project: Gasco PDI

Location: Project No: GTX-310685
Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 11/08/19 Checked By: bfs

Depth: --- Test Id: 527734

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- PT-18.6 -20.6-19		Moist, dark olive brown silt with sand	2.54	
	PDI- SPT-23 -28.1-191		Moist, very dark olive brown sand with silt	2.75	
	PDI- PT-41.5 -49.3-19		Moist, olive brown silty sand	2.76	
	PDI- SPT-00 -4.5-190		Wet, olive brown silt	2.67	
	PDI- SPT-20 -26.7-190		Moist, dark gray silty sand	2.77	
	PDI- PT-26.7 -28.6-19		Wet, grayish brown silt	2.69	
	PDI- PT-51.5 -54.2-19		Moist, olive brown silty sand	2.76	
	PDI- SPT-11 -29.1-191		Moist, dark gray sand	2.75	
	PDI- SPT-29.1 -32-191		Moist, dark gray silty sand	2.73	
	PDI- PT-44.1 -53.5-19		Moist, dark gray silty sand	2.71	



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/30/19 Checked By: bfs

Depth: --- Test Id: 527744

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- PT-53.5 -63.5-19		Wet, dark grayish brown silt with sand	2.66	
	PDI- SPT-00 -4.5-191		Wet, dark grayish brown silt	2.65	
	PDI- SPT-4.5 -15-191		Moist, dark grayish brown silt with sand	2.53	
	PDI- SPT-46.5 -61-191		Wet, dark grayish brown silty sand	2.71	
	PDI- SPT-00 -4.5-191		Moist, dark grayish brown silt with sand	2.62	
	PDI- SPT-18.3 -31-191		Moist, dark gray silty sand	2.70	
	PDI- 9SPT-47 -52-1910		Moist, dark grayish brown silty sand	2.78	
	PDI- SPT-9.5 -18.3-191		Moist, dark grayish brown sand with silt	2.73	
	PDI- 1SPT-00 -06-1909		Moist, olive brown silt	2.59	
	PDI- SPT-11 -20.7-190		Moist, dark olive brown silt	2.67	



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg Sample ID: ---Test Date: 11/08/19 Checked By: bfs

Test Id: Depth: 527689

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- 1SPT-21 -38-1909		Moist, dark olive gray silty sand	2.73	
	PDI- SPT-49.4 -54-190		Moist, dark grayish brown silty sand	2.70	
	PDI- 2SPT-04 -09-1909		Wet, olive brown silt	2.71	
	PDI- SPT-16.6 -24-190		Moist, dark olive brown silty sand	2.71	
	PDI- 2SPT-61 -66-1909		Wet, olive brown silty sand	2.74	
	PDI- SPT-00 -4.5-190		Wet, dark olive silt with sand	2.66	
	PDI- PT-25.5 -30.5-19		Moist, dark gray silty sand	2.77	
	PDI- PT-63.2 -65.5-19		Moist, dark olive brown silt with sand	2.67	
	PDI- SC-B-05 -07-1910		Moist, dark olive brown sandy silt	2.67	



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-016SC-B-06-08 Test Date: 10/29/19 Checked By: bfs

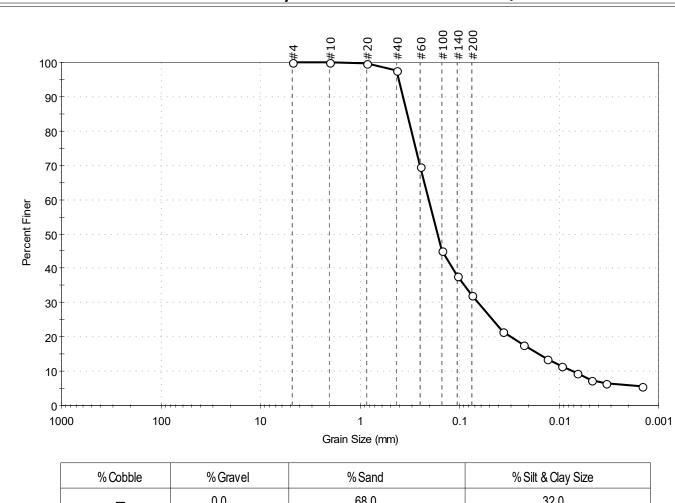
Test Id: 527547 -1910 Depth:

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	68.0	32.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	70		
#100	0.15	45		
#140	0.11	38		
#200	0.075	32		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0364	22		
	0.0229	18		
	0.0132	14		
	0.0094	12		
	0.0066	10		
	0.0047	7		
	0.0034	6		
	0.0015	5		

<u>Coefficients</u>					
D <sub>85</sub> = 0.3339 mm	$D_{30} = 0.0651 \text{ mm}$				
D <sub>60</sub> = 0.2042 mm	$D_{15} = 0.0161 \text{ mm}$				
D <sub>50</sub> = 0.1659 mm	$D_{10} = 0.0072 \text{ mm}$				
C <sub>11</sub> =28.361	$C_c = 2.883$				

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By:

ckg Sample ID: PDI-027SC-B-11-13.5 Test Date: 10/25/19 Checked By: bfs Test Id:

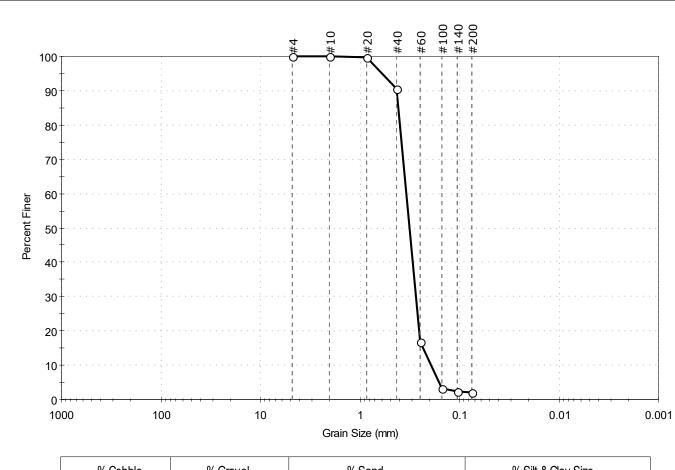
527551

-191 Depth: Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	97.9	2.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	91		
#60	0.25	17		
#100	0.15	3		
#140	0.11	2		
#200	0.075	2.0		

<u>Coefficients</u>				
D <sub>85</sub> = 0.4084 mm	$D_{30} = 0.2747 \text{ mm}$			
D <sub>60</sub> = 0.3411 mm	$D_{15} = 0.2327 \text{ mm}$			
D <sub>50</sub> = 0.3173 mm	$D_{10} = 0.1931 \text{ mm}$			
C <sub>u</sub> =1.766	C <sub>c</sub> =1.146			

Classification
Poorly graded SAND (SP) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-033SC-B-8.7-10.7 Test Date: 11/05/19 Checked By: bfs

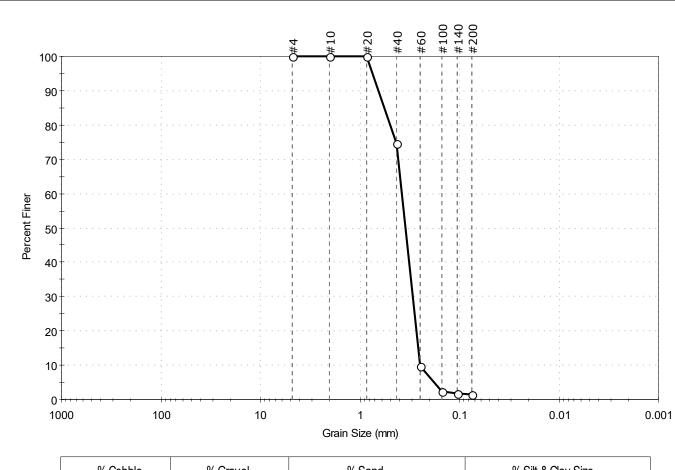
527550

-19 Depth: Test Id: Test Comment:

Visual Description: Moist, dark grayish brown sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	98.5	1.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	75		
#60	0.25	10		
#100	0.15	2		
#140	0.11	2		
#200	0.075	1.5		

<u>Coefficients</u>				
D <sub>85</sub> = 0.5635 mm	$D_{30} = 0.2948 \text{ mm}$			
D <sub>60</sub> = 0.3767 mm	$D_{15} = 0.2608 \text{ mm}$			
D <sub>50</sub> = 0.3471 mm	$D_{10} = 0.2503 \text{ mm}$			
C <sub>u</sub> =1.505	$C_c = 0.922$			

Classification
Poorly graded SAND (SP) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Test Date: Sample ID: PDI-038SC-B-7.1-9.1 10/24/19 Checked By: bfs Test Id:

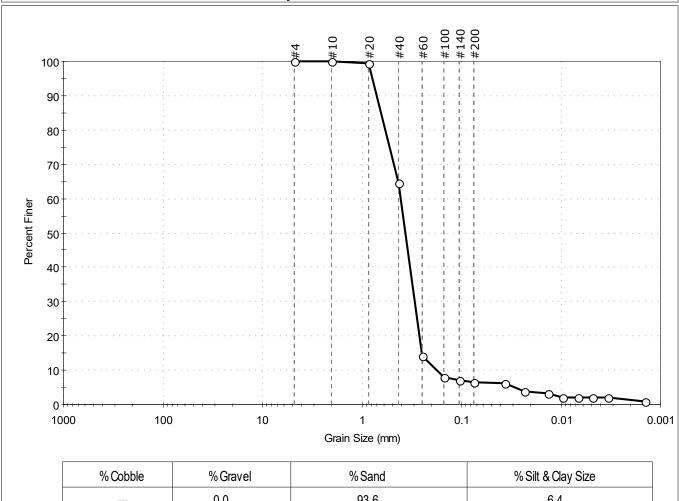
527548

-191 Depth: Test Comment:

Visual Description: Moist, dark gray sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



ne	Sieve Size, mm Percen	t Finer Spec. Percent (	Complies	Coefficients	_
		0.0	93.6	6.4	
	% Cobble	% Gravel	% Sand	% Silt & Clay Size	

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	65		
#60	0.25	14		
#100	0.15	8		
#140	0.11	7		
#200	0.075	6.4		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0370	6		
	0.0235	4		
	0.0136	3		
	0.0096	2		
	0.0068	2		
	0.0048	2		
	0.0034	2		
	0.0014	1		

<u> </u>	- IIICICIICS
D <sub>85</sub> = 0.6378 mm	$D_{30} = 0.2953 \text{ mm}$
D <sub>60</sub> = 0.4052 mm	$D_{15} = 0.2521 \text{ mm}$
D <sub>50</sub> = 0.3646 mm	$D_{10} = 0.1779 \text{ mm}$
C <sub>u</sub> =2.278	$C_c = 1.210$

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-041SC-B-8.2-10.2 Test Date: 10/30/19 Checked By: bfs Test Id:

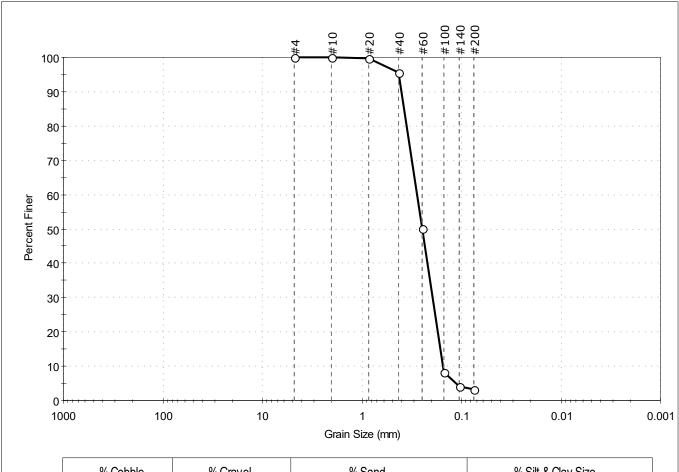
527545

-19 Depth: Test Comment:

Visual Description: Moist, dark grayish brown sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	96.6	3.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	96		
#60	0.25	50		
#100	0.15	8		
#140	0.11	4		
#200	0.075	3.4		

<u>Coefficients</u>			
D <sub>85</sub> = 0.3758 mm	$D_{30} = 0.1957 \text{ mm}$		
D <sub>60</sub> = 0.2808 mm	$D_{15} = 0.1629 \text{ mm}$		
D <sub>50</sub> = 0.2500 mm	$D_{10} = 0.1532 \text{ mm}$		
C <sub>u</sub> =1.833	$C_{c} = 0.890$		

Classification
Poorly graded SAND (SP) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-049SC-B-06-08 Test Date: 10/24/19 Checked By: bfs

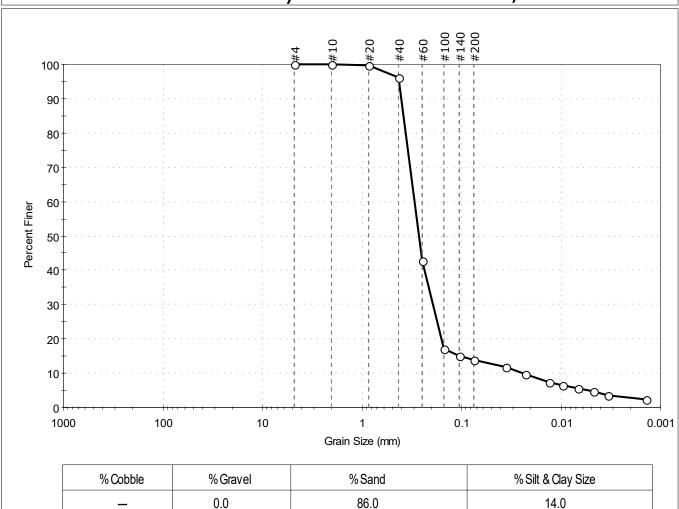
Test Id: 527554 -1910 Depth:

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	96		
#60	0.25	43		
#100	0.15	17		
#140	0.11	15		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0361	12		
	0.0230	10		
	0.0131	7		
	0.0095	6		
	0.0068	5		
	0.0048	5		
	0.0034	4		
	0.0014	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3801 mm	$D_{30} = 0.1941 \text{ mm}$			
D <sub>60</sub> = 0.2968 mm	$D_{15} = 0.1066 \text{ mm}$			
D <sub>50</sub> = 0.2688 mm	$D_{10} = 0.0249 \text{ mm}$			
Cu =11.920	$C_c = 5.098$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-052SC-B-06-08 Test Date: 10/24/19 Checked By: bfs

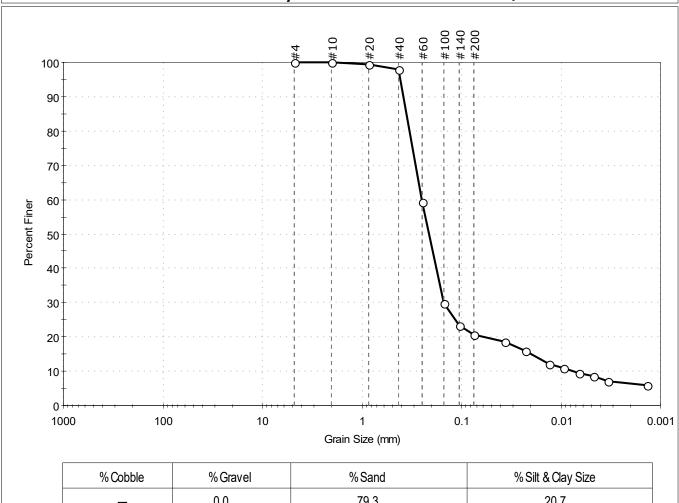
527555 Test Id: -1910 Depth:

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	79.3	20.7

	_			
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	59		
#100	0.15	30		
#140	0.11	23		
#200	0.075	21		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0365	19		
	0.0229	16		
	0.0131	12		
	0.0094	11		
	0.0067	10		
	0.0047	8		
	0.0034	7		
	0.0014	6		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.3554 mm		$D_{30} = 0.1505 \text{ mm}$	
	D <sub>60</sub> = 0.2521 mm	$D_{15} = 0.0198 \text{ mm}$	
	D <sub>50</sub> = 0.2126 mm	$D_{10} = 0.0075 \text{ mm}$	
	C <sub>11</sub> =33.613	$C_c = 11.980$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



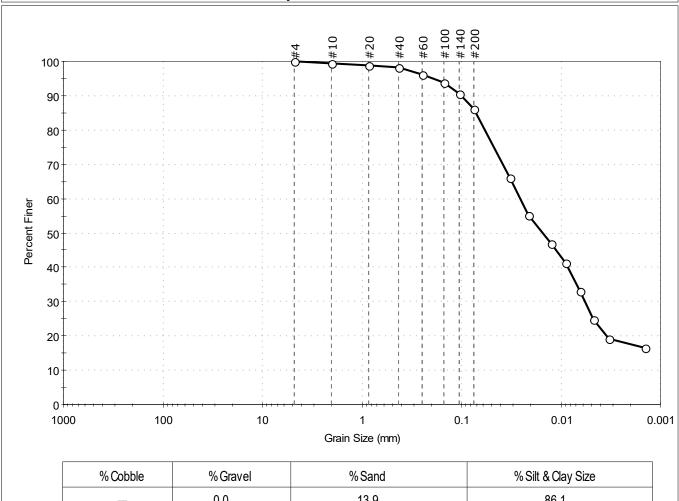
Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-066SC-B-06-08 Test Date: 10/29/19 Checked By: bfs

Test Id: 527552 -1910 Depth:

Test Comment:

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	13.9	86.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	94		
#140	0.11	90		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0324	66		
	0.0213	55		
	0.0126	47		
	0.0090	41		
	0.0065	33		
	0.0047	25		
	0.0033	19		
	0.0014	17		

<u>Coefficients</u>		
D <sub>85</sub> =0.0716 mm	$D_{30} = 0.0057 \text{ mm}$	
D <sub>60</sub> = 0.0257 mm	$D_{15} = N/A$	
D <sub>50</sub> = 0.0155 mm	$D_{10} = N/A$	
Cu =N/A	$C_c = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (42))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527546

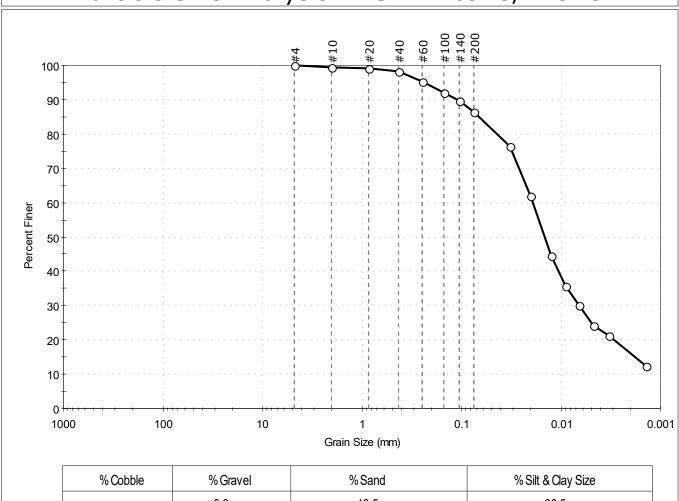
Sample ID: PDI-067SC-B-02-04 Test Date: 10/29/19 Checked By: bfs

Test Id: -1910 Depth: Test Comment:

Visual Description: Wet, dark olive brown silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	13.5	86.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	95		
#100	0.15	92		
#140	0.11	90		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0328	76		
	0.0202	62		
	0.0126	44		
	0.0091	36		
	0.0065	30		
	0.0047	24		
	0.0033	21		
	0.0014	13		

<u>Coefficients</u>		
D <sub>85</sub> = 0.0663 mm	$D_{30} = 0.0065 \text{ mm}$	
$D_{60} = 0.0192 \text{ mm}$	$D_{15} = 0.0018 \text{ mm}$	
$D_{50} = 0.0146 \text{ mm}$	$D_{10} = N/A$	
$C_{ij} = N/A$	$C_{c} = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (32))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-077SC-B-04-06 Test Date: 10/29/19 Checked By: bfs

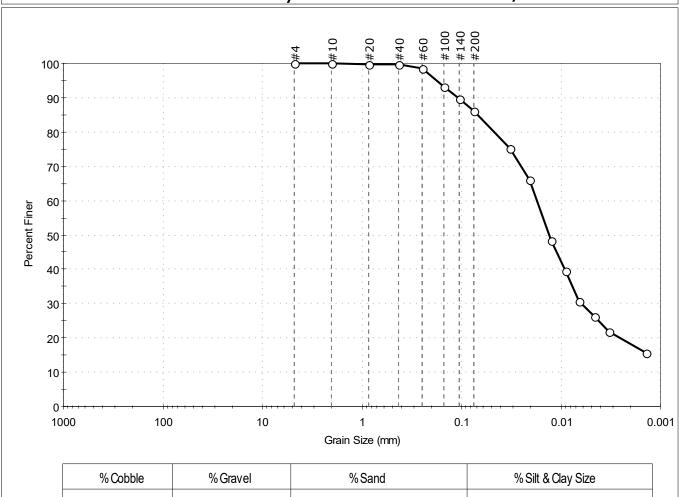
Test Id: 527543 -1910 Depth:

Test Comment:

Visual Description: Wet, dark olive brown silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	13.7	86.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
	,		-	
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	93		
#140	0.11	90		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0326	75		
	0.0208	66		
	0.0126	48		
	0.0090	39		
	0.0065	31		
	0.0046	26		
	0.0033	22		
	0.0014	16		

Coeffic	<u>cients</u>
D <sub>85</sub> = 0.0682 mm	$D_{30} = 0.0062 \text{ mm}$
D <sub>60</sub> = 0.0175 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0132 mm	$D_{10} = N/A$
C <sub>II</sub> =N/A	$C_C = N/A$

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (29))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

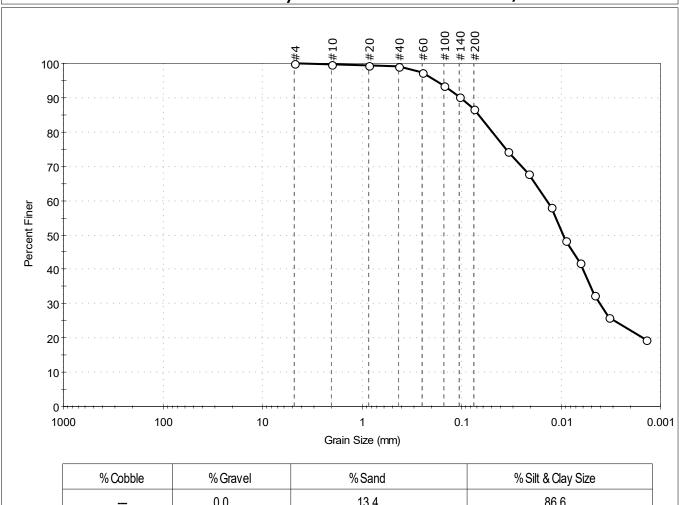
Sample ID: PDI-079SC-B-06-08 Test Date: 10/24/19 Checked By: bfs 527544

Test Id: -1910 Depth: Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



me	Sieve Size, mm Percen	t Finer Spec. Percent (	Complies	Coefficients	-
		0.0	13.4	86.6	
	% Cobble	% Gravel	% Sand	% Silt & Clay Size	

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	97		
#100	0.15	94		
#140	0.11	90		
#200	0.075	87		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0341	74		
	0.0213	68		
	0.0125	58		
	0.0090	48		
	0.0064	42		
	0.0046	32		
	0.0033	26		
	0.0014	19		

<u> </u>	TOTOTICS.
D <sub>85</sub> = 0.0677 mm	$D_{30} = 0.0041 \text{ mm}$
D <sub>60</sub> = 0.0138 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0095 mm	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (24))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

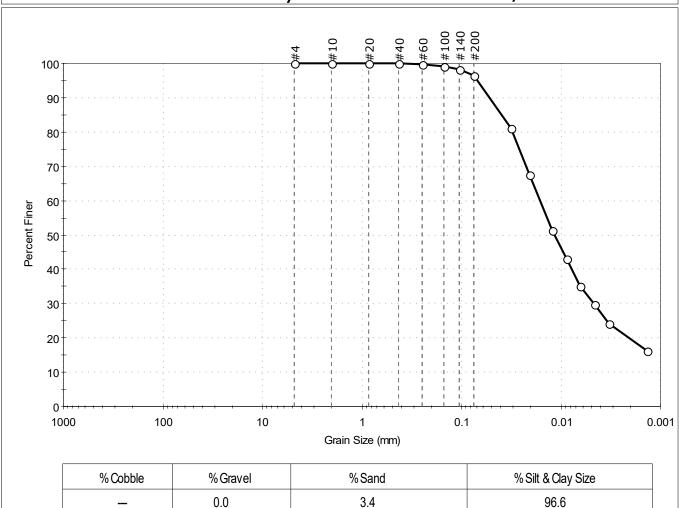
10/29/19 Checked By: bfs Sample ID: PDI-090SC-B-06-08 Test Date: Test Id:

527553

-1910 Depth: Test Comment:

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#140	0.11	98		
#200	0.075	97		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0322	81		
	0.0207	68		
	0.0123	51		
	0.0089	43		
	0.0064	35		
	0.0046	30		
	0.0033	24		
	0.0014	16		

<u>Coefficients</u>		
D <sub>85</sub> = 0.0400 mm	$D_{30} = 0.0047 \text{ mm}$	
$D_{60} = 0.0163 \text{ mm}$	$D_{15} = N/A$	
$D_{50} = 0.0117 \text{ mm}$	$D_{10} = N/A$	
$C_{u} = N/A$	$C_c = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (51))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve printed 11/18/2019 3:20:51 PM



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-107SPT-00-04 est Date: 11/06/19 Checked By: bfs

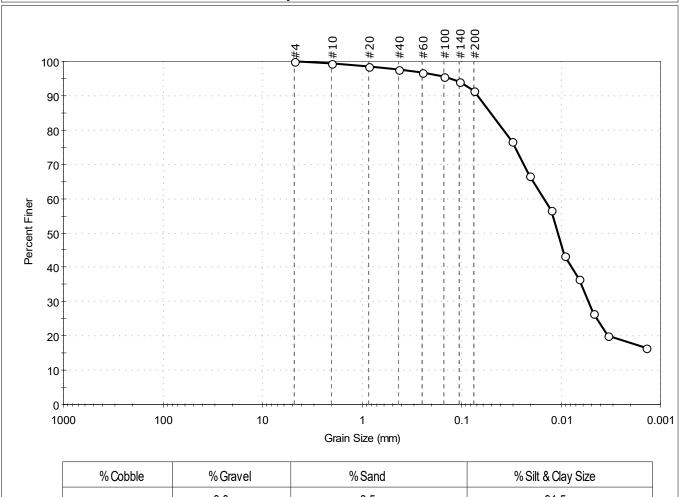
527556 -190923T Depth: Test Id:

Test Comment:

Visual Description: Wet, dark olive brown silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	8.5	91.5

Sieve Name   Sieve Size, mm   Percent Finer   Spec. Percent			Complies	
Sieve Maille	Sieve Size, IIIII	reicent i mei	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	96		
#140	0.11	94		
#200	0.075	91		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0308	77		
	0.0208	67		
	0.0125	57		
	0.0091	43		
	0.0065	37		
	0.0047	27		
	0.0033	20		
	0.0014	17		

	<u>Coefficients</u>				
D <sub>85</sub> = 0.0509 mm		$D_{30} = 0.0052 \text{ mm}$			
D <sub>60</sub> = 0.0149 mm		$D_{15} = N/A$			
	$D_{50} = 0.0107 \text{ mm}$	$D_{10} = N/A$			
	$C_{II} = N/A$	$C_c = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (53))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Test Comment:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

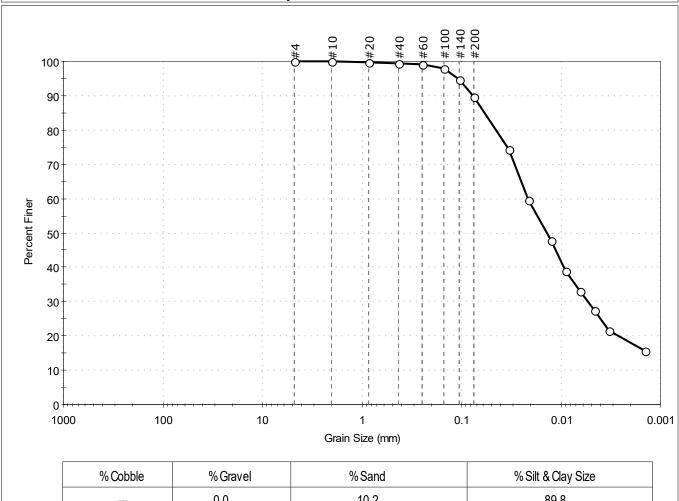
527557

Sample ID: PDI-107SPT-04-09 est Date: 11/06/19 Checked By: bfs

-190923T Depth: Test Id:

Visual Description: Wet, dark olive brown silt Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	10.2	89.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#140	0.11	95		
#200	0.075	90		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0330	74		
	0.0213	60		
	0.0126	48		
	0.0091	39		
	0.0065	33		
	0.0046	27		
	0.0033	21		
	0.0014	16		

	<u>Coeffic</u>	<u>cients</u>
	D <sub>85</sub> = 0.0583 mm	$D_{30} = 0.0054 \text{ mm}$
D <sub>60</sub> = 0.0216 mm		$D_{15} = N/A$
	D <sub>50</sub> = 0.0138 mm	$D_{10} = N/A$
	Cu =N/A	$C_C = N/A$

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (30))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527558

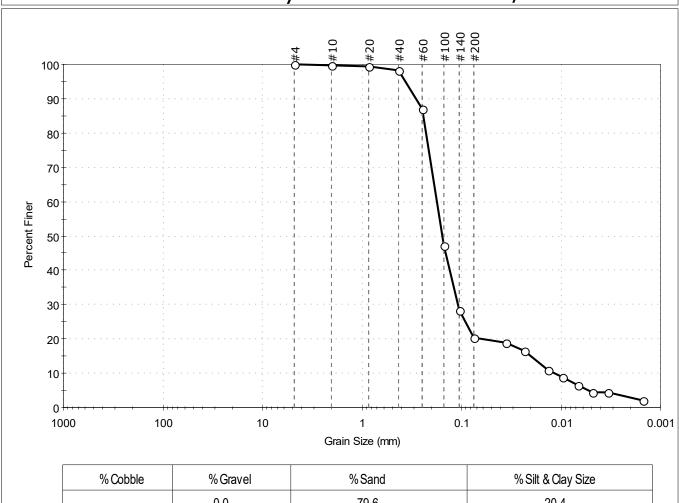
Sample ID: PDI-107SPT-17-18 est Date: 11/06/19 Checked By: bfs Test Id:

-190923T Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	79.6	20.4

Sieve Name	Sieve Size, mm	Percent Finer	Snec Percent	Complies
Sieve maine	Dieve Size, iiiii	r creciie i ilici	Speci i ci cent	compiles
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	87		
#100	0.15	47		
#140	0.11	28		
#200	0.075	20		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0355	19		
	0.0233	17		
	0.0135	11		
	0.0096	9		
	0.0068	7		
	0.0048	4		
	0.0034	4		
	0.0015	2		

Coefficients				
D <sub>85</sub> = 0.2437 mm	D <sub>30</sub> = 0.1094 mm			
$D_{60} = 0.1767 \text{ mm}$	$D_{15} = 0.0199 \text{ mm}$			
$D_{50} = 0.1554 \text{ mm}$	$D_{10} = 0.0114 \text{ mm}$			
$C_{11} = 15.500$	$C_c = 5.941$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527559

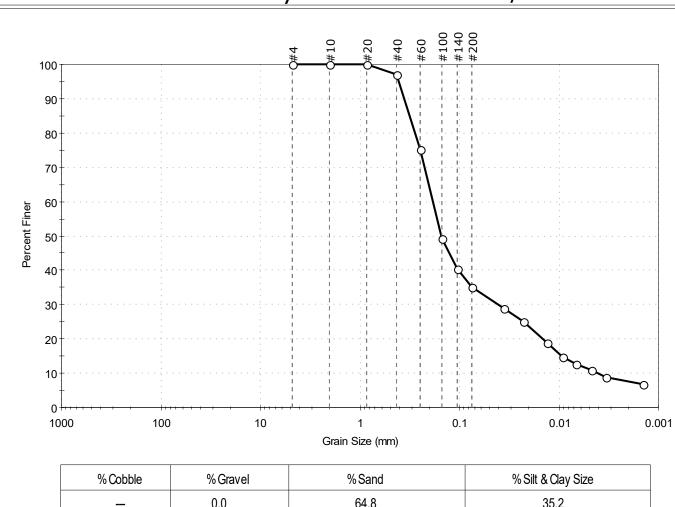
Sample ID: PDI-107SPT-62-64 est Date: 11/06/19 Checked By: bfs Test Id:

-190923T Depth: Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	64.8	35.2

4.75 2.00 0.85 0.42 0.25 0.15 0.11	100 100 100 97 75 49	Spec. Percent	Complies
2.00 0.85 0.42 0.25 0.15	100 100 97 75 49		
0.85 0.42 0.25 0.15	100 97 75 49		
0.42 0.25 0.15 0.11	97 75 49 40		
0.25 0.15 0.11	75 49 40		
0.15 0.11	49		
0.11	40		
0.075	25		
	35		
article Size (mm)	Percent Finer	Spec. Percent	Complies
0.0357	29		
0.0225	25		
0.0131	19		
0.0093	15		
0.0067	13		
0.0047	11		
0.0034	9		
0.0014	7		
	0.0093 0.0067 0.0047	0.0093         15           0.0067         13           0.0047         11           0.0034         9	0.0093     15       0.0067     13       0.0047     11       0.0034     9

<u>Coefficients</u>		
D <sub>85</sub> = 0.3165 mm	$D_{30} = 0.0401 \text{ mm}$	
D <sub>60</sub> = 0.1854 mm	D <sub>15</sub> =0.0094 mm	
D <sub>50</sub> = 0.1524 mm	$D_{10} = 0.0042 \text{ mm}$	
C <sub>u</sub> =44.143	$C_c = 2.065$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

527560

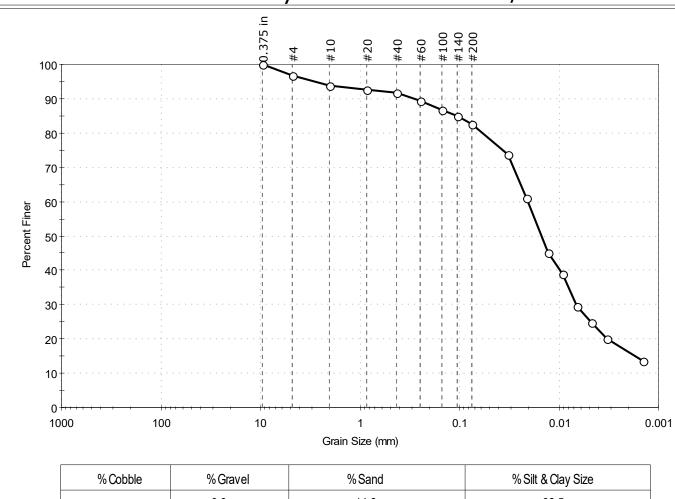
Sample ID: PDI-108SPT-00-6.4 Test Date: 11/01/19 Checked By: bfs Test Id:

-19100 Depth: Test Comment:

Visual Description: Wet, olive brown silt with sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	3.3	14.2	82.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.075	0.50	100		
0.375 in	9.50	100		
#4	4.75	97		
#10	2.00	94		
#20	0.85	93		
#40	0.42	92		
#60	0.25	89		
#100	0.15	87		
#140	0.11	85		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0328	74		
	0.0213	61		
	0.0127	45		
	0.0091	39		
	0.0066	29		
	0.0047	25		
	0.0033	20		
	0.0014	14		

COCII	ICICIICS
D <sub>85</sub> =0.1081 mm	$D_{30} = 0.0067 \text{ mm}$
D <sub>60</sub> = 0.0206 mm	$D_{15} = 0.0017 \text{ mm}$
D <sub>50</sub> = 0.0149 mm	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

Coefficients

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (41))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness: HARD

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Sample ID: PDI-108SPT-14-33.5 Test Date: 11/01/19 Checked By: bfs

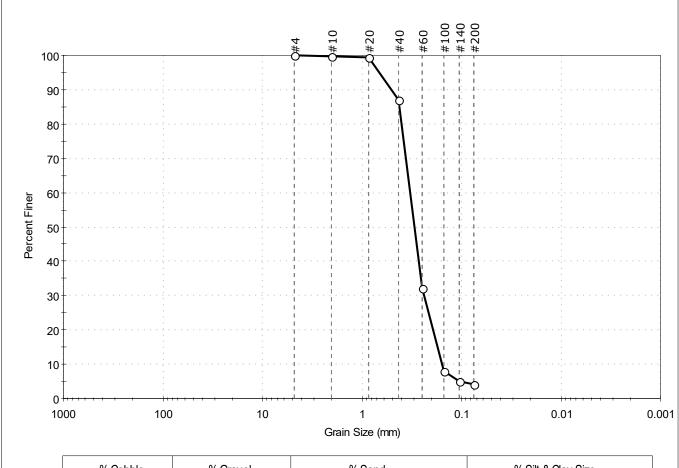
-1910 Depth: --- Test Id: 527561

Test Comment: ---

Visual Description: Moist, dark olive brown sand

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	95.9	4.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	87		
#60	0.25	32		
#100	0.15	8		
#140	0.11	5		
#200	0.075	4.1		

<u>Coefficients</u>				
D <sub>85</sub> = 0.4167 mm	$D_{30} = 0.2394 \text{ mm}$			
D <sub>60</sub> = 0.3274 mm	$D_{15} = 0.1743 \text{ mm}$			
D <sub>50</sub> = 0.2973 mm	$D_{10} = 0.1568 \text{ mm}$			
C <sub>u</sub> =2.088	C <sub>c</sub> =1.116			

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description
Sand/Gravel Particle Shape: --Sand/Gravel Hardness: ---



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-108SPT-33.5-66.5 Test Date: 11/01/19 Checked By: bfs Test Id:

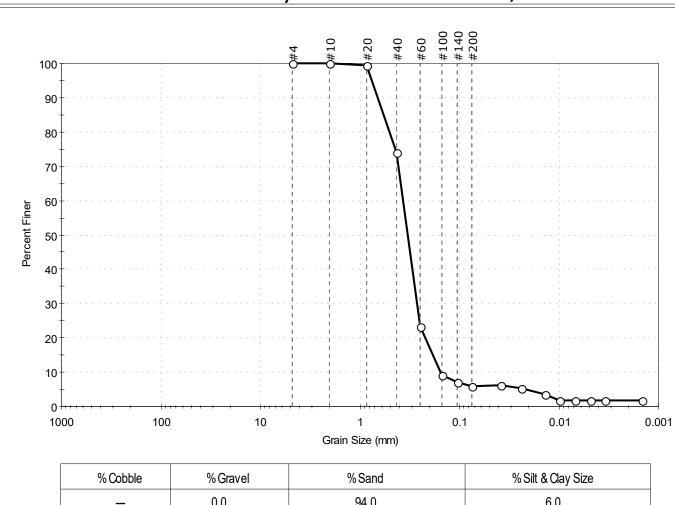
527562

-19 Depth: Test Comment:

Visual Description: Moist, dark gray sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



1e	Sieve Size, mm Percent Finer Spec. Percent		Complies	Coefficients
		0.0	94.0	6.0
	% Cobble	% Gravel	% Sand	% Silt & Clay Size

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	74		
#60	0.25	23		
#100	0.15	9		
#140	0.11	7		
#200	0.075	6.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0385	6		
	0.0237	5		
	0.0137	4		
	0.0098	2		
	0.0069	2		
	0.0049	2		
	0.0034	2		
	0.0015	2		

Cochicicnes			
D <sub>85</sub> = 0.5740 mm	$D_{30} = 0.2682 \text{ mm}$		
D <sub>60</sub> = 0.3670 mm	$D_{15} = 0.1849 \text{ mm}$		
D <sub>50</sub> = 0.3306 mm	$D_{10} = 0.1541 \text{ mm}$		
$C_u = 2.382$	$C_c = 1.272$		

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

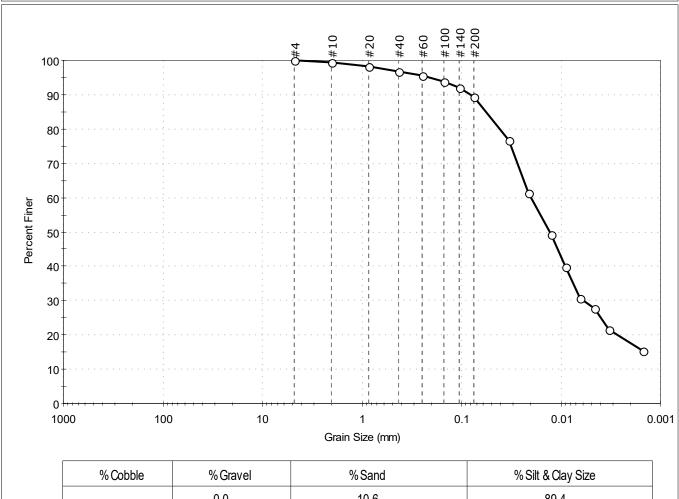
Sample ID: PDI-109SPT-00-6.5 Test Date: 10/29/19 Checked By: bfs 527563 Test Id:

-19100 Depth:

Test Comment:

Visual Description: Wet, very dark olive silt Sample Comment: Sample contains organics

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	10.6	89.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	97		
#60	0.25	96		
#100	0.15	94		
#140	0.11	92		
#200	0.075	89		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0332	77		
	0.0211	61		
	0.0125	49		
	0.0090	40		
	0.0065	31		
	0.0046	28		
	0.0033	22		
	0.0015	15		

	Coeffic	<u>cients</u>	
	D <sub>85</sub> = 0.0563 mm	$D_{30} = 0.0060 \text{ mm}$	
D <sub>60</sub> = 0.0199 mm		$D_{15} = N/A$	
D <sub>50</sub> = 0.0130 mm		$D_{10} = N/A$	
	Cu =N/A	$C_c = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (48))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Test Date: 10/29/19 Checked By: bfs Sample ID: PDI-109SPT-16.5-18.1

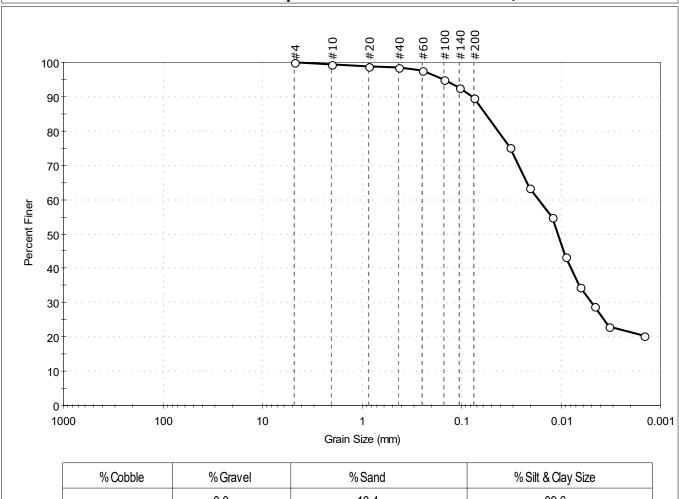
Test Id: -19 Depth: 527564

Test Comment:

Visual Description: Moist, dark olive brown silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	10.4	89.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	98		
#100	0.15	95		
#140	0.11	93		
#200	0.075	90		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0329	75		
	0.0209	64		
	0.0123	55		
	0.0089	43		
	0.0064	35		
	0.0046	29		
	0.0033	23		
	0.0015	20		

COCI	Helenes
D <sub>85</sub> = 0.0578 mm	$D_{30} = 0.0049 \text{ mm}$
D <sub>60</sub> = 0.0168 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0107 mm	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

Coefficients

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (38))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Separation of Sample: #200 Sieve

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

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Location: GTX-310685 Project No: Sample Type: bag Tested By: ckg

527565

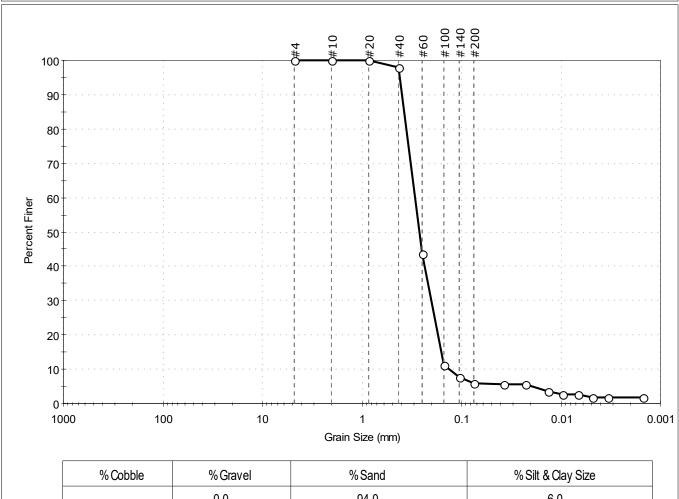
Boring ID: ---Sample ID: PDI-109SPT-22-30 est Date: 10/29/19 Checked By: bfs Test Id:

-191004T Depth: Test Comment:

Visual Description: Moist, olive brown sand with silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	94.0	6.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	44		
#100	0.15	11		
#140	0.11	8		
#200	0.075	6.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0374	5		
	0.0229	5		
	0.0134	4		
	0.0095	3		
	0.0067	3		
	0.0048	2		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3747 mm	$D_{30} = 0.2015 \text{ mm}$			
D <sub>60</sub> = 0.2933 mm	$D_{15} = 0.1592 \text{ mm}$			
D <sub>50</sub> = 0.2659 mm	$D_{10} = 0.1336 \text{ mm}$			
C <sub>u</sub> =2.195	$C_c = 1.036$			

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

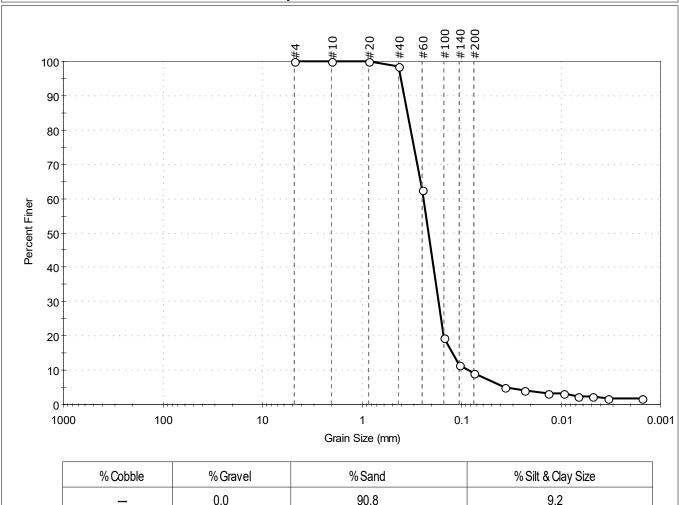
Test Date: 10/29/19 Checked By: bfs Sample ID: PDI-109SPT-35.5-48.3 Test Id: 527566

-19 Depth: Test Comment:

Visual Description: Moist, olive brown sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	63		
#100	0.15	20		
#140	0.11	11		
#200	0.075	9.2		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0365	5		
	0.0233	4		
	0.0133	3		
	0.0095	3		
	0.0067	2		
	0.0048	2		
	0.0034	2		
	0.0015	2		
			[	

	<u>Coefficients</u>				
D <sub>85</sub> = 0.3483 mm		$D_{30} = 0.1699 \text{ mm}$			
	D <sub>60</sub> = 0.2426 mm	$D_{15} = 0.1233 \text{ mm}$			
	D <sub>50</sub> = 0.2154 mm	$D_{10} = 0.0849 \text{ mm}$			
	Cu =2.857	$C_{c} = 1.401$			

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-109SPT-48.3-51 Test Date: 10/29/19 Checked By: bfs

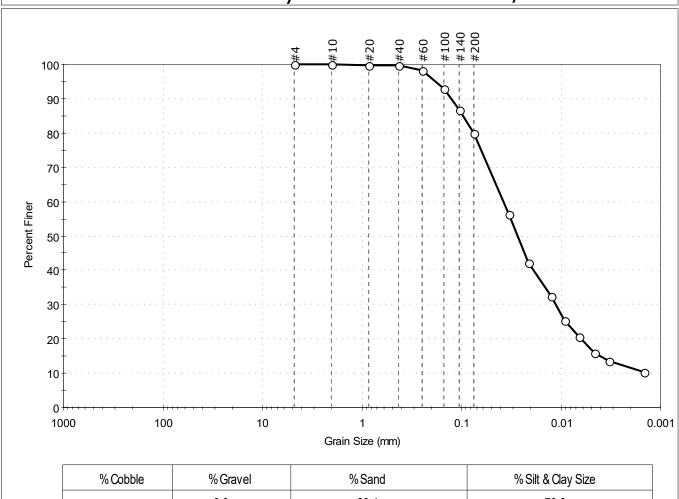
527567

Test Id: -1910 Depth: Test Comment:

Visual Description: Moist, dark olive brown silt with sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	20.1	79.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	98		
#100	0.15	93		
#140	0.11	87		
#200	0.075	80		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0335	56		
	0.0210	42		
	0.0126	33		
	0.0091	25		
	0.0065	21		
	0.0046	16		
	0.0033	14		
	0.0015	10		

	<u>Coefficients</u>				
D <sub>85</sub> = 0.0976 mm		$D_{30} = 0.0112 \text{ mm}$			
	D <sub>60</sub> = 0.0380 mm	$D_{15} = 0.0041 \text{ mm}$			
	D <sub>50</sub> = 0.0273 mm	$D_{10} = N/A$			
	Cu =N/A	$C_{c} = N/A$			

<u>Classification</u> SILT with Sand (ML) **ASTM** 

AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

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Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg 10/29/19 Checked By: bfs

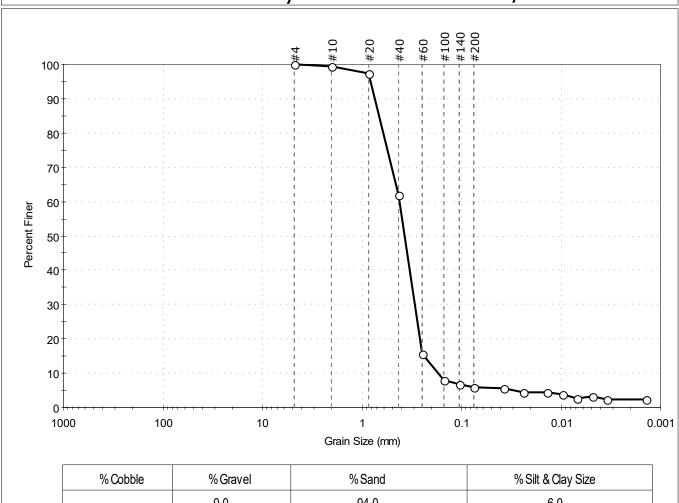
Sample ID: PDI-110 B-54-64.5 Test Date: Test Id: 527568 -19101 Depth:

Test Comment:

Visual Description: Moist, black sand with silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



ame	Sieve Size, mm Percen	t Finer Spec. Percent (	Complies	Coefficients	_
		0.0	94.0	6.0	
	% Cobble	% Gravel	% Sand	% Silt & Clay Size	

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	62		
#60	0.25	16		
#100	0.15	8		
#140	0.11	7		
#200	0.075	6.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0375	6		
	0.0237	4		
	0.0137	4		
	0.0096	4		
	0.0068	3		
	0.0048	3		
	0.0034	2		
	0.0014	2		

<u>Coefficients</u>			
	D <sub>85</sub> = 0.6681 mm	$D_{30} = 0.2948 \text{ mm}$	
	D <sub>60</sub> = 0.4158 mm	D <sub>15</sub> =0.2399 mm	
	D <sub>50</sub> = 0.3707 mm	$D_{10} = 0.1717 \text{ mm}$	
	C <sub>u</sub> =2.422	$C_c = 1.217$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

527569

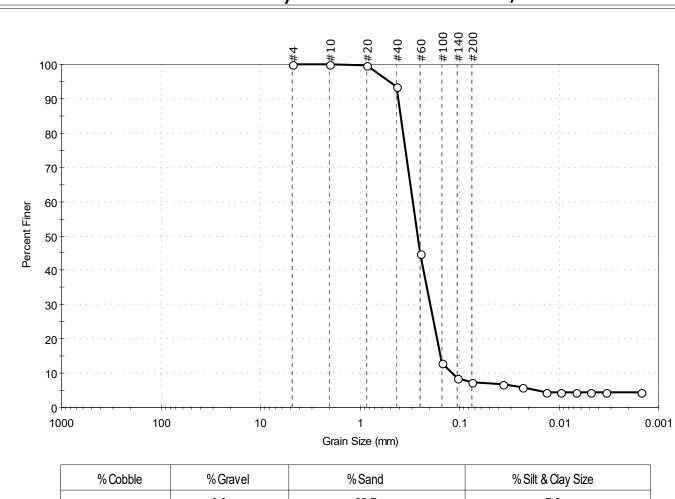
Sample ID: PDI-110SPT-21-32 est Date: 10/29/19 Checked By: bfs Test Id:

-191010T Depth: Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	92.7	7.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	94		
#60	0.25	45		
#100	0.15	13		
#140	0.11	9		
#200	0.075	7.3		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0368	7		
	0.0232	6		
	0.0135	5		
	0.0096	5		
	0.0068	5		
	0.0048	5		
	0.0034	5		
	0.0015	5		

<u>Coefficients</u>			
D <sub>85</sub> = 0.3872 mm	$D_{30} = 0.1973 \text{ mm}$		
D <sub>60</sub> = 0.2950 mm	$D_{15} = 0.1552 \text{ mm}$		
D <sub>50</sub> = 0.2646 mm	$D_{10} = 0.1184 \text{ mm}$		
C <sub>11</sub> =2.492	$C_{c} = 1.115$		

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-110SPT-32-45 est Date: 10/30/19 Checked By: bfs Test Id: 527570

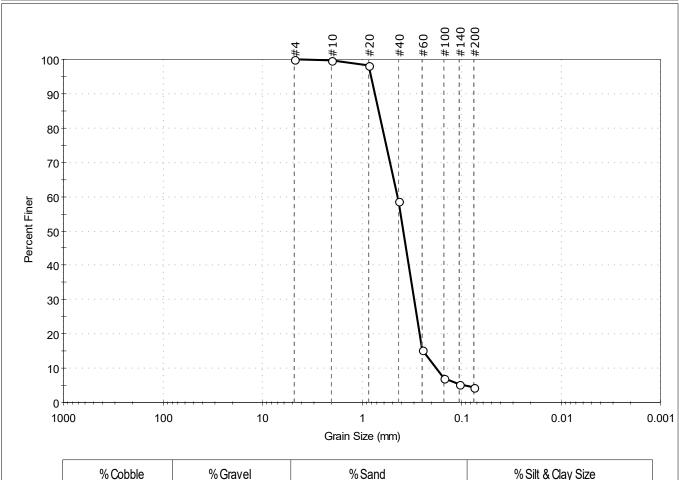
-191010T Depth:

Test Comment:

Visual Description: Moist, black sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	95.6	4.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	59		
#60	0.25	15		
#100	0.15	7		
#140	0.11	5		
#200	0.075	4.3		

<u>Coefficients</u>			
D <sub>85</sub> = 0.6746 mm	$D_{30} = 0.2994 \text{ mm}$		
D <sub>60</sub> = 0.4347 mm	D <sub>15</sub> =0.2464 mm		
D <sub>50</sub> = 0.3821 mm	$D_{10} = 0.1799 \text{ mm}$		
C <sub>u</sub> =2.416	C <sub>c</sub> =1.146		

Classification
Poorly graded SAND (SP) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527571

Sample ID: PDI-112SPT-00-6.5 Test Date: 11/05/19 Checked By: bfs Test Id:

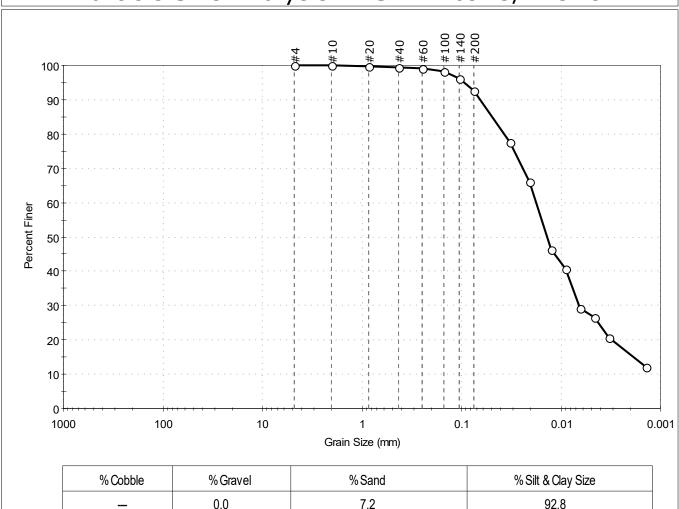
-19100 Depth:

Visual Description: Moist, dark brown silt

Sample Comment:

Test Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0323	78		
	0.0208	66		
	0.0126	46		
	0.0090	41		
	0.0065	29		
	0.0046	26		
	0.0033	21		
	0.0014	12		

<del>500.</del>	110101100
D <sub>85</sub> = 0.0488 mm	$D_{30} = 0.0066 \text{ mm}$
D <sub>60</sub> = 0.0178 mm	$D_{15} = 0.0018 \text{ mm}$
D <sub>50</sub> = 0.0138 mm	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

Coefficients

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (45))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527572

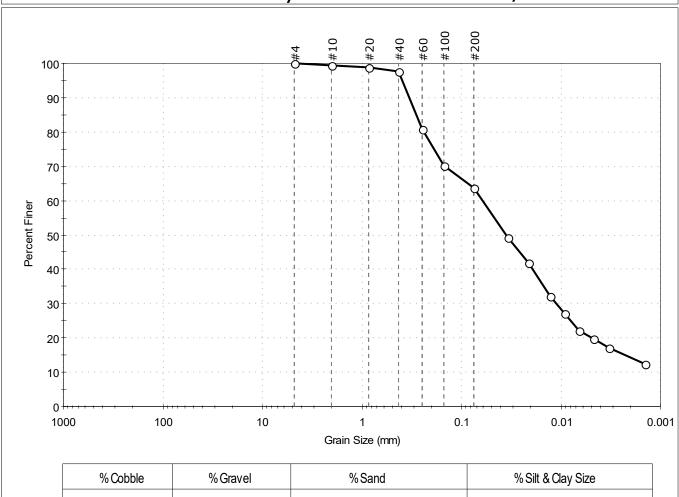
Sample ID: PDI-112SPT-07-11.5 Test Date: 11/01/19 Checked By: bfs Test Id:

-1910 Depth: Test Comment:

Visual Description: Moist, dark gray sandy silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	36.3	63.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	81		
#100	0.15	70		
#200	0.075	64		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0344	49		
	0.0211	42		
	0.0129	32		
	0.0092	27		
	0.0066	22		
	0.0047	20		
	0.0033	17		
	0.0014	12		

<u>Coefficients</u>			
D <sub>85</sub> =0.2849 mm	$D_{30} = 0.0112 \text{ mm}$		
D <sub>60</sub> = 0.0615 mm	$D_{15} = 0.0023 \text{ mm}$		
D <sub>50</sub> = 0.0357 mm	$D_{10} = N/A$		
C <sub>u</sub> =N/A	$C_c = N/A$		

<u>Classification</u> Sandy Elastic SILT (MH) **ASTM** 

AASHTO Clayey Soils (A-7-5 (11))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-112SPT-11.5-26.5 Test Date: 10/31/19 Checked By: bfs

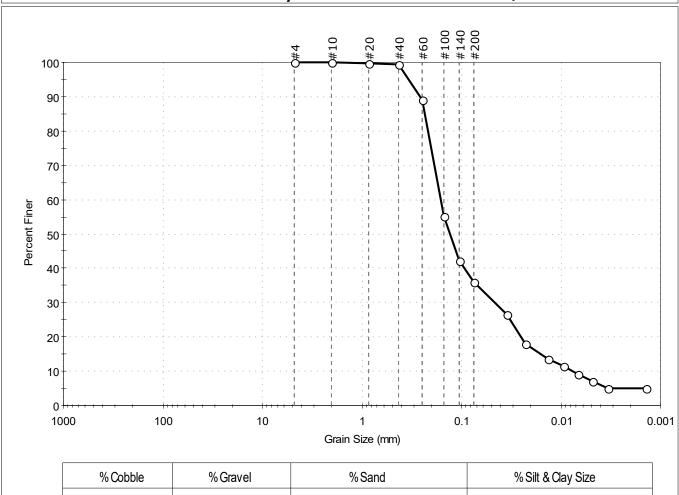
Test Id: 527573 -19 Depth:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	64.1	35.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	89		
#100	0.15	55		
#140	0.11	42		
#200	0.075	36		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0351	27		
	0.0225	18		
	0.0134	14		
	0.0094	11		
	0.0067	9		
	0.0048	7		
	0.0034	5		
	0.0014	5		

<u>Coefficients</u>		
D <sub>85</sub> = 0.2350 mm	$D_{30} = 0.0465 \text{ mm}$	
D <sub>60</sub> = 0.1614 mm	$D_{15} = 0.0159 \text{ mm}$	
D <sub>50</sub> = 0.1309 mm	$D_{10} = 0.0075 \text{ mm}$	
C <sub>11</sub> =21.520	$C_c = 1.786$	

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Sample ID: PDI-112SPT-37.5-58 Test Date: 10/29/19 Checked By: bfs

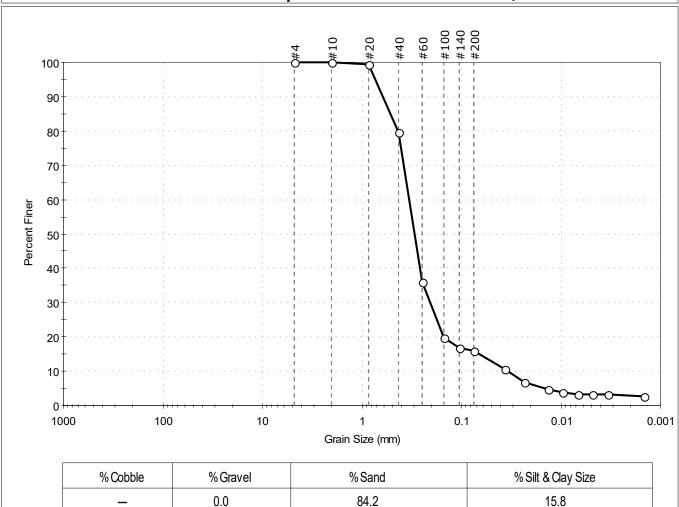
-1910 Depth: --- Test Id: 527574

Test Comment: ---

Visual Description: Moist, very dark olive gray silty sand

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	80		
#60	0.25	36		
#100	0.15	20		
#140	0.11	17		
#200	0.075	16		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0367	11		
	0.0234	7		
	0.0136	5		
	0.0096	4		
	0.0068	3		
	0.0048	3		
	0.0034	3		
	0.0014	3		

<u>Coefficients</u>		
D <sub>85</sub> = 0.5121 mm	$D_{30} = 0.2062 \text{ mm}$	
D <sub>60</sub> = 0.3344 mm	$D_{15} = 0.0671 \text{ mm}$	
D <sub>50</sub> = 0.2961 mm	$D_{10} = 0.0339 \text{ mm}$	
Cu =9.864	$C_c = 3.751$	

<u>Classification</u> ASTM Silty SAND (SM)

AASHTO Silty Gravel and Sand (A-2-4 (0))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sarra, Starter Laterers Strape :

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Sample Type: bag Tested By: ckg

527575

Boring ID: ---Sample ID: PDI-113SPT-06-16 Test Date: 11/05/19 Checked By: bfs Test Id:

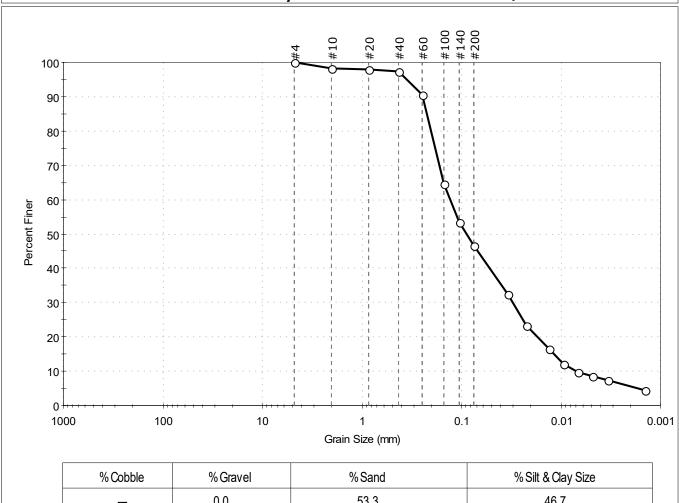
Test Comment:

-19101 Depth:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	53.3	46.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	98		
#20	0.85	98		
#40	0.42	97		
#60	0.25	90		
#100	0.15	65		
#140	0.11	53		
#200	0.075	47		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0341	32		
	0.0224	23		
	0.0130	17		
	0.0095	12		
	0.0067	10		
	0.0048	9		
	0.0034	7		
	0.0014	5	<del>                                     </del>	

<u>Coefficients</u>		
D <sub>85</sub> = 0.2243 mm	$D_{30} = 0.0305 \text{ mm}$	
D <sub>60</sub> = 0.1298 mm	$D_{15} = 0.0117 \text{ mm}$	
D <sub>50</sub> = 0.0888 mm	$D_{10} = 0.0070 \text{ mm}$	
C <sub>11</sub> =18.543	$C_{c} = 1.024$	

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-113SPT-16-22 Test Date: 10/31/19 Checked By: bfs

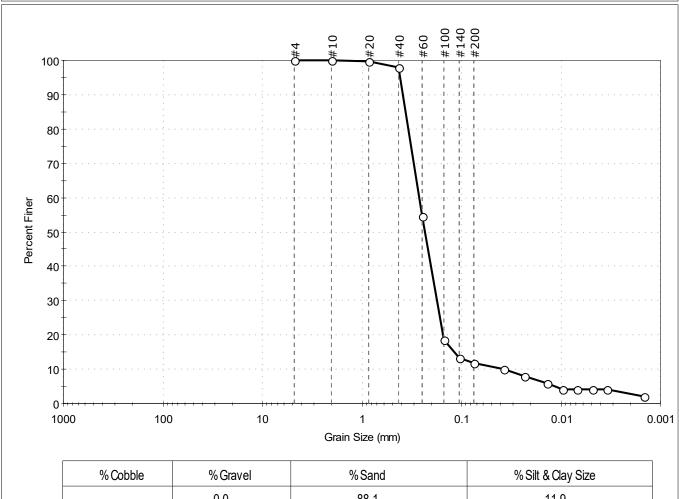
Test Id: 527576 -19101 Depth:

Test Comment:

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	88.1	11.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	54		
#100	0.15	19		
#140	0.11	13		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0379	10		
	0.0232	8		
	0.0137	6		
	0.0097	4		
	0.0069	4		
	0.0048	4		
	0.0034	4		
	0.0015	2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3627 mm	$D_{30} = 0.1766 \text{ mm}$	
D <sub>60</sub> = 0.2675 mm	$D_{15} = 0.1182 \text{ mm}$	
D <sub>50</sub> = 0.2347 mm	$D_{10} = 0.0377 \text{ mm}$	
Cu =7.095	$C_c = 3.093$	

GTX-310685

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527577

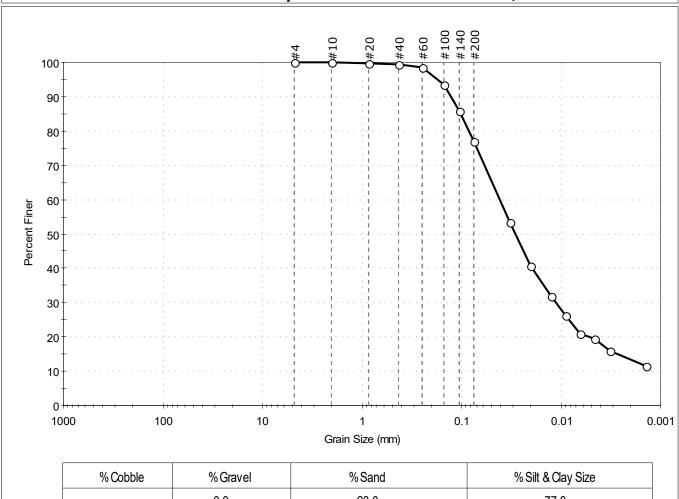
Sample ID: PDI-113SPT-22-25.2 10/24/19 Checked By: bfs Test Date:

Test Id: -1910 Depth: Test Comment:

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	23.0	77.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	94		
#140	0.11	86		
#200	0.075	77		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0322	54		
	0.0201	41		
	0.0124	32		
	0.0089	26		
	0.0064	21		
	0.0046	19		
	0.0033	16		
	0.0014	11		

<u>Coefficients</u>		
D <sub>85</sub> = 0.1025 mm	$D_{30} = 0.0111 \text{ mm}$	
D <sub>60</sub> = 0.0407 mm	$D_{15} = 0.0028 \text{ mm}$	
D <sub>50</sub> = 0.0283 mm	$D_{10} = N/A$	
Cu =N/A	$C_{c} = N/A$	

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (18))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg 11/01/19 Checked By: bfs

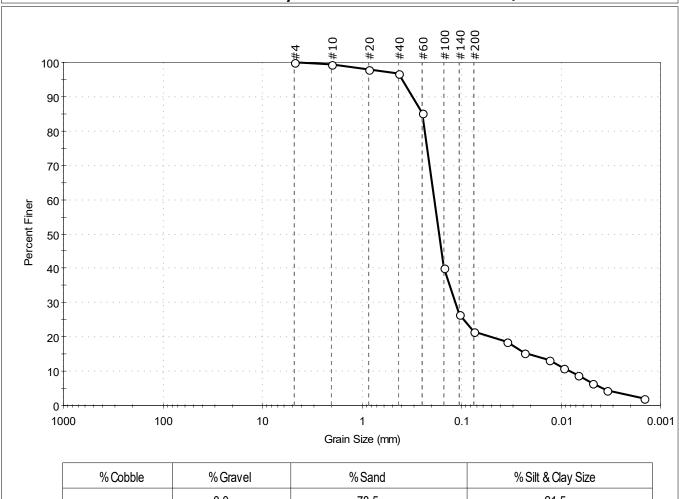
Sample ID: PDI-113SPT-31.9-39.4 Test Date: Test Id: 527578 -19 Depth:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	78.5	21.5

Sieve Name	Sieve Size, mm	Dorcont Einer	Snoc Borcont	Complies
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	97		
#60	0.25	85		
#100	0.15	40		
#140	0.11	27		
#200	0.075	21		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0353	19		
	0.0231	15		
	0.0133	13		
	0.0095	11		
	0.0068	9		
	0.0048	7		
	0.0034	4		
	0.0015	2		

<u>Coefficients</u>			
D <sub>85</sub> = 0.2492 mm	$D_{30} = 0.1158 \text{ mm}$		
D <sub>60</sub> = 0.1879 mm	$D_{15} = 0.0208 \text{ mm}$		
D <sub>50</sub> = 0.1679 mm	$D_{10} = 0.0081 \text{ mm}$		
C <sub>11</sub> =23.198	$C_{c} = 8.811$		

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-114SPT-00-7.5 Test Date: 11/01/19 Checked By: bfs 527579 Test Id:

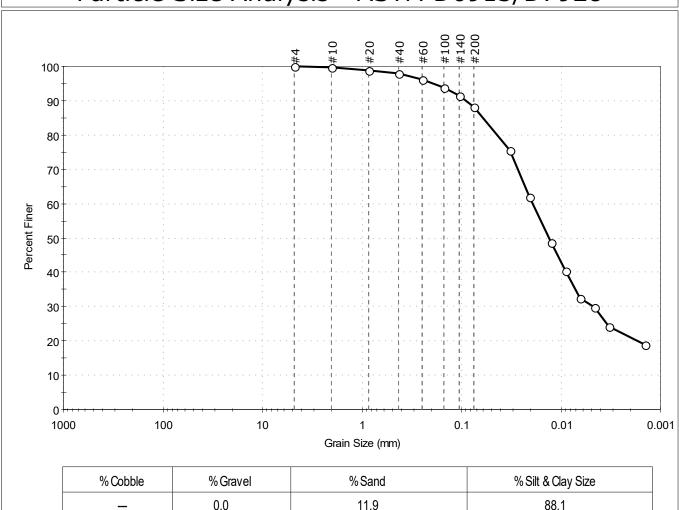
-19100 Depth:

Test Comment:

Visual Description: Wet, olive brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	94		
#140	0.11	92		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0324	76		
	0.0208	62		
	0.0125	49		
	0.0090	40		
	0.0065	32		
	0.0046	30		
	0.0033	24		
	0.0014	19		

<u>Coefficients</u>		
D <sub>85</sub> = 0.0610 mm	$D_{30} = 0.0048 \text{ mm}$	
D <sub>60</sub> = 0.0193 mm	$D_{15} = N/A$	
D <sub>50</sub> = 0.0132 mm	$D_{10} = N/A$	
$C_u = N/A$	$C_c = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (29))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527580

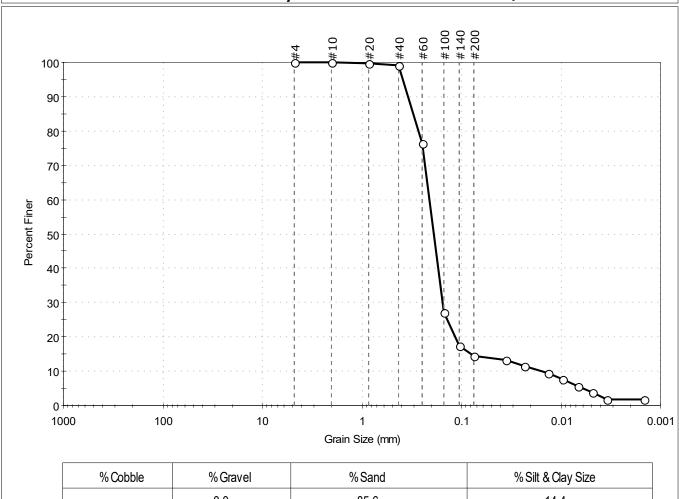
Sample ID: PDI-114SPT-25.5-28 Test Date: 11/01/19 Checked By: bfs Test Id:

-1910 Depth: Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	85.6	14.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	76		
#100	0.15	27		
#140	0.11	17		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0359	13		
	0.0236	11		
	0.0135	9		
	0.0096	8		
	0.0068	6		
	0.0048	4		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3059 mm	$D_{30} = 0.1547 \text{ mm}$			
D <sub>60</sub> = 0.2111 mm	$D_{15} = 0.0809 \text{ mm}$			
D <sub>50</sub> = 0.1903 mm	$D_{10} = 0.0157 \text{ mm}$			
Cu =13.446	$C_c = 7.221$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

printed 11/18/2019 3:26:29 PM



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527581

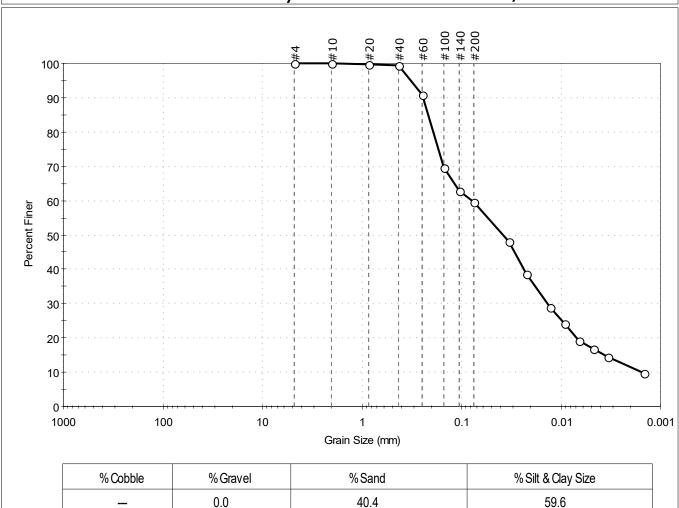
Sample ID: PDI-114SPT-42-50.5 Test Date: 11/01/19 Checked By: bfs

Test Id: -1910 Depth: Test Comment:

Visual Description: Wet, olive brown sandy silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	91		
#100	0.15	70		
#140	0.11	63		
#200	0.075	60		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0337	48		
	0.0221	39		
	0.0130	29		
	0.0093	24		
	0.0066	19		
	0.0047	17		
	0.0034	14		
	0.0014	10		

<u>Coefficients</u>		
D <sub>85</sub> = 0.2166 mm	$D_{30} = 0.0138 \text{ mm}$	
D <sub>60</sub> = 0.0786 mm	D <sub>15</sub> =0.0036 mm	
D <sub>50</sub> = 0.0384 mm	$D_{10} = 0.0015 \text{ mm}$	
C <sub>u</sub> =52.400	$C_c = 1.615$	

<u>Classification</u> Sandy SILT (ML) <u>ASTM</u>

AASHTO Silty Soils (A-5 (5))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-114SPT-50.5-55 Test Date: 11/01/19 Checked By: bfs

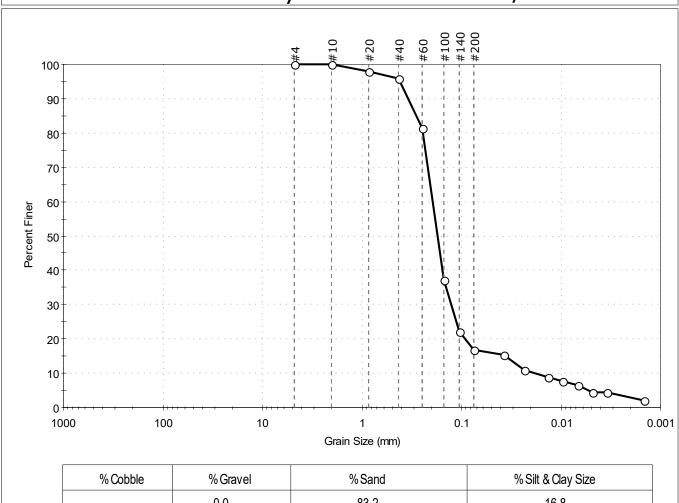
527582 Test Id: -1910 Depth:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	83.2	16.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	96		
#60	0.25	81		
#100	0.15	37		
#140	0.11	22		
#200	0.075	17		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0377	15		
	0.0236	11		
	0.0136	9		
	0.0096	8		
	0.0068	7		
	0.0048	4		
	0.0034	4		
	0.0015	2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.2851 mm	$D_{30} = 0.1275 \text{ mm}$	
D <sub>60</sub> = 0.1953 mm	$D_{15} = 0.0358 \text{ mm}$	
D <sub>50</sub> = 0.1741 mm	$D_{10} = 0.0181 \text{ mm}$	
$C_{11} = 10.790$	$C_c = 4.599$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Sample Type: bag Tested By: ckg

527583

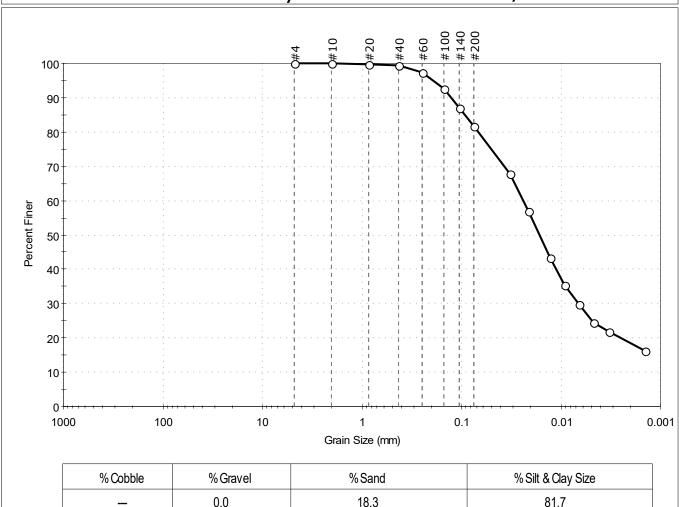
Boring ID: ---Sample ID: PDI-114SPT-7.5-12.5 Test Date: 11/01/19 Checked By: bfs

Test Id: -191 Depth: Test Comment:

Visual Description: Moist, olive brown silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



	,		-	
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	97		
#100	0.15	93		
#140	0.11	87		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0324	68		
	0.0213	57		
	0.0127	43		
	0.0091	35		
	0.0065	30		
	0.0047	24		

22

16

Sieve Name | Sieve Size, mm | Percent Finer | Spec. Percent | Complies

<u>Coefficients</u>				
D <sub>85</sub> = 0.0928 mm	$D_{30} = 0.0066 \text{ mm}$			
D <sub>60</sub> = 0.0239 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0163 mm	$D_{10} = N/A$			
C <sub>u</sub> =N/A	$C_C = N/A$			

<u>Classification</u> Elastic SILT with Sand (MH) **ASTM** 

AASHTO Clayey Soils (A-7-5 (24))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

0.0033

0.0014



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527584

Sample ID: PDI-115SPT-06-11 est Date: 11/07/19 Checked By: bfs Test Id:

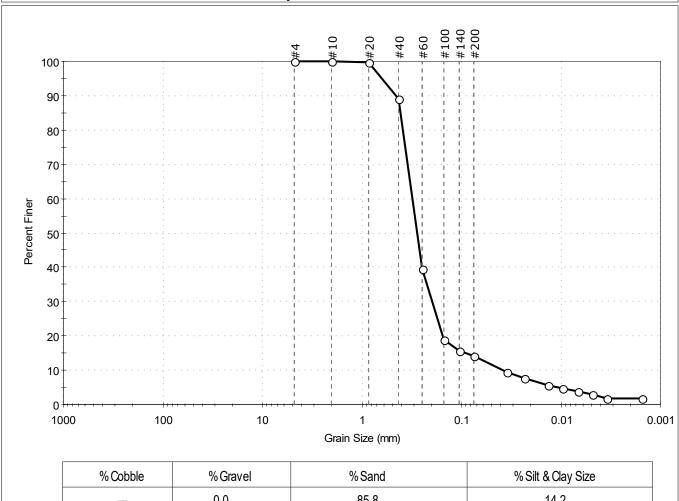
Test Comment:

-191009T Depth:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	85.8	14.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	89		
#60	0.25	40		
#100	0.15	19		
#140	0.11	16		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0349	9		
	0.0235	8		
	0.0135	6		
	0.0096	5		
	0.0068	4		
	0.0048	3		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.4072 mm	$D_{30} = 0.1974 \text{ mm}$	
D <sub>60</sub> = 0.3113 mm	$D_{15} = 0.0918 \text{ mm}$	
D <sub>50</sub> = 0.2796 mm	$D_{10} = 0.0380 \text{ mm}$	
Cu =8.192	$C_c = 3.294$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Test Date: 10/29/19 Checked By: bfs Sample ID: PDI-115SPT-18.6-20.6

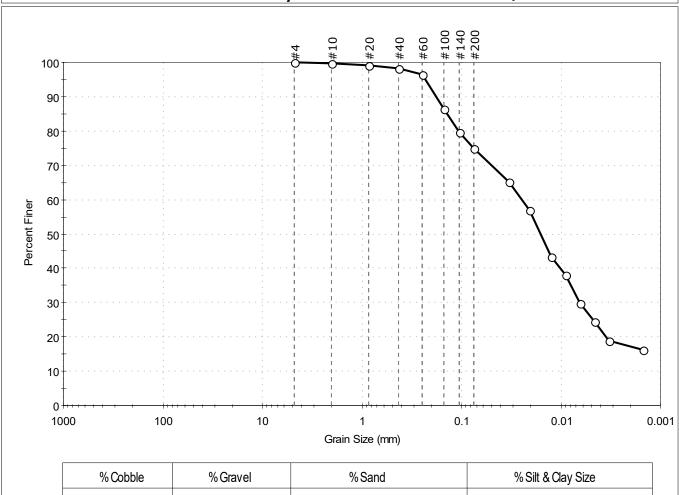
Test Id: 527585 -19 Depth:

Test Comment:

Visual Description: Moist, dark olive brown silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	24.9	75.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	87		
#140	0.11	80		
#200	0.075	75		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0335	65		
	0.0209	57		
	0.0125	43		
	0.0089	38		
	0.0064	30		
	0.0046	24		
	0.0033	19		
	0.0015	16		

<u>Coefficients</u>		
D <sub>85</sub> =0.1387 mm	$D_{30} = 0.0065 \text{ mm}$	
D <sub>60</sub> = 0.0249 mm	$D_{15} = N/A$	
D <sub>50</sub> = 0.0160 mm	$D_{10} = N/A$	
C <sub>u</sub> =N/A	$C_c = N/A$	

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (22))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

Test Date: Sample ID: PDI-115SPT-23-28.1 10/29/19 Checked By: bfs

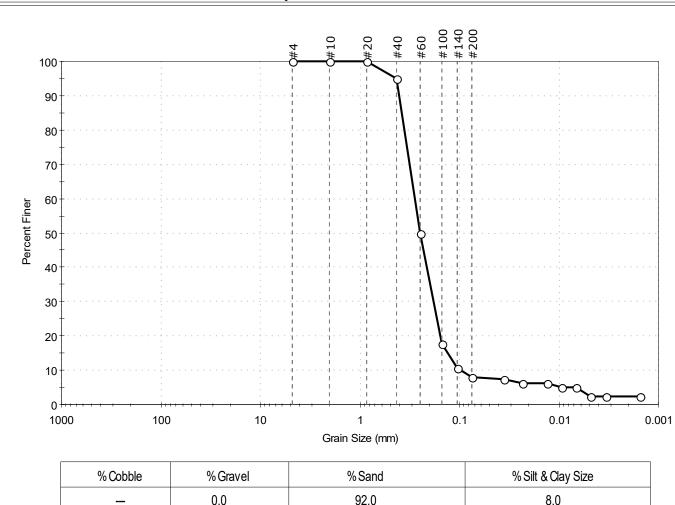
527586

Test Id: -1910 Depth: Test Comment:

Visual Description: Moist, very dark olive brown sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	92.0	8.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	95		
#60	0.25	50		
#100	0.15	18		
#140	0.11	11		
#200	0.075	8.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0360	7		
	0.0233	6		
	0.0133	6		
	0.0095	5		
	0.0067	5		
	0.0048	2		
	0.0034	2		
	0.0015	2		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.3780 mm		$D_{30} = 0.1827 \text{ mm}$	
	D <sub>60</sub> = 0.2820 mm	$D_{15} = 0.1316 \text{ mm}$	
	D <sub>50</sub> = 0.2508 mm	$D_{10} = 0.0970 \text{ mm}$	
	C <sub>11</sub> =2.907	$C_c = 1.220$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Test Date: 10/29/19 Checked By: bfs Sample ID: PDI-115SPT-41.5-49.3

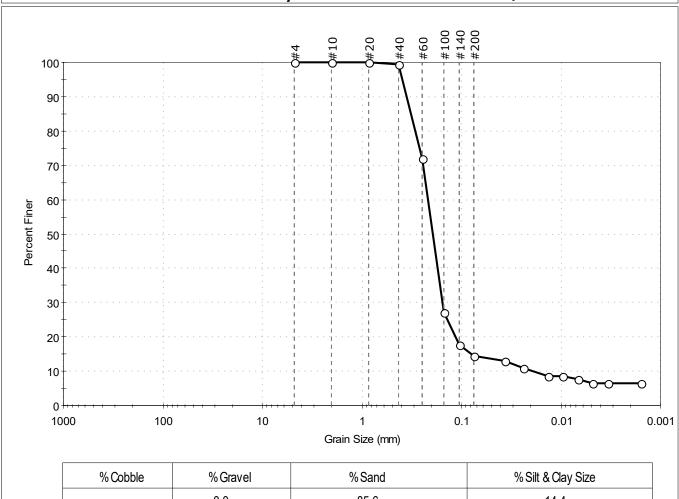
Test Id: 527587 -19 Depth:

Test Comment:

Visual Description: Moist, olive brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
-	0.0	85.6	14.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	72		
#100	0.15	27		
#140	0.11	18		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0370	13		
	0.0237	11		
	0.0136	9		
	0.0096	9		
	0.0068	8		
	0.0048	6		
	0.0034	6		
	0.0016	6		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3216 mm	$D_{30} = 0.1552 \text{ mm}$			
D <sub>60</sub> = 0.2181 mm	$D_{15} = 0.0799 \text{ mm}$			
D <sub>50</sub> = 0.1947 mm	$D_{10} = 0.0193 \text{ mm}$			
C <sub>11</sub> =11.301	$C_c = 5.722$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685
Boring ID: --- Sample Type: bag Tested By: ckg

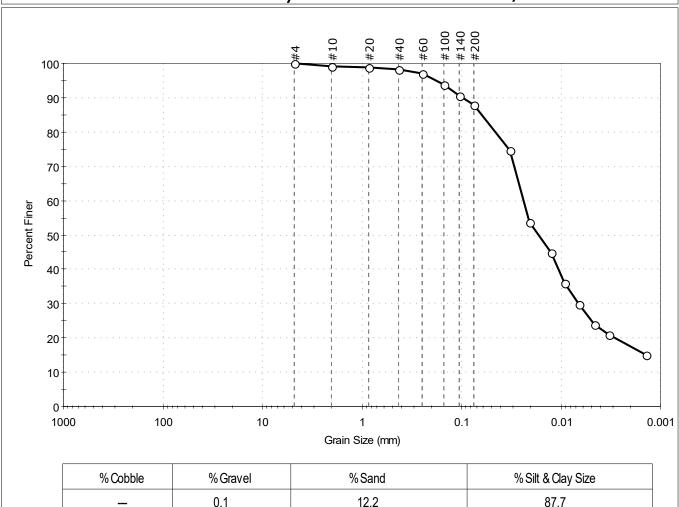
Boring ID: --- Sample Type: bag Tested By: ckg
Sample ID: PDI-116SPT-00-4.5 Test Date: 10/30/19 Checked By: bfs
-19092 Depth: --- Test Id: 527588

-19092 Depth: ---Test Comment: ---

Visual Description: Wet, olive brown silt

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	94		
#140	0.11	91		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0322	75		
	0.0209	54		
	0.0127	45		
	0.0091	36		
	0.0065	30		
	0.0047	24		
	0.0033	21		
	0.0014	15		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0627 mm	$D_{30} = 0.0066 \text{ mm}$			
D <sub>60</sub> = 0.0238 mm	$D_{15} = 0.0014 \text{ mm}$			
D <sub>50</sub> = 0.0169 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_c = N/A$			

<u>Classification</u> <u>ASTM</u> Elastic SILT (MH)

AASHTO Clayey Soils (A-7-5 (40))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-116SPT-20-26.7 10/30/19 Checked By: bfs Test Date:

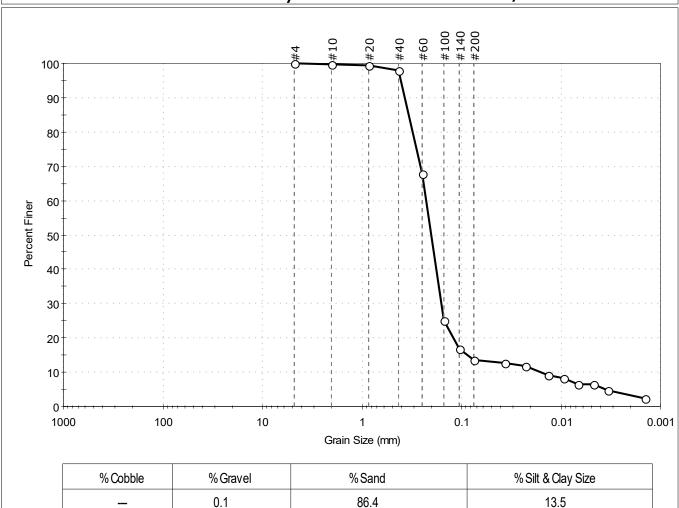
-1909 Depth: Test Id: 527589

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	68		
#100	0.15	25		
#140	0.11	17		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0368	13		
	0.0227	12		
	0.0134	9		
	0.0095	8		
	0.0067	6		
	0.0048	6		
	0.0034	5		
	0.0014	2		

Coe	<u>Coefficients</u>			
D <sub>85</sub> = 0.3380 mm	$D_{30} = 0.1591 \text{ mm}$			
D <sub>60</sub> = 0.2276 mm	$D_{15} = 0.0881 \text{ mm}$			
D <sub>50</sub> = 0.2020 mm	$D_{10} = 0.0157 \text{ mm}$			
C <sub>11</sub> =14.497	$C_c = 7.084$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

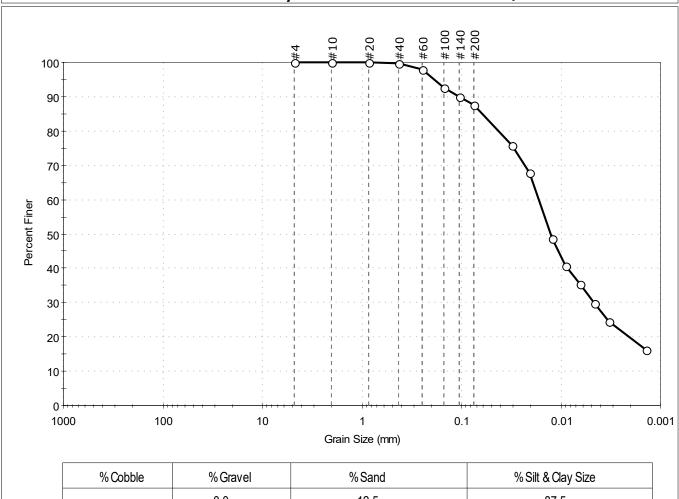
Test Date: 10/30/19 Checked By: bfs Sample ID: PDI-116SPT-26.7-28.6 Test Id: 527590 -19 Depth:

Test Comment:

Visual Description: Wet, grayish brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	12.5	87.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
	,			
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	98		
#100	0.15	93		
#140	0.11	90		
#200	0.075	87		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0310	76		
	0.0206	68		
	0.0124	49		
	0.0090	41		
	0.0064	35		
	0.0046	30		
	0.0033	24		
	0.0014	16		

	CHICICHES
D <sub>85</sub> = 0.0620 mm	$D_{30} = 0.0046 \text{ mm}$
D <sub>60</sub> = 0.0167 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0128 mm	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

Coefficients

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (15))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By:

ckg Test Date: 10/30/19 Checked By: bfs Sample ID: PDI-116SPT-51.5-54.2

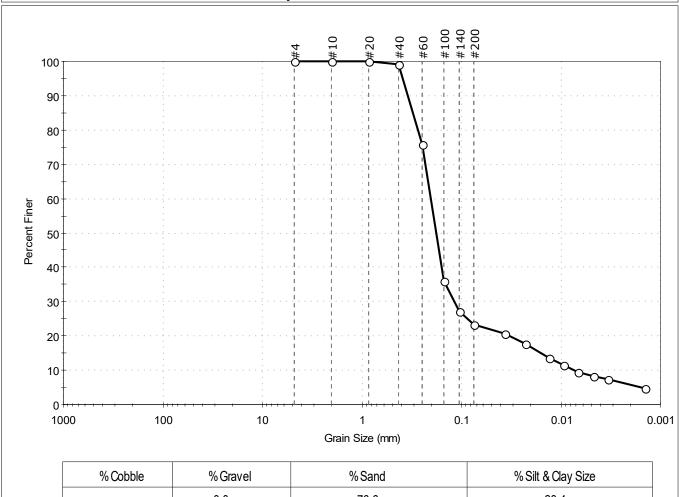
Test Id: 527591 -19 Depth:

Test Comment:

Visual Description: Moist, olive brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	76.6	23.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	76		
#100	0.15	36		
#140	0.11	27		
#200	0.075	23		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0368	21		
	0.0228	18		
	0.0133	13		
	0.0094	11		
	0.0067	9		
	0.0048	8		
	0.0034	7		
	0.0014	5		

COCI	ICICIICO
D <sub>85</sub> = 0.3086 mm	$D_{30} = 0.1182 \text{ mm}$
D <sub>60</sub> = 0.2041 mm	$D_{15} = 0.0163 \text{ mm}$
D <sub>50</sub> = 0.1794 mm	$D_{10} = 0.0075 \text{ mm}$
C <sub>u</sub> =27.213	$C_c = 9.127$

Coefficients

Classification Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

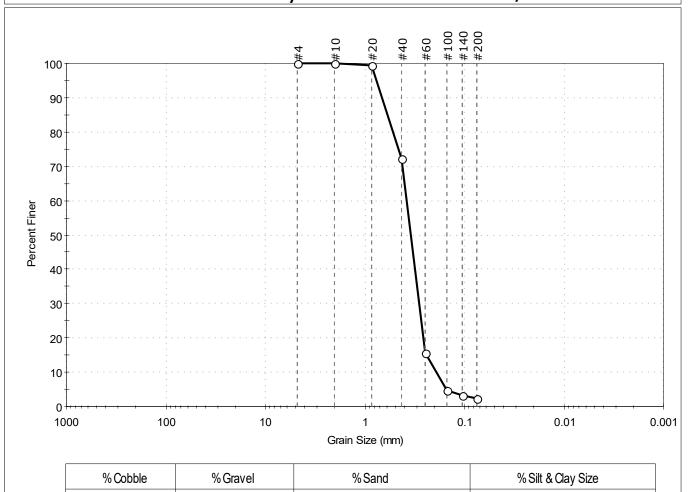
Sample ID: PDI-117SPT-11-29.1 Test Date: 10/31/19 Checked By: bfs 527592 Test Id:

-1910 Depth: Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



97.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	72		
#60	0.25	16		
#100	0.15	5		
#140	0.11	3		
#200	0.075	2.4		

0.0

<u>Coefficients</u>				
D <sub>85</sub> = 0.5889 mm	$D_{30} = 0.2860 \text{ mm}$			
D <sub>60</sub> = 0.3791 mm	D <sub>15</sub> =0.2421 mm			
D <sub>50</sub> = 0.3451 mm	$D_{10} = 0.1922 \text{ mm}$			
C <sub>u</sub> =1.972	C <sub>c</sub> =1.123			

2.4

Classification
Poorly graded SAND (SP) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg 10/24/19 Checked By: bfs

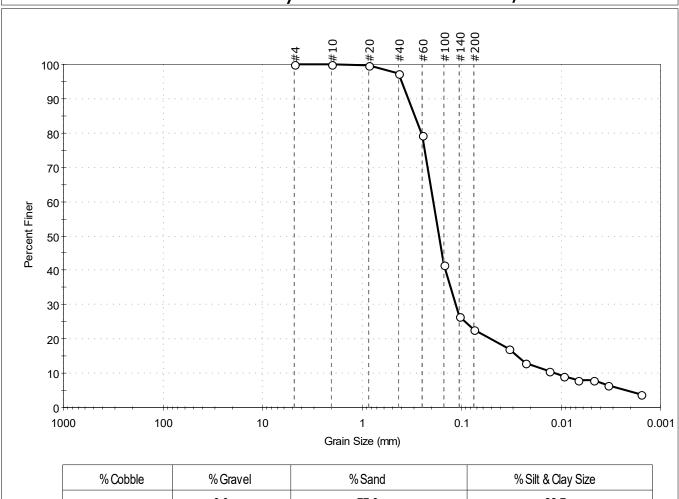
Sample ID: PDI-117SPT-29.1-32 Test Date: Test Id: 527593 -1910 Depth:

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	77.3	22.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	79		
#100	0.15	42		
#140	0.11	27		
#200	0.075	23		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0331	17		
	0.0225	13		
	0.0132	10		
	0.0094	9		
	0.0067	8		
	0.0047	8		
	0.0034	7		
	0.0016	4		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2955 mm	$D_{30} = 0.1146 \text{ mm}$			
D <sub>60</sub> = 0.1923 mm	D <sub>15</sub> =0.0271 mm			
D <sub>50</sub> = 0.1680 mm	$D_{10} = 0.0117 \text{ mm}$			
C <sub>11</sub> =16.436	$C_c = 5.837$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg 10/31/19 Checked By: bfs

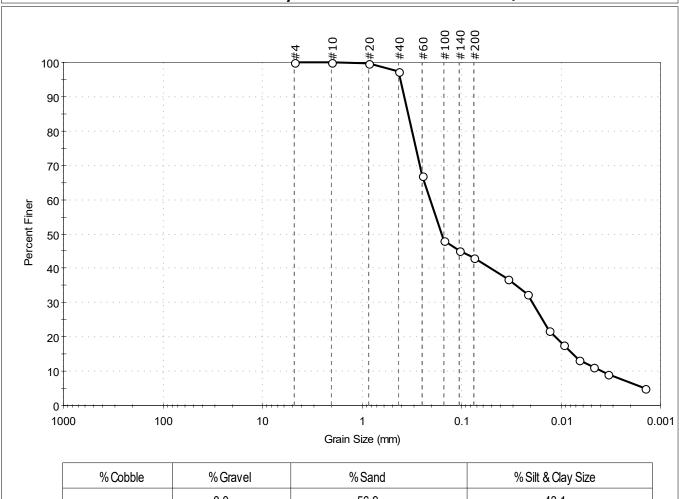
Sample ID: PDI-117SPT-44.1-53.5 Test Date: -19 Depth: Test Id: 527594

Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	56.9	43.1

				•
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	67		
#100	0.15	48		
#140	0.11	45		
#200	0.075	43		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0340	37		
	0.0218	33		
	0.0131	22		
	0.0093	18		
	0.0067	13		
	0.0047	11		
	0.0034	9		
	0.0014	5		

	<u>Coefficients</u>			
$D_{85} = 0.3430 \text{ mm}$ $D_{30} = 0$		$D_{30} = 0.0193 \text{ mm}$		
D <sub>60</sub> = 0.2072 mm D <sub>15</sub> = 0.0076 r		$D_{15} = 0.0076 \text{ mm}$		
	D <sub>50</sub> = 0.1576 mm	$D_{10} = 0.0039 \text{ mm}$		
	C <sub>11</sub> =53.128	$C_c = 0.461$		

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Clayey Soils (A-7-6 (3))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-117SPT-53.5-63.5 Test Date: 10/24/19 Checked By: bfs

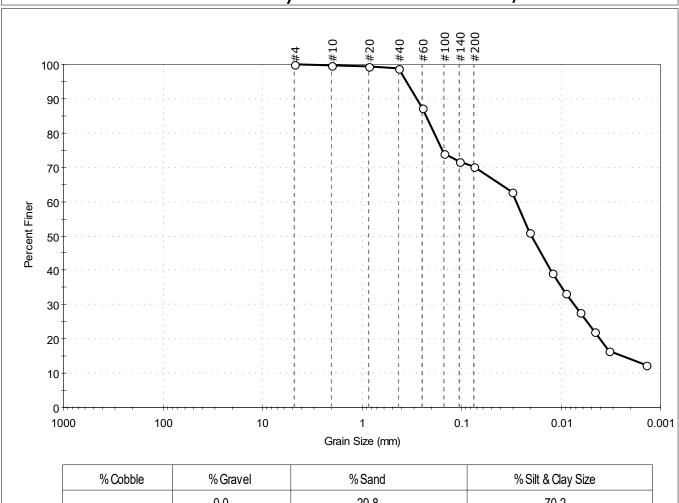
-19 Depth: Test Id: 527595

Test Comment:

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	29.8	70.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	87		
#100	0.15	74		
#140	0.11	72		
#200	0.075	70		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0310	63		
	0.0205	51		
	0.0123	39		
	0.0089	33		
	0.0064	28		
	0.0046	22		
	0.0033	17		
	0.0014	12		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2293 mm	$D_{30} = 0.0073 \text{ mm}$			
D <sub>60</sub> = 0.0281 mm	$D_{15} = 0.0024 \text{ mm}$			
D <sub>50</sub> = 0.0196 mm	$D_{10} = N/A$			
C <sub>II</sub> =N/A	$C_c = N/A$			

<u>Classification</u> SILT with Sand (ML) **ASTM** 

AASHTO Clayey Soils (A-7-5 (9))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-118SPT-00-4.5 Test Date: 10/24/19 Checked By: bfs Test Id:

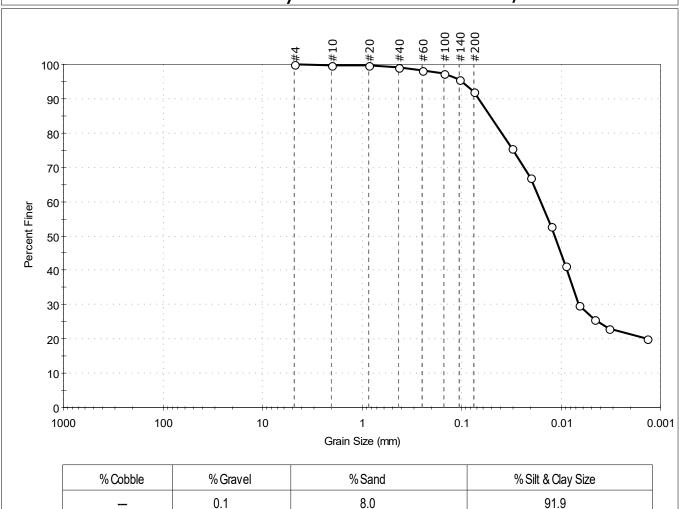
527596

-19101 Depth: Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	98		
#100	0.15	97		
#140	0.11	95		
#200	0.075	92		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0313	76		
	0.0204	67		
	0.0125	53		
	0.0091	41		
	0.0065	30		
	0.0047	26		
	0.0033	23		
	0.0014	20		

	<u>Coefficients</u>				
D <sub>85</sub> = 0.0518 mm		$D_{30} = 0.0066 \text{ mm}$			
	D <sub>60</sub> = 0.0161 mm	$D_{15} = N/A$			
	$D_{50} = 0.0116 \text{ mm}$	$D_{10} = N/A$			
	$C_u = N/A$	$C_c = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (37))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527597

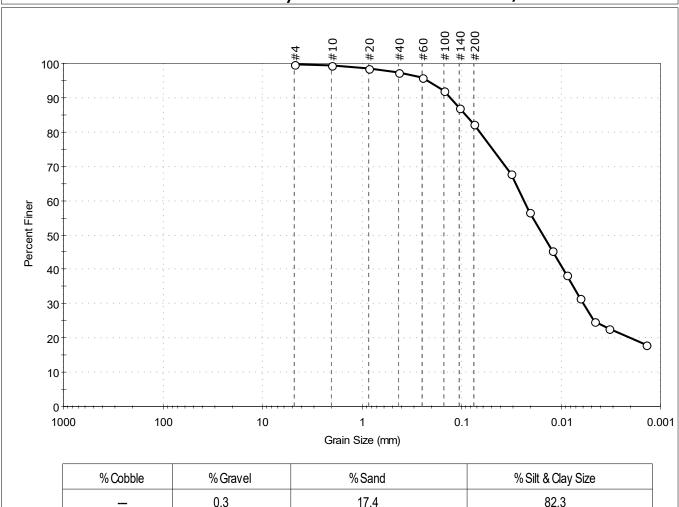
Sample ID: PDI-118SPT-4.5-15 10/24/19 Checked By: bfs Test Date: Test Id:

-19101 Depth: Test Comment:

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	97		
#60	0.25	96		
#100	0.15	92		
#140	0.11	87		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0316	68		
	0.0206	57		
	0.0123	45		
	0.0088	38		
	0.0064	32		
	0.0046	25		
	0.0033	23		
	0.0014	18		

	<u>Coefficients</u>				
	D <sub>85</sub> = 0.0914 mm	$D_{30} = 0.0059 \text{ mm}$			
D <sub>60</sub> = 0.0234 mm		$D_{15} = N/A$			
	D <sub>50</sub> = 0.0152 mm	$D_{10} = N/A$			
	$C_u = N/A$	$C_c = N/A$			

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (34))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

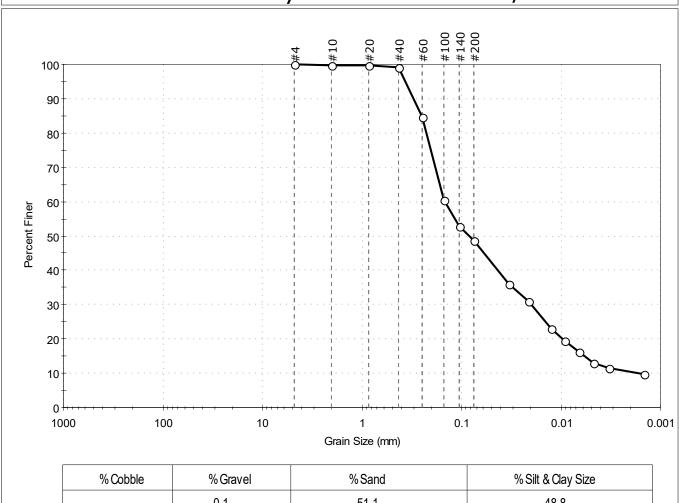
Sample ID: PDI-118SPT-46.5-61 Test Date: 10/24/19 Checked By: bfs Test Id: 527598

-1910 Depth: Test Comment:

Visual Description: Wet, dark grayish brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	51.1	48.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	85		
#100	0.15	60		
#140	0.11	53		
#200	0.075	49		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0337	36		
	0.0210	31		
	0.0127	23		
	0.0092	20		
	0.0065	16		
	0.0047	13		
	0.0033	11		
	0.0015	10		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2537 mm	$D_{30} = 0.0197 \text{ mm}$			
D <sub>60</sub> = 0.1474 mm	D <sub>15</sub> =0.0057 mm			
D <sub>50</sub> = 0.0832 mm	$D_{10} = 0.0016 \text{ mm}$			
Cu =92.125	$C_c = 1.646$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Soils (A-4 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-119SPT-00-4.5 Test Date: 10/25/19 Checked By: bfs

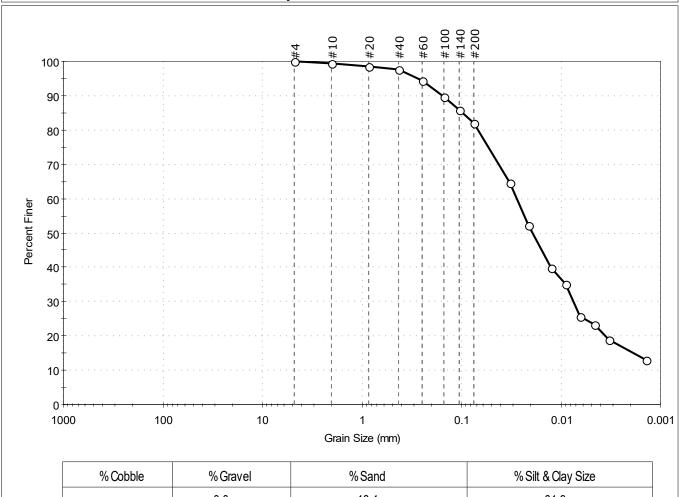
Test Id: 527599 -19100 Depth:

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment:

Test Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	18.1	81.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	95		
#100	0.15	90		
#140	0.11	86		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0329	64		
	0.0210	52		
	0.0126	40		
	0.0090	35		
	0.0065	26		
	0.0046	23		
	0.0033	19		
	0.0014	13		

<u>Coefficients</u>					
D <sub>85</sub> =0.0981 mm	$D_{30} = 0.0075 \text{ mm}$				
$D_{60} = 0.0279 \text{ mm}$	$D_{15} = 0.0019 \text{ mm}$				
D <sub>50</sub> = 0.0191 mm	$D_{10} = N/A$				
$C_{ij} = N/A$	$C_{c} = N/A$				

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (37))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527600

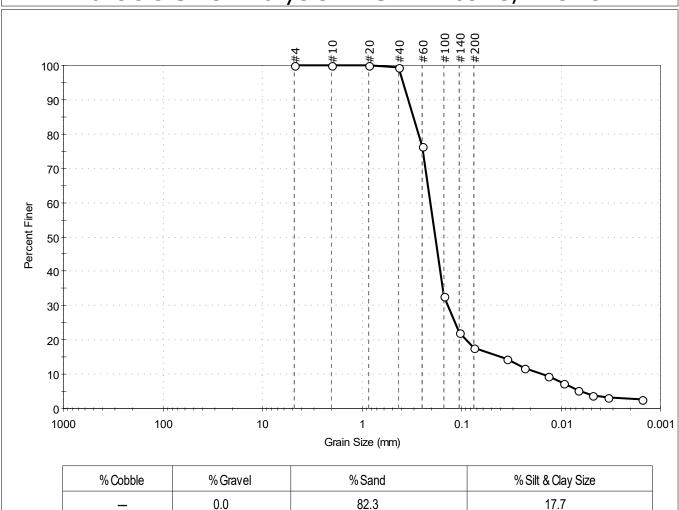
Sample ID: PDI-119SPT-18.3-31 Test Date: 10/29/19 Checked By: bfs

Test Id: -1910 Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	76		
#100	0.15	33		
#140	0.11	22		
#200	0.075	18		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0350	15		
	0.0231	12		
	0.0134	10		
	0.0095	7		
	0.0067	5		
	0.0048	4		
	0.0034	3		
	0.0015	3		

<u>Coefficients</u>					
D <sub>85</sub> = 0.3051 mm	$D_{30} = 0.1369 \text{ mm}$				
D <sub>60</sub> = 0.2063 mm	D <sub>15</sub> =0.0393 mm				
D <sub>50</sub> = 0.1835 mm	$D_{10} = 0.0149 \text{ mm}$				
$C_u = 13.846$	$C_c = 6.097$				

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

Sample ID: PDI-119SPT-47-52 Test Date: 10/25/19 Checked By: bfs

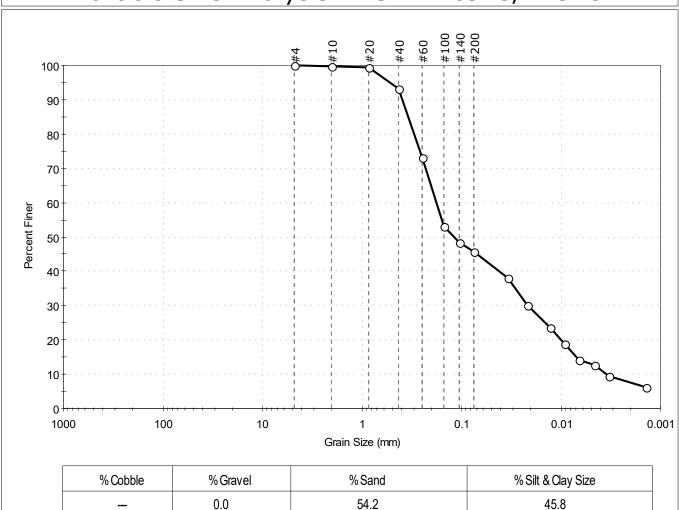
-19100 Depth: --- Test Id: 527601

Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	93		
#60	0.25	73		
#100	0.15	53		
#140	0.11	48		
#200	0.075	46		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0339	38		
	0.0216	30		
	0.0127	24		
	0.0092	19		
	0.0066	14		
	0.0047	13		
	0.0033	9		
	0.0014	6		

<u>Coefficients</u>					
D <sub>85</sub> =0.3420 mm	$D_{30} = 0.0214 \text{ mm}$				
D <sub>60</sub> = 0.1784 mm	$D_{15} = 0.0069 \text{ mm}$				
D <sub>50</sub> = 0.1186 mm	$D_{10} = 0.0035 \text{ mm}$				
C <sub>u</sub> =50.971	$C_c = 0.733$				

<u>Classification</u> ASTM Silty SAND (SM)

AASHTO Silty Soils (A-4 (1))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sarra, States talking Strape :

Sand/Gravel Hardness : ---

 $\label{eq:Dispersion Device: Apparatus A - Mech Mixer} \end{\mbox{\sf Dispersion Device: Apparatus A - Mech Mixer}}$ 



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

527602

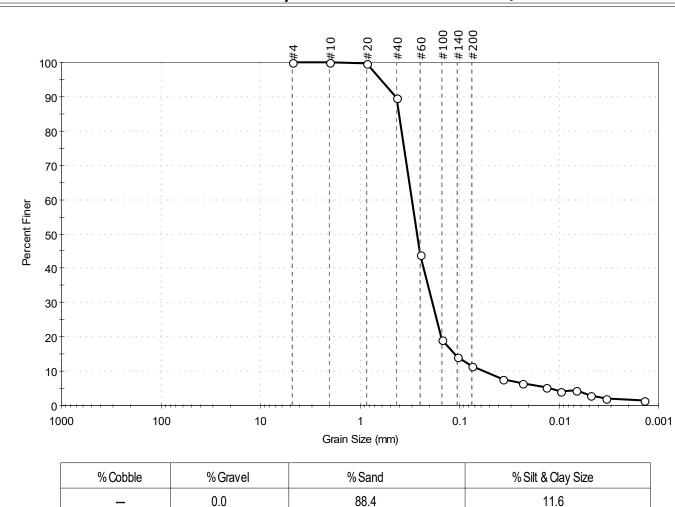
Test Date: 10/25/19 Checked By: bfs Sample ID: PDI-119SPT-9.5-18.3 Test Id:

-191 Depth: Test Comment:

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	88.4	11.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	90		
#60	0.25	44		
#100	0.15	19		
#140	0.11	14		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0370	8		
	0.0233	7		
	0.0135	5		
	0.0096	4		
	0.0067	4		
	0.0048	3		
	0.0034	2		
	0.0014	2		

<u>Coefficients</u>					
D <sub>85</sub> = 0.4029 mm	$D_{30} = 0.1875 \text{ mm}$				
D <sub>60</sub> = 0.3010 mm	$D_{15} = 0.1128 \text{ mm}$				
D <sub>50</sub> = 0.2679 mm	$D_{10} = 0.0555 \text{ mm}$				
C <sub>11</sub> =5.423	$C_c = 2.104$				

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: ---Sample Type: bag Tested By: ckg

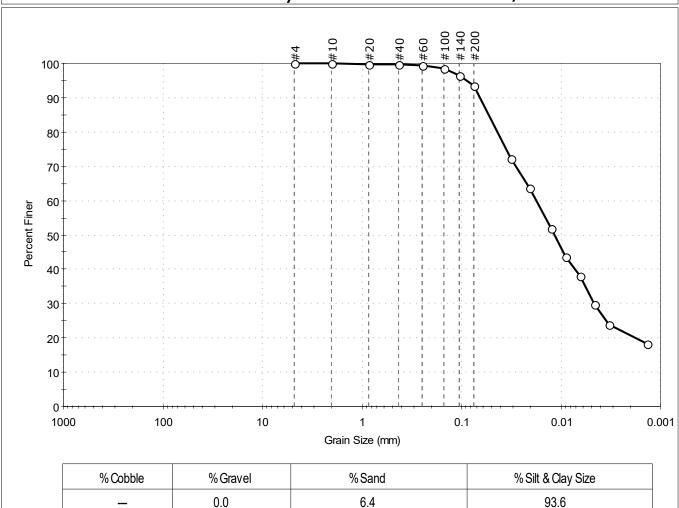
Sample ID: PDI-121SPT-00-06 est Date: 10/29/19 Checked By: bfs Test Id: 527603

-190930T Depth: Test Comment:

Visual Description: Moist, olive brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



			- •	•
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	99		
#140	0.11	97		
#200	0.075	94		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0319	72		
	0.0209	64		
	0.0125	52		
	0.0090	44		
	0.0064	38		
	0.0046	30		

24

18

Sieve Name | Sieve Size, mm | Percent Finer | Spec. Percent | Complies

	<u>Coefficients</u>				
D <sub>85</sub> = 0.0532 mm		$D_{30} = 0.0046 \text{ mm}$			
	D <sub>60</sub> = 0.0178 mm	$D_{15} = N/A$			
	D <sub>50</sub> = 0.0115 mm	$D_{10} = N/A$			
	C <sub>u</sub> =N/A	$C_c = N/A$			

<u>Classification</u> Elastic SILT (MH) **ASTM** AASHTO Clayey Soils (A-7-5 (38))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

0.0033

0.0014



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg 10/30/19 Checked By: bfs

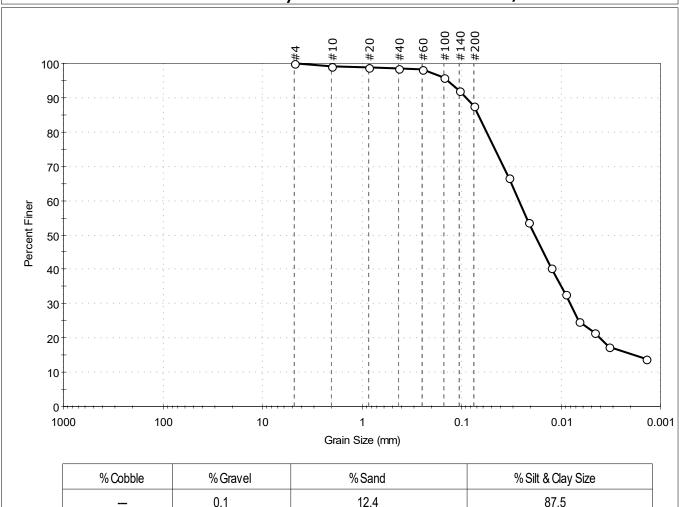
Sample ID: PDI-121SPT-11-20.7 Test Date: -1909 Depth: Test Id: 527604

Test Comment:

Visual Description: Moist, dark olive brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	96		
#140	0.11	92		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0331	67		
	0.0212	54		
	0.0126	41		
	0.0091	33		
	0.0065	25		
	0.0046	21		
	0.0033	18		
	0.0014	14		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0679 mm	$D_{30} = 0.0081 \text{ mm}$			
D <sub>60</sub> = 0.0264 mm	$D_{15} = 0.0018 \text{ mm}$			
D <sub>50</sub> = 0.0184 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_C = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (26))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527605

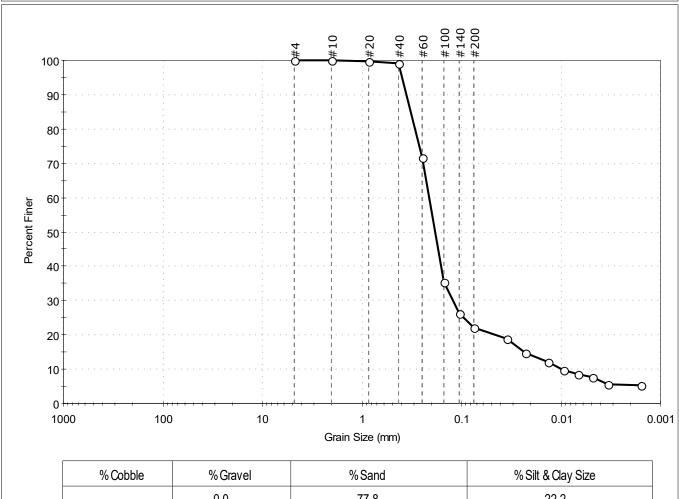
Sample ID: PDI-121SPT-21-38 est Date: 10/29/19 Checked By: bfs

-190930T Depth: Test Id: Test Comment:

Visual Description: Moist, dark olive gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	77.8	22.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	72		
#100	0.15	35		
#140	0.11	26		
#200	0.075	22		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0352	19		
	0.0226	15		
	0.0135	12		
	0.0095	10		
	0.0068	9		
	0.0048	8		
	0.0034	6		
	0.0016	5		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3231 mm	$D_{30} = 0.1227 \text{ mm}$			
D <sub>60</sub> = 0.2122 mm	$D_{15} = 0.0231 \text{ mm}$			
D <sub>50</sub> = 0.1844 mm	$D_{10} = 0.0098 \text{ mm}$			
C <sub>11</sub> =21.653	$C_c = 7.240$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527606

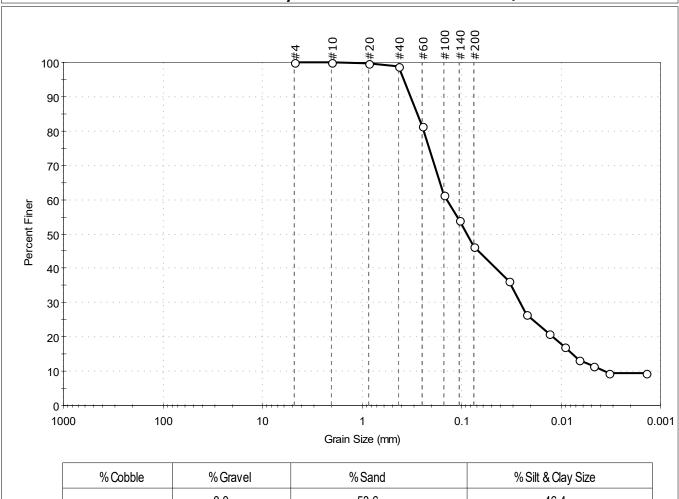
Sample ID: PDI-121SPT-49.4-54 Test Date: 10/25/19 Checked By: bfs Test Id:

-1909 Depth: Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	53.6	46.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	81		
#100	0.15	61		
#140	0.11	54		
#200	0.075	46		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0337	36		
	0.0220	27		
	0.0131	21		
	0.0093	17		
	0.0066	13		
	0.0047	11		
	0.0033	10		
	0.0014	10		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2788 mm	$D_{30} = 0.0256 \text{ mm}$			
D <sub>60</sub> = 0.1404 mm	D <sub>15</sub> =0.0077 mm			
D <sub>50</sub> = 0.0886 mm	$D_{10} = 0.0036 \text{ mm}$			
C <sub>II</sub> =39.000	$C_c = 1.297$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Clayey Soils (A-7-5 (3))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

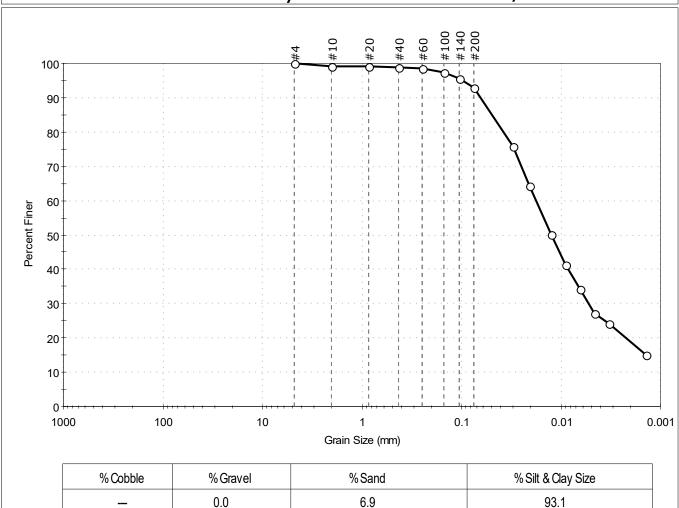
527607

11/07/19 Checked By: bfs Sample ID: PDI-122SPT-04-09 est Date: Test Id:

-190925T Depth: Test Comment:

Visual Description: Wet, olive brown silt Sample Comment: Sample contains organics

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	97		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0306	76		
	0.0209	64		
	0.0124	50		
	0.0089	41		
	0.0064	34		
	0.0046	27		
	0.0033	24		
	0.0014	15		

	<u>Coefficients</u>				
D <sub>85</sub> = 0.0494 mm		$D_{30} = 0.0053 \text{ mm}$			
	D <sub>60</sub> = 0.0178 mm	$D_{15} = N/A$			
	D <sub>50</sub> = 0.0124 mm	$D_{10} = N/A$			
	$C_u = N/A$	$C_c = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (40))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-122SPT-16.6-24 11/07/19 Checked By: bfs Test Date:

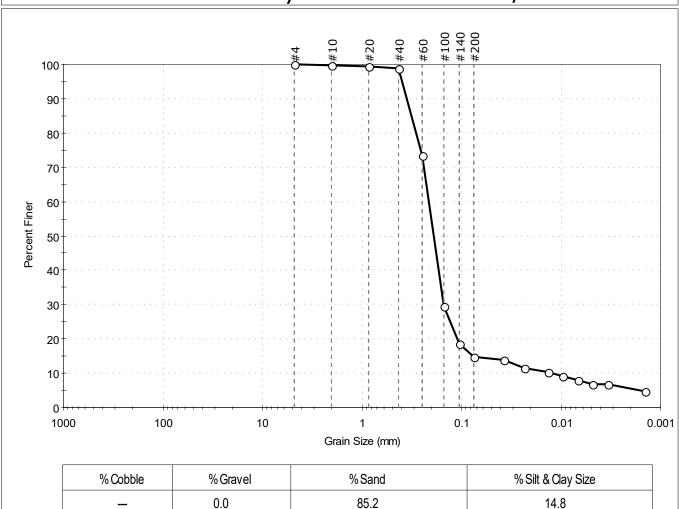
-1909 Depth: Test Id: 527608

Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	74		
#100	0.15	30		
#140	0.11	19		
#200	0.075	15		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0377	14		
	0.0232	12		
	0.0135	10		
	0.0095	9		
	0.0068	8		
	0.0048	7		
	0.0034	7		
	0.0014	5		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3182 mm	$D_{30} = 0.1506 \text{ mm}$	
D <sub>60</sub> = 0.2136 mm	D <sub>15</sub> =0.0767 mm	
D <sub>50</sub> = 0.1901 mm	$D_{10} = 0.0120 \text{ mm}$	
$C_u = 17.800$	$C_c = 8.848$	

GTX-310685

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

527609

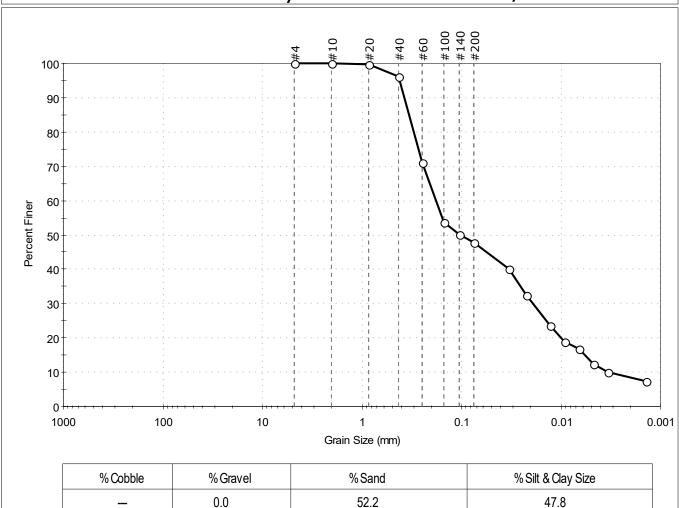
10/30/19 Checked By: bfs Sample ID: PDI-122SPT-61-66 est Date: Test Id:

-190926T Depth: Test Comment:

Visual Description: Wet, olive brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	96		
#60	0.25	71		
#100	0.15	54		
#140	0.11	50		
#200	0.075	48		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0332	40		
	0.0222	32		
	0.0130	23		
	0.0093	19		
	0.0066	17		
	0.0047	12		
	0.0034	10		
	0.0014	7		

<u>Coefficients</u>			
D <sub>85</sub> = 0.3352 mm	$D_{30} = 0.0192 \text{ mm}$		
D <sub>60</sub> = 0.1803 mm	$D_{15} = 0.0058 \text{ mm}$		
D <sub>50</sub> = 0.1049 mm	$D_{10} = 0.0033 \text{ mm}$		
Cu =54.636	$C_c = 0.620$		

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Clayey Soils (A-6 (3))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Sample Type: bag Tested By: ckg

527610

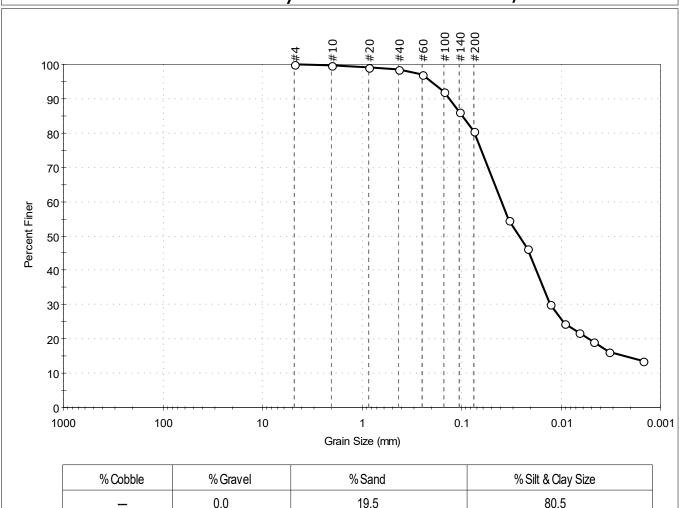
Boring ID: ---Sample ID: PDI-123SPT-00-4.5 Test Date: 10/29/19 Checked By: bfs Test Id:

-19092 Depth: Test Comment:

Visual Description: Wet, dark olive silt with sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	97		
#100	0.15	92		
#140	0.11	86		
#200	0.075	80		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0335	54		
	0.0217	46		
	0.0129	30		
	0.0092	25		
	0.0066	22		
	0.0047	19		
	0.0033	16		
	0.0015	14		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0992 mm	$D_{30} = 0.0129 \text{ mm}$			
D <sub>60</sub> = 0.0398 mm	$D_{15} = 0.0022 \text{ mm}$			
D <sub>50</sub> = 0.0264 mm	$D_{10} = N/A$			
C <sub>u</sub> =N/A	$C_C = N/A$			

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (23))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-123SPT-25.5-30.5 Test Date: 11/11/19 Checked By: bfs Test Id:

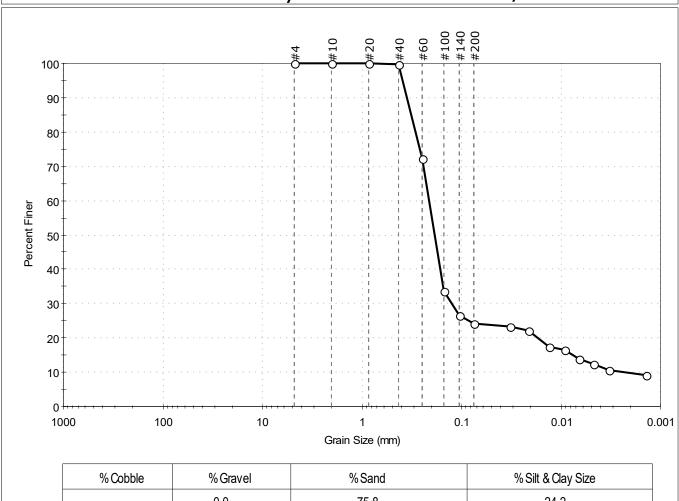
527611

-19 Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



	% Cobbl	е	% Gravel		% Sand		% Silt &	Clay Size
	_		0.0		75.8		2	4.2
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies	1		Coeffic	rients
							COCITIC	<u>icits</u>
						D <sub>85</sub> = 0.32		D <sub>30</sub> = 0.1255 mm

#10 #20 0.85 100 #40 0.42 100 72 #60 0.25 34 #100 0.15 #140 0.11 27 24 #200 0.075 Particle Size (mm) Hydromete Percent Finer Spec. Percent Complies 0.0326 23 0.0211 22 0.0131 17 0.0093 16 0.0066 14 0.0047 12

11

9

 $D_{60} = 0.2128 \text{ mm}$  $D_{15} = 0.0076 \text{ mm}$  $D_{10} = 0.0023 \text{ mm}$  $D_{50} = 0.1865 \text{ mm}$  $C_c = 32.180$  $C_u = 92.522$ 

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

0.0033

0.0014



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-123SPT-63.2-65.5 Test Date: 11/05/19 Checked By: bfs

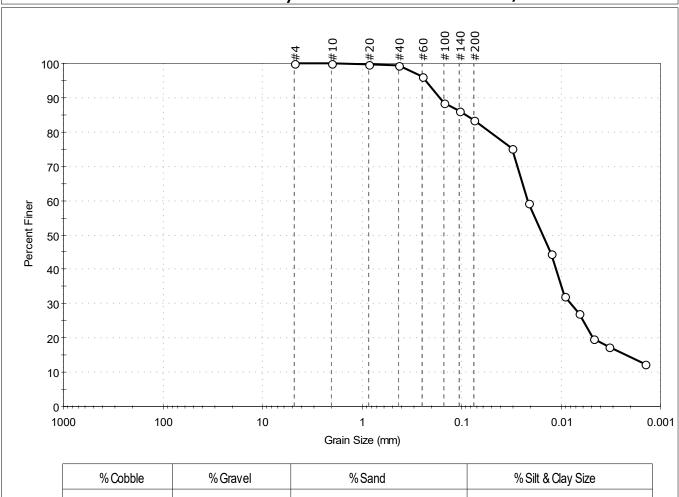
Test Id: -19 Depth: 527612

Test Comment:

Visual Description: Moist, dark olive brown silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	16.5	83.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	96		
#100	0.15	89		
#140	0.11	86		
#200	0.075	83		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0313	75		
	0.0210	59		
	0.0125	44		
	0.0091	32		
	0.0065	27		
	0.0047	20		
	0.0033	17		
	0.0014	12		

<u>Coefficients</u>		
D <sub>85</sub> =0.0911 mm	$D_{30} = 0.0079 \text{ mm}$	
D <sub>60</sub> = 0.0214 mm	$D_{15} = 0.0022 \text{ mm}$	
D <sub>50</sub> = 0.0152 mm	$D_{10} = N/A$	
C <sub>u</sub> =N/A	$C_c = N/A$	

<u>Classification</u> SILT with Sand (ML) **ASTM** 

AASHTO Clayey Soils (A-7-5 (13))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Separation of Sample: #200 Sieve

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

Sample ID: PDI-19SC-B-05-07 est Date: 10/29/19 Checked By: bfs Test Id:

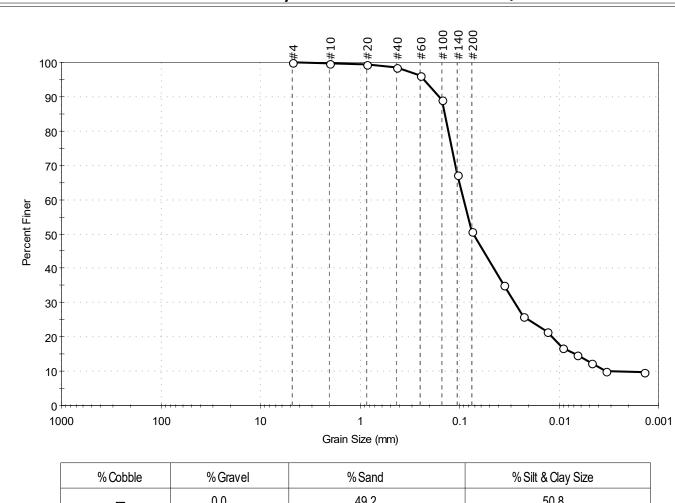
527549

-191008T Depth: Test Comment:

Visual Description: Moist, dark olive brown sandy silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	49.2	50.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	96		
#100	0.15	89		
#140	0.11	67		
#200	0.075	51		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0357	35		
	0.0226	26		
	0.0130	21		
	0.0093	17		
	0.0066	15		
	0.0047	12		
	0.0033	10		
	0.0014	10		

<u>Coefficients</u>									
D <sub>85</sub> = 0.1405 mm	$D_{30} = 0.0277 \text{ mm}$								
D <sub>60</sub> = 0.0909 mm	$D_{15} = 0.0070 \text{ mm}$								
D <sub>50</sub> = 0.0722 mm	$D_{10} = 0.0024 \text{ mm}$								
C <sub>11</sub> =37.875	$C_c = 3.517$								

<u>Classification</u> Sandy SILT (ML) **ASTM** 

AASHTO Silty Soils (A-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

Sample ID: PDI-016SC-B-06-08 Test Date: 11/06/19 Checked By: bfs Test Id:

527477

-1910 Depth: Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	016SC-B-06-08-19			35	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a

The sample was determined to be Non-Plastic



Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

Sample ID: PDI-027SC-B-11-13.5 Test Date: 11/12/19 Checked By: bfs Test Id:

527481

-191 Depth: Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	27SC-B-11-13.5-19			19	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

9% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a

The sample was determined to be Non-Plastic



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

Sample ID: PDI-033SC-B-8.7-10.7 Test Date: 11/01/19 Checked By: bfs 527480 Test Id:

-19 Depth: Test Comment:

Visual Description: Moist, dark grayish brown sand

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	33SC-B-8.7-10.7-1			18	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

25% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-038SC-B-7.1-9.1 Test Date: 10/25/19 Checked By: bfs

Sample ID: PDI-038SC-B-7.1-9.1 Test Date: 10/25/1 -191 Depth: --- Test Id: 527478

Test Comment: ---

Visual Description: Moist, dark gray sand with silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	38SC-B-7.1-9.1-19			20	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

35% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: hag Tested By: cam

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-041SC-B-8.2-10.2 Test Date: 10/30/19 Checked By: bfs

527475

-19 Depth: --- Test Id:

Visual Description: Moist, dark grayish brown sand

Sample Comment: ---

Test Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	\$1SC-B-8.2-10.2-1			29	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

4% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-049SC-B-06-08 Test Date: 11/05/19 Checked By: bfs

Test Id:

527484

-1910 Depth: ---

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	049SC-B-06-08-19			32	n/a	n/a	n/a	n/a	Silty SAND (SM)

4% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

527485

Sample ID: PDI-052SC-B-06-08 Test Date: 11/06/19 Checked By: bfs Test Id:

-1910 Depth:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

Test Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)52SC-B-06-08-19			45	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



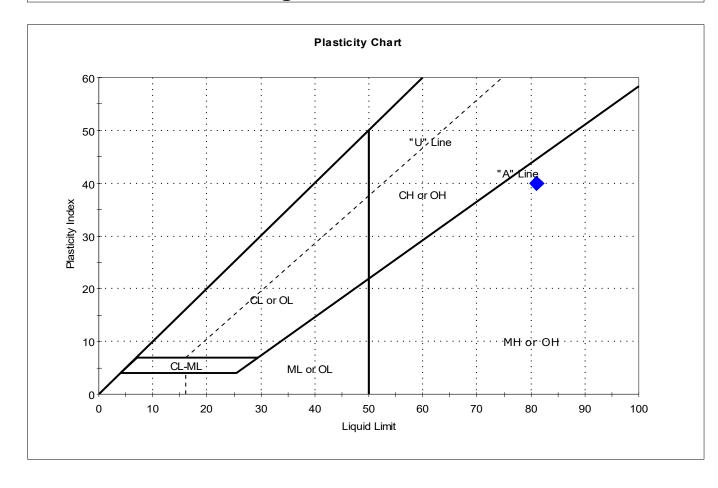
Location:Project No:GTX-310685Boring ID: ---Sample Type:bagTested By:camSample ID: PDI-066SC-B-06-08Test Date:11/13/19Checked By:bfs

-1910 Depth: --- Test Id: 527482

Test Comment: ---

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	066SC-B-06-08-19			68	81	41	40	0.7	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-067SC-B-02-04 Test Date: 11/11/19 Checked By: bfs

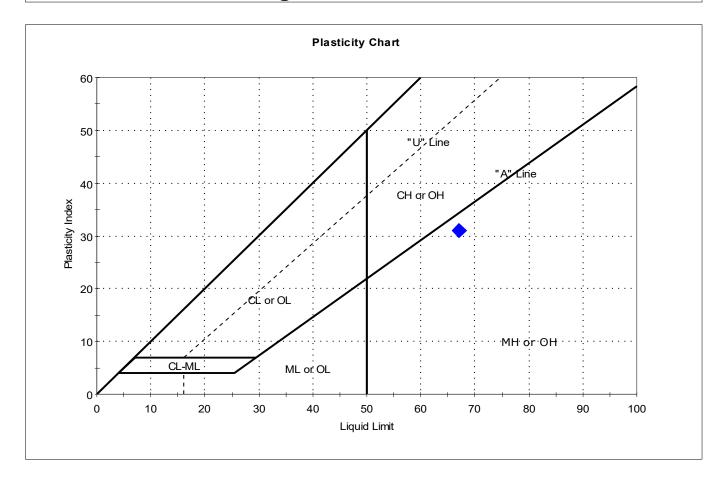
-1910 Depth: --- Test Id: 527476

Test Comment: ---

Visual Description: Wet, dark olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	067SC-B-02-04-19			74	67	36	31	1.2	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-077SC-B-04-06 Test Date: 10/25/19 Checked By: bfs

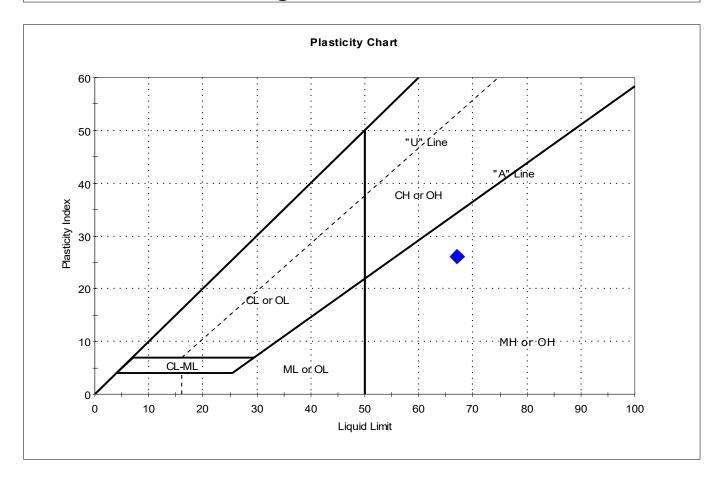
-1910 Depth: --- Test Id: 527473

Test Comment: ---

Visual Description: Wet, dark olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)77SC-B-04-06-19			81	67	41	26	1.6	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-079SC-B-06-08 Test Date: 11/18/19 Checked By: bfs

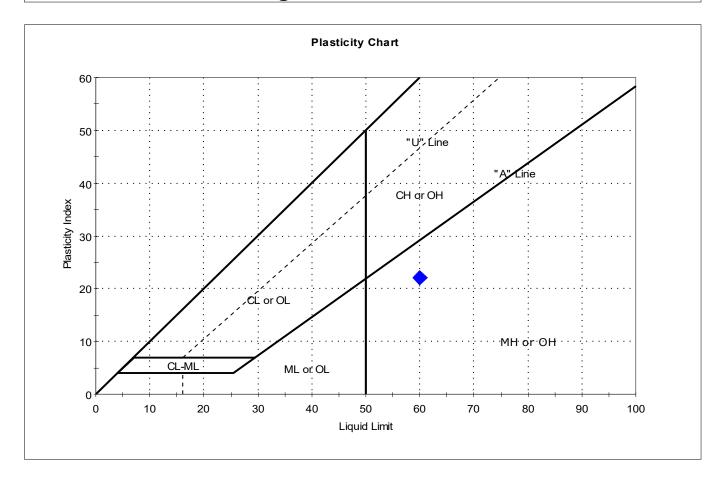
-1910 Depth : --- Test Id: 527474

Test Comment: ---

Visual Description: Wet, dark grayish brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)79SC-B-06-08-19			115	60	38	22	3.5	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



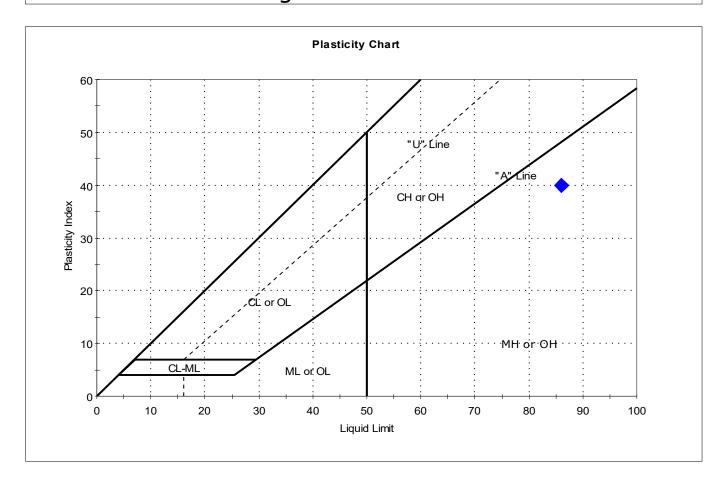
Location:Project No:GTX-310685Boring ID: ---Sample Type:bagTested By:camSample ID: PDI-090SC-B-06-08Test Date:11/11/19Checked By:bfs

-1910 Depth: --- Test Id: 527483

Test Comment: ---

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	090SC-B-06-08-19			82	86	46	40	0.9	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-107SPT-00-04 est Date: 11/12/19 Checked By: bfs

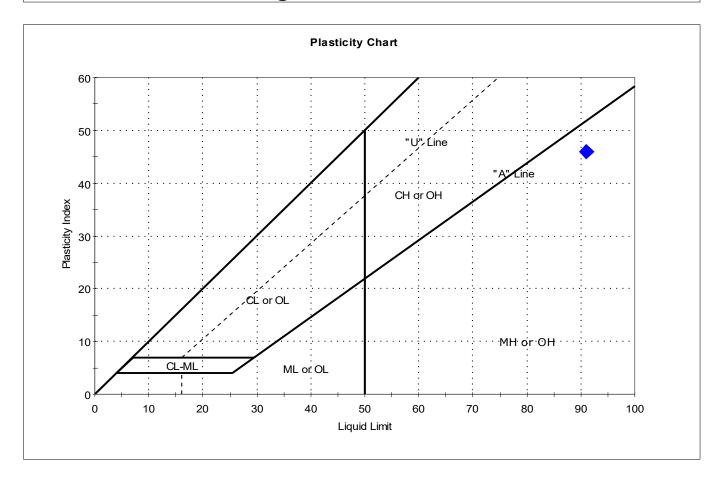
-190923T Depth: --- Test Id: 527486

Test Comment: ---

Visual Description: Wet, dark olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbo	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	107SPT-00-04-190			108	91	45	46	1.4	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: SLOW Toughness: MEDIUM



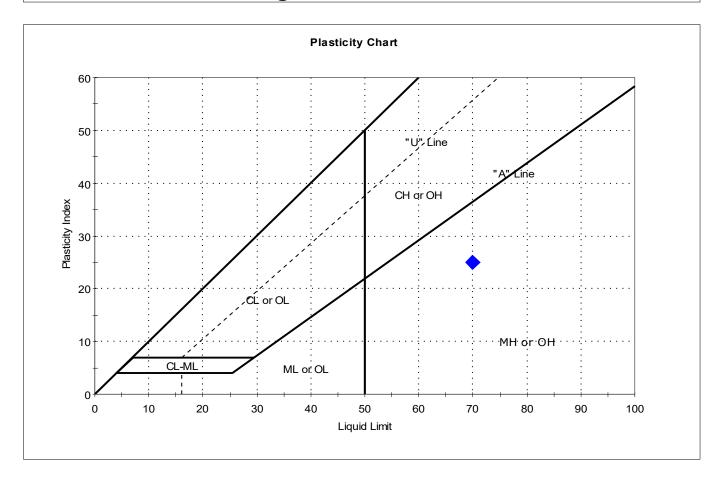
Location:Project No:GTX-310685Boring ID: ---Sample Type:bagTested By:camSample ID: PDI-107SPT-04-09est Date:11/18/19Checked By:bfs

-190923T Depth : --- Test Id: 527487

Test Comment: ---

Visual Description: Wet, dark olive brown silt Sample Comment: Sample contains organics

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	107SPT-04-09-190			84	70	45	25	1.6	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No:

Boring ID: --- Sample Type: bag Tested By:

Boring ID: --- Sample Type: bag Tested By: cam
Sample ID: PDI-107SPT-17-18 est Date: 11/11/19 Checked By: bfs
-190923T Depth: --- Test Id: 527488

GTX-310685

Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	107SPT-17-18-190			42	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 cam

527489

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-107SPT-62-64 est Date: 10/28/19 Checked By: bfs Test Id:

Test Comment:

-190923T Depth:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	107SPT-62-64-190			27	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

Sample ID: PDI-108SPT-00-6.4 Test Date: 11/11/19 Checked By: bfs Test Id: 527490

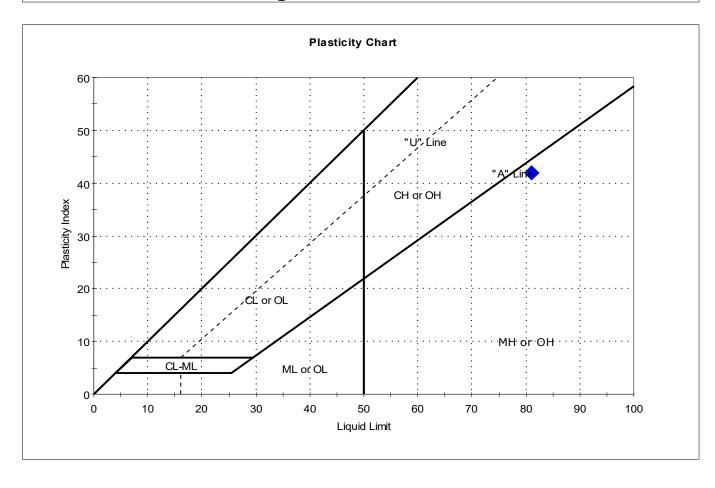
Test Comment:

-19100 Depth:

Visual Description: Wet, olive brown silt with sand

Sample Comment:

### Atterberg Limits - ASTM D4318



Syn	nbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
	•	108SPT-00-6.4-19:			95	81	39	42	1.3	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

8% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-108SPT-14-33.5 Test Date: 10/23/19 Checked By: bfs

Sample ID: PDI-108SPT-14-33.5 Test Date: 10/23/19
-1910 Depth: --- Test Id: 527491

Test Comment: ---

Visual Description: Moist, dark olive brown sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.08SPT-14-33.5-19			39	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

13% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No:

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-108SPT-33.5-66.5 Test Date: 10/28/19 Checked By: bfs

527492

GTX-310685

-19 Depth: --- Test Id: Test Comment: ---

Visual Description: Moist, dark gray sand with silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	08SPT-33.5-66.5-1			30	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

26% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

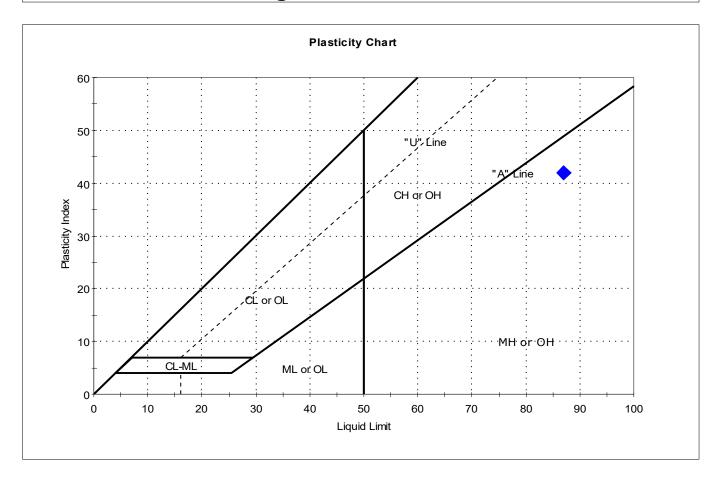
Sample ID: PDI-109SPT-00-6.5 Test Date: 11/18/19 Checked By: n/a

-19100 Depth: --- Test Id: 527493

Test Comment: ---

Visual Description: Wet, very dark olive silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	109SPT-00-6.5-19			93	87	45	42	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

3% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location:Project No:GTX-310685Boring ID:---Sample Type:bagTested By:camSample ID:PDI-109SPT-16.5-18.1Test Date:11/18/19Checked By:bfs

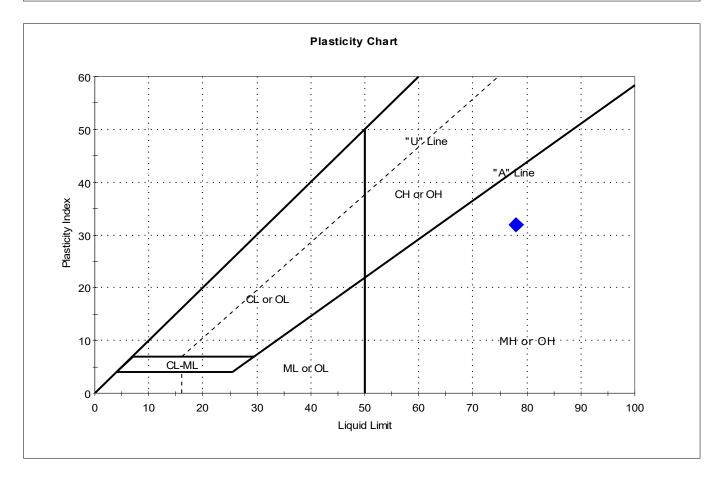
-19 Depth : --- Test Id: 527494

Test Comment: ---

Visual Description: Moist, dark olive brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)9SPT-16.5-18.1-1			80	78	46	32	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685

527495

Boring ID: ---Sample Type: bag Tested By: cam Sample ID: PDI-109SPT-22-30 est Date: 10/25/19 Checked By: bfs Test Id:

-191004T Depth: Test Comment:

Visual Description: Moist, olive brown sand with silt

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	109SPT-22-30-191			35	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:

Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam Sample ID: PDI-109SPT-35.5-48.3 Test Date: 10/24/19 Checked By: bfs

-19 Depth: Test Id: 527496

Test Comment:

Moist, olive brown sand with silt Visual Description:

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	D9SPT-35.5-48.3-1			26	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

527497

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-109SPT-48.3-51 Test Date: 11/12/19 Checked By: bfs

-1910 Depth: --- Test Id: Test Comment: ---

Visual Description: Moist, dark olive brown silt with sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.09SPT-48.3-51-19			48	n/a	n/a	n/a	n/a	SILT with Sand (ML)

0% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID:---Sample Type: bagTested By: cam

Sample ID: PDI-110 B-54-64.5 Test Date: 10/24/19 Checked By: bfs -19101 Depth: --- Test Id: 527498

-19101 Depth : ---Test Comment: ---

Visual Description: Moist, black sand with silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	PDI-110 B-54-64.5-191015			18	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

38% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

527499

Sample ID: PDI-110SPT-21-32 est Date: 10/24/19 Checked By: bfs Test Id:

Test Comment:

-191010T Depth:

Visual Description: Moist, dark gray sand

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	110SPT-21-32-191			24	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

6% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID:---Sample Type: bagTested By: cam

Boring ID: --- Sample Type: bag Tested By: can est Date: 10/24/19 Checked By: bfs Test Id: 527500

Test Comment: ---

Visual Description: Moist, black sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	110SPT-32-45-191			28	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

41% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID: ---Sample Type:bagTested By:camSample ID: PDI-112SPT-00-6.5Test Date:11/11/19Checked By:bfs

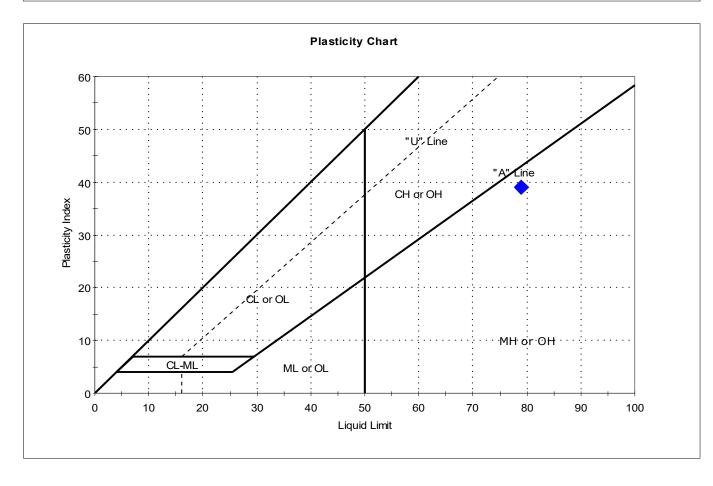
-19100 Depth: --- Test Id: 527501

Test Comment: ---

Visual Description: Moist, dark brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	112SPT-00-6.5-19			77	79	40	39	0.9	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-112SPT-07-11.5 Test Date: 11/15/19 Checked By: bfs

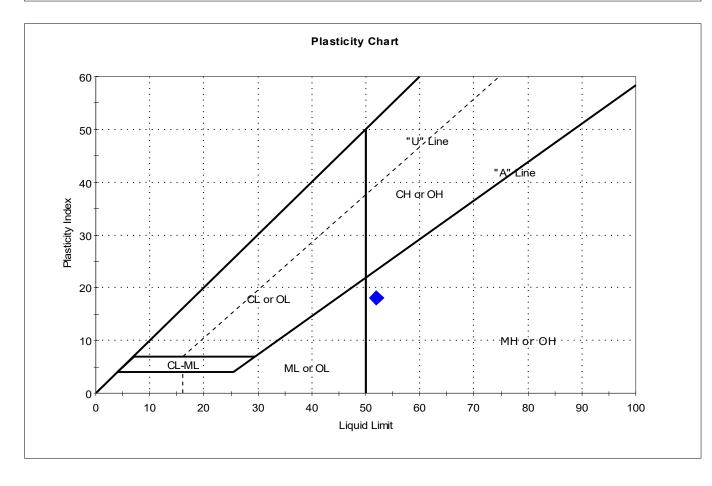
-1910 Depth: --- Test Id: 527502

Test Comment: ---

Visual Description: Moist, dark gray sandy silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.12SPT-07-11.5-19			53	52	34	18	1.1	Sandy Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No:

Boring ID: ---Sample Type: bag Tested By: cam Sample ID: PDI-112SPT-11.5-26.5 Test Date: 11/12/19 Checked By: bfs Test Id:

527503

GTX-310685

-19 Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	12SPT-11.5-26.5-1			37	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location:

Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam Sample ID: PDI-112SPT-37.5-58 Test Date: 10/28/19 Checked By: bfs

Test Id:

527504

-1910 Depth: Test Comment:

Visual Description: Moist, very dark olive gray silty sand

Sample Comment:

### Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.12SPT-37.5-58-19			19	n/a	n/a	n/a	n/a	Silty SAND (SM)

20% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

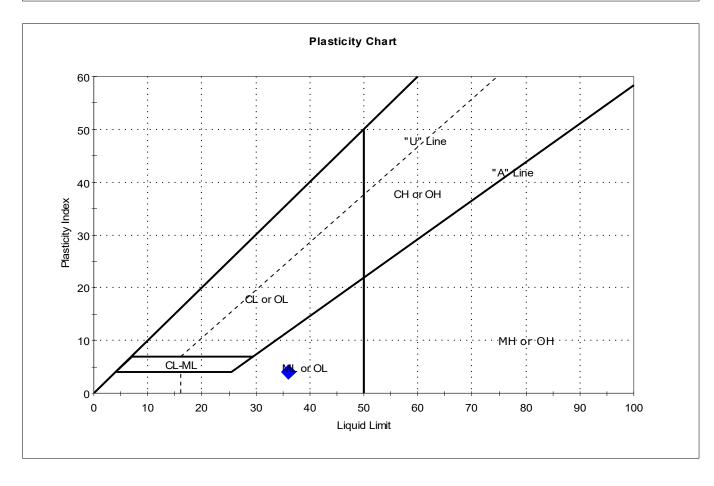
Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-113SPT-06-16 Test Date: 11/13/19 Checked By: bfs -19101 Depth: --- Test Id: 527505

Test Comment: ---

Visual Description: Wet, dark grayish brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	113SPT-06-16-191			43	36	32	4	2.7	Silty SAND (SM)

Sample Prepared using the WET method

3% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location:

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-113SPT-16-22 Test Date: 10/23/19 Checked By: bfs

Test Id:

527506

Project No:

GTX-310685

-19101 Depth: ---

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment: ---

Test Comment:

#### Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	113SPT-16-22-191			37	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-113SPT-22-25.2 Test Date: 11/12/19 Checked By: bfs

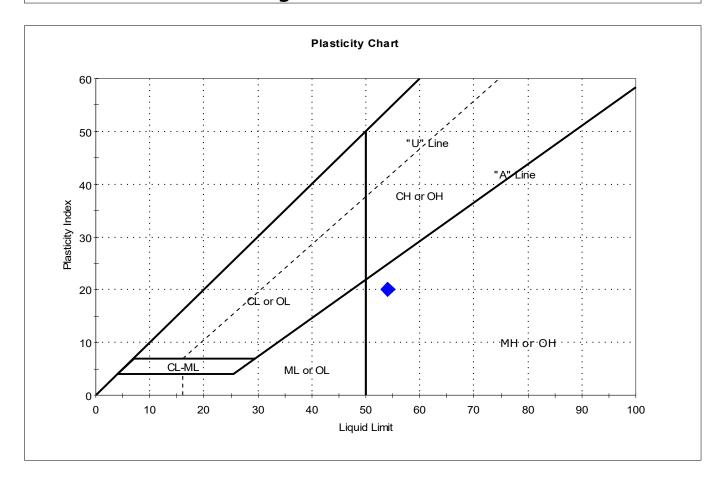
-1910 Depth: --- Test Id: 527507

Test Comment: ---

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	.13SPT-22-25.2-19			61	54	34	20	1.3	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag cam

Tested By: Sample ID: PDI-113SPT-31.9-39.4 Test Date: 10/23/19 Checked By: bfs Test Id:

527508

-19 Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	13SPT-31.9-39.4-1			33	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-114SPT-00-7.5 Test Date: 11/11/19 Checked By: bfs

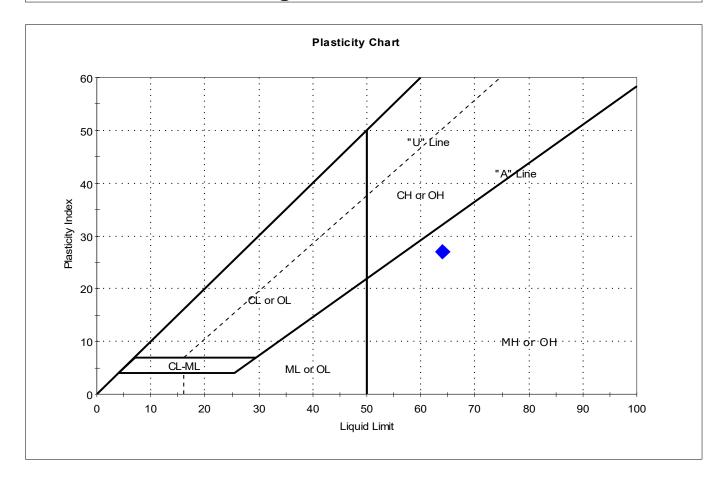
-19100 Depth: --- Test Id: 527509

Test Comment: ---

Visual Description: Wet, olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	114SPT-00-7.5-19			73	64	37	27	1.3	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685 cam

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-114SPT-25.5-28 Test Date: 10/30/19 Checked By: bfs Test Id:

527510

-1910 Depth: Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.14SPT-25.5-28-19			31	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-114SPT-42-50.5 Test Date: 11/15/19 Checked By: bfs

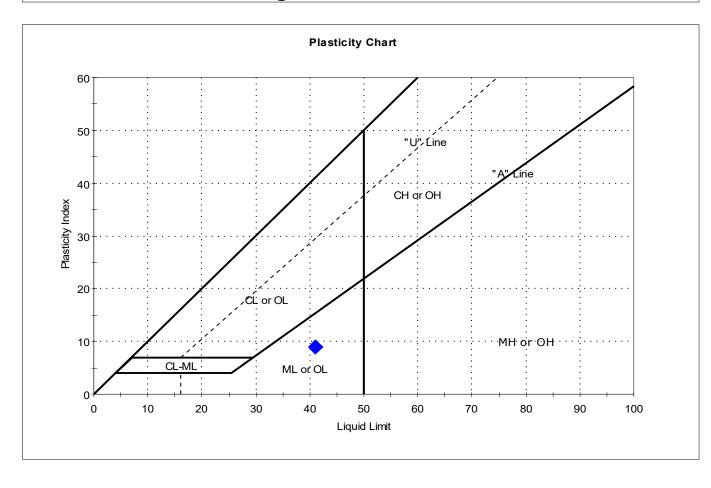
-1910 Depth: --- Test Id: 527511

Test Comment: ---

Visual Description: Wet, olive brown sandy silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.14SPT-42-50.5-19			50	41	32	9	2	Sandy SILT (ML)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No:

Boring ID: ---Sample Type: bag Tested By: cam Sample ID: PDI-114SPT-50.5-55 Test Date: 10/28/19 Checked By: bfs Test Id:

527512

GTX-310685

-1910 Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	14SPT-50.5-55-19			37	n/a	n/a	n/a	n/a	Silty SAND (SM)

4% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-114SPT-7.5-12.5 Test Date: 11/18/19 Checked By: bfs

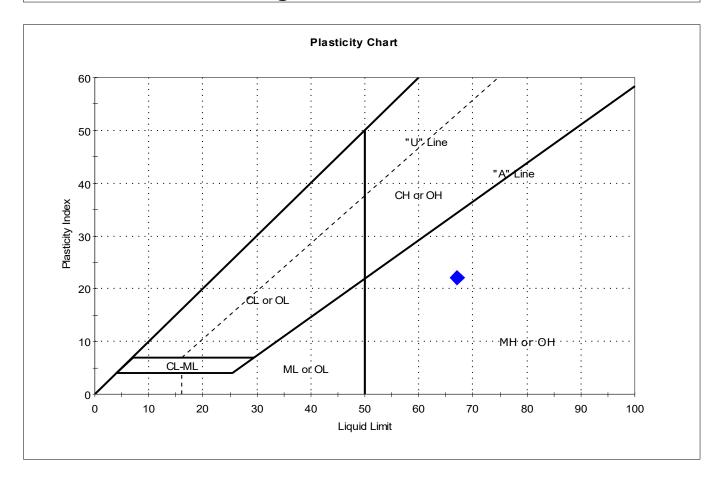
-191 Depth : --- Test Id: 527513

Test Comment: ---

Visual Description: Moist, olive brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbo	I Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	14SPT-7.5-12.5-19			65	67	45	22	0.9	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location:Project No:GTX-310685Boring ID:---Sample Type: bagTested By: cam

Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-115SPT-06-11 est Date: 10/24/19 Checked By: bfs -191009T Depth: --- Test Id: 527514

-191009T Depth: ---Test Comment: ---

Visual Description: Moist, very dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	115SPT-06-11-191			17	n/a	n/a	n/a	n/a	Silty SAND (SM)

11% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-115SPT-18.6-20.6 Test Date: 11/13/19 Checked By: bfs

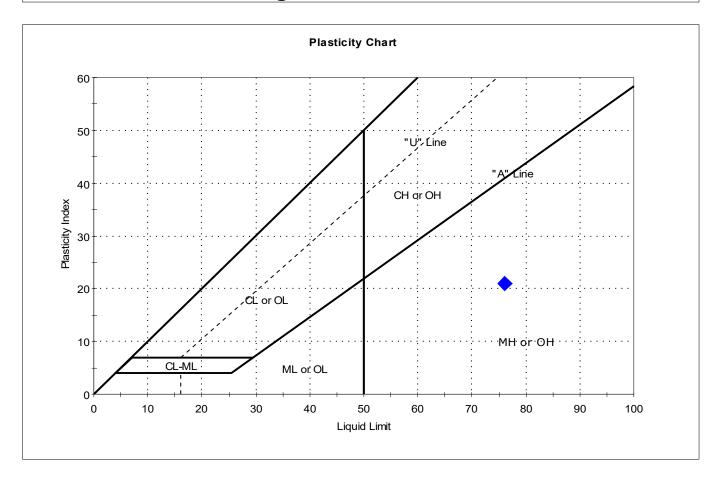
Sample ID: PDI-115SPT-18.6-20.6 Test Date: 11/13/19
-19 Depth: --- Test Id: 527515

Test Comment: ---

Visual Description: Moist, dark olive brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Sym	bol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
		15SPT-18.6-20.6-1			72	76	55	21	0.8	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-115SPT-23-28.1 Test Date: 10/24/19 Checked By: bfs

-1910 Depth: --- Test Id: 527516

Test Comment: --Visual Description: Moist, very dark olive brown sand with silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	15SPT-23-28.1-19			28	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

5% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

527517

Boring ID: ---Sample Type: bag Tested By: cam Sample ID: PDI-115SPT-41.5-49.3 Test Date: 10/25/19 Checked By: bfs Test Id:

-19 Depth: Test Comment:

Visual Description: Moist, olive brown silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	15SPT-41.5-49.3-1			39	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-116SPT-00-4.5 Test Date: 11/11/19 Checked By: bfs

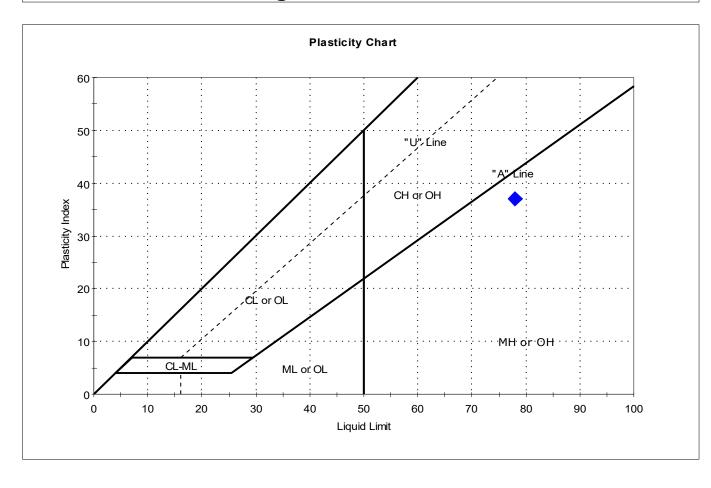
-19092 Depth: --- Test Id: 527518

Test Comment: ---

Visual Description: Wet, olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	116SPT-00-4.5-190			83	78	41	37	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location:

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-116SPT-20-26.7 Test Date: 11/01/19 Checked By: bfs

Test Id:

527519

Project No:

GTX-310685

-1909 Depth: ---

Test Comment: --Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	16SPT-20-26.7-19			26	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-116SPT-26.7-28.6 Test Date: 11/11/19 Checked By: bfs

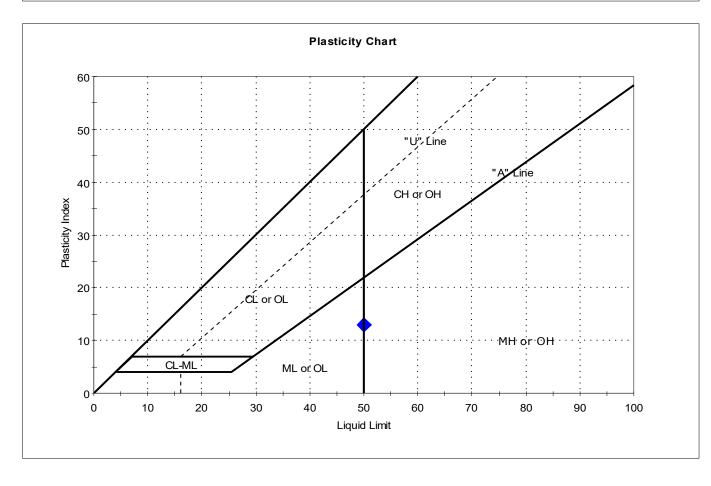
-19 Depth: --- Test Id: 527520

Test Comment: ---

Visual Description: Wet, grayish brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	L6SPT-26.7-28.6-1			64	50	37	13	2.1	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: cam

527521

Sample ID: PDI-116SPT-51.5-54.2 Test Date: 10/25/19 Checked By: bfs

-19 Depth: Test Id: Test Comment:

Visual Description: Moist, olive brown silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	16SPT-51.5-54.2-1			27	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:

Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam Sample ID: PDI-117SPT-11-29.1 Test Date: 10/28/19 Checked By: bfs

Test Id:

527522

-1910 Depth: Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.17SPT-11-29.1-19			38	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

28% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-117SPT-29.1-32 Test Date: 11/05/19 Checked By: bfs -1910 Depth: --- Test Id: 527523

-1910 Depth: ---Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	17SPT-29.1-32-19			45	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

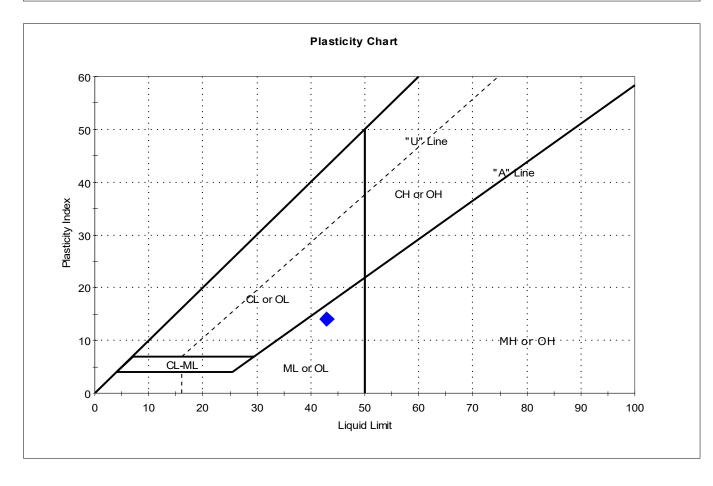
Sample ID: --- Sample Type: bag Tested By: can Sample ID: PDI-117SPT-44.1-53.5 Test Date: 11/11/19 Checked By: bfs -19 Depth: --- Test Id: 527524

-19 Depth: ---Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	L7SPT-44.1-53.5-1			46	43	29	14	1.2	Silty SAND (SM)

Sample Prepared using the WET method

3% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-117SPT-53.5-63.5 Test Date: 11/12/19 Checked By: bfs

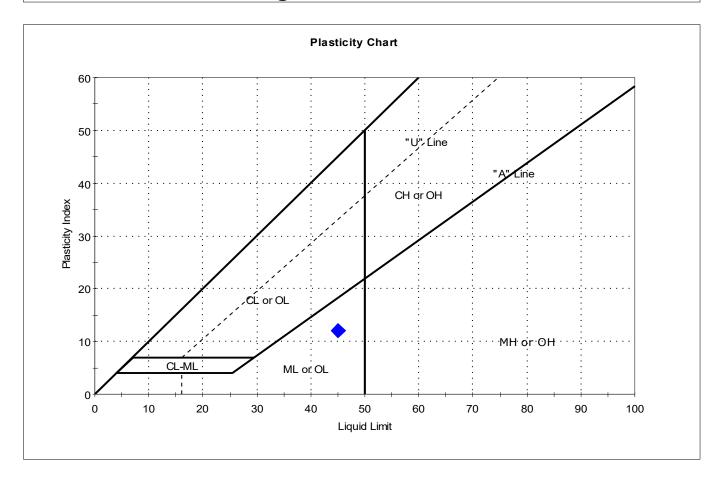
-19 Depth : --- Test Id: 527525

Test Comment: ---

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbo	I Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	17SPT-53.5-63.5-1			83	45	33	12	4.2	SILT with Sand (ML)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-118SPT-00-4.5 Test Date: 11/18/19 Checked By: bfs

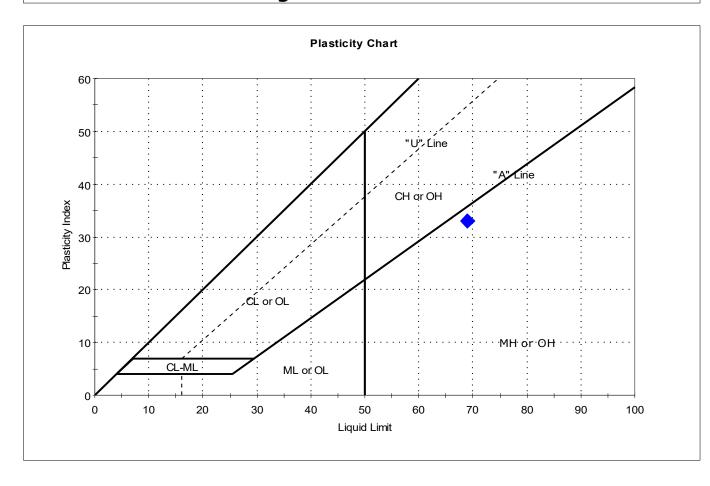
Sample ID: PDI-118SPT-00-4.5 Test Date: 11/18/1 -19101 Depth: --- Test Id: 527526

Test Comment: ---

Visual Description: Wet, dark grayish brown silt

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	118SPT-00-4.5-19			113	69	36	33	2.3	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location:Project No:GTX-310685Boring ID:---Sample Type:bagTested By:camSample ID:PDI-118SPT-4.5-15Test Date:11/12/19Checked By:bfs

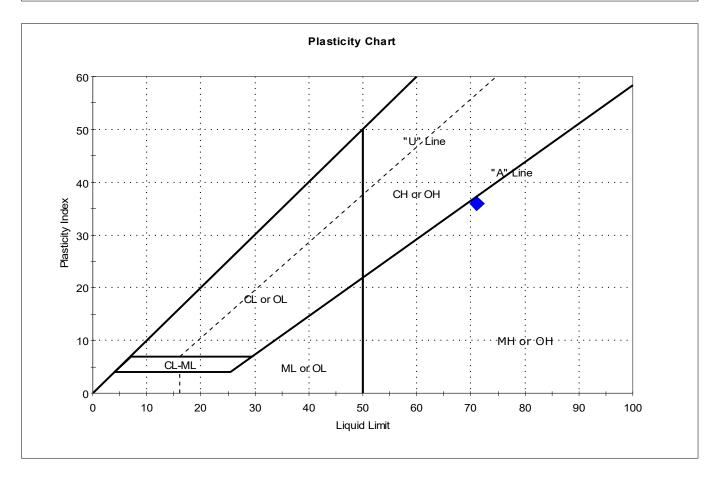
-19101 Depth: --- Test Id: 527527

Test Comment: ---

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbo	I Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	118SPT-4.5-15-19			70	71	35	36	1	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

3% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

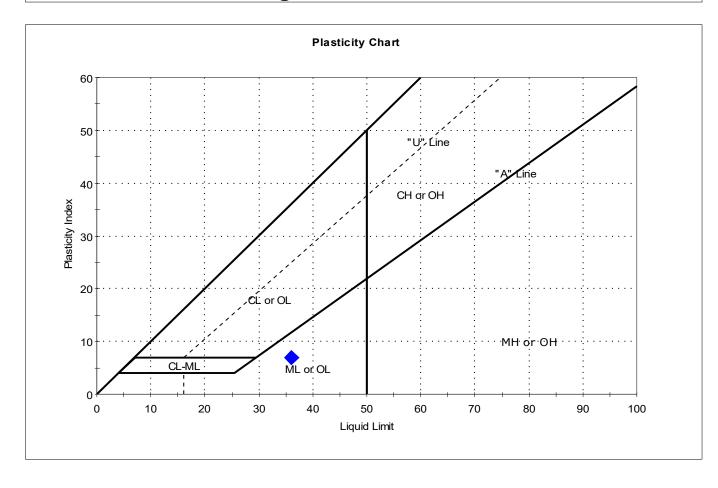
Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-118SPT-46.5-61 Test Date: 11/11/19 Checked By: bfs -1910 Depth: --- Test Id: 527528

-1910 Depth: --- Test Id: Test Comment: ---

Visual Description: Wet, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.18SPT-46.5-61-19			62	36	29	7	4.7	Silty SAND (SM)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-119SPT-00-4.5 Test Date: 11/12/19 Checked By: bfs

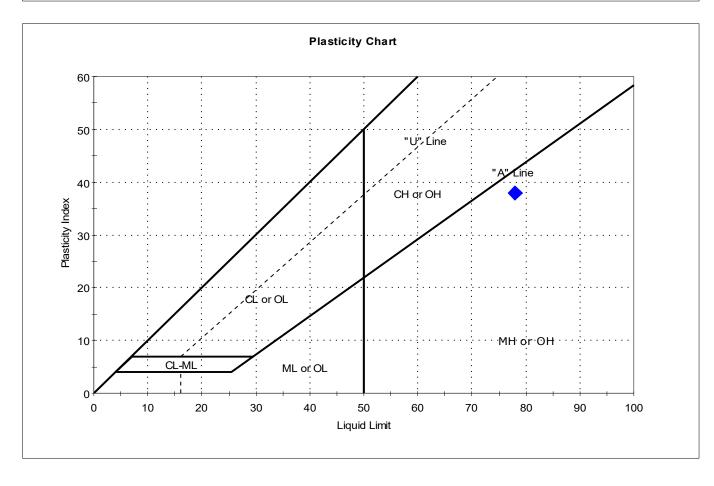
-19100 Depth: --- Test Id: 527529

Test Comment: ---

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbo	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	119SPT-00-4.5-19			77	78	40	38	1	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-119SPT-18.3-31 Test Date: 10/25/19 Checked By: bfs

Sample ID: PDI-119SPT-18.3-31 Test Date: 10/25/1 -1910 Depth: --- Test Id: 527530

Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	19SPT-18.3-31-19			30	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

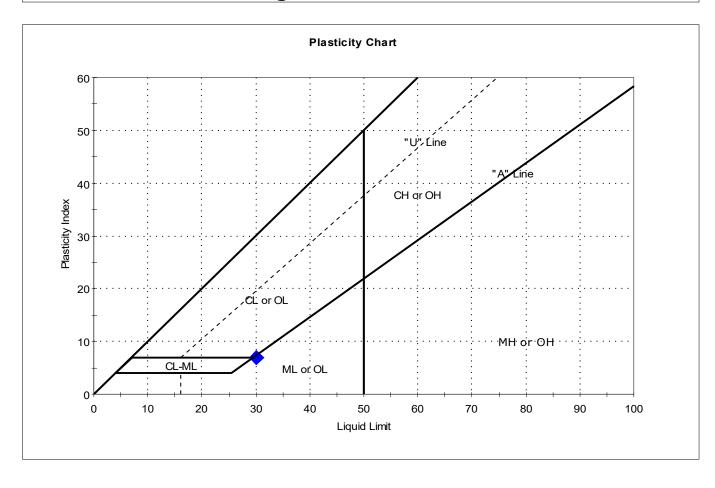
Boring ID: --- Sample Type: bag Tested By: can Sample ID: PDI-119SPT-47-52 Test Date: 11/11/19 Checked By: bfs -19100 Depth: --- Test Id: 527531

-19100 Depth: ---Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	119SPT-47-52-191			33	30	23	7	1.5	Silty SAND (SM)

Sample Prepared using the WET method

7% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Sample ID: PDI-119SPT-9.5-18.3

Location:
Boring ID: --- Sample Type:

Project No: GTX-310685

Sample Type: bag Tested By: cam

Test Date: 11/12/19 Checked By: bfs

-191 Depth: --- Test Id: 527532

Test Comment: ---

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	19SPT-9.5-18.3-19			37	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

10% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

The sample was determined to be Non-Plastic

Toughness: n/a



Location:Project No:GTX-310685Boring ID: ---Sample Type:bagTested By:camSample ID: PDI-121SPT-00-06est Date:11/15/19Checked By:bfs

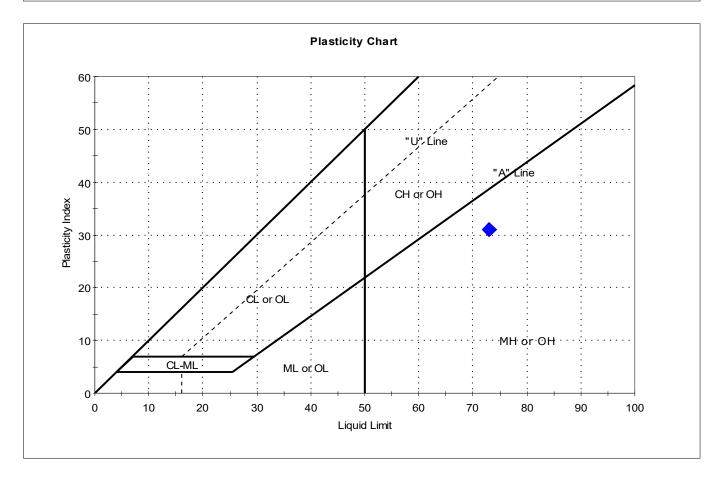
-190930T Depth: --- Test Id: 527533

Test Comment: ---

Visual Description: Moist, olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	121SPT-00-06-190			76	73	42	31	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-121SPT-11-20.7 Test Date: 11/11/19 Checked By: bfs

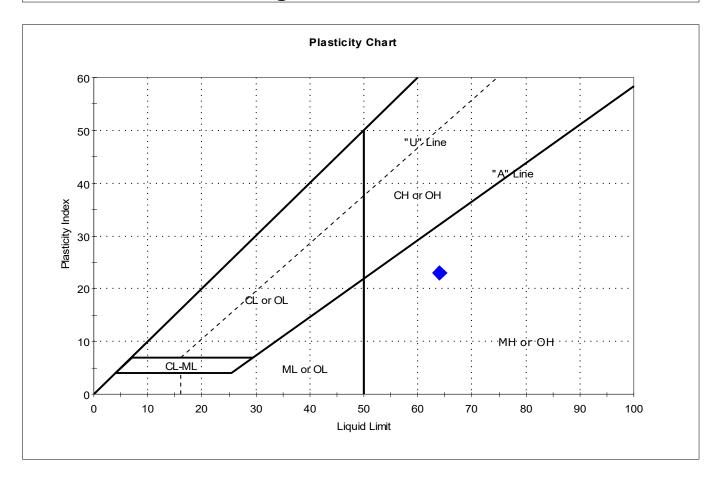
-1909 Depth: --- Test Id: 527534

Test Comment: ---

Visual Description: Moist, dark olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbo	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	21SPT-11-20.7-19			60	64	41	23	0.8	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By:

cam Sample ID: PDI-121SPT-21-38 est Date: 10/28/19 Checked By: bfs Test Id:

527535

Test Comment:

-190930T Depth:

Visual Description: Moist, dark olive gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	121SPT-21-38-190			43	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

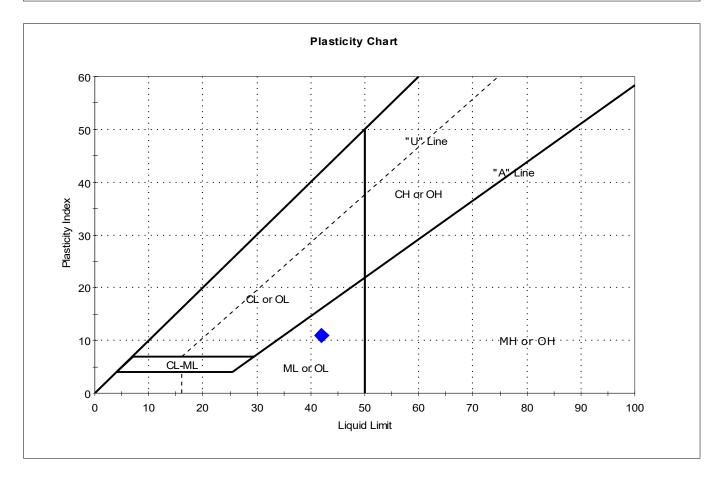
Sample ID: PDI-121SPT-49.4-54 Test Date: 11/18/19 Checked By: bfs -1909 Depth: --- Test Id: 527536

Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.21SPT-49.4-54-19			45	42	31	11	1.2	Silty SAND (SM)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: MEDIUM



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

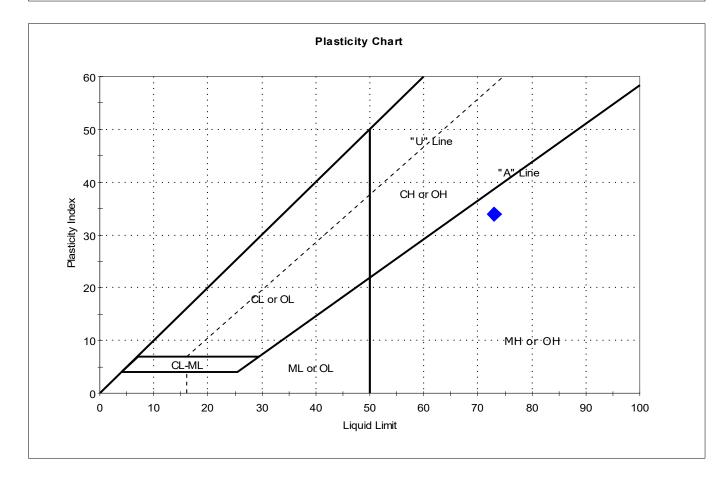
Sample ID: PDI-122SPT-04-09 est Date: 11/12/19 Checked By: bfs

-190925T Depth: --- Test Id: 527537

Test Comment: ---

Visual Description: Wet, olive brown silt
Sample Comment: Sample contains organics

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	122SPT-04-09-190			80	73	39	34	1.2	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

527538

Sample ID: PDI-122SPT-16.6-24 Test Date: 11/11/19 Checked By: bfs Test Id:

-1909 Depth: Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	.22SPT-16.6-24-19			49	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID: ---Sample Type:bagTested By:camSample ID: PDI-122SPT-61-66est Date:11/08/19Checked By:bfs

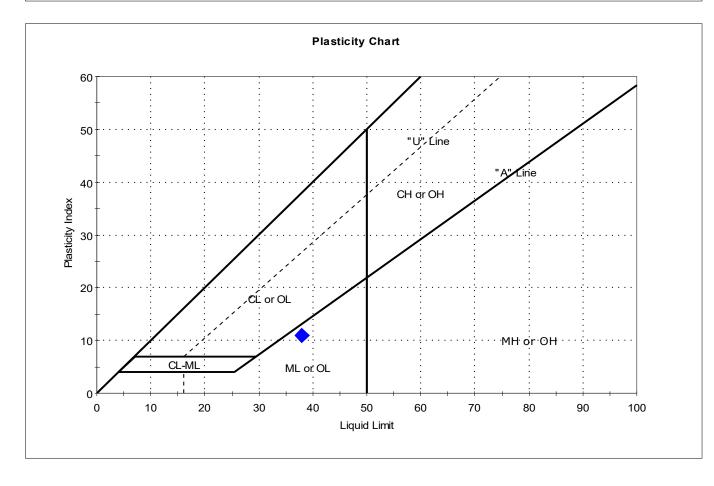
Sample ID: PDI-122SPT-61-66 est Date: 11/08/1 -190926T Depth: --- Test Id: 527539

Test Comment: ---

Visual Description: Wet, olive brown silty sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	122SPT-61-66-190			42	38	27	11	1.3	Silty SAND (SM)

Sample Prepared using the WET method

4% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-123SPT-00-4.5 Test Date: 11/11/19 Checked By: bfs

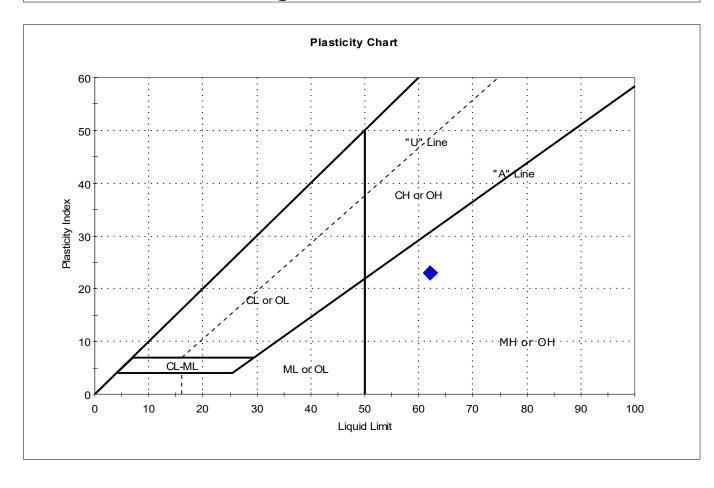
-19092 Depth: --- Test Id: 527540

Test Comment: ---

Visual Description: Wet, dark olive silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	123SPT-00-4.5-190			72	62	39	23	1.4	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685 cam

527541

Boring ID: ---Sample Type: bag Tested By: Sample ID: PDI-123SPT-25.5-30.5 Test Date: 10/25/19 Checked By: bfs Test Id:

-19 Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	23SPT-25.5-30.5-1			19	n/a	n/a	n/a	n/a	Silty SAND (SM)

0% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID:---Sample Type:bagTested By:camSample ID:PDI-123SPT-63.2-65.5Test Date:11/13/19Checked By:bfs

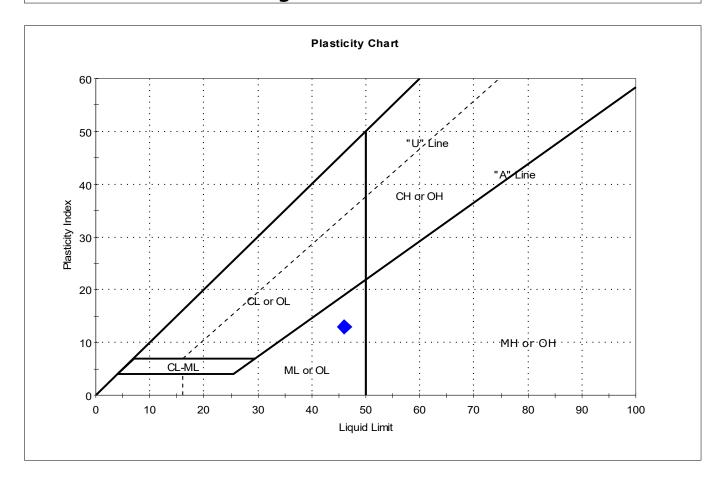
-19 Depth : --- Test Id: 527542

Test Comment: ---

Visual Description: Moist, dark olive brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbo	I Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	23SPT-63.2-65.5-1			48	46	33	13	1.2	SILT with Sand (ML)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685 Sample Type: bag Boring ID: ---Tested By: cam

Sample ID: PDI-19SC-B-05-07 est Date: 11/05/19 Checked By: bfs Test Id:

527479

Test Comment:

-191008T Depth:

Visual Description: Moist, dark olive brown sandy silt

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	19SC-B-05-07-191			61	n/a	n/a	n/a	n/a	Sandy SILT (ML)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID Toughness: n/a



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg 11/19/19 Checked By: bfs Sample ID: ---Test Date:

Test Id: Depth: 529668

### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
	PDI- 2SC-B-5.5 -7.5-1910		Moist, dark gray sand	10.7
	PDI- SC-B-8.9 -10.9-1910		Moist, dark gray sand	16.0
	PDI- 57SC-B-06 -08-19102		Wet, dark gray clay	77.2
	PDI- 59SC-B-06 -08-19101		Moist, dark grayish brown silty sand	38.4
	PDI- 69SC-B-10 -12-19101		Moist, very dark gray silt	67.2
	PDI- 83SC-B-08 -10-19102		Moist, dark gray clay	76.2
	PDI- 97SC-B-02 -04-19101		Wet, dark gray silt	86.8
	PDI- 99SC-B-02 -04-19102		Moist, very dark gray clay	79.6

Notes: Temperature of Drying: 110° Celsius



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg 11/19/19 Checked By: bfs Sample ID: ---Test Date:

Test Id: Depth: 529676

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
	PDI- 3C-B-5.5-7.5-19		Moist, dark gray sand	2.75	
	PDI- C-B-8.9-10.9-19		Moist, dark gray sand	2.75	
	PDI- SC-B-06-08-191		Wet, dark gray clay	2.71	
	PDI- SC-B-06-08-191		Moist, dark grayish brown silty sand	2.80	
	PDI- SC-B-10-12-191		Moist, very dark gray silt	2.73	
	PDI- SC-B-08-10-191		Moist, dark gray clay	2.65	
	PDI- SC-B-02-04-191		Wet, dark gray silt	2.66	
	PDI- SC-B-02-04-191		Moist, very dark gray clay	2.71	

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854 Moisture Content determined by ASTM D2216.



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

529663

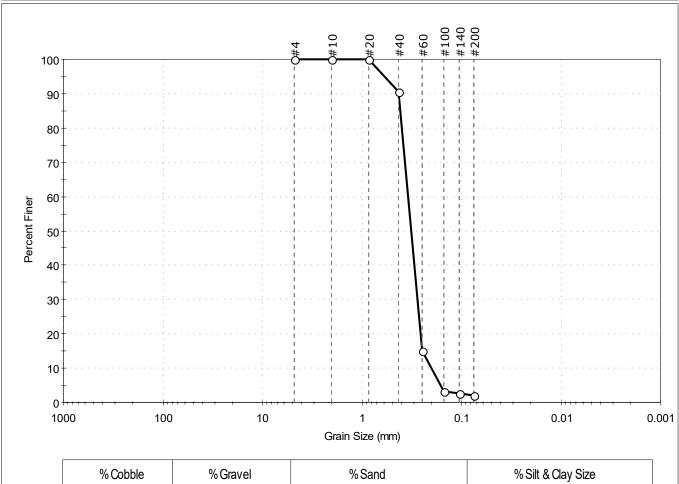
Sample ID: PDI-022SC-B-5.5-7.5 Test Date: 11/19/19 Checked By: bfs Test Id:

-191 Depth: Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	97.8	2.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	90		
#60	0.25	15		
#100	0.15	3		
#140	0.11	3		
#200	0.075	2.2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.4090 mm	$D_{30} = 0.2779 \text{ mm}$	
D <sub>60</sub> = 0.3431 mm	$D_{15} = 0.2500 \text{ mm}$	
D <sub>50</sub> = 0.3198 mm	$D_{10} = 0.2015 \text{ mm}$	
C <sub>u</sub> =1.703	C <sub>c</sub> =1.117	

Classification
Poorly graded SAND (SP) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

529661

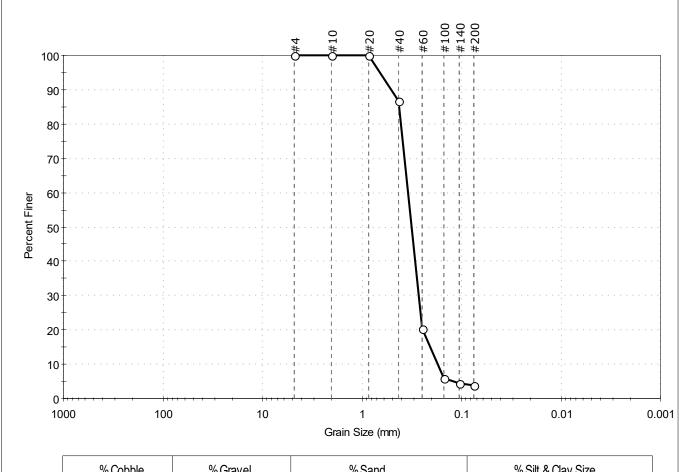
Boring ID: --- Sample Type: bag Tested By: ckg Sample ID: PDI-031SC-B-8.9-10.9 Test Date: 11/19/19 Checked By: bfs

-19 Depth: --- Test Id:

Test Comment: --Visual Description: Moist, dark gray sand

Sample Comment: ---

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	96.1	3.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	87		
#60	0.25	20		
#100	0.15	6		
#140	0.11	4		
#200	0.075	3.9		

<u>Coefficients</u>		
D <sub>85</sub> = 0.4188 mm	$D_{30} = 0.2702 \text{ mm}$	
D <sub>60</sub> = 0.3432 mm	$D_{15} = 0.2076 \text{ mm}$	
D <sub>50</sub> = 0.3169 mm	$D_{10} = 0.1740 \text{ mm}$	
C <sub>u</sub> =1.972	$C_c = 1.223$	

ASTM Poorly graded SAND (SP)

AASHTO Fine Sand (A-3 (1))

Sample/Test Description
Sand/Gravel Particle Shape: --Sand/Gravel Hardness: ---



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

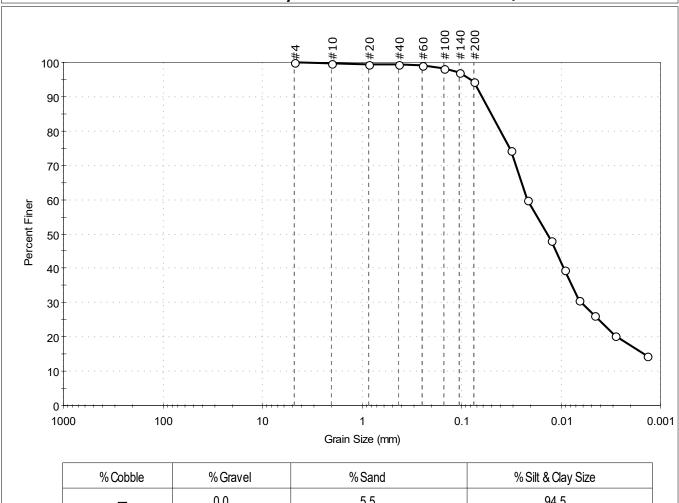
529658

Sample ID: PDI-057SC-B-06-08 Test Date: 11/19/19 Checked By: bfs Test Id:

-1910 Depth: Test Comment:

Visual Description: Wet, dark gray clay Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	5.5	94.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	98		
#140	0.11	97		
#200	0.075	94		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0320	74		
	0.0215	60		
	0.0126	48		
	0.0091	39		
	0.0065	31		
	0.0047	26		
	0.0029	20		
	0.0014	15		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0502 mm	$D_{30} = 0.0062 \text{ mm}$			
D <sub>60</sub> = 0.0216 mm	$D_{15} = 0.0015 \text{ mm}$			
D <sub>50</sub> = 0.0137 mm	$D_{10} = N/A$			
$C_u = N/A$	C <sub>c</sub> =N/A			

<u>Classification</u> Fat CLAY (CH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-6 (49))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

529664

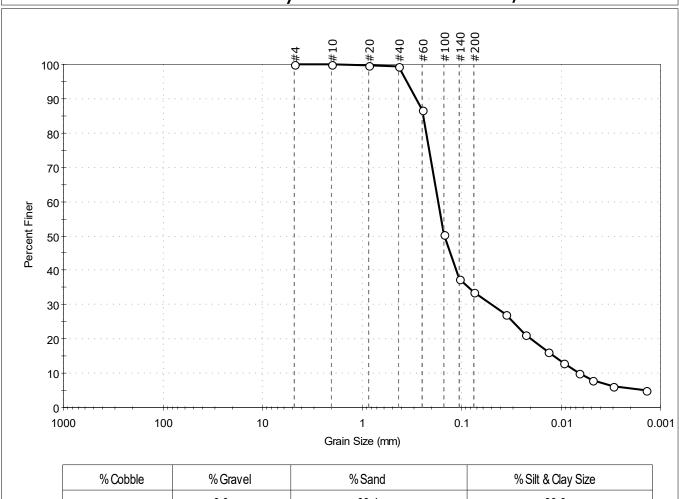
Sample ID: PDI-059SC-B-06-08 Test Date: 11/19/19 Checked By: bfs Test Id:

-1910 Depth: Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	66.4	33.6

Sieve Name	Sieve Size, mm	Dorcont Einer	Snoc Borcont	Complies
Sieve Maille	Sieve Size, IIIIII	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	87		
#100	0.15	51		
#140	0.11	37		
#200	0.075	34		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0356	27		
	0.0229	21		
	0.0133	16		
	0.0095	13		
	0.0067	10		
	0.0048	8		
	0.0030	6		
	0.0014	5		

<u>Coefficients</u>			
D <sub>85</sub> = 0.2437 mm	$D_{30} = 0.0492 \text{ mm}$		
D <sub>60</sub> = 0.1713 mm	$D_{15} = 0.0117 \text{ mm}$		
D <sub>50</sub> = 0.1477 mm	$D_{10} = 0.0066 \text{ mm}$		
C <sub>11</sub> =25.955	$C_{c} = 2.141$		

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685
Boring ID: --- Sample Type: bag Tested By: ckg

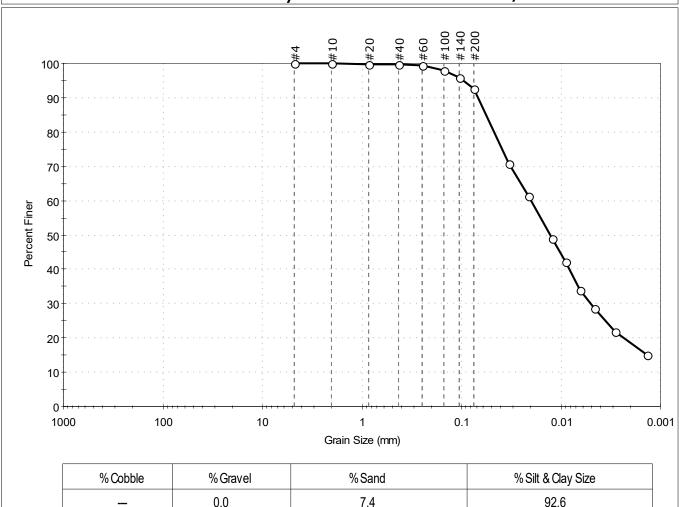
Sample ID: PDI-069SC-B-10-12 Test Date: 11/19/19 Checked By: bfs -1910 Depth: --- Test Id: 529665

Test Comment: ---

Visual Description: Moist, very dark gray silt

Sample Comment: ---

#### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0330	71		
	0.0210	61		
	0.0124	49		
	0.0090	42		
	0.0065	34		
	0.0046	29		
	0.0029	22		
	0.0014	15		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0563 mm	$D_{30} = 0.0050 \text{ mm}$			
D <sub>60</sub> = 0.0199 mm	$D_{15} = 0.0014 \text{ mm}$			
D <sub>50</sub> = 0.0129 mm	$D_{10} = N/A$			
C <sub>u</sub> =N/A	$C_c = N/A$			

<u>Classification</u> <u>ASTM</u> Elastic SILT (MH)

AASHTO Clayey Soils (A-7-5 (40))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sarra, Starter Laterers Strape :

Sand/Gravel Hardness : ---

 $\label{eq:Dispersion Device: Apparatus A - Mech Mixer} \end{\mbox{\sf Dispersion Device: Apparatus A - Mech Mixer}}$ 



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: ckg

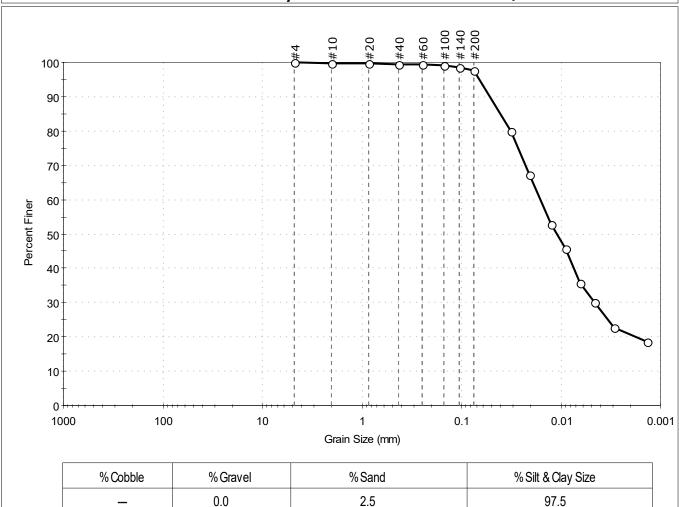
Sample ID: PDI-083SC-B-08-10 Test Date: 11/19/19 Checked By: bfs

-1910 Depth: --- Test Id: 529659

Test Comment: ---

Visual Description: Moist, dark gray clay
Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#140	0.11	99		
#200	0.075	98		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0320	80		
	0.0208	67		
	0.0125	53		
	0.0089	46		
	0.0065	36		
	0.0046	30		
	0.0029	23		
	0.0014	19		

<u>Coefficients</u>			
D <sub>85</sub> = 0.0408 mm	$D_{30} = 0.0046 \text{ mm}$		
D <sub>60</sub> = 0.0161 mm	$D_{15} = N/A$		
D <sub>50</sub> = 0.0109 mm	$D_{10} = N/A$		
$C_u = N/A$	$C_c = N/A$		

<u>Classification</u> <u>ASTM</u> Fat CLAY (CH)

AASHTO Clayey Soils (A-7-5 (55))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



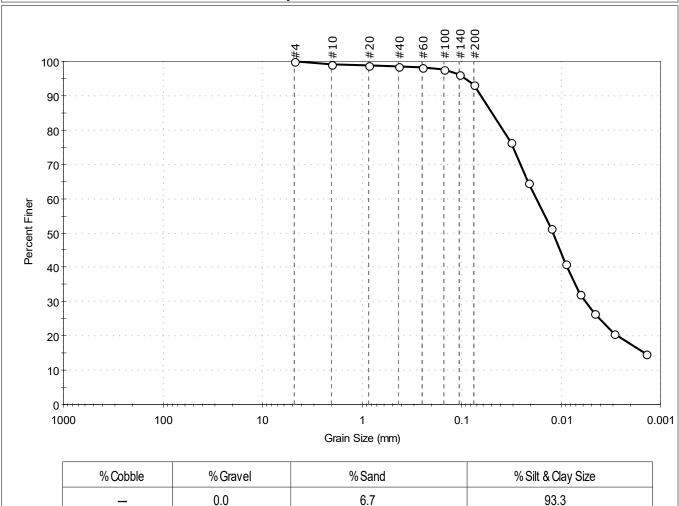
Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-097SC-B-02-04 Test Date: 11/19/19 Checked By: bfs

Test Id: 529662 -1910 Depth:

Test Comment:

Visual Description: Wet, dark gray silt Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	98		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0318	76		
	0.0212	65		
	0.0125	51		
	0.0091	41		
	0.0065	32		
	0.0047	26		
	0.0030	21		
	0.0014	15		

<u>Coefficients</u>			
D <sub>85</sub> = 0.0493 mm	$D_{30} = 0.0057 \text{ mm}$		
D <sub>60</sub> = 0.0177 mm	$D_{15} = 0.0014 \text{ mm}$		
D <sub>50</sub> = 0.0120 mm	$D_{10} = N/A$		
Cu =N/A	$C_c = N/A$		

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (39))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-099SC-B-02-04 Test Date: 11/19/19 Checked By: bfs

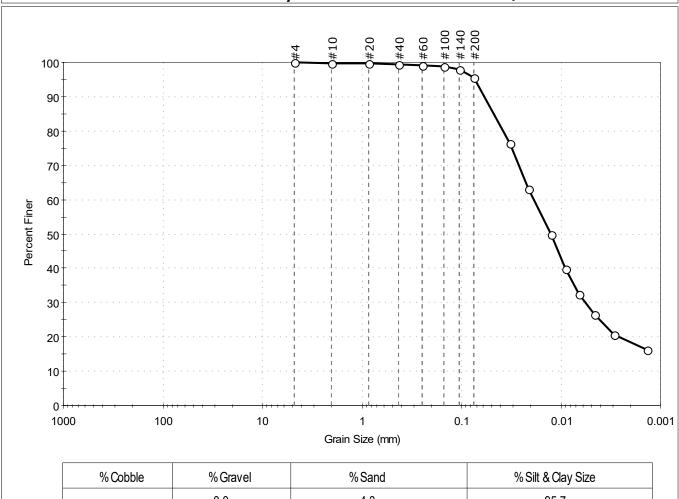
Test Id: 529660 -1910 Depth:

Test Comment:

Visual Description: Moist, very dark gray clay

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	4.3	95.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#140	0.11	98		
#200	0.075	96		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0326	76		
	0.0214	63		
	0.0126	50		
	0.0091	40		
	0.0065	32		
	0.0047	26		
	0.0029	21		
	0.0014	16		

COCI	i i Ci Ci i Co
D <sub>85</sub> = 0.0472 mm	$D_{30} = 0.0057 \text{ mm}$
D <sub>60</sub> = 0.0188 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0126 mm	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

Coefficients

<u>Classification</u> Fat CLAY (CH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (54))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Separation of Sample: #200 Sieve

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

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Location:Project No:GTX-310685Boring ID:---Sample Type: bagTested By: cam

Sample ID: PDI-022SC-B-5.5-7.5 Test Date: 11/18/19 Checked By: bfs -191 Depth: --- Test Id: 529655

-191 Depth: ---Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	22SC-B-5.5-7.5-19			11	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

10% Retained on #40 Sieve

Dry Strength: NONE Dilatancy: RAPID Toughness: n/a

The sample was determined to be Non-Plastic



Location: Project No:

Sample Type: bag Boring ID: ---Tested By: cam Sample ID: PDI-031SC-B-8.9-10.9 Test Date: 11/18/19 Checked By: bfs Test Id:

529653

GTX-310685

-19 Depth : Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

### Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	31SC-B-8.9-10.9-1			16	n/a	n/a	n/a	n/a	Poorly graded SAND (SP)

13% Retained on #40 Sieve

Dry Strength: NONE Dilatancy: RAPID Toughness: n/a

The sample was determined to be Non-Plastic



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

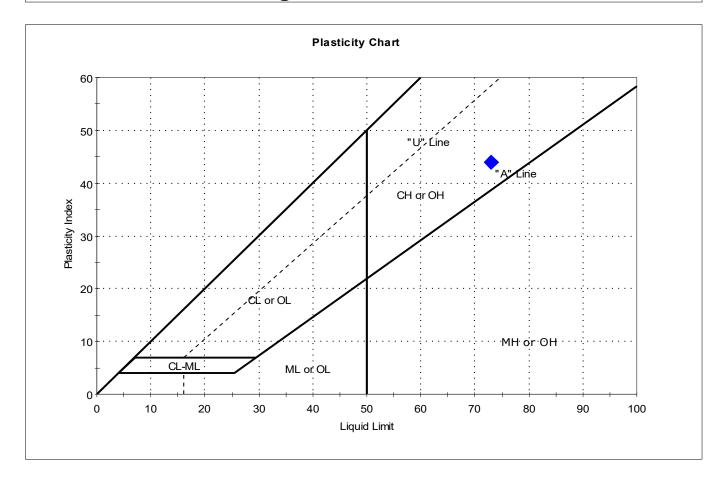
Sample ID: PDI-057SC-B-06-08 Test Date: 11/21/19 Checked By: bfs

-1910 Depth: --- Test Id: 529650

Test Comment: ---

Visual Description: Wet, dark gray clay
Sample Comment: Sample contains organics

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)57SC-B-06-08-19			77	73	29	44	1.1	Fat CLAY (CH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location:Project No:GTX-310685Boring ID:---Sample Type: bagTested By: cam

Test Id:

529656

Sample ID: PDI-059SC-B-06-08 Test Date: 11/19/19 Checked By: bfs

-1910 Depth: ---Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	059SC-B-06-08-19			38	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic



Location:

Boring ID: --- Sample Type: bag Tested By: cam Sample ID: PDI-069SC-B-10-12 Test Date: 11/20/19 Checked By: bfs

Project No:

GTX-310685

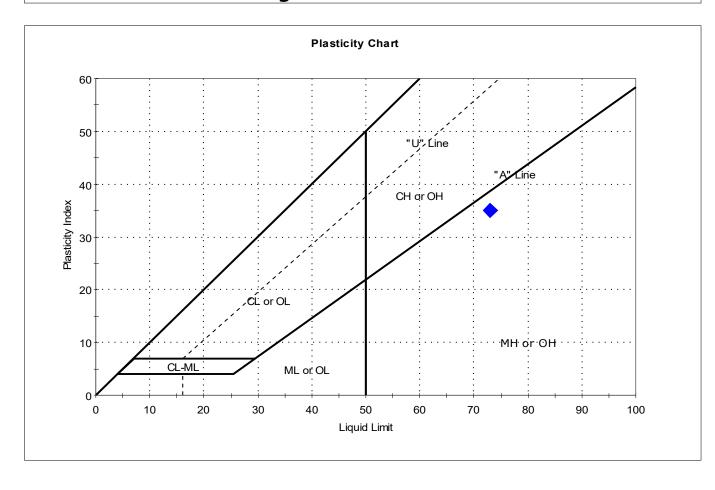
-1910 Depth: --- Test Id: 529657

Test Comment: ---

Visual Description: Moist, very dark gray silt

Sample Comment: ---

#### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	069SC-B-10-12-19			67	73	38	35	0.8	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

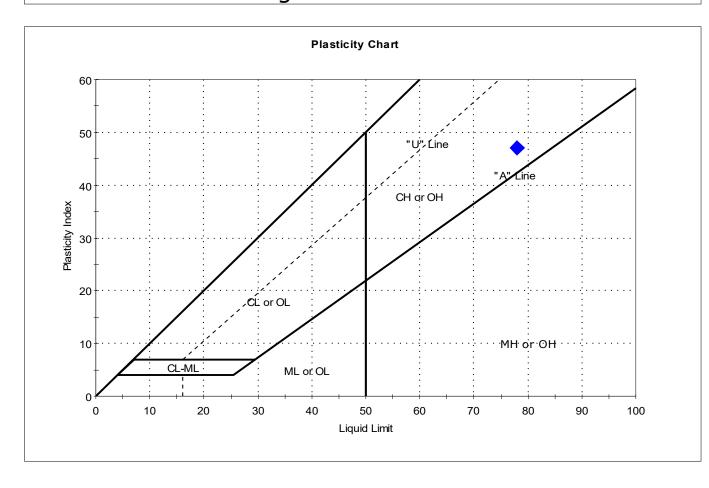
Sample ID: PDI-083SC-B-08-10 Test Date: 11/20/19 Checked By: bfs

-1910 Depth: --- Test Id: 529651

Test Comment: ---

Visual Description: Moist, dark gray clay
Sample Comment: Sample contains organics

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)83SC-B-08-10-19			76	78	31	47	1	Fat CLAY (CH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

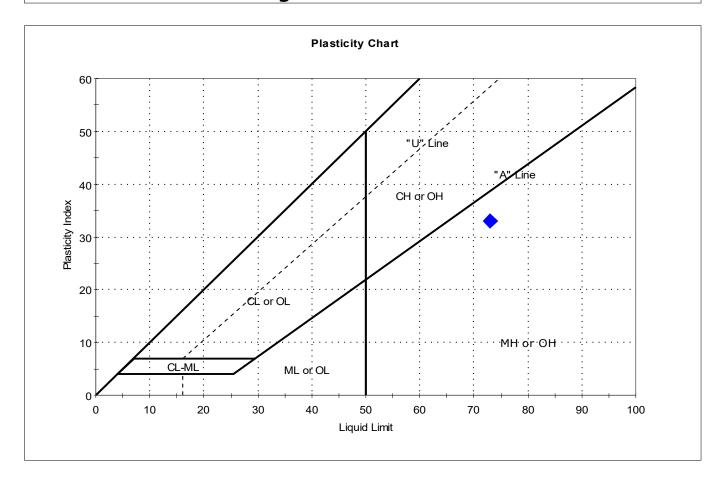
Sample ID: PDI-097SC-B-02-04 Test Date: 11/19/19 Checked By: bfs

-1910 Depth: --- Test Id: 529654

Test Comment: ---

Visual Description: Wet, dark gray silt
Sample Comment: Sample contains organics

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	)97SC-B-02-04-19			87	73	40	33	1.4	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: --- Sample Type: bag Tested By: cam

Sample ID: PDI-099SC-B-02-04 Test Date: 11/20/19 Checked By: bfs

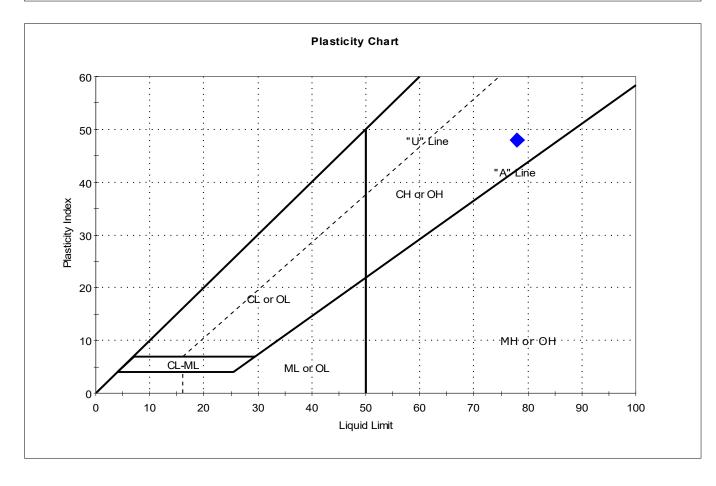
-1910 Depth: --- Test Id: 529652

Test Comment: ---

Visual Description: Moist, very dark gray clay

Sample Comment: ---

#### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	099SC-B-02-04-19			80	78	30	48	1	Fat CLAY (CH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg

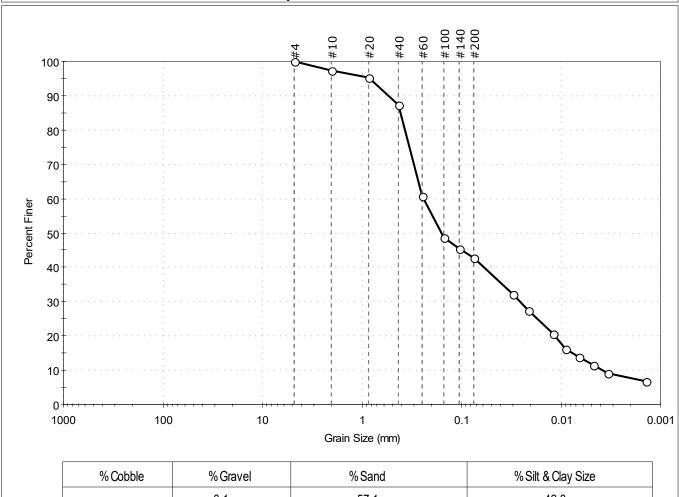
Sample ID: PDI-071SC-2-06-08 est Date: 11/27/19 Checked By: bfs Test Id: 531000

-19100T Depth: Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.1	57.1	42.8

Sieve Name Sieve Size, mm		Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	97		
#20	0.85	95		
#40	0.42	87		
#60	0.25	61		
#100	0.15	49		
#140	0.11	45		
#200	0.075	43		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0303	32		
	0.0214	28		
	0.0120	21		
	0.0089	16		
	0.0067	14		
	0.0048	11		
	0.0033	9		
	0.0014	7		

<u>9</u>	<u>Coefficients</u>
D <sub>85</sub> = 0.4063 mm	$D_{30} = 0.0257 \text{ mm}$
D <sub>60</sub> = 0.2426 mm	$D_{15} = 0.0078 \text{ mm}$
D <sub>50</sub> = 0.1586 mm	$D_{10} = 0.0038 \text{ mm}$
C <sub>11</sub> =63.842	$C_c = 0.716$

**Classification** 

<u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: ---Sample Type: bag Tested By: ckg Sample ID: PDI-084SC-2-06-08 11/27/19 Checked By: bfs est Date:

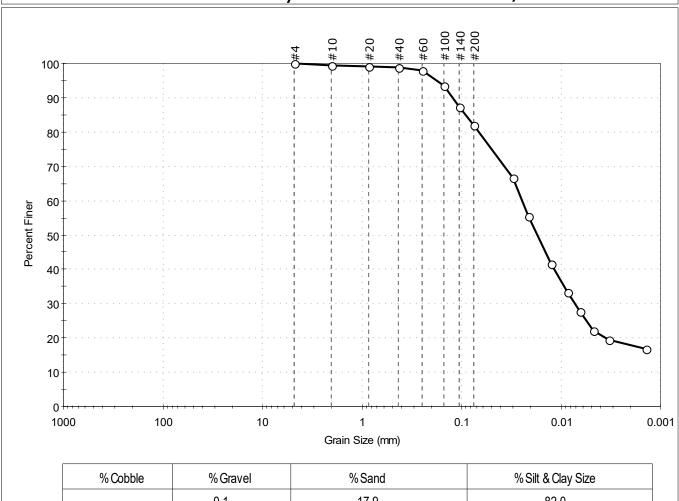
-19100T Depth: Test Id: 531001

Test Comment:

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment:

### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.1	17.9	82.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	93		
#140	0.11	87		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0306	67		
	0.0210	56		
	0.0125	42		
	0.0086	33		
	0.0064	28		
	0.0047	22		
	0.0033	19		
	0.0014	17		

Coeffic	<u>cients</u>
D <sub>85</sub> =0.0906 mm	$D_{30} = 0.0072 \text{ mm}$
D <sub>60</sub> = 0.0244 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0171 mm	$D_{10} = N/A$
C <sub>u</sub> =N/A	$C_c = N/A$

**Classification** <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Depth: --- Test Id: 527617

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-033SC-B	8.7- 10.7-191008		Moist, dark grayish brown sand	17.8
PDI-031SC-B	8.9- 10.9-191017		Moist, dark gray sand	16.0
PDI-028SC	10.7- 12.7-191003		Moist, very dark gray sand	14.7
PDI-027SC-B	11- 13.5-191011		Moist, dark gray sand	19.1
PDI-024SC-B	10- 12.1-190927		Moist, very dark gray sand with silt	38.1
PDI-022SC-B	5.5- 7.5-191016		Moist, dark gray sand	10.7
PDI-021SC-B	7.7- 9.7-190927		Moist, very dark gray sand with silt	13.0
PDI-018SC-A	06- 07-190926		Moist, very dark gray silt	77.1
PDI-018SC-A	08- 09-190926		Moist, very dark gray sand	23.3
PDI-016SC-B	06- 08-191009		Moist, dark grayish brown silty sand	34.6



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg Sample ID: ---Test Date: 10/07/19 Checked By: bfs

Test Id: Depth: 525985

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-036SC-B	4.2- 6.2-190929		Moist, very dark gray sand	14.3
PDI-038SC	B- 7.1-9.1-191009		Moist, dark gray sand with silt	20.4
PDI-039SC-B	7.8- 9.8-190930		Moist, very dark gray sand with silt	40.3
PDI-041SC-B	8.2- 10.2-191010		Moist, dark grayish brown sand	28.6
PDI-046SC-B	9.8- 11.8-191001		Moist, very dark gray silty sand	23.8
PDI-049SC-B	06- 08-191015		Moist, dark grayish brown silty sand	31.8
PDI-052SC-B	06- 08-191015		Moist, dark grayish brown silty sand	45.4
PDI-057SC-B	06- 08-191023		Wet, dark gray clay	77.2
PDI-059SC-B	06- 08-191016		Moist, dark grayish brown silty sand	38.4
PDI-064SC-B	04- 06-190929		Moist, very dark gray silt with sand	66.1



Project: Gasco PDI Location:

Location:Project No:GTX-310685Boring ID:---Tested By:ckgSample ID:---Test Date:11/19/19Checked By:bfs

Depth: --- Test Id: 529670

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-066SC-B	06- 08-191011		Moist, dark olive brown silt	67.8
PDI-067SC-B	02- 04-191010		Wet, dark olive brown silt	74.4
PDI-069SC-B	10- 12-191016		Moist, very dark gray silt	67.2
PDI-071SC-B	- 08-10-191001		Wet, very dark gray silty sand	42.8
PDI-077SC-B	04- 06-191014		Wet, dark olive brown silt	81.4
PDI-079SC-B	06- 08-191014		Wet, dark grayish brown silt	114.7
PDI-081SC-B	08- 10-191002		Wet, dark grayish olive silt with sand	64.1
PDI-083SC-B	08- 10-191022		Moist, dark gray clay	76.2
PDI-090SC-B	06- 08-191012		Moist, dark olive brown silt	81.9
PDI-097SC-B	02- 04-191017		Wet, dark gray silt	86.8



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Depth: --- Test Id: 527636

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-099SC-B	02- 04-191022		Moist, very dark gray clay	79.6
PDI-107SPT	62- 64-190923		Moist, dark olive brown silty sand	27.3
PDI-107SPT	17- 18-190923		Moist, dark gray silty sand	42.3
PDI-107SPT	04- 09-190923		Wet, dark olive brown silt	84.4
PDI-107SPT	00- 04-190923		Wet, dark olive brown silt	107.7
PDI-108SPT	33.5- 66.5-191007		Moist, dark gray sand with silt	29.8
PDI-108SPT	14- 33.5-191007		Moist, dark olive brown sand	39.5
PDI-108SPT	00- 6.4-191007		Wet, olive brown silt with sand	94.8
PDI-109SPT	48.3- 51-191004		Moist, dark olive brown silt with sand	47.9
PDI-109SPT	35.5- 48.3-191004		Moist, olive brown sand with silt	25.9



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Depth: --- Test Id: 527641

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-109SPT	22- 30-191004		Moist, olive brown sand with silt	34.5
PDI-109SPT	16.5- 18.1-191004		Moist, dark olive brown silt	80.2
PDI-109SPT	00- 6.5-191004		Wet, very dark olive silt	92.7
PDI-110 B	54- 64.5-191015		Moist, black sand with silt	18.0
PDI-110SPT	32- 45-191010		Moist, black sand	28.2
PDI-110SPT	21- 32-191010		Moist, dark gray sand	23.5
PDI-112SPT	11.5- 26.5-191003		Moist, dark gray silty sand	36.6
PDI-112SPT	37.5- 58-191003		Moist, very dark olive gray silty sand	19.1
PDI-112SPT	07- 11.5-191003		Moist, dark gray sandy silt	53.2
PDI-112SPT	00- 6.5-191003		Moist, dark brown silt	76.7



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg 10/23/19 Checked By: bfs Sample ID: ---Test Date:

Test Id: Depth: 527657

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-113SPT	31.9- 39.4-191011		Moist, dark gray silty sand	33.2
PDI-113SPT	22- 25.2-191011		Wet, dark grayish brown silt with sand	61.0
PDI-113SPT	16- 22-191011		Moist, dark grayish brown sand with silt	36.9
PDI-113SPT	06- 16-191011		Wet, dark grayish brown silt	42.8
PDI-114SPT	7.5- 12.5-191008		Moist, olive brown silt with sand	64.8
PDI-114SPT	50.5- 55-191008		Moist, dark gray silty sand	37.2
PDI-114SPT	42- 50.5-191008		Wet, olive brown sandy silt	49.6
PDI-114SPT	25.5- 28-191008		Moist, dark olive brown silty sand	30.9
PDI-114SPT	00- 7.5-191008		Wet, olive brown silt	72.9
PDI-115SPT	41.5- 49.3-191009		Moist, olive brown silty sand	38.8



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg Sample ID: ---Test Date: 10/23/19 Checked By: bfs

Test Id: Depth: 527663

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-115SPT	23- 28.1-191009		Moist, very dark olive brown sand with silt	27.8
PDI-115SPT	18.6- 20.6-191009		Moist, dark olive brown silt with sand	71.7
PDI-115SPT	06- 11-191009		Moist, very dark gray silty sand	17.4
PDI-116SPT	51.5- 54.2-190927		Moist, olive brown silty sand	27.4
PDI-116SPT	26.7- 28.6-190926		Wet, grayish brown silt	64.0
PDI-116SPT	20- 26.7-190927		Moist, dark gray silty sand	26.2
PDI-116SPT	00- 4.5-190926		Wet, olive brown silt	82.8
PDI-117SPT	53.5- 63.5-191002		Wet, dark grayish brown silt with sand	83.1
PDI-117SPT	44.1- 53.5-191002		Moist, dark gray silty sand	45.6
PDI-117SPT	29.1- 32-191002		Moist, dark gray silty sand	45.0



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 10/23/19 Checked By: bfs

Depth: --- Test Id: 527675

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-117SPT	11- 29.1-191002		Moist, dark gray sand	37.6
PDI-118SPT	46.5- 61-191014		Wet, dark grayish brown silty sand	62.1
PDI-118SPT	4.5- 15-191014		Moist, dark grayish brown silt with sand	70.1
PDI-118SPT	00- 4.5-191014		Wet, dark grayish brown silt	112.9
PDI-119SPT	9.5- 18.3-191001		Moist, dark grayish brown sand with silt	37.5
PDI-119SPT	47- 52-191001		Moist, dark grayish brown silty sand	33.5
PDI-119SPT	18.3- 31-191001		Moist, dark gray silty sand	30.4
PDI-119SPT	00- 4.5-191001		Moist, dark grayish brown silt with sand	76.8
PDI-121SPT	49.4- 54-190930		Moist, dark grayish brown silty sand	44.7
PDI-121SPT	21- 38-190930		Moist, dark olive gray silty sand	43.0



Project: Gasco PDI

Location:Project No:GTX-310685Boring ID:Sample Type:---Tested By:ckgSample ID:Test Date:10/23/19Checked By:bfs

Depth: --- Test Id: 527619

#### Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
PDI-121SPT	11- 20.7-190930		Moist, dark olive brown silt	59.6
PDI-121SPT	00- 06-190930		Moist, olive brown silt	75.8
PDI-122SPT	61- 66-190926		Wet, olive brown silty sand	41.8
PDI-122SPT	16.6- 24-190925		Moist, dark olive brown silty sand	48.8
PDI-122SPT	04- 09-190925		Wet, olive brown silt	79.7
PDI-123SPT	63.2- 65.5-190925		Moist, dark olive brown silt with sand	48.0
PDI-123SPT	25.5- 30.5-190925 Moist, dark		Moist, dark gray silty sand	18.8
PDI-123SPT	00- 4.5-190924		Wet, dark olive silt with sand	71.5
PDI-19SC-B	05- 07-191008		Moist, dark olive brown sandy silt	60.6



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 11/08/19 Checked By: bfs

Depth: --- Test Id: 527690

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI-016SC-B	06- 08-191009		Moist, dark grayish brown silty sand	2.71	
PDI-018SC-A	06- 07-190926		Moist, very dark gray silt	2.53	
PDI-018SC-A	08- 09-190926		Moist, very dark gray sand	2.73	
PDI-021SC-B	7.7- 9.7-190927		Moist, very dark gray sand with silt	2.73	
PDI-022SC-B	5.5- 7.5-191016		Moist, dark gray sand	2.75	
PDI-024SC-B	10- 12.1-190927		Moist, very dark gray sand with silt	2.76	
PDI-027SC-B	11- 13.5-191011		Moist, dark gray sand	2.74	
PDI-028SC	10.7- 12.7-191003		Moist, very dark gray sand	2.79	
PDI-031SC-B	8.9- 10.9-191017		Moist, dark gray sand	2.75	
PDI-033SC-B	8.7- 10.7-191008		Moist, dark grayish brown sand	2.73	



Project: Gasco PDI

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Boring ID: --- Sample Type: --- Tested By: ckg
Sample ID: --- Test Date: 10/10/19 Checked By: bfs

Depth: --- Test Id: 525995

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI-024SC-B	10- 12.1-190927		Moist, very dark gray sand with silt	2.76	
PDI-027SC-B	11- 13.5-191011		Moist, dark gray sand	2.74	
PDI-028SC	10.7- 12.7-191003		Moist, very dark gray sand	2.79	
PDI-031SC-B	8.9- 10.9-191017		Moist, dark gray sand	2.75	
PDI-033SC-B	8.7- 10.7-191008		Moist, dark grayish brown sand	2.73	
PDI-036SC-B	4.2- 6.2-190929		Moist, very dark gray sand	2.76	
PDI-038SC	B- 7.1-9.1-191009		Moist, dark gray sand with silt	2.69	
PDI-039SC-B	7.8- 9.8-190930		Moist, very dark gray sand with silt	2.72	
PDI-041SC-B	8.2- 10.2-191010		Moist, dark grayish brown sand	2.77	
PDI-046SC-B	9.8- 11.8-191001		Moist, very dark gray silty sand	2.77	



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 11/08/19 Checked By: bfs

Depth: --- Test Id: 527683

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI-049SC-B	06- 08-191015		Moist, dark grayish brown silty sand	2.75	
PDI-052SC-B	06- 08-191015		Moist, dark grayish brown silty sand	2.68	
PDI-057SC-B	06- 08-191023		Wet, dark gray clay	2.71	
PDI-059SC-B	06- 08-191016		Moist, dark grayish brown silty sand	2.80	
PDI-064SC-B	04- 06-190929		Moist, very dark gray silt with sand	2.63	
PDI-066SC-B	06- 08-191011		Moist, dark olive brown silt	2.56	
PDI-067SC-B	02- 04-191010		Wet, dark olive brown silt	2.65	
PDI-069SC-B	10- 12-191016		Moist, very dark gray silt	2.73	
PDI-071SC-B	- 08-10-191001		Wet, very dark gray silty sand	2.67	
PDI-077SC-B	04- 06-191014		Wet, dark olive brown silt	2.68	



Project: Gasco PDI

Location:Project No:GTX-310685Boring ID:Sample Type:---Tested By:ckgSample ID:Test Date:11/01/19Checked By:bfs

Depth: --- Test Id: 527699

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI-079SC-B	06- 08-191014		Wet, dark grayish brown silt	2.64	
PDI-081SC-B	08- 10-191002		Wet, dark grayish olive silt with sand	2.72	
PDI-083SC-B	08- 10-191022		Moist, dark gray clay	2.65	
PDI-090SC-B	06- 08-191012		Moist, dark olive brown silt	2.60	
PDI-097SC-B	02- 04-191017		Wet, dark gray silt	2.66	
PDI-099SC-B	02- 04-191022		Moist, very dark gray clay	2.71	
PDI-107SPT	00- 04-190923		Wet, dark olive brown silt	2.65	
PDI-107SPT	04- 09-190923		Wet, dark olive brown silt	2.58	
PDI-107SPT	17- 18-190923		Moist, dark gray silty sand	2.76	
PDI-107SPT	62- 64-190923		Moist, dark olive brown silty sand	2.76	



Location:

Boring ID: --- Sample Type: --- Tested By: ckg
Sample ID: --- Test Date: 10/29/19 Checked By: bfs

Project No:

GTX-310685

Depth: --- Test Id: 527709

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI-108SPT	00- 6.4-191007		Wet, olive brown silt with sand	2.55	
PDI-108SPT	14- 33.5-191007		Moist, dark olive brown sand	2.74	
PDI-108SPT	33.5- 66.5-191007		Moist, dark gray sand with silt	2.75	
PDI-109SPT	00- 6.5-191004		Wet, very dark olive silt	2.54	
PDI-109SPT	16.5- 18.1-191004		Moist, dark olive brown silt	2.55	
PDI-109SPT	22- 30-191004		Moist, olive brown sand with silt	2.72	
PDI-109SPT	35.5- 48.3-191004		Moist, olive brown sand with silt	2.75	
PDI-109SPT	48.3- 51-191004		Moist, dark olive brown silt with sand	2.62	
PDI-110 B	54- 64.5-191015		Moist, black sand with silt	2.75	
PDI-110SPT	21- 32-191010		Moist, dark gray sand	2.79	



Project: Gasco PDI

Location:Project No:GTX-310685Boring ID:Sample Type:---Tested By:ckgSample ID:Test Date:11/06/19Checked By:bfs

Depth: --- Test Id: 527719

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI-110SPT	32- 45-191010		Moist, black sand	2.76	
PDI-112SPT	00- 6.5-191003		Moist, dark brown silt	2.60	
PDI-112SPT	07- 11.5-191003		Moist, dark gray sandy silt	2.64	
PDI-112SPT	11.5- 26.5-191003		Moist, dark gray silty sand	2.75	
PDI-112SPT	37.5- 58-191003		Moist, very dark olive gray silty sand	2.75	
PDI-113SPT	06- 16-191011		Wet, dark grayish brown silt	2.73	
PDI-113SPT	16- 22-191011		Moist, dark grayish brown sand with silt	2.77	
PDI-113SPT	22- 25.2-191011		Wet, dark grayish brown silt with sand	2.66	
PDI-113SPT	31.9- 39.4-191011		Moist, dark gray silty sand	2.44	
PDI-114SPT	00- 7.5-191008		Wet, olive brown silt	2.62	



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 11/06/19 Checked By: bfs

Depth: --- Test Id: 527729

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI-114SPT	25.5- 28-191008		Moist, dark olive brown silty sand	2.75	
PDI-114SPT	42- 50.5-191008		Wet, olive brown sandy silt	2.77	
PDI-114SPT	50.5- 55-191008		Moist, dark gray silty sand	2.77	
PDI-114SPT	7.5- 12.5-191008		Moist, olive brown silt with sand	2.66	
PDI-115SPT	06- 11-191009		Moist, very dark gray silty sand	2.77	
PDI-115SPT	18.6- 20.6-191009		Moist, dark olive brown silt with sand	2.54	
PDI-115SPT	23- 28.1-191009		Moist, very dark olive brown sand with silt	2.75	
PDI-115SPT	41.5- 49.3-191009		Moist, olive brown silty sand	2.76	
PDI-116SPT	00- 4.5-190926		Wet, olive brown silt	2.67	
PDI-116SPT	20- 26.7-190927		Moist, dark gray silty sand	2.77	



Project: Gasco PDI Location:

Location: Project No: GTX-310685

Boring ID: --- Sample Type: --- Tested By: ckg

Sample ID: --- Test Date: 11/08/19 Checked By: bfs

Depth: --- Test Id: 527739

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI-116SPT	26.7- 28.6-190926		Wet, grayish brown silt	2.69	
PDI-116SPT	51.5- 54.2-190927		Moist, olive brown silty sand	2.76	
PDI-117SPT	11- 29.1-191002		Moist, dark gray sand	2.75	
PDI-117SPT	29.1- 32-191002		Moist, dark gray silty sand	2.73	
PDI-117SPT	44.1- 53.5-191002		Moist, dark gray silty sand	2.71	
PDI-117SPT	53.5- 63.5-191002		Wet, dark grayish brown silt with sand	2.66	
PDI-118SPT	00- 4.5-191014		Wet, dark grayish brown silt	2.65	
PDI-118SPT	4.5- 15-191014		Moist, dark grayish brown silt with sand	2.53	
PDI-118SPT	46.5- 61-191014		Wet, dark grayish brown silty sand	2.71	
PDI-119SPT	00- 4.5-191001		Moist, dark grayish brown silt with sand	2.62	



Project: Gasco PDI

Location:Project No:GTX-310685Boring ID:Sample Type:---Tested By:ckgSample ID:Test Date:10/29/19Checked By:bfs

Depth: --- Test Id: 527749

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI-119SPT	18.3- 31-191001		Moist, dark gray silty sand	2.70	
PDI-119SPT	47- 52-191001		Moist, dark grayish brown silty sand	2.78	
PDI-119SPT	9.5- 18.3-191001		Moist, dark grayish brown sand with silt	2.73	
PDI-121SPT	00- 06-190930		Moist, olive brown silt	2.59	
PDI-121SPT	11- 20.7-190930		Moist, dark olive brown silt	2.67	
PDI-121SPT	21- 38-190930		Moist, dark olive gray silty sand	2.73	
PDI-121SPT	49.4- 54-190930		Moist, dark grayish brown silty sand	2.70	
PDI-122SPT	04- 09-190925		Wet, olive brown silt	2.71	
PDI-122SPT	16.6- 24-190925		Moist, dark olive brown silty sand	2.71	
PDI-122SPT	61- 66-190926		Wet, olive brown silty sand	2.74	



Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: ---Sample Type: ---Tested By: ckg

Sample ID: ---Test Date: 11/08/19 Checked By: bfs

Test Id: Depth: 527689

# Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity	Comment
PDI-123SPT	00- 4.5-190924		Wet, dark olive silt with sand	2.66	
PDI-123SPT	25.5- 30.5-190925		Moist, dark gray silty sand	2.77	
PDI-123SPT	63.2- 65.5-190925		Moist, dark olive brown silt with sand	2.67	
PDI-19SC-B	05- 07-191008		Moist, dark olive brown sandy silt	2.67	



Location: Project No: GTX-310685 Boring ID: PDI-014SG Sample Type: bag Tested By: ckg

525297

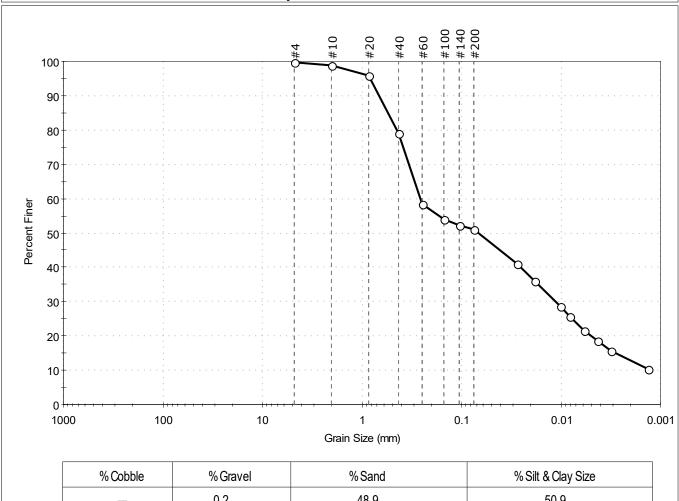
Sample ID: 00-0.99-190923 Test Date: 10/02/19 Checked By: jsc Test Id:

Depth: Test Comment:

Visual Description: Moist, very dark gray sandy silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.2	48.9	50.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies		
#4	4.75	100				
#10	2.00	99				
#20	0.85	96				
#40	0.42	79				
#60	0.25	58				
#100	0.15	54				
#140	0.11	52				
#200	0.075	51				
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies		
	0.0276	41				
	0.0182	36				
	0.0101	29				
	0.0081	26				
	0.0059	22				
	0.0043	19				
	0.0032	16				
	0.0013	10				

<u>Coefficients</u>							
D <sub>85</sub> = 0.5444 mm	$D_{30} = 0.0112 \text{ mm}$						
D <sub>60</sub> = 0.2601 mm	D <sub>15</sub> =0.0029 mm						
D <sub>50</sub> = 0.0681 mm	$D_{10} = N/A$						
C <sub>u</sub> =N/A	$C_c = N/A$						

**Classification** <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-015SG Sample Type: bag Tested By: ckg

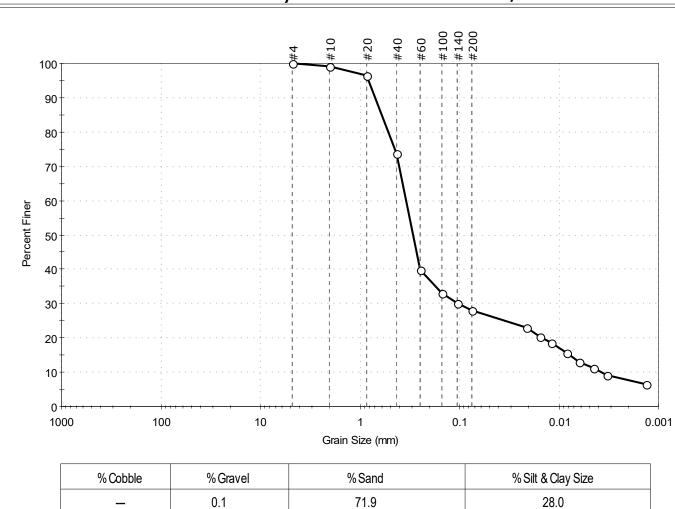
Sample ID: 00-0.87-190924 Test Date: 10/02/19 Checked By: jsc Test Id: 525298

Depth: Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	71.9	28.0

Sieve Size, mm	Percent Finer	Spec. Percent	Complies
	100		
	100		
2.00	99		
0.85	97		
0.42	74		
0.25	40		
0.15	33		
0.11	30		
0.075	28		
Particle Size (mm)	Percent Finer	Spec. Percent	Complies
0.0210	23		
0.0157	20		
0.0120	18		
0.0084	16		
0.0063	13		
0.0045	11		
0.0033	9		
0.0013	6		
	0.42 0.25 0.15 0.11 0.075 Particle Size (mm) 0.0210 0.0157 0.0120 0.0084 0.0063 0.0045 0.0033	0.42 74 0.25 40 0.15 33 0.11 30 0.075 28  Particle Size (mm) Percent Finer 0.0210 23 0.0157 20 0.0120 18 0.0084 16 0.0063 13 0.0045 11 0.0033 9	0.42 74 0.25 40 0.15 33 0.11 30 0.075 28  Particle Size (mm) Percent Finer Spec. Percent 0.0210 23 0.0157 20 0.0120 18 0.0084 16 0.0063 13 0.0045 11 0.0033 9

<u>Coefficients</u>				
D <sub>85</sub> = 0.5984 mm	$D_{30} = 0.1051 \text{ mm}$			
D <sub>60</sub> = 0.3429 mm	$D_{15} = 0.0078 \text{ mm}$			
D <sub>50</sub> = 0.2934 mm	$D_{10} = 0.0037 \text{ mm}$			
C <sub>11</sub> =92.676	$C_c = 8.706$			

**Classification** <u>ASTM</u> N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-016SC-B Sample Type: bag Tested By: ckg

527547

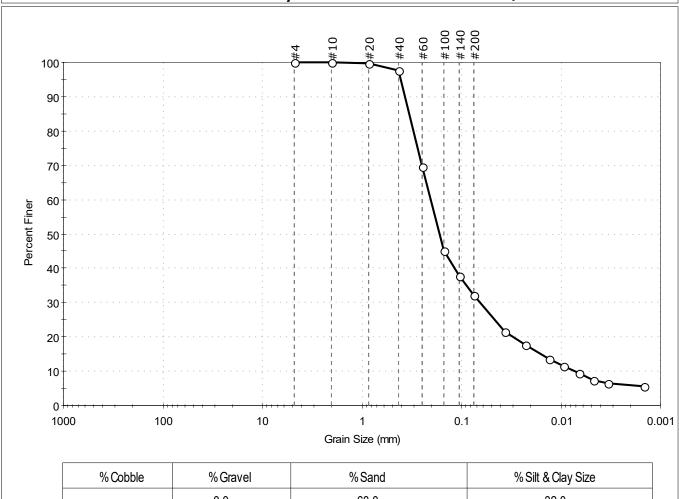
Sample ID: 06-08-191009 Test Date: 10/29/19 Checked By: bfs

Test Id: Depth: Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	68.0	32.0

_				
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
	4 75	100		
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	70		
#100	0.15	45		
#140	0.11	38		
#200	0.075	32		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0364	22		
	0.0229	18		
	0.0132	14		
	0.0094	12		
	0.0066	10		
	0.0047	7		
	0.0034	6		
	0.0015	5		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3339 mm	$D_{30} = 0.0651 \text{ mm}$			
D <sub>60</sub> = 0.2042 mm	$D_{15} = 0.0161 \text{ mm}$			
D <sub>50</sub> = 0.1659 mm	$D_{10} = 0.0072 \text{ mm}$			
C <sub>11</sub> =28.361	$C_c = 2.883$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-018SC-A Sample Type: bag Tested By: ckg

Sample ID: 06-07-190926 Test Date: 10/08/19 Checked By: bfs

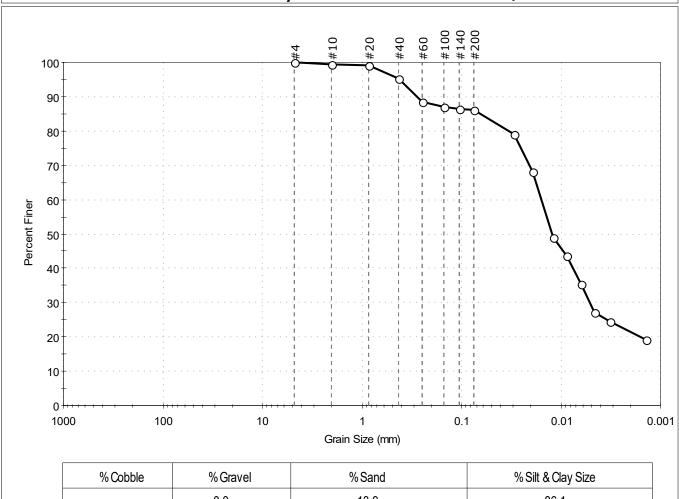
Depth: Test Id: 525971

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	13.9	86.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
	4.75	100		
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	95		
#60	0.25	89		
#100	0.15	87		
#140	0.11	87		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0294	79		
	0.0194	68		
	0.0120	49		
	0.0088	44		
	0.0063	35		
	0.0046	27		
	0.0032	25		
	0.0014	19		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0652 mm	$D_{30} = 0.0051 \text{ mm}$			
D <sub>60</sub> = 0.0158 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0123 mm	$D_{10} = N/A$			
C <sub>II</sub> =N/A	$C_C = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (47))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685
Boring ID: PDI-018SC-A Sample Type: bag Tested By: ckg

Boring ID: PDI-018SC-A Sample Type: bag Tested By: ckg Sample ID: 08-09-190926 Test Date: 10/08/19 Checked By: bfs

Depth: --- Test Id: 525972
Test Comment: ---

Visual Description: Moist, very dark gray sand

Sample Comment: ---

# Particle Size Analysis - ASTM D6913

<u>Coefficients</u>				
$D_{85} = N/A$	$D_{30} = N/A$			
$D_{60} = N/A$	$D_{15} = N/A$			
$D_{50} = N/A$	$D_{10} = N/A$			
$C_{u} = N/A$	C <sub>c</sub> =N/A			

ASHTO ()



Location: Project No: GTX-310685 ckg

525973

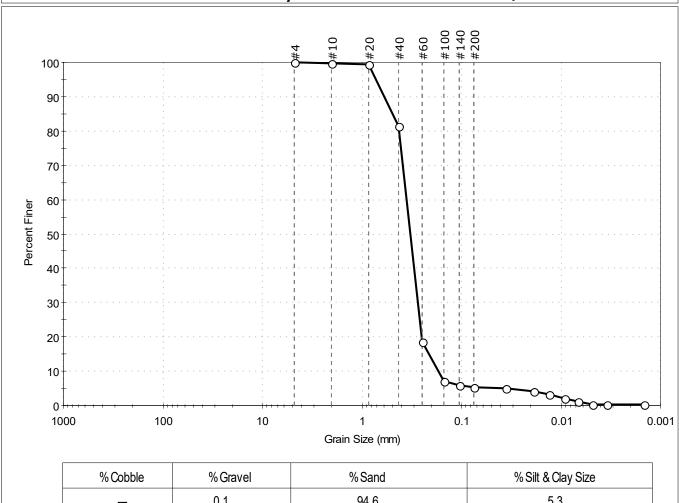
Boring ID: PDI-021SC-B Sample Type: bag Tested By: 10/08/19 Checked By: bfs Sample ID: 7.7-9.7-190927 Test Date: Test Id:

Depth: Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	94.6	5.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	82		
#60	0.25	18		
#100	0.15	7		
#140	0.11	6		
#200	0.075	5.3		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0360	5		
	0.0190	4		
	0.0132	3		
	0.0092	2		
	0.0067	1		
	0.0049	0		
	0.0034	0		
	0.0015	0		

Coe	<u>fficients</u>
D <sub>85</sub> = 0.4863 mm	$D_{30} = 0.2754 \text{ mm}$
D <sub>60</sub> = 0.3546 mm	$D_{15} = 0.2140 \text{ mm}$
D <sub>50</sub> = 0.3260 mm	$D_{10} = 0.1714 \text{ mm}$
C <sub>u</sub> =2.069	C <sub>c</sub> =1.248

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685
Boring ID: PDI-022SC-B Sample Type: bag Tested By: ckg

Boring ID: PDI-022SC-B Sample Type: bag Tested By: ckg Sample ID: 5.5-7.5-191016 Test Date: 11/19/19 Checked By: bfs

Depth: --- Test Id: 529663
Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

# Particle Size Analysis - ASTM D6913

	Coefficients
$D_{85} = N/A$	D <sub>30</sub> = N/A
$D_{60} = N/A$	$D_{15} = N/A$
$D_{50} = N/A$	$D_{10} = N/A$
$C_u = N/A$	C <sub>c</sub> =N/A

ASTM N/A

AASHTO ()



Location: Project No: GTX-310685 Boring ID: PDI-022SG Sample Type: bag Tested By: ckg

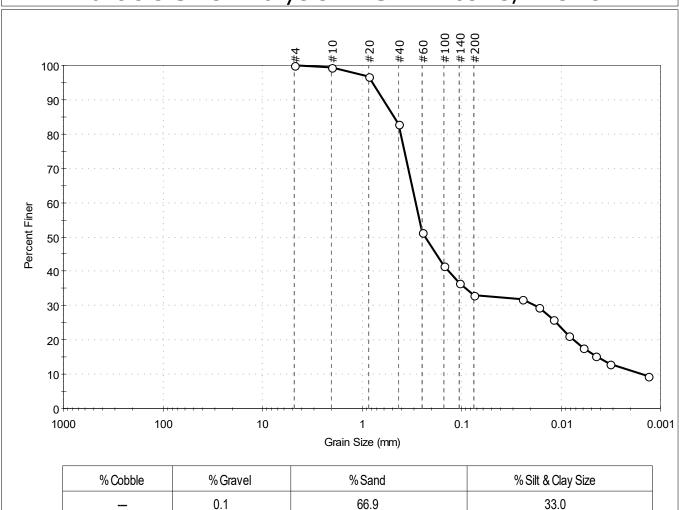
Sample ID: 00-01-190924 Test Date: 10/02/19 Checked By: jsc 525299

Depth: Test Id: Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	83		
#60	0.25	51		
#100	0.15	42		
#140	0.11	37		
#200	0.075	33		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0242	32		
	0.0168	29		
	0.0119	26		
	0.0084	21		
	0.0060	18		
	0.0045	15		
	0.0032	13		
	0.0013	9		

Coeffic	<u>cients</u>	
D <sub>85</sub> = 0.4712 mm	$D_{30} = 0.0185 \text{ mm}$	
D <sub>60</sub> = 0.2896 mm	D <sub>15</sub> =0.0043 mm	
D <sub>50</sub> = 0.2342 mm	$D_{10} = 0.0016 \text{ mm}$	
C <sub>u</sub> =181.000	$C_c = 0.739$	

Classification N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

<u>ASTM</u>

Dispersion Device : Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: PDI-024SC-B Sample Type: bag Tested By: ckg

Test Date: 10/08/19 Checked By: bfs Sample ID: 10-12.1-190927

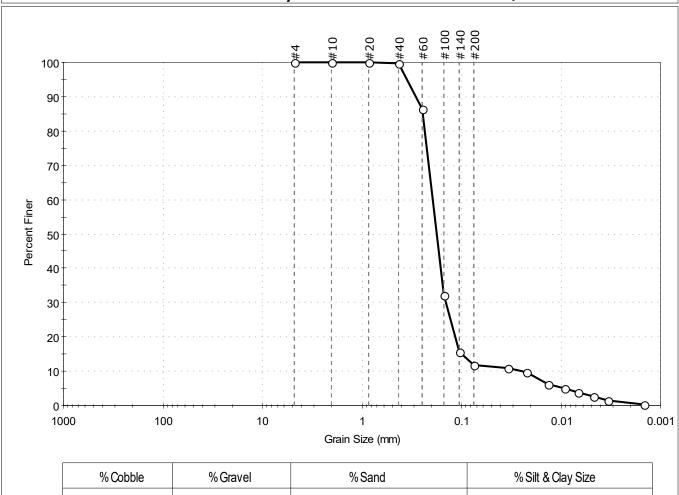
Test Id: Depth: 525974

Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	88.2	11.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	86		
#100	0.15	32		
#140	0.11	16		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0344	11		
	0.0222	10		
	0.0134	6		
	0.0091	5		
	0.0067	4		
	0.0047	3		
	0.0034	2		
	0.0015	0		

<u>Coeffi</u>	<u>cients</u>
D <sub>85</sub> = 0.2465 mm	$D_{30} = 0.1434 \text{ mm}$
D <sub>60</sub> = 0.1949 mm	D <sub>15</sub> =0.0998 mm
D <sub>50</sub> = 0.1774 mm	$D_{10} = 0.0234 \text{ mm}$
C <sub>11</sub> =8.329	$C_c = 4.509$

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

printed 12/24/2019 9:44:00 AM



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Sample Type: bag Tested By: ckg

527551

Boring ID: PDI-027SC-B Sample ID: 11-13.5-191011 Test Date: 10/25/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

# Particle Size Analysis - ASTM D6913

	Coefficients
$D_{85} = N/A$	D <sub>30</sub> = N/A
$D_{60} = N/A$	$D_{15} = N/A$
$D_{50} = N/A$	$D_{10} = N/A$
$C_u = N/A$	C <sub>c</sub> =N/A

Classification <u>ASTM</u> N/A <u>AASHTO</u> ()



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: PDI-028SC Sample Type: bag Tested By: ckg Sample ID: 10.7-12.7-191003 Test Date: 10/14/19 Checked By: bfs

Test Id: Depth: 526420

Test Comment: Visual Description: Moist, very dark gray sand

Sample Comment:

# Particle Size Analysis - ASTM D6913

	<u>Coefficients</u>
$D_{85} = N/A$	$D_{30} = N/A$
$D_{60} = N/A$	$D_{15} = N/A$
$D_{50} = N/A$	$D_{10} = N/A$
$C_{u} = N/A$	C <sub>c</sub> =N/A

Classification <u>ASTM</u> N/A <u>AASHTO</u> ()



Location:Project No:GTX-310685Boring ID:PDI-031SC-BSample Type:bagTested By:ckgSample ID:8.9-10.9-191017Test Date:11/19/19Checked By:bfs

Sample ID: 8.9-10.9-191017 Test Date: 11/19/19
Depth: --- Test Id: 529661

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

# Particle Size Analysis - ASTM D6913

	Coefficients
$D_{85} = N/A$	D <sub>30</sub> = N/A
$D_{60} = N/A$	$D_{15} = N/A$
$D_{50} = N/A$	$D_{10} = N/A$
$C_u = N/A$	C <sub>c</sub> =N/A

ASHTO ()



Location: Project No: GTX-310685

Boring ID: PDI-033SC-B Sample Type: bag Tested By: ckg

Sample ID: 8.7-10.7-191008 Test Date: 11/05/19 Checked By: bfs
Depth: --- Test Id: 527550

Test Comment: --

Visual Description: Moist, dark grayish brown sand

Sample Comment: ---

# Particle Size Analysis - ASTM D6913

	Coefficients
$D_{85} = N/A$	D <sub>30</sub> = N/A
$D_{60} = N/A$	$D_{15} = N/A$
$D_{50} = N/A$	$D_{10} = N/A$
$C_u = N/A$	C <sub>c</sub> =N/A

ASTM N/A

AASHTO ()



Location:Project No:GTX-310685Boring ID: PDI-036SC-BSample Type:bagTested By:ckgSample ID: 4.2-6.2-190929Test Date:10/08/19Checked By:bfs

Depth: --- Test Id: 525975

Test Comment: --

Visual Description: Moist, very dark gray sand

Sample Comment: ---

# Particle Size Analysis - ASTM D6913

<u>Coefficients</u>		
$D_{85} = N/A$	$D_{30} = N/A$	
$D_{60} = N/A$	$D_{15} = N/A$	
$D_{50} = N/A$	$D_{10} = N/A$	
$C_u = N/A$	C <sub>c</sub> =N/A	

ASHTO ()



Location: GTX-310685 Project No: Boring ID: PDI-038SC Sample Type: bag Tested By: ckg

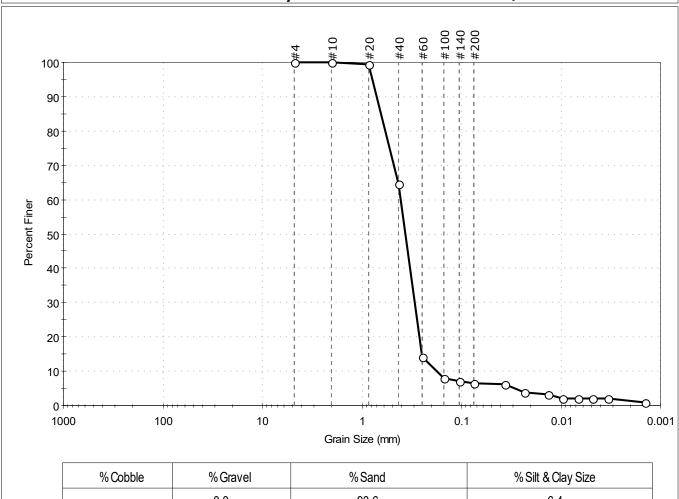
Test Date: Sample ID: B-7.1-9.1-191009 10/24/19 Checked By: bfs Test Id: 527548 Depth:

Test Comment:

Visual Description: Moist, dark gray sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	93.6	6.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	65		
#60	0.25	14		
#100	0.15	8		
#140	0.11	7		
#200	0.075	6.4		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0370	6		
	0.0235	4		
	0.0136	3		
	0.0096	2		
	0.0068	2		
	0.0048	2		
	0.0034	2		
	0.0014	1		

<u>C</u>	<u>coefficients</u>
D <sub>85</sub> = 0.6378 mm	$D_{30} = 0.2953 \text{ mm}$
D <sub>60</sub> = 0.4052 mm	$D_{15} = 0.2521 \text{ mm}$
D <sub>50</sub> = 0.3646 mm	$D_{10} = 0.1779 \text{ mm}$
C <sub>11</sub> =2.278	$C_{c} = 1.210$

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-039SC-B Sample Type: bag Tested By: ckg

525979

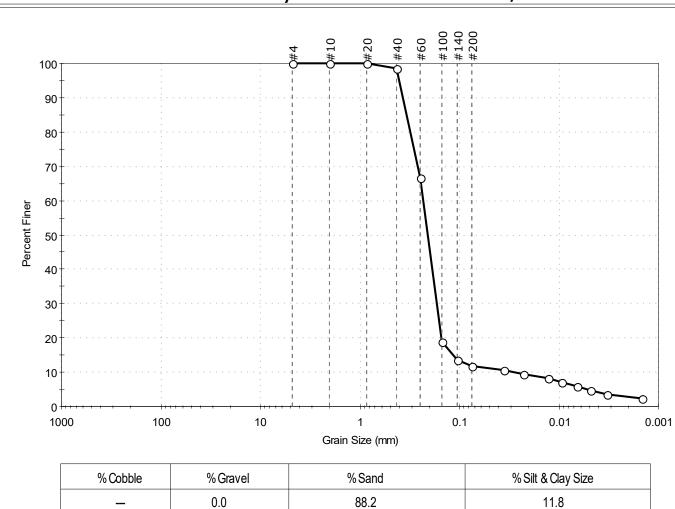
10/08/19 Checked By: bfs Sample ID: 7.8-9.8-190930 Test Date: Test Id:

Depth: Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	88.2	11.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	67		
#100	0.15	19		
#140	0.11	13		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0361	11		
	0.0226	9		
	0.0130	8		
	0.0094	7		
	0.0066	6		
	0.0048	5		
	0.0033	4		
	0.0014	2		

<u>Coefficients</u>			
D <sub>85</sub> = 0.3391 mm	$D_{30} = 0.1688 \text{ mm}$		
D <sub>60</sub> = 0.2326 mm	D <sub>15</sub> =0.1169 mm		
D <sub>50</sub> = 0.2090 mm	D <sub>10</sub> = 0.0286 mm		
C <sub>u</sub> =8.133	$C_c = 4.283$		

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685
Boring ID: PDI-041SC-B Sample Type: bag Tested By: ckg

Boring ID: PDI-041SC-B Sample Type: bag Tested By: ckg
Sample ID: 8.2-10.2-191010 Test Date: 10/30/19 Checked By: bfs
Depth: --- Test Id: 527545

Depth: ---Test Comment: ---

Visual Description: Moist, dark grayish brown sand

Sample Comment: ---

# Particle Size Analysis - ASTM D6913

<u>Coefficients</u>			
$D_{85} = N/A$	$D_{30} = N/A$		
$D_{60} = N/A$	$D_{15} = N/A$		
$D_{50} = N/A$	$D_{10} = N/A$		
$C_u = N/A$	C <sub>c</sub> =N/A		

ASTM N/A

AASHTO ()



Location: Project No: GTX-310685 Boring ID: PDI-046SC-B Sample Type: bag Tested By: ckg

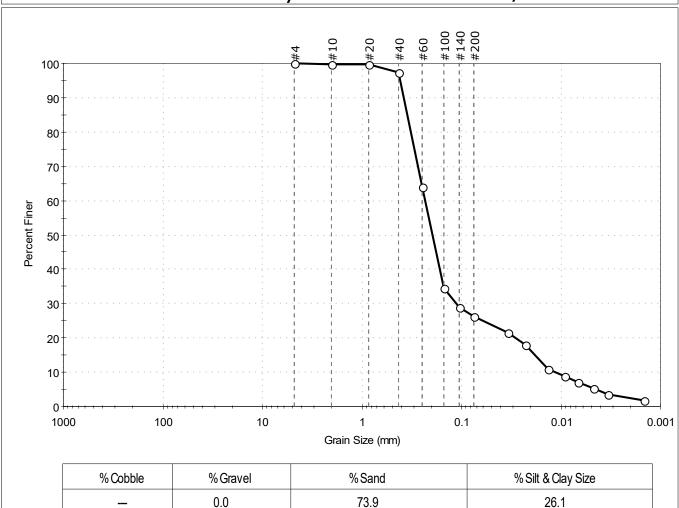
10/08/19 Checked By: bfs Test Date: Sample ID: 9.8-11.8-191001 Test Id: 525977

Depth: Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	64		
#100	0.15	34		
#140	0.11	29		
#200	0.075	26		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0340	22		
	0.0227	18		
	0.0134	11		
	0.0093	9		
	0.0067	7		
	0.0048	5		
	0.0034	4		
	0.0015	2		

<u>Coefficients</u>		
D <sub>85</sub> =0.3497 mm	$D_{30} = 0.1135 \text{ mm}$	
D <sub>60</sub> = 0.2334 mm	$D_{15} = 0.0182 \text{ mm}$	
D <sub>50</sub> = 0.1963 mm	$D_{10} = 0.0114 \text{ mm}$	
C <sub>u</sub> =20.474	$C_c = 4.842$	

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-049SC-B Sample Type: bag Tested By: ckg

527554

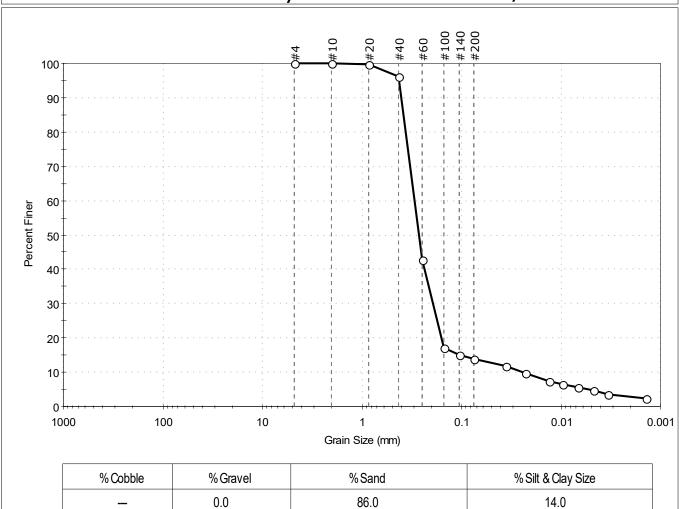
Sample ID: 06-08-191015 Test Date: 10/24/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	96		
#60	0.25	43		
#100	0.15	17		
#140	0.11	15		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0361	12		
	0.0230	10		
	0.0131	7		
	0.0095	6		
	0.0068	5		
	0.0048	5		
	0.0034	4		
	0.0014	2		

<u>Coefficients</u>		
D <sub>85</sub> =0.3801 mm	$D_{30} = 0.1941 \text{ mm}$	
D <sub>60</sub> = 0.2968 mm	$D_{15} = 0.1066 \text{ mm}$	
D <sub>50</sub> = 0.2688 mm	$D_{10} = 0.0249 \text{ mm}$	
Cu =11.920	$C_c = 5.098$	

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-052SC-B Sample Type: bag Tested By: ckg

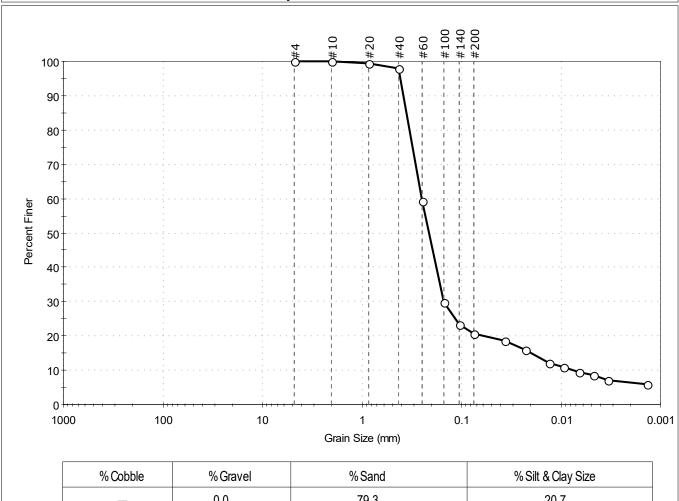
10/24/19 Checked By: bfs Sample ID: 06-08-191015 Test Date: 527555 Depth: Test Id:

Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	79.3	20.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	59		
#100	0.15	30		
#140	0.11	23		
#200	0.075	21		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0365	19		
	0.0229	16		
	0.0131	12		
	0.0094	11		
	0.0067	10		
	0.0047	8		
	0.0034	7		
	0.0014	6		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.3554 mm D <sub>30</sub> = 0.1505 mm		$D_{30} = 0.1505 \text{ mm}$	
	D <sub>60</sub> = 0.2521 mm	$D_{15} = 0.0198 \text{ mm}$	
	D <sub>50</sub> = 0.2126 mm	$D_{10} = 0.0075 \text{ mm}$	
	C <sub>11</sub> =33.613	$C_c = 11.980$	

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-057SC-B Sample Type: bag Tested By: ckg

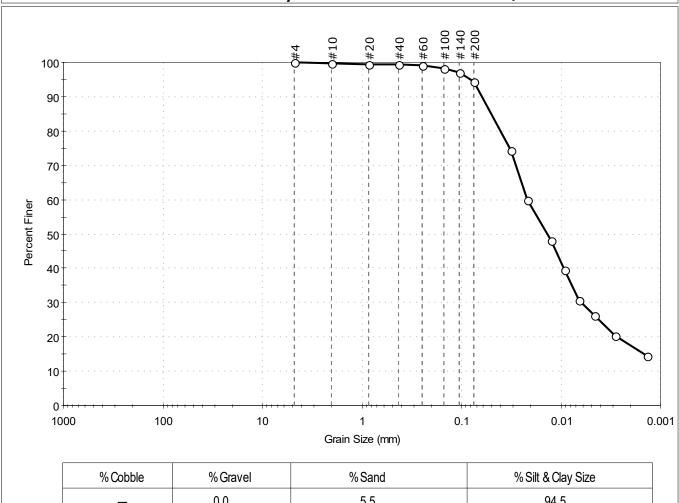
Sample ID: 06-08-191023 Test Date: 11/19/19 Checked By: bfs

Test Id: 529658 Depth:

Test Comment:

Visual Description: Wet, dark gray clay Sample Comment: Sample contains organics

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	5.5	94.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	98		
#140	0.11	97		
#200	0.075	94		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0320	74		
	0.0215	60		
	0.0126	48		
	0.0091	39		
	0.0065	31		
	0.0047	26		
	0.0029	20		
	0.0014	15		

COCITICICITES		
D <sub>85</sub> = 0.0502 mm	$D_{30} = 0.0062 \text{ mm}$	
D <sub>60</sub> = 0.0216 mm	$D_{15} = 0.0015 \text{ mm}$	
D <sub>50</sub> = 0.0137 mm	$D_{10} = N/A$	
$C_u = N/A$	$C_c = N/A$	

Coefficients

<u>Classification</u> Fat CLAY (CH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-6 (49))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-059SC-B Sample Type: bag Tested By: ckg

529664

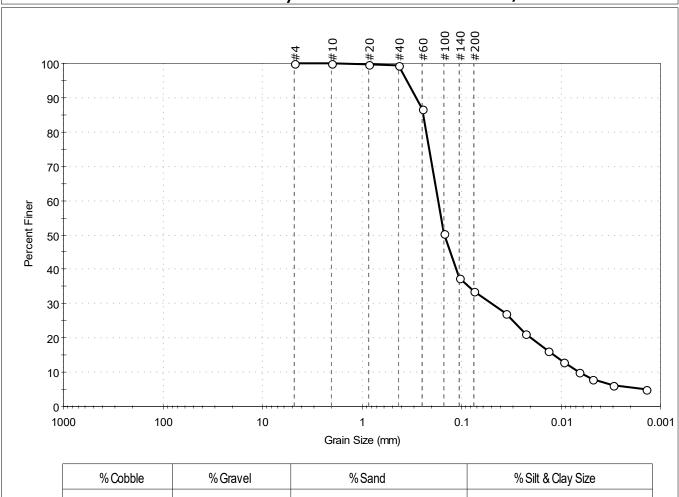
Sample ID: 06-08-191016 Test Date: 11/19/19 Checked By: bfs

Test Id: Depth: Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	66.4	33.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	87		
#100	0.15	51		
#140	0.11	37		
#200	0.075	34		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0356	27		
	0.0229	21		
	0.0133	16		
	0.0095	13		
	0.0067	10		
	0.0048	8		
	0.0030	6		
	0.0014	5		

<u>Coefficients</u>		
D <sub>85</sub> = 0.2437 mm	$D_{30} = 0.0492 \text{ mm}$	
D <sub>60</sub> = 0.1713 mm	$D_{15} = 0.0117 \text{ mm}$	
D <sub>50</sub> = 0.1477 mm	$D_{10} = 0.0066 \text{ mm}$	
C <sub>11</sub> =25.955	$C_c = 2.141$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: PDI-064SC-B Sample Type: bag Tested By: ckg

525976

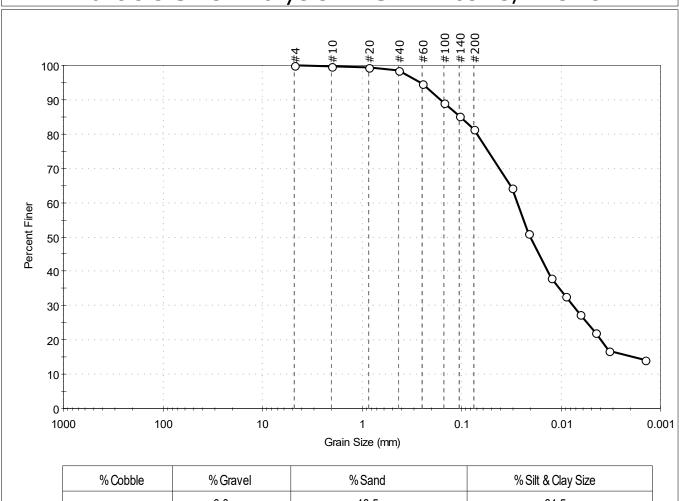
10/08/19 Checked By: bfs Sample ID: 04-06-190929 Test Date: Test Id:

Depth: Test Comment:

Visual Description: Moist, very dark gray silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	18.5	81.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	95		
#100	0.15	89		
#140	0.11	85		
#200	0.075	81		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0313	64		
	0.0212	51		
	0.0124	38		
	0.0090	33		
	0.0065	27		
	0.0045	22		
	0.0033	17		
	0.0014	14		

	<u>Coefficients</u>			
D <sub>85</sub> = 0.1044 mm		$D_{30} = 0.0076 \text{ mm}$		
	D <sub>60</sub> = 0.0275 mm	D <sub>15</sub> =0.0019 mm		
	D <sub>50</sub> = 0.0202 mm	$D_{10} = N/A$		
	C <sub>u</sub> =N/A	$C_c = N/A$		

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (29))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: PDI-066SC-B Sample Type: bag Tested By: ckg

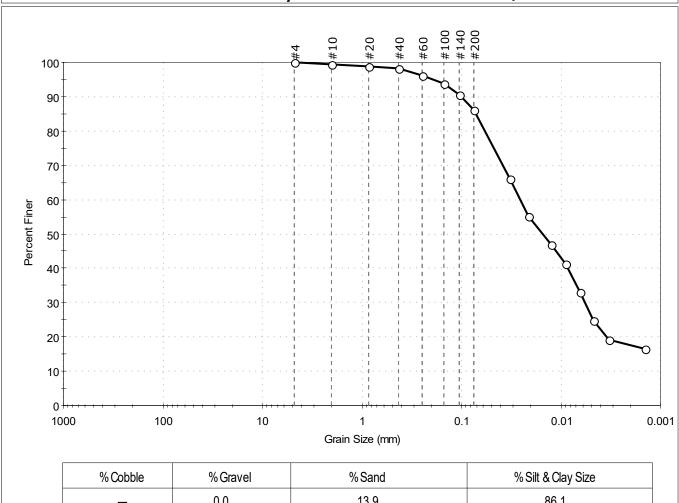
Sample ID: 06-08-191011 Test Date: 10/29/19 Checked By: bfs

Depth: Test Id: 527552

Test Comment:

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	13.9	86.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	94		
#140	0.11	90		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0324	66		
	0.0213	55		
	0.0126	47		
	0.0090	41		
	0.0065	33		
	0.0047	25		
	0.0033	19		
	0.0014	17		

<u>Coefficients</u>					
D <sub>85</sub> =0.0716 mm	$D_{30} = 0.0057 \text{ mm}$				
D <sub>60</sub> = 0.0257 mm	$D_{15} = N/A$				
D <sub>50</sub> = 0.0155 mm	$D_{10} = N/A$				
C <sub>II</sub> =N/A	$C_C = N/A$				

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (42))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: PDI-067SC-B Sample Type: bag Tested By: ckg

527546

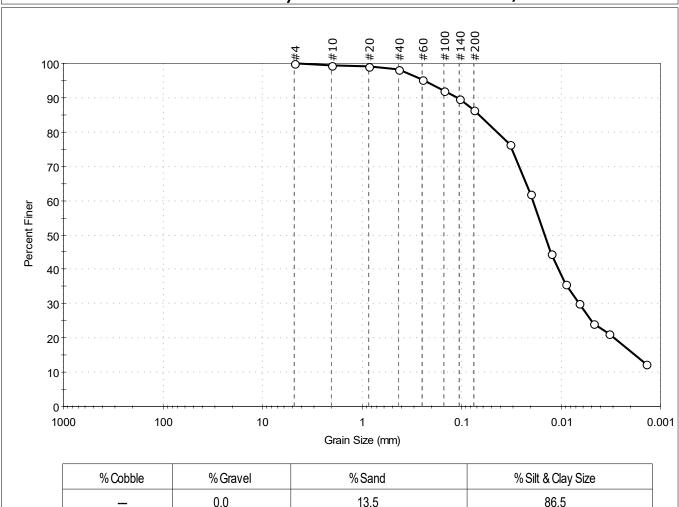
Sample ID: 02-04-191010 Test Date: 10/29/19 Checked By: bfs

Test Id: Depth: Test Comment:

Visual Description: Wet, dark olive brown silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



			_	-
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	95		
#100	0.15	92		
#140	0.11	90		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0328	76		
	0.0202	62		
	0.0126	44		
	0.0091	36		
	0.0065	30		
	0.0047	24		
	0.0033	21		

13

Sieve Name | Sieve Size, mm | Percent Finer | Spec. Percent | Complies

<u>Coefficients</u>					
D <sub>85</sub> = 0.0663 mm	$D_{30} = 0.0065 \text{ mm}$				
D <sub>60</sub> = 0.0192 mm	$D_{15} = 0.0018 \text{ mm}$				
D <sub>50</sub> = 0.0146 mm	$D_{10} = N/A$				
$C_u = N/A$	$C_C = N/A$				

<u>Classification</u> Elastic SILT (MH) **ASTM** 

AASHTO Clayey Soils (A-7-5 (32))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

0.0014



Location: Project No: GTX-310685

Boring ID: PDI-069SC-B Sample Type: bag Tested By: ckg

Boring ID: PDI-069SC-B Sample Type: bag Tested By: ckg Sample ID: 10-12-191016 Test Date: 11/19/19 Checked By: bfs

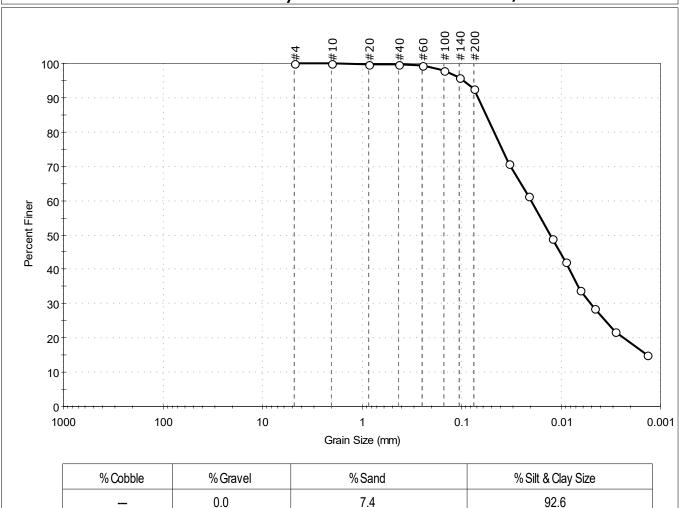
Depth: --- Test Id: 529665

Test Comment: ---

Visual Description: Moist, very dark gray silt

Sample Comment: ---

# Particle Size Analysis - ASTM D6913/D7928



#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0330	71		
	0.0210	61		
	0.0124	49		
	0.0090	42		
	0.0065	34		
	0.0046	29		

22

15

Sieve Name | Sieve Size, mm | Percent Finer | Spec. Percent | Complies

<u>Coefficients</u>					
D <sub>85</sub> = 0.0563 mm	$D_{30} = 0.0050 \text{ mm}$				
D <sub>60</sub> = 0.0199 mm	$D_{15} = 0.0014 \text{ mm}$				
D <sub>50</sub> = 0.0129 mm	$D_{10} = N/A$				
C <sub>II</sub> =N/A	$C_c = N/A$				

<u>Classification</u> <u>ASTM</u> Elastic SILT (MH)

AASHTO Clayey Soils (A-7-5 (40))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Samu, States tarties Smaps :

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute
Est. Specific Gravity: 2.65
Separation of Sample: #200 Sieve

0.0029

0.0014



Location: Project No: GTX-310685 Boring ID: PDI-071SC-B Sample Type: bag Tested By: ckg

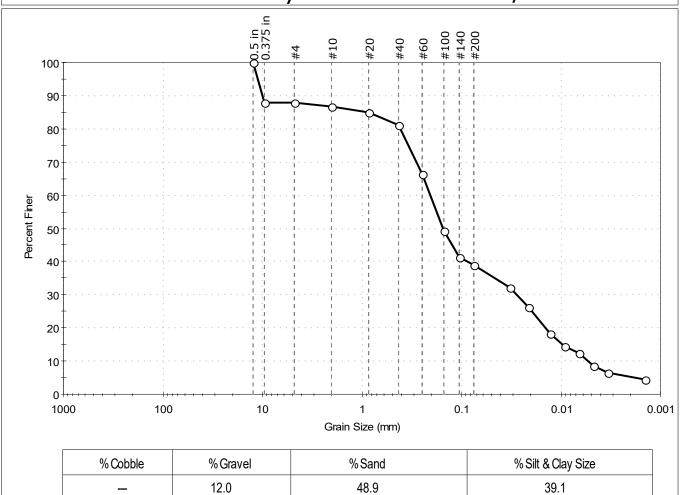
10/08/19 Checked By: bfs Sample ID: -08-10-191001 Test Date: Test Id: 525978

Depth: Test Comment:

Visual Description: Wet, very dark gray silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size	
_	12.0	48.9	39.1	

		<u> </u>		
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	88		
#4	4.75	88		
#10	2.00	87		
#20	0.85	85		
#40	0.42	81		
#60	0.25	66		
#100	0.15	49		
#140	0.11	41		
#200	0.075	39		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0328	32		
	0.0212	26		
	0.0129	18		
	0.0093	14		
	0.0067	12		
	0.0047	9		
	0.0033	7		
	0.0014	5		

<u>Coefficients</u>					
D <sub>85</sub> = 0.8858 mm	$D_{30} = 0.0279 \text{ mm}$				
D <sub>60</sub> = 0.2068 mm	$D_{15} = 0.0097 \text{ mm}$				
D <sub>50</sub> = 0.1534 mm	$D_{10} = 0.0054 \text{ mm}$				
C <sub>11</sub> = 38 296	$C_c = 0.697$				

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

<u>AASHTO</u> Silty Soils (A-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness: HARD

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: PDI-077SC-B Sample Type: bag Tested By: ckg

527543

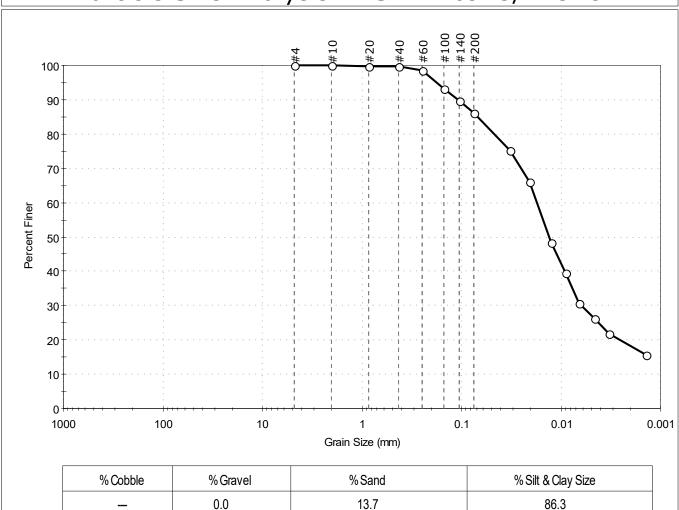
10/29/19 Checked By: bfs Sample ID: 04-06-191014 Test Date: Test Id:

Depth: Test Comment:

Visual Description: Wet, dark olive brown silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	93		
#140	0.11	90		
#200	0.075	86		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0326	75		
	0.0208	66		
	0.0126	48		
	0.0090	39		
	0.0065	31		
	0.0046	26		
	0.0033	22		
	0.0014	16		

<u>Coefficients</u>					
D <sub>85</sub> = 0.0682 mm	$D_{30} = 0.0062 \text{ mm}$				
D <sub>60</sub> = 0.0175 mm	$D_{15} = N/A$				
$D_{50} = 0.0132 \text{ mm}$	$D_{10} = N/A$				
$C_u = N/A$	$C_{c} = N/A$				

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (29))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-079SC-B Sample Type: bag Tested By: ckg

527544

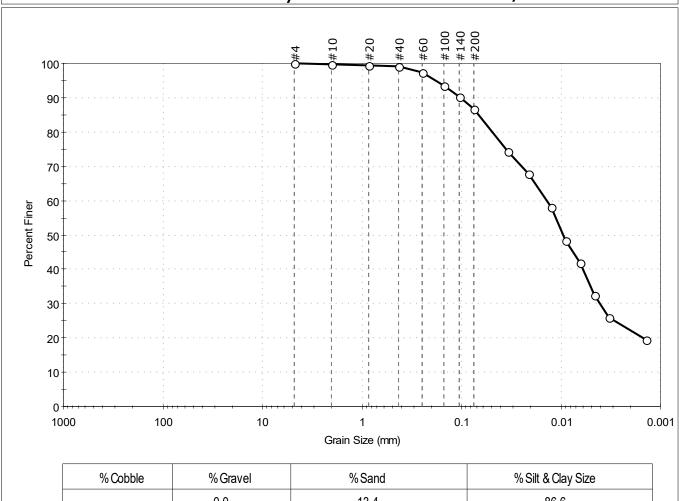
Sample ID: 06-08-191014 Test Date: 10/24/19 Checked By: bfs

Test Id: Depth: Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



ne	Sieve Size, mm Percen	t Finer Spec. Percent (	Complies	Coefficients	_
	_	0.0	13.4	86.6	
	% Cobble	% Gravel	% Sand	% Silt & Clay Size	

Sieve Name	Sieve Size, mm	<b>Percent Finer</b>	Spec. Percent	Complies
	,			
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	97		
#100	0.15	94		
#140	0.11	90		
#200	0.075	87		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0341	74		
	0.0213	68		
	0.0125	58		
	0.0090	48		
	0.0064	42		
	0.0046	32		
	0.0033	26		
	0.0014	19		

COCI	HICICIICS
D <sub>85</sub> = 0.0677 mm	$D_{30} = 0.0041 \text{ mm}$
D <sub>60</sub> = 0.0138 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0095 mm	$D_{10} = N/A$
$C_u = N/A$	C <sub>c</sub> =N/A

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (24))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-081SC-B Sample Type: bag Tested By: ckg

526421

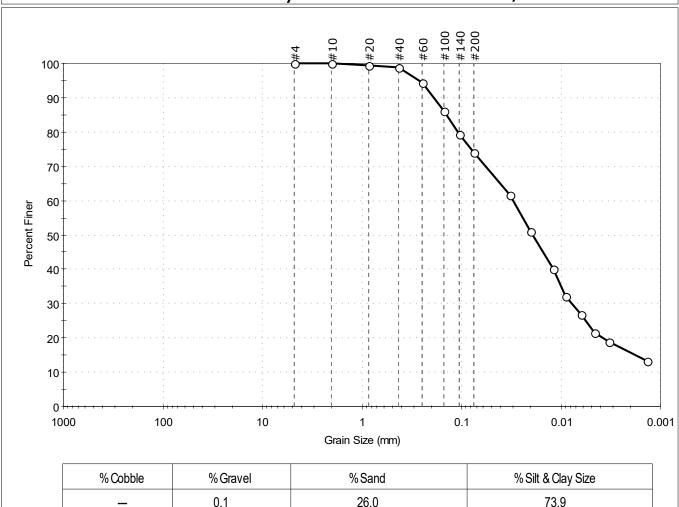
Sample ID: 08-10-191002 Test Date: 10/14/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Wet, dark grayish olive silt with sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	94		
#100	0.15	86		
#140	0.11	79		
#200	0.075	74		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0325	62		
	0.0204	51		
	0.0121	40		
	0.0089	32		
	0.0063	27		
	0.0046	21		
	0.0033	19		
	0.0014	13		

<u>Coefficients</u>				
D <sub>85</sub> = 0.1414 mm	$D_{30} = 0.0078 \text{ mm}$			
D <sub>60</sub> = 0.0301 mm	$D_{15} = 0.0018 \text{ mm}$			
D <sub>50</sub> = 0.0194 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_C = N/A$			

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (17))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



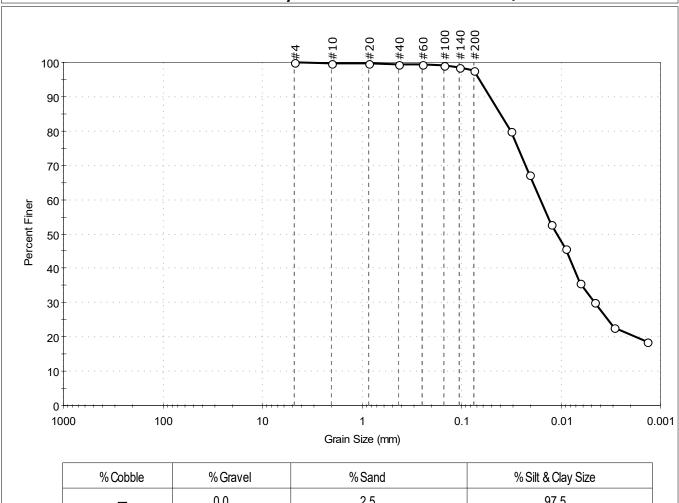
Location: Project No: GTX-310685 Boring ID: PDI-083SC-B Sample Type: bag Tested By: ckg

Sample ID: 08-10-191022 Test Date: 11/19/19 Checked By: bfs Depth: Test Id: 529659

Test Comment:

Visual Description: Moist, dark gray clay Sample Comment: Sample contains organics

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	2.5	97.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#140	0.11	99		
#200	0.075	98		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0320	80		
	0.0208	67		
	0.0125	53		
	0.0089	46		
	0.0065	36		
	0.0046	30		
	0.0029	23		
	0.0014	19		

<u>Coefficients</u>			
D <sub>85</sub> =0.0408 mm	$D_{30} = 0.0046 \text{ mm}$		
D <sub>60</sub> = 0.0161 mm	$D_{15} = N/A$		
D <sub>50</sub> = 0.0109 mm	$D_{10} = N/A$		
Cu =N/A	$C_c = N/A$		

<u>Classification</u> Fat CLAY (CH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (55))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-090SC-B Sample Type: bag Tested By: ckg

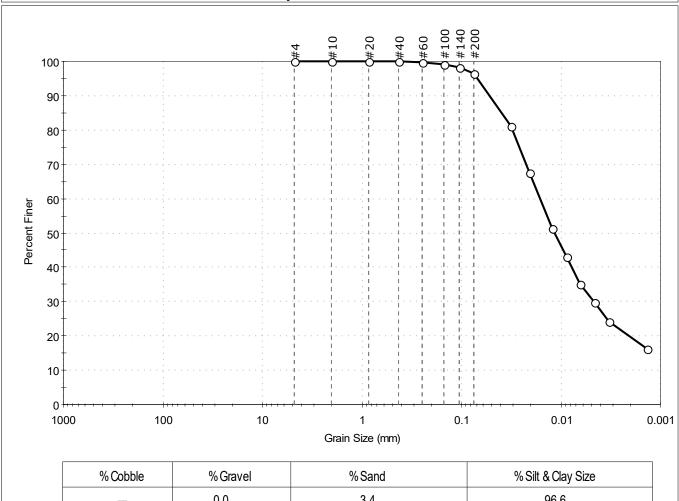
Sample ID: 06-08-191012 Test Date: 10/29/19 Checked By: bfs

Depth: Test Id: 527553

Test Comment:

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	3.4	96.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	99		
#140	0.11	98		
#200	0.075	97		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0322	81		
	0.0207	68		
	0.0123	51		
	0.0089	43		
	0.0064	35		
	0.0046	30		
	0.0033	24		
	0.0014	16		

<u>Coefficients</u>			
D <sub>85</sub> =0.0400 mm	$D_{30} = 0.0047 \text{ mm}$		
D <sub>60</sub> = 0.0163 mm	$D_{15} = N/A$		
D <sub>50</sub> = 0.0117 mm	$D_{10} = N/A$		
Cu =N/A	$C_c = N/A$		

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (51))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Separation of Sample: #200 Sieve

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65



Location: Project No: GTX-310685 Boring ID: PDI-097SC-B Sample Type: bag Tested By: ckg

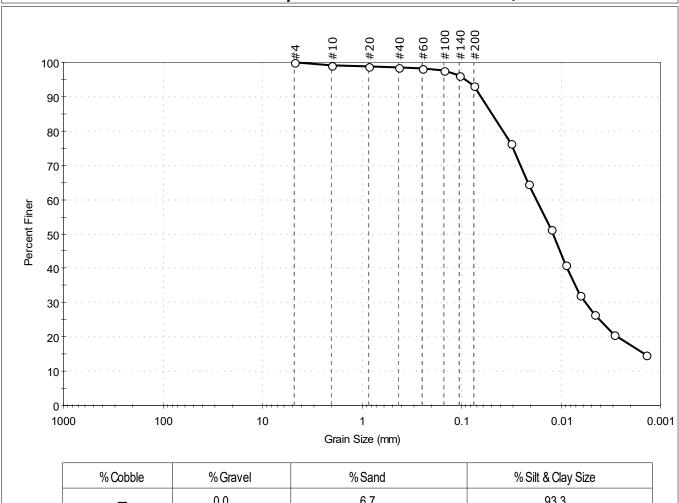
529662

Sample ID: 02-04-191017 Test Date: 11/19/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Wet, dark gray silt Sample Comment: Sample contains organics

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	6.7	93.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	98		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0318	76		
	0.0212	65		
	0.0125	51		
	0.0091	41		
	0.0065	32		
	0.0047	26		
	0.0030	21		
	0.0014	15		

<u>Coefficients</u>		
D <sub>85</sub> = 0.0493 mm	$D_{30} = 0.0057 \text{ mm}$	
D <sub>60</sub> = 0.0177 mm	$D_{15} = 0.0014 \text{ mm}$	
D <sub>50</sub> = 0.0120 mm	$D_{10} = N/A$	
$C_u = N/A$	$C_C = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (39))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-099SC-B Sample Type: bag Tested By: ckg

529660

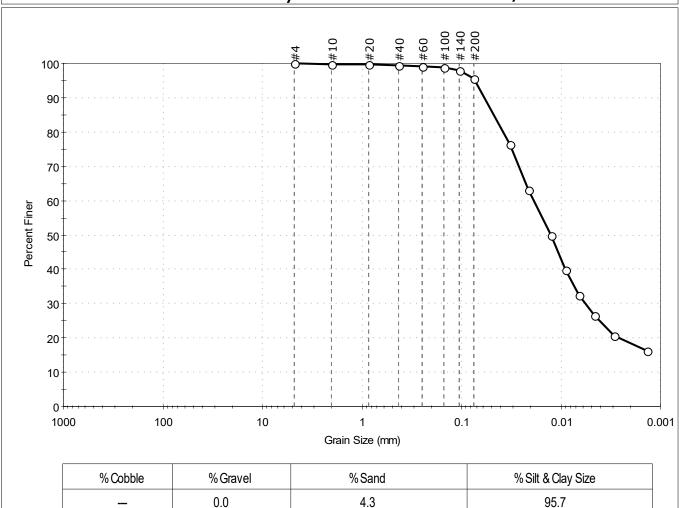
11/19/19 Checked By: bfs Sample ID: 02-04-191022 Test Date: Test Id:

Depth: Test Comment:

Visual Description: Moist, very dark gray clay

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#140	0.11	98		
#200	0.075	96		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0326	76		
	0.0214	63		
	0.0126	50		
	0.0091	40		
	0.0065	32		
	0.0047	26		
	0.0029	21		
	0.0014	16		

<u>Coefficients</u>		
D <sub>85</sub> = 0.0472 mm	$D_{30} = 0.0057 \text{ mm}$	
$D_{60} = 0.0188 \text{ mm}$	$D_{15} = N/A$	
D <sub>50</sub> = 0.0126 mm	$D_{10} = N/A$	
$C_u = N/A$	$C_{c} = N/A$	

<u>Classification</u> Fat CLAY (CH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (54))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-101SG Sample Type: bag Tested By: ckg

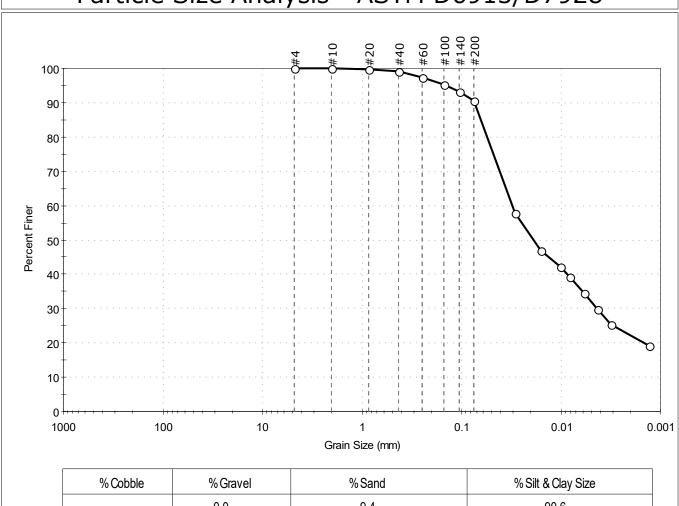
Sample ID: 00-01-190924 Test Date: 10/02/19 Checked By: jsc Test Id: 525300

Depth: Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	9.4	90.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	97		
#100	0.15	95		
#140	0.11	93		
#200	0.075	91		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0289	58		
	0.0160	47		
	0.0101	42		
	0.0082	39		
	0.0058	35		
	0.0043	30		
	0.0031	25		
	0.0013	19		

<u>Coefficients</u>		
D <sub>85</sub> = 0.0637 mm	$D_{30} = 0.0043 \text{ mm}$	
D <sub>60</sub> = 0.0308 mm	$D_{15} = N/A$	
D <sub>50</sub> = 0.0189 mm	$D_{10} = N/A$	
$C_u = N/A$	$C_C = N/A$	

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-102SG Sample Type: bag Tested By: ckg

Sample ID: 00-01-190924 Test Date: 10/02/19 Checked By: jsc

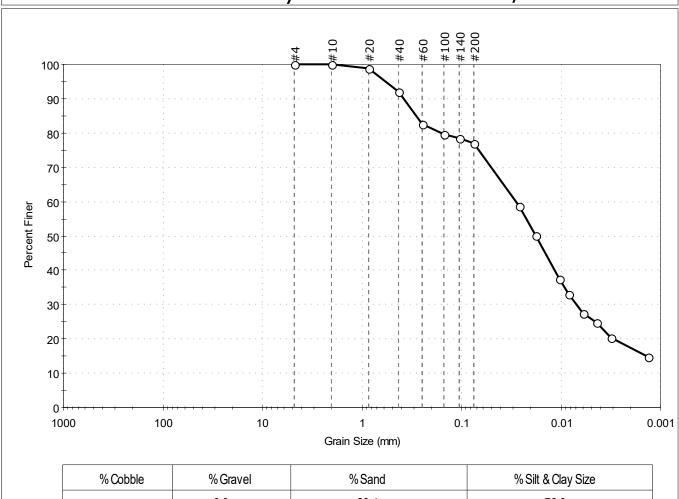
Depth: Test Id: 525301

Test Comment:

Visual Description: Moist, very dark gray silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	23.1	76.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	92		
#60	0.25	83		
#100	0.15	80		
#140	0.11	78		
#200	0.075	77		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0264	59		
	0.0179	50		
	0.0104	37		
	0.0083	33		
	0.0059	27		
	0.0044	25		
	0.0032	20		
	0.0013	15		

<u>Coefficients</u>		
D <sub>85</sub> = 0.2852 mm	$D_{30} = 0.0069 \text{ mm}$	
D <sub>60</sub> = 0.0283 mm	$D_{15} = 0.0014 \text{ mm}$	
D <sub>50</sub> = 0.0177 mm	$D_{10} = N/A$	
Cu =N/A	$C_c = N/A$	

**Classification** <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-103SG Sample Type: bag Tested By: ckg

525302

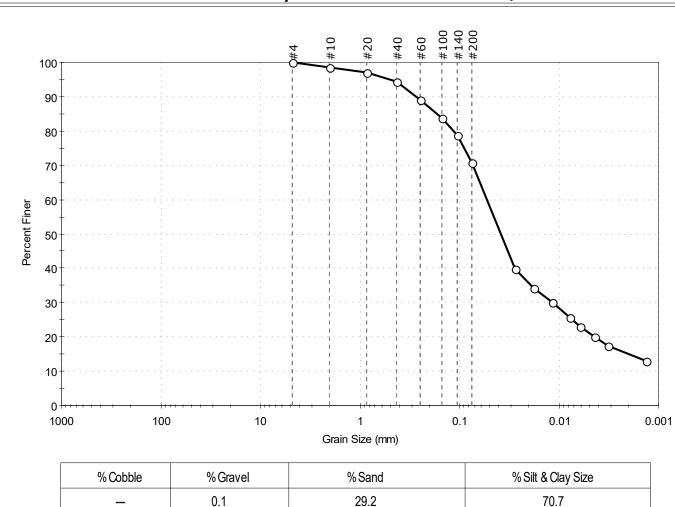
Sample ID: 00-01-190924 Test Date: 10/02/19 Checked By: jsc Depth: Test Id:

Test Comment:

Visual Description: Moist, very dark gray silt with sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	29.2	70.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	94		
#60	0.25	89		
#100	0.15	84		
#140	0.11	79		
#200	0.075	71		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0277	40		
	0.0179	34		
	0.0117	30		
	0.0078	26		
	0.0061	23		
	0.0044	20		
	0.0032	17		
	0.0013	13		

<u>Coefficients</u>		
D <sub>85</sub> = 0.1678 mm	$D_{30} = 0.0116 \text{ mm}$	
D <sub>60</sub> = 0.0531 mm	$D_{15} = 0.0020 \text{ mm}$	
D <sub>50</sub> = 0.0384 mm	$D_{10} = N/A$	
C <sub>u</sub> =N/A	C <sub>c</sub> =N/A	

Classification <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-104SG Sample Type: bag Tested By: ckg

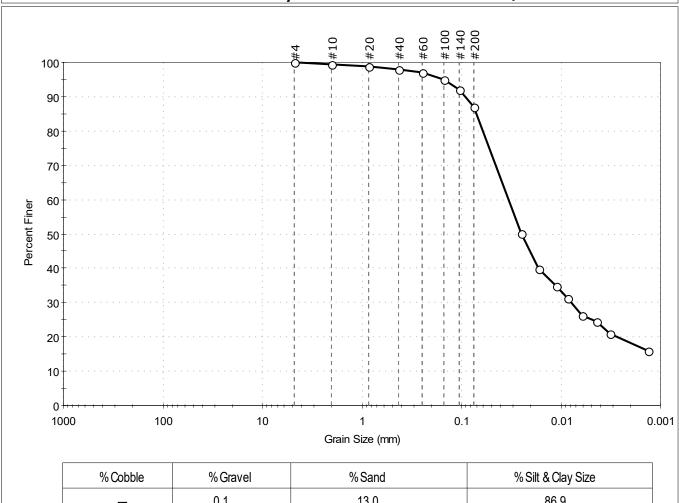
Sample ID: 00-01-190924 Test Date: 10/02/19 Checked By: jsc

Depth: Test Id: 525303 Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	13.0	86.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	95		
#140	0.11	92		
#200	0.075	87		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0253	50		
	0.0167	40		
	0.0111	35		
	0.0086	31		
	0.0061	26		
	0.0044	24		
	0.0032	21		
	0.0013	16		

<u>Coefficients</u>		
D <sub>85</sub> = 0.0709 mm	$D_{30} = 0.0079 \text{ mm}$	
D <sub>60</sub> = 0.0339 mm	$D_{15} = N/A$	
D <sub>50</sub> = 0.0252 mm	$D_{10} = N/A$	
Cu =N/A	$C_C = N/A$	

**Classification** <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-105SG Sample Type: bag Tested By: ckg

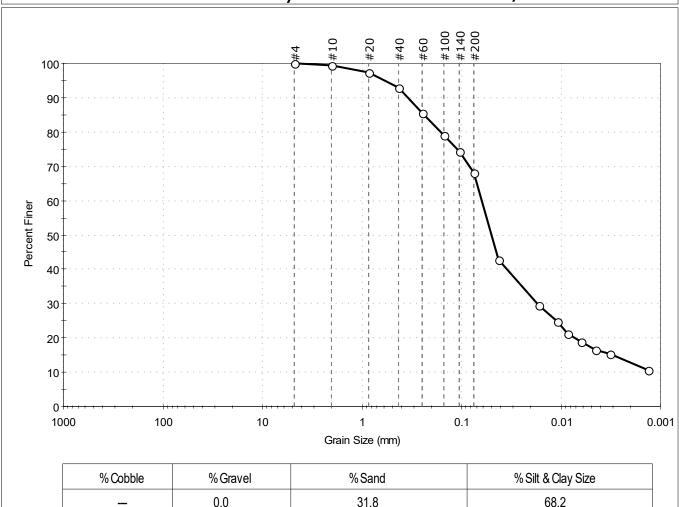
Sample ID: 00-0.99-190924 Test Date: 10/02/19 Checked By: jsc Depth: Test Id: 525304

Test Comment:

Visual Description: Moist, very dark gray sandy silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	93		
#60	0.25	85		
#100	0.15	79		
#140	0.11	74		
#200	0.075	68		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0425	43		
	0.0169	30		
	0.0109	25		
	0.0085	21		
	0.0062	19		
	0.0045	17		
	0.0032	15		
	0.0013	11		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2406 mm	$D_{30} = 0.0174 \text{ mm}$			
D <sub>60</sub> = 0.0625 mm	$D_{15} = 0.0030 \text{ mm}$			
D <sub>50</sub> = 0.0501 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_C = N/A$			

**Classification** <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-106SG Sample Type: bag Tested By: ckg

Sample ID: 00-01-190924 Test Date: 10/02/19 Checked By: jsc

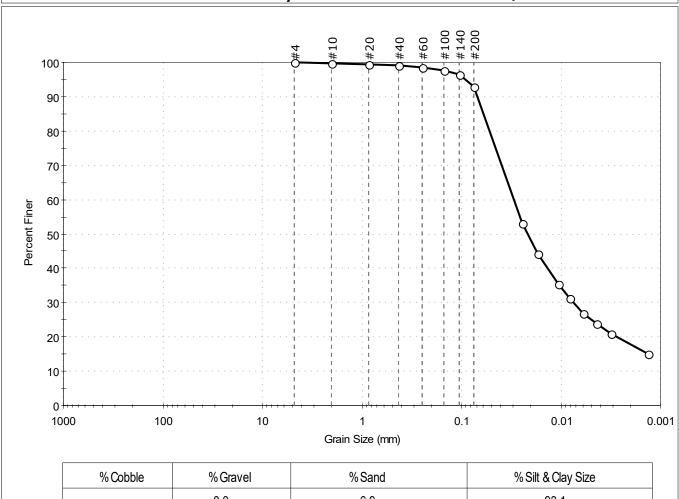
Depth: Test Id: 525305

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	6.9	93.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0243	53		
	0.0173	44		
	0.0106	36		
	0.0082	31		
	0.0060	27		
	0.0044	24		
	0.0032	21		
	0.0013	15		
				-

<u>Coefficients</u>			
D <sub>85</sub> = 0.0598 mm	$D_{30} = 0.0075 \text{ mm}$		
D <sub>60</sub> = 0.0295 mm	$D_{15} = N/A$		
D <sub>50</sub> = 0.0216 mm	$D_{10} = N/A$		
Cu =N/A	$C_c = N/A$		

**Classification** <u>ASTM</u> N/A AASHTO Silty Soils (A-4 (0))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: PDI-107SPT Sample Type: bag Tested By: ckg

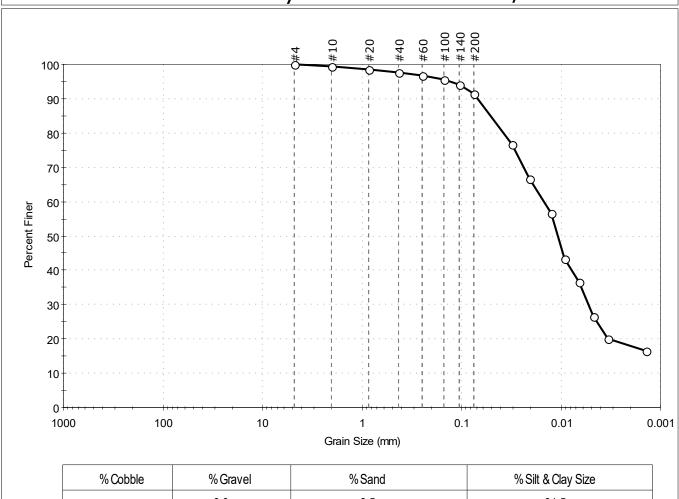
Sample ID: 00-04-190923 Test Date: 11/06/19 Checked By: bfs 527556 Test Id:

Depth: Test Comment:

Visual Description: Wet, dark olive brown silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	8.5	91.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	96		
#140	0.11	94		
#200	0.075	91		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0308	77		
	0.0208	67		
	0.0125	57		
	0.0091	43		
	0.0065	37		
	0.0047	27		
	0.0033	20		
	0.0014	17		

<u>Coefficients</u>		
D <sub>85</sub> =0.0509 mm	$D_{30} = 0.0052 \text{ mm}$	
D <sub>60</sub> = 0.0149 mm	$D_{15} = N/A$	
D <sub>50</sub> = 0.0107 mm	$D_{10} = N/A$	
Cu =N/A	$C_c = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (53))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



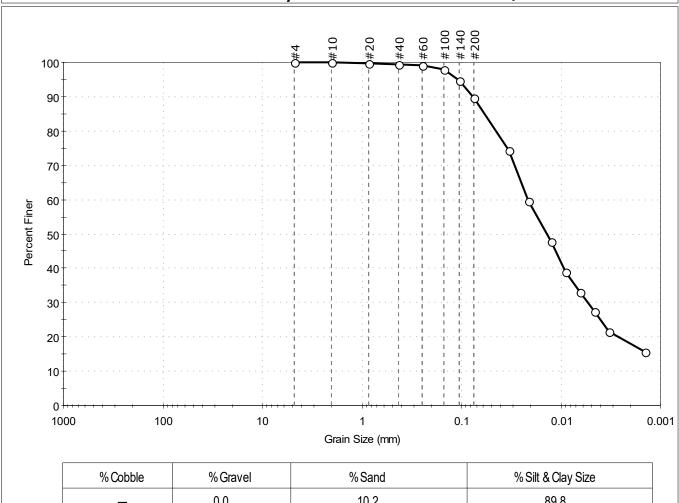
Location: Project No: GTX-310685 Boring ID: PDI-107SPT Sample Type: bag Tested By: ckg

Sample ID: 04-09-190923 Test Date: 11/06/19 Checked By: bfs Test Id: 527557

Depth: Test Comment:

Visual Description: Wet, dark olive brown silt Sample Comment: Sample contains organics

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	10.2	89.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#140	0.11	95		
#200	0.075	90		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0330	74		
	0.0213	60		
	0.0126	48		
	0.0091	39		
	0.0065	33		
	0.0046	27		
	0.0033	21		
	0.0014	16		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.0583 mm		$D_{30} = 0.0054 \text{ mm}$	
	D <sub>60</sub> = 0.0216 mm	$D_{15} = N/A$	
	$D_{50} = 0.0138 \text{ mm}$	$D_{10} = N/A$	
	$C_{u} = N/A$	$C_C = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (30))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-107SPT Sample Type: bag Tested By: ckg

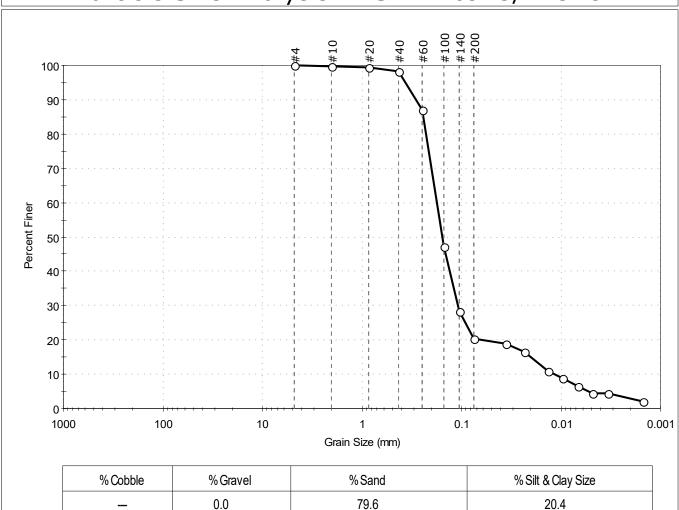
Test Date: 11/06/19 Checked By: bfs Sample ID: 17-18-190923

Test Id: 527558 Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	87		
#100	0.15	47		
#140	0.11	28		
#200	0.075	20		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0355	19		
	0.0233	17		
	0.0135	11		
	0.0096	9		
	0.0068	7		
	0.0048	4		
	0.0034	4		
	0.0015	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2437 mm	$D_{30} = 0.1094 \text{ mm}$			
D <sub>60</sub> = 0.1767 mm	$D_{15} = 0.0199 \text{ mm}$			
D <sub>50</sub> = 0.1554 mm	$D_{10} = 0.0114 \text{ mm}$			
$C_u = 15.500$	$C_c = 5.941$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-107SPT Sample Type: bag Tested By: ckg

527559

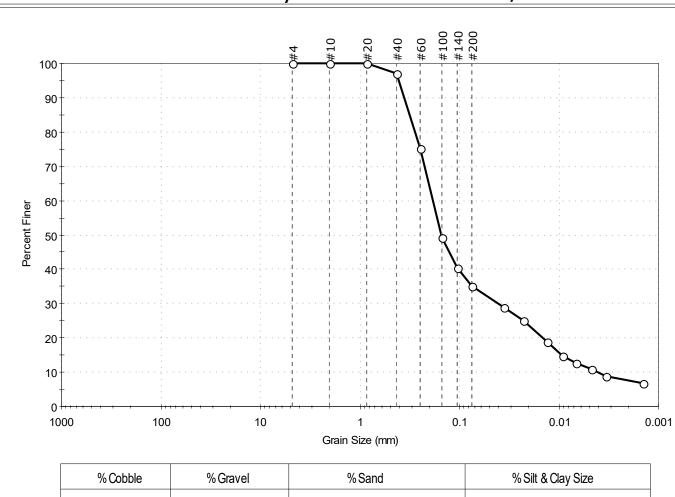
Test Date: 11/06/19 Checked By: bfs Sample ID: 62-64-190923

Test Id: Depth: Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	64.8	35.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	75		
#100	0.15	49		
#140	0.11	40		
#200	0.075	35		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0357	29		
	0.0225	25		
	0.0131	19		
	0.0093	15		
	0.0067	13		
	0.0047	11		
	0.0034	9		
	0.0014	7		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3165 mm	$D_{30} = 0.0401 \text{ mm}$	
D <sub>60</sub> = 0.1854 mm	$D_{15} = 0.0094 \text{ mm}$	
D <sub>50</sub> = 0.1524 mm	$D_{10} = 0.0042 \text{ mm}$	
C <sub>11</sub> =44.143	$C_c = 2.065$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Soils (A-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-108SPT Sample Type: bag Tested By: ckg

527560

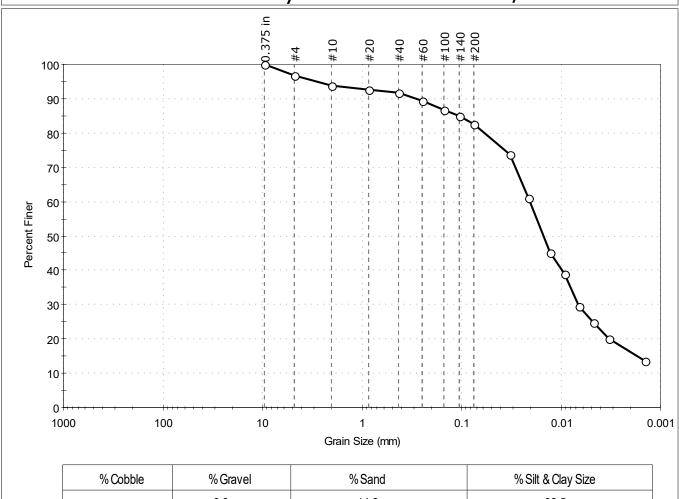
11/01/19 Checked By: bfs Sample ID: 00-6.4-191007 Test Date: Test Id:

Depth: Test Comment:

Visual Description: Wet, olive brown silt with sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	3.3	14.2	82.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	97		
#10	2.00	94		
#20	0.85	93		
#40	0.42	92		
#60	0.25	89		
#100	0.15	87		
#140	0.11	85		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0328	74		
	0.0213	61		
	0.0127	45		
	0.0091	39		
	0.0066	29		
	0.0047	25		
	0.0033	20		
	0.0014	14		

<u>Coefficients</u>				
D <sub>85</sub> = 0.1081 mm	$D_{30} = 0.0067 \text{ mm}$			
D <sub>60</sub> = 0.0206 mm	$D_{15} = 0.0017 \text{ mm}$			
D <sub>50</sub> = 0.0149 mm	$D_{10} = N/A$			
$C_u = N/A$	C <sub>c</sub> =N/A			

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (41))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness: HARD

Dispersion Device: Apparatus A - Mech Mixer



Location:Project No:GTX-310685Boring ID:PDI-108SPTSample Type: bagTested By: ckg

Sample ID: 14-33.5-191007 Test Date: 11/01/19 Checked By: bfs

Depth: --- Test Id: 527561

Test Comment: ---

Visual Description: Moist, dark olive brown sand Sample Comment: ---

Particle Size Analysis - ASTM D6913

<u>Coefficients</u>			
$D_{85} = N/A$	$D_{30} = N/A$		
$D_{60} = N/A$	$D_{15} = N/A$		
$D_{50} = N/A$	$D_{10} = N/A$		
$C_u = N/A$	C <sub>C</sub> =N/A		

ASTM N/A Classification

AASHTO ()

Sample/Test Description



Location: GTX-310685 Project No: Boring ID: PDI-108SPT Sample Type: bag Tested By: ckg

527562

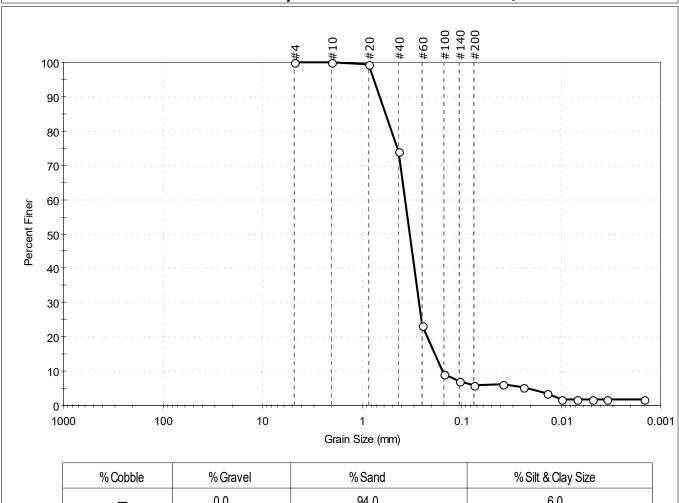
Test Date: Sample ID: 33.5-66.5-191007 11/01/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray sand with silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	94.0	6.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	74		
#60	0.25	23		
#100	0.15	9		
#140	0.11	7		
#200	0.075	6.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0385	6		
	0.0237	5		
	0.0137	4		
	0.0098	2		
	0.0069	2		
	0.0049	2		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.5740 mm	$D_{30} = 0.2682 \text{ mm}$			
D <sub>60</sub> = 0.3670 mm	$D_{15} = 0.1849 \text{ mm}$			
D <sub>50</sub> = 0.3306 mm	$D_{10} = 0.1541 \text{ mm}$			
C <sub>u</sub> =2.382	C <sub>c</sub> =1.272			

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



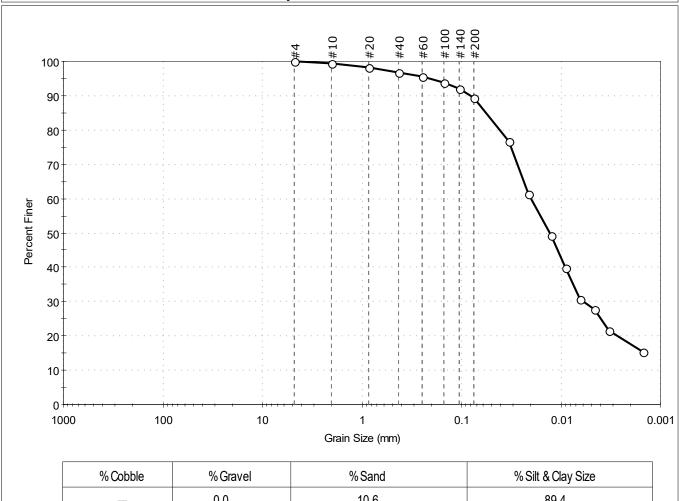
Location: Project No: GTX-310685 Boring ID: PDI-109SPT Sample Type: bag Tested By: ckg Sample ID: 00-6.5-191004 Test Date: 10/29/19 Checked By: bfs

527563 Depth: Test Id:

Test Comment:

Visual Description: Wet, very dark olive silt Sample Comment: Sample contains organics

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	10.6	89.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	97		
#60	0.25	96		
#100	0.15	94		
#140	0.11	92		
#200	0.075	89		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0332	77		
	0.0211	61		
	0.0125	49		
	0.0090	40		
	0.0065	31		
	0.0046	28		
	0.0033	22		
	0.0015	15		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0563 mm	$D_{30} = 0.0060 \text{ mm}$			
D <sub>60</sub> = 0.0199 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0130 mm	$D_{10} = N/A$			
Cu =N/A	$C_c = N/A$			

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (48))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-109SPT Sample Type: bag Tested By: ckg

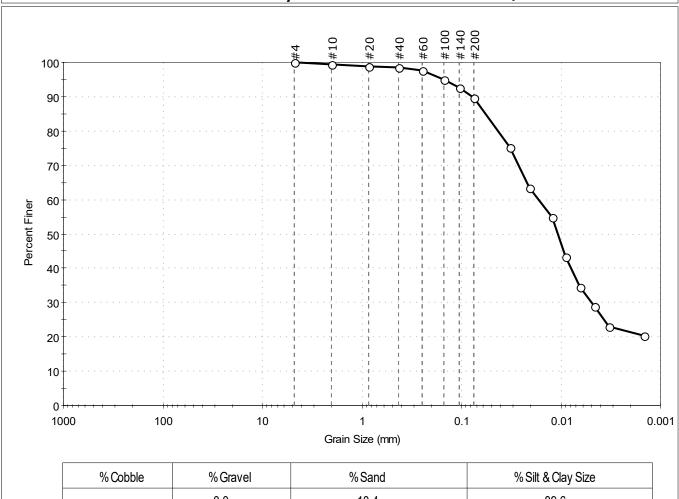
Test Date: 10/29/19 Checked By: bfs Sample ID: 16.5-18.1-191004 Test Id: 527564

Depth: Test Comment:

Visual Description: Moist, dark olive brown silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	10.4	89.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	98		
#100	0.15	95		
#140	0.11	93		
#200	0.075	90		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0329	75		
	0.0209	64		
	0.0123	55		
	0.0089	43		
	0.0064	35		
	0.0046	29		
	0.0033	23		
	0.0015	20		

<u>Coefficients</u>					
D <sub>85</sub> = 0.0578 mm	$D_{30} = 0.0049 \text{ mm}$				
D <sub>60</sub> = 0.0168 mm	$D_{15} = N/A$				
D <sub>50</sub> = 0.0107 mm	$D_{10} = N/A$				
C <sub>II</sub> =N/A	$C_C = N/A$				

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (38))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No:

Boring ID: PDI-109SPT Sample Type: bag Tested By: ckg Test Date: 10/29/19 Checked By: bfs Sample ID: 22-30-191004

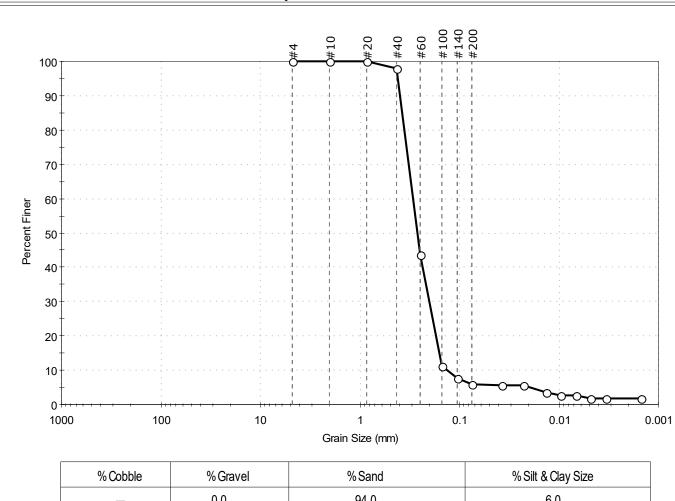
Test Id: 527565 Depth:

Test Comment:

Visual Description: Moist, olive brown sand with silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	94.0	6.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	44		
#100	0.15	11		
#140	0.11	8		
#200	0.075	6.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0374	5		
	0.0229	5		
	0.0134	4		
	0.0095	3		
	0.0067	3		
	0.0048	2		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3747 mm	$D_{30} = 0.2015 \text{ mm}$			
D <sub>60</sub> = 0.2933 mm	D <sub>15</sub> =0.1592 mm			
D <sub>50</sub> = 0.2659 mm	$D_{10} = 0.1336 \text{ mm}$			
C <sub>u</sub> =2.195	$C_c = 1.036$			

GTX-310685

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: PDI-109SPT Sample Type: bag Tested By: ckg

527566

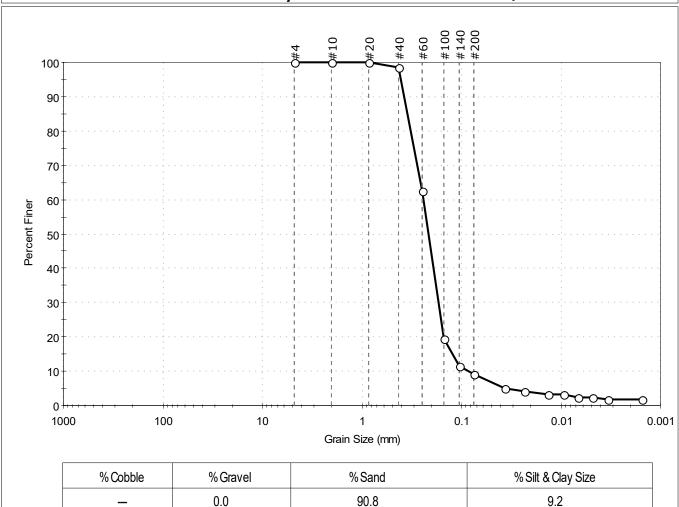
10/29/19 Checked By: bfs Test Date: Sample ID: 35.5-48.3-191004 Test Id:

Depth: Test Comment:

Visual Description: Moist, olive brown sand with silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	63		
#100	0.15	20		
#140	0.11	11		
#200	0.075	9.2		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0365	5		
	0.0233	4		
	0.0133	3		
	0.0095	3		
	0.0067	2		
	0.0048	2		
	0.0034	2		
	0.0015	2		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.3483 mm		$D_{30} = 0.1699 \text{ mm}$	
	D <sub>60</sub> = 0.2426 mm	$D_{15} = 0.1233 \text{ mm}$	
D <sub>50</sub> = 0.2154 mm		$D_{10} = 0.0849 \text{ mm}$	
	Cu =2.857	$C_{c} = 1.401$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-109SPT Sample Type: bag Tested By: ckg

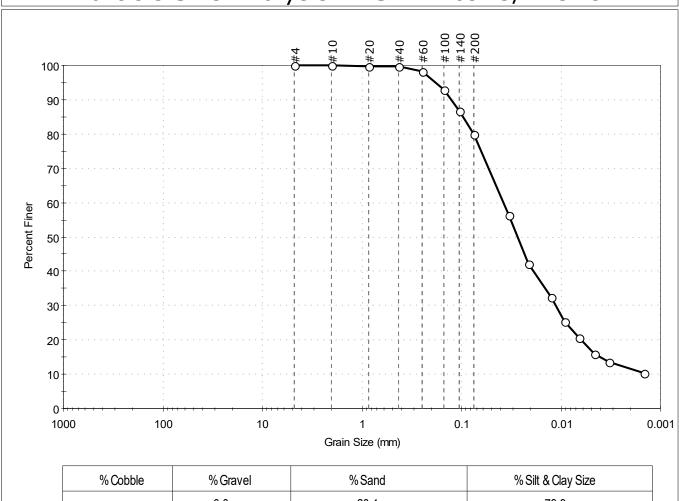
Test Date: 10/29/19 Checked By: bfs Sample ID: 48.3-51-191004 Test Id: 527567 Depth:

Test Comment:

Visual Description: Moist, dark olive brown silt with sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	20.1	79.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	98		
#100	0.15	93		
#140	0.11	87		
#200	0.075	80		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0335	56		
	0.0210	42		
	0.0126	33		
	0.0091	25		
	0.0065	21		
	0.0046	16		
	0.0033	14		
	0.0015	10		

<u>Coefficients</u>			
D <sub>85</sub> = 0.0976 mm	$D_{30} = 0.0112 \text{ mm}$		
D <sub>60</sub> = 0.0380 mm	D <sub>15</sub> =0.0041 mm		
D <sub>50</sub> = 0.0273 mm	$D_{10} = N/A$		
C <sub>u</sub> =N/A	C <sub>c</sub> =N/A		

<u>Classification</u> SILT with Sand (ML) **ASTM** 

AASHTO Silty Soils (A-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: PDI-110 B Sample Type: bag Tested By: ckg

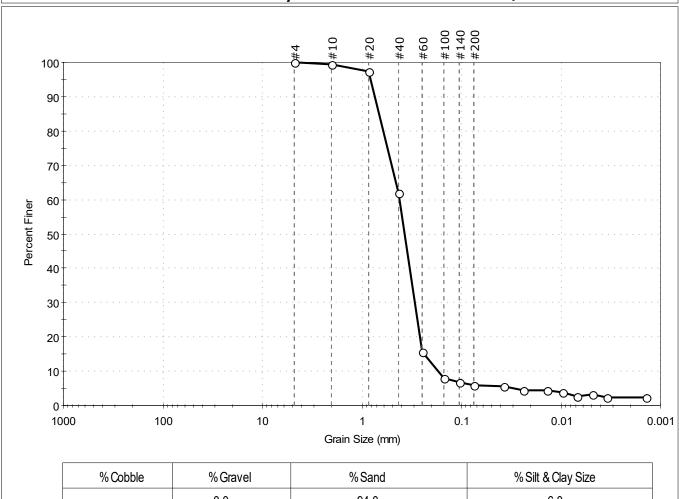
Test Date: Sample ID: 54-64.5-191015 10/29/19 Checked By: bfs 527568 Test Id:

Depth: Test Comment:

Visual Description: Moist, black sand with silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	94.0	6.0

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	97		
#40	0.42	62		
#60	0.25	16		
#100	0.15	8		
#140	0.11	7		
#200	0.075	6.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0375	6		
	0.0237	4		
	0.0137	4		
	0.0096	4		
	0.0068	3		
	0.0048	3		
	0.0034	2		
	0.0014	2		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.6681 mm		$D_{30} = 0.2948 \text{ mm}$	
	D <sub>60</sub> = 0.4158 mm	D <sub>15</sub> =0.2399 mm	
D <sub>50</sub> = 0.3707 mm		$D_{10} = 0.1717 \text{ mm}$	
	C <sub>u</sub> =2.422	$C_c = 1.217$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: PDI-110SPT Sample Type: bag Tested By: ckg

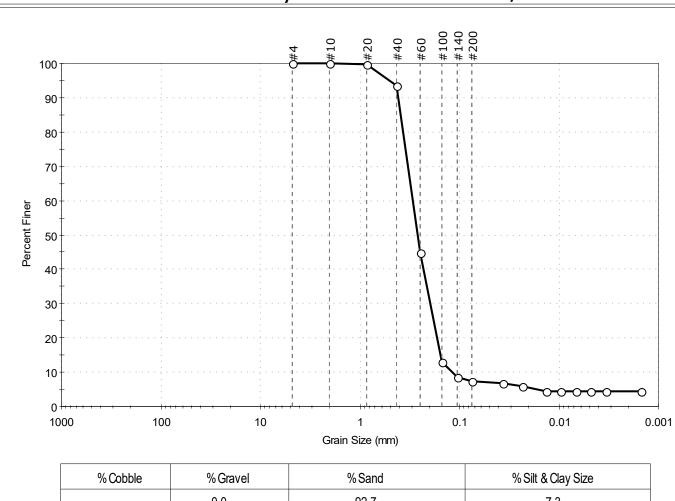
Test Date: 10/29/19 Checked By: bfs Sample ID: 21-32-191010 Test Id: 527569

Depth: Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	92.7	7.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	94		
#60	0.25	45		
#100	0.15	13		
#140	0.11	9		
#200	0.075	7.3		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0368	7		
	0.0232	6		
	0.0135	5		
	0.0096	5		
	0.0068	5		
	0.0048	5		
	0.0034	5		
	0.0015	5		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.3872 mm		$D_{30} = 0.1973 \text{ mm}$	
	D <sub>60</sub> = 0.2950 mm	D <sub>15</sub> =0.1552 mm	
	D <sub>50</sub> = 0.2646 mm	$D_{10} = 0.1184 \text{ mm}$	
	C <sub>u</sub> =2.492	$C_c = 1.115$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u> AASHTO Fine Sand (A-3 (1))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

printed 12/24/2019 9:45:07 AM



Location: Project No: GTX-310685

Roring ID: PDI-110SPT Sample Type: hag Tested By: ckg

Boring ID: PDI-110SPT Sample Type: bag Tested By: ckg
Sample ID: 32-45-191010 Test Date: 10/30/19 Checked By: bfs
Depth: --- Test Id: 527570

Test Comment: --

Visual Description: Moist, black sand

Sample Comment: ---

# Particle Size Analysis - ASTM D6913

<u>Coefficients</u>			
$D_{85} = N/A$	D <sub>30</sub> = N/A		
$D_{60} = N/A$	$D_{15} = N/A$		
$D_{50} = N/A$	$D_{10} = N/A$		
$C_u = N/A$	C <sub>c</sub> =N/A		

ASHTO ()

Sample/Test Description



Location: Project No: GTX-310685 Boring ID: PDI-112SPT Sample Type: bag Tested By: ckg

527571

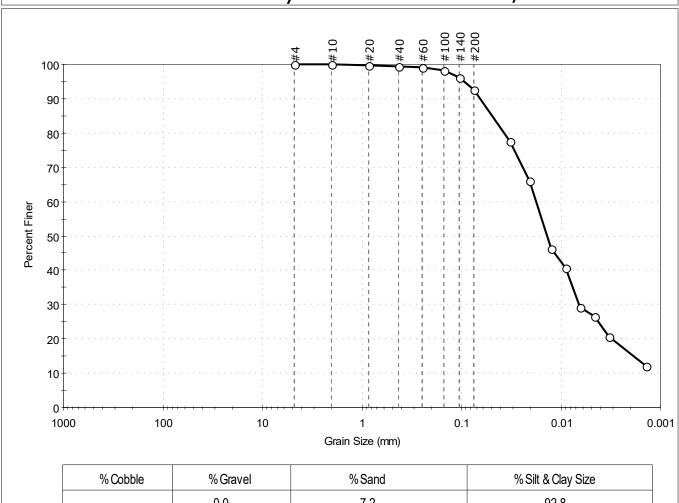
Sample ID: 00-6.5-191003 Test Date: 11/05/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark brown silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	7.2	92.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	98		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0323	78		
	0.0208	66		
	0.0126	46		
	0.0090	41		
	0.0065	29		
	0.0046	26		
	0.0033	21		
	0.0014	12		

<u>Coefficients</u>					
D <sub>85</sub> = 0.0488 mm	$D_{30} = 0.0066 \text{ mm}$				
D <sub>60</sub> = 0.0178 mm	$D_{15} = 0.0018 \text{ mm}$				
D <sub>50</sub> = 0.0138 mm	$D_{10} = N/A$				
C <sub>II</sub> =N/A	$C_c = N/A$				

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (45))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-112SPT Sample Type: bag Tested By: ckg

Sample ID: 07-11.5-191003 Test Date: 11/01/19 Checked By: bfs Test Id:

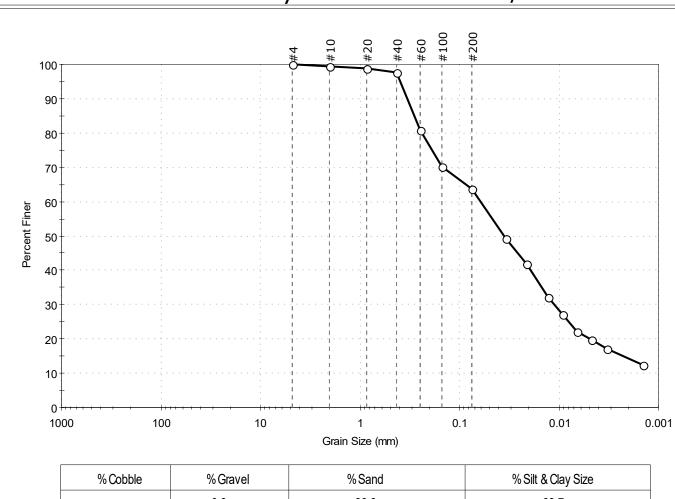
527572

Depth: Test Comment:

Visual Description: Moist, dark gray sandy silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	36.3	63.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	81		
#100	0.15	70		
#200	0.075	64		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0344	49		
	0.0211	42		
	0.0129	32		
	0.0092	27		
	0.0066	22		
	0.0047	20		
	0.0033	17		
	0.0014	12		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2849 mm	$D_{30} = 0.0112 \text{ mm}$			
D <sub>60</sub> = 0.0615 mm	$D_{15} = 0.0023 \text{ mm}$			
D <sub>50</sub> = 0.0357 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_C = N/A$			

<u>Classification</u> Sandy Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (11))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-112SPT Sample Type: bag Tested By: ckg

527573

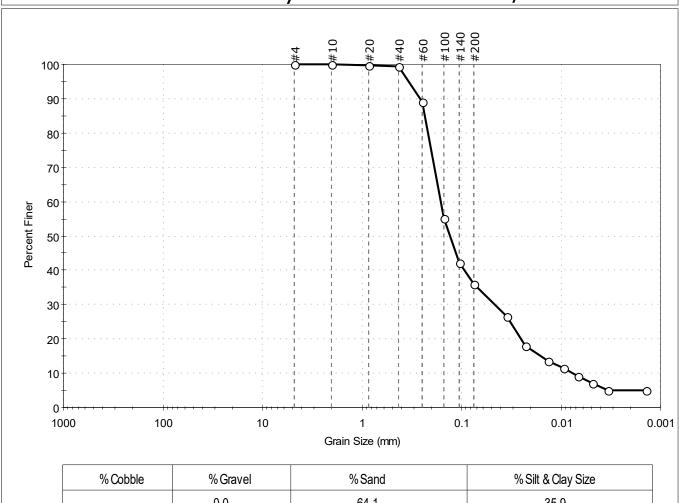
Test Date: 10/31/19 Checked By: bfs Sample ID: 11.5-26.5-191003 Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	64.1	35.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	89		
#100	0.15	55		
#140	0.11	42		
#200	0.075	36		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0351	27		
	0.0225	18		
	0.0134	14		
	0.0094	11		
	0.0067	9		
	0.0048	7		
	0.0034	5		
	0.0014	5		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2350 mm	$D_{30} = 0.0465 \text{ mm}$			
D <sub>60</sub> = 0.1614 mm	$D_{15} = 0.0159 \text{ mm}$			
D <sub>50</sub> = 0.1309 mm	$D_{10} = 0.0075 \text{ mm}$			
C <sub>11</sub> =21.520	$C_c = 1.786$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Soils (A-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-112SPT Sample Type: bag Tested By: ckg

527574

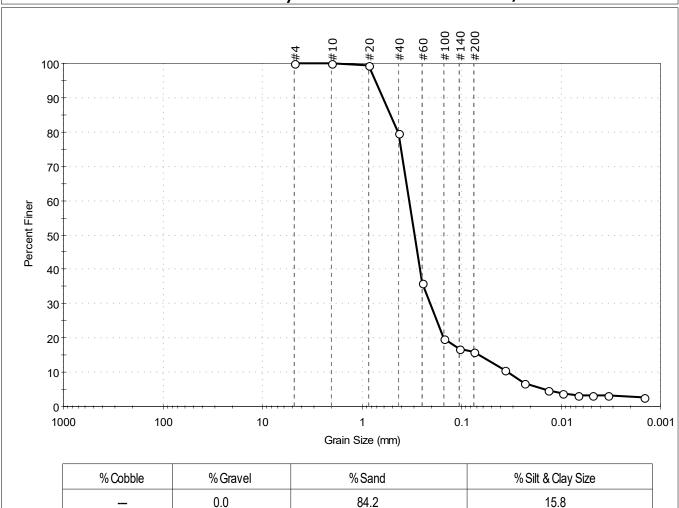
10/29/19 Checked By: bfs Test Date: Sample ID: 37.5-58-191003 Test Id:

Depth: Test Comment:

Visual Description: Moist, very dark olive gray silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	80		
#60	0.25	36		
#100	0.15	20		
#140	0.11	17		
#200	0.075	16		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0367	11		
	0.0234	7		
	0.0136	5		
	0.0096	4		
	0.0068	3		
	0.0048	3		
	0.0034	3		
	0.0014	3		

<u>Coefficients</u>				
D <sub>85</sub> = 0.5121 mm	$D_{30} = 0.2062 \text{ mm}$			
D <sub>60</sub> = 0.3344 mm	$D_{15} = 0.0671 \text{ mm}$			
D <sub>50</sub> = 0.2961 mm	$D_{10} = 0.0339 \text{ mm}$			
Cu =9.864	$C_c = 3.751$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-113SPT Sample Type: bag Tested By: ckg

527575

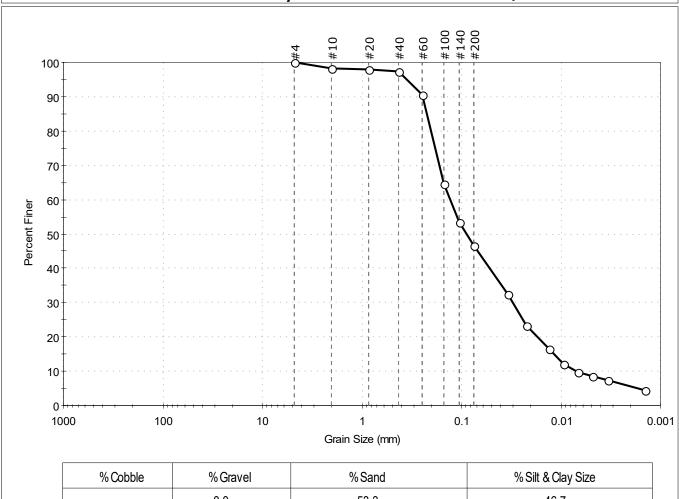
Sample ID: 06-16-191011 Test Date: 11/05/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
	0.0	53.3	46.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	98		
#20	0.85	98		
#40	0.42	97		
#60	0.25	90		
#100	0.15	65		
#140	0.11	53		
#200	0.075	47		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0341	32		
	0.0224	23		
	0.0130	17		
	0.0095	12		
	0.0067	10		
	0.0048	9		
	0.0034	7		
	0.0014	5		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.2243 mm D <sub>30</sub> = 0.0305 mm		$D_{30} = 0.0305 \text{ mm}$	
	D <sub>60</sub> = 0.1298 mm	$D_{15} = 0.0117 \text{ mm}$	
	D <sub>50</sub> = 0.0888 mm	$D_{10} = 0.0070 \text{ mm}$	
	C <sub>11</sub> =18.543	$C_{c} = 1.024$	

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Soils (A-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: PDI-113SPT Sample Type: bag Tested By: ckg

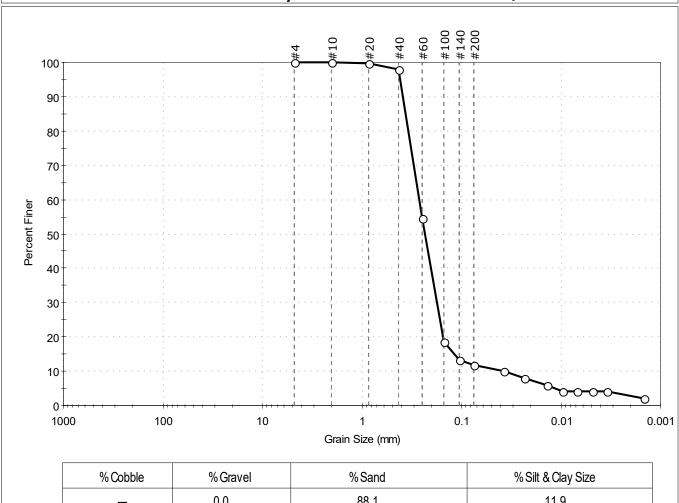
Test Date: Sample ID: 16-22-191011 10/31/19 Checked By: bfs

Test Id: 527576 Depth: Test Comment:

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	88.1	11.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	98		
#60	0.25	54		
#100	0.15	19		
#140	0.11	13		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0379	10		
	0.0232	8		
	0.0137	6		
	0.0097	4		
	0.0069	4		
	0.0048	4		
	0.0034	4		
	0.0015	2		

<u>Coefficients</u>			
D <sub>85</sub> = 0.3627 mm	$D_{30} = 0.1766 \text{ mm}$		
D <sub>60</sub> = 0.2675 mm	$D_{15} = 0.1182 \text{ mm}$		
D <sub>50</sub> = 0.2347 mm	$D_{10} = 0.0377 \text{ mm}$		
C <sub>u</sub> =7.095	$C_c = 3.093$		

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685
Boring ID: PDI-113SPT Sample Type: bag Tested By: ckg

527577

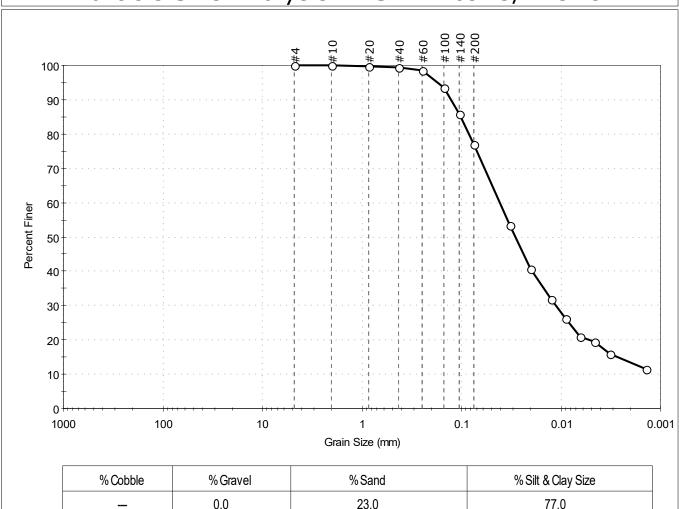
Boring ID: PDI-113SPT Sample Type: bag Tested By: ckg Sample ID: 22-25.2-191011 Test Date: 10/24/19 Checked By: bfs

Depth: --- Test Id:
Test Comment: ---

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment: ---

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	94		
#140	0.11	86		
#200	0.075	77		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0322	54		
	0.0201	41		
	0.0124	32		
	0.0089	26		
	0.0064	21		
	0.0046	19		
	0.0033	16		
	0.0014	11		

	<u>Coefficients</u>				
D <sub>85</sub> = 0.1025 mm D <sub>30</sub> = 0.0111 mm		$D_{30} = 0.0111 \text{ mm}$			
	D <sub>60</sub> = 0.0407 mm	$D_{15} = 0.0028 \text{ mm}$			
	D <sub>50</sub> = 0.0283 mm	$D_{10} = N/A$			
	$C_u = N/A$	$C_c = N/A$			

<u>Classification</u> ASTM Elastic SILT with Sand (MH)

AASHTO Clayey Soils (A-7-5 (18))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: GTX-310685 Project No: Boring ID: PDI-113SPT Sample Type: bag Tested By: ckg

527578

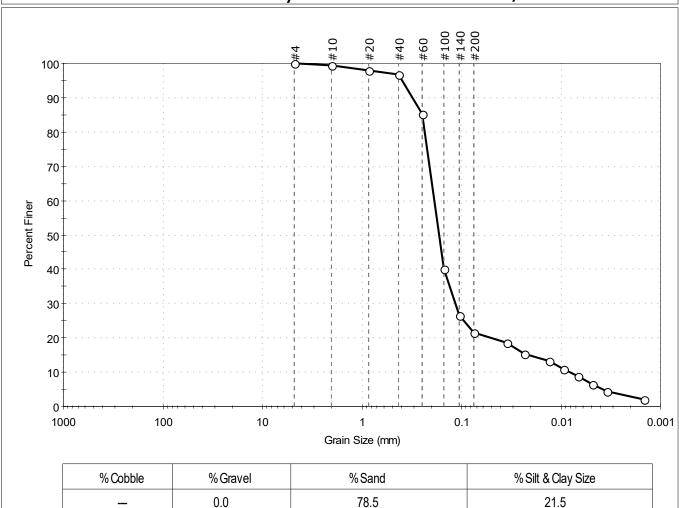
Test Date: 11/01/19 Checked By: bfs Sample ID: 31.9-39.4-191011 Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	97		
#60	0.25	85		
#100	0.15	40		
#140	0.11	27		
#200	0.075	21		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0353	19		
	0.0231	15		
	0.0133	13		
	0.0095	11		
	0.0068	9		
	0.0048	7		
	0.0034	4		
	0.0015	2		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.2492 mm D <sub>30</sub> = 0.1158 mm		$D_{30} = 0.1158 \text{ mm}$	
	D <sub>60</sub> = 0.1879 mm	D <sub>15</sub> =0.0208 mm	
	D <sub>50</sub> = 0.1679 mm	$D_{10} = 0.0081 \text{ mm}$	
	$C_u = 23.198$	$C_c = 8.811$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-114SPT Sample Type: bag Tested By: ckg

527579

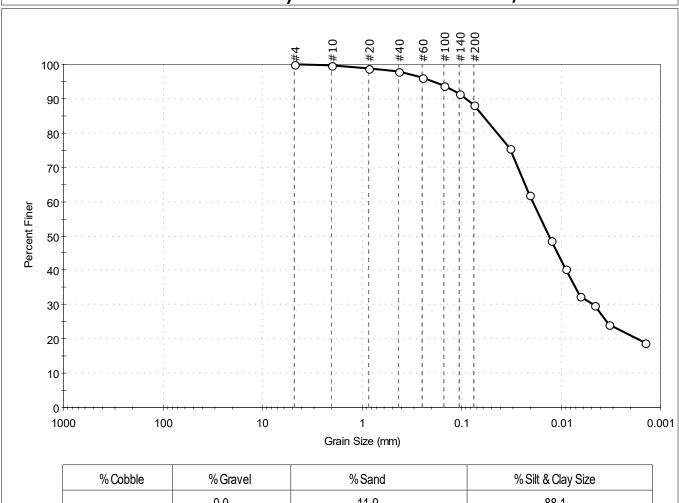
Sample ID: 00-7.5-191008 Test Date: 11/01/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Wet, olive brown silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	11.9	88.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	94		
#140	0.11	92		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0324	76		
	0.0208	62		
	0.0125	49		
	0.0090	40		
	0.0065	32		
	0.0046	30		
	0.0033	24		
	0.0014	19		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.0610 mm D <sub>30</sub> = 0.0048		$D_{30} = 0.0048 \text{ mm}$	
	D <sub>60</sub> = 0.0193 mm	$D_{15} = N/A$	
	D <sub>50</sub> = 0.0132 mm	$D_{10} = N/A$	
	C <sub>II</sub> =N/A	$C_C = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (29))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-114SPT Sample Type: bag Tested By: ckg

527580

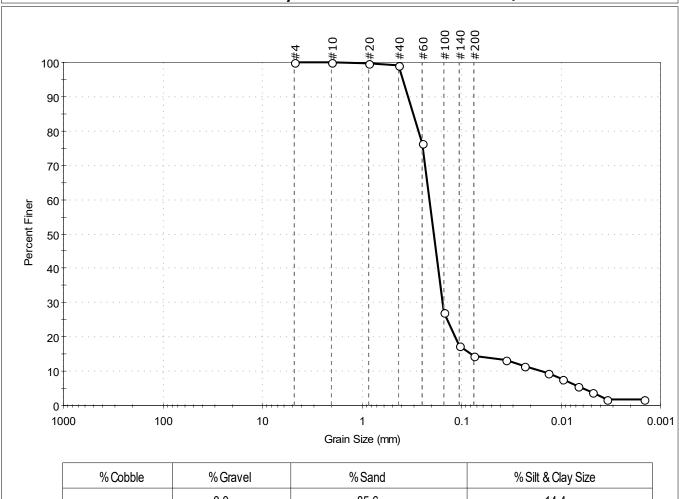
Test Date: 11/01/19 Checked By: bfs Sample ID: 25.5-28-191008 Test Id:

Depth: Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	85.6	14.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	76		
#100	0.15	27		
#140	0.11	17		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0359	13		
	0.0236	11		
	0.0135	9		
	0.0096	8		
	0.0068	6		
	0.0048	4		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3059 mm	$D_{30} = 0.1547 \text{ mm}$			
D <sub>60</sub> = 0.2111 mm	$D_{15} = 0.0809 \text{ mm}$			
D <sub>50</sub> = 0.1903 mm	$D_{10} = 0.0157 \text{ mm}$			
C <sub>11</sub> =13.446	$C_c = 7.221$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-114SPT Sample Type: bag Tested By: ckg

Test Date: 11/01/19 Checked By: bfs Sample ID: 42-50.5-191008

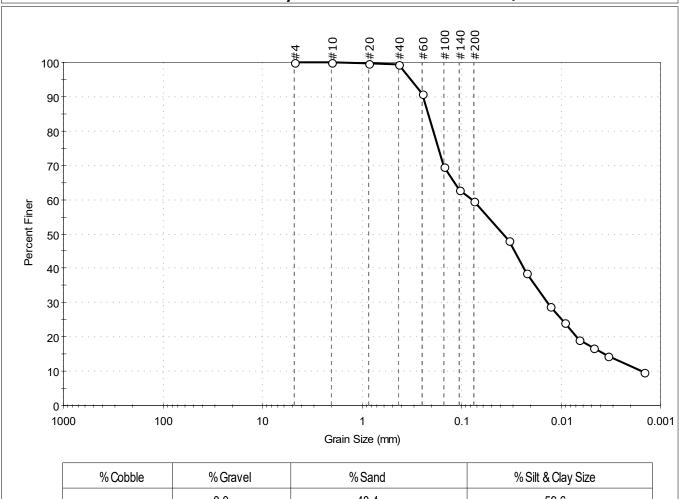
527581 Test Id: Depth:

Test Comment:

Visual Description: Wet, olive brown sandy silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	40.4	59.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	91		
#100	0.15	70		
#140	0.11	63		
#200	0.075	60		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0337	48		
	0.0221	39		
	0.0130	29		
	0.0093	24		
	0.0066	19		
	0.0047	17		
	0.0034	14		
	0.0014	10		

<u>Coefficients</u>				
D <sub>85</sub> = 0.2166 mm	$D_{30} = 0.0138 \text{ mm}$			
D <sub>60</sub> = 0.0786 mm	$D_{15} = 0.0036 \text{ mm}$			
D <sub>50</sub> = 0.0384 mm	$D_{10} = 0.0015 \text{ mm}$			
C <sub>11</sub> =52.400	$C_c = 1.615$			

<u>Classification</u> Sandy SILT (ML) **ASTM** 

AASHTO Silty Soils (A-5 (5))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: PDI-114SPT Sample Type: bag Tested By: ckg

527582

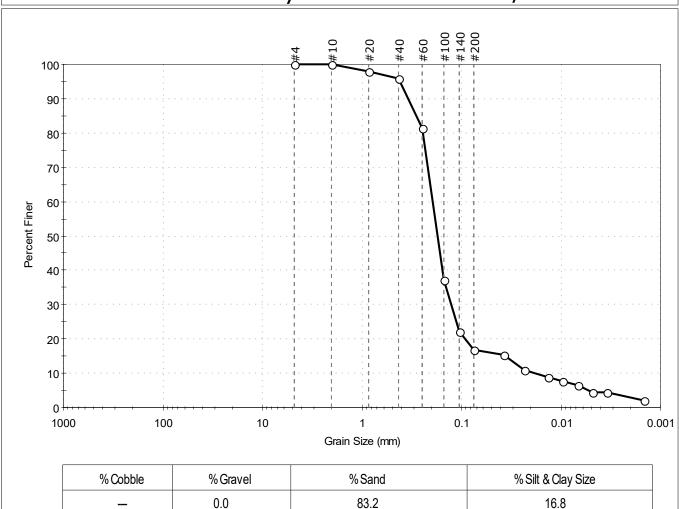
Sample ID: 50.5-55-191008 Test Date: 11/01/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



	ŕ			
#4	4.75	100		
#10	2.00	100		
#20	0.85	98		
#40	0.42	96		
#60	0.25	81		
#100	0.15	37		
#140	0.11	22		
#200	0.075	17		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0377	15		
	0.0236	11		
	0.0136	9		
	0.0096	8		
	0.0068	7		

Sieve Name | Sieve Size, mm | Percent Finer | Spec. Percent | Complies

<u>Coefficients</u>					
D <sub>85</sub> = 0.2851 mm	$D_{30} = 0.1275 \text{ mm}$				
D <sub>60</sub> = 0.1953 mm	$D_{15} = 0.0358 \text{ mm}$				
D <sub>50</sub> = 0.1741 mm	$D_{10} = 0.0181 \text{ mm}$				
C <sub>u</sub> =10.790	$C_c = 4.599$				

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

0.0048 0.0034

0.0015



Location: Project No: GTX-310685 Boring ID: PDI-114SPT Sample Type: bag Tested By: ckg

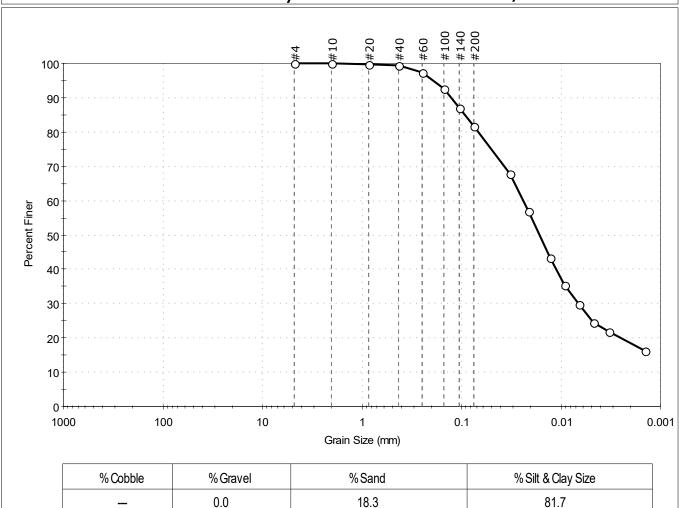
11/01/19 Checked By: bfs Test Date: Sample ID: 7.5-12.5-191008

Test Id: 527583 Depth: Test Comment:

Visual Description: Moist, olive brown silt with sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve ivanie	pieve size, iiiii	r cr cent i mei	Spec. Fercent	compiles
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	97		
#100	0.15	93		
#140	0.11	87		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0324	68		
	0.0213	57		
	0.0127	43		
	0.0091	35		
	0.0065	30		
	0.0047	24		
	0.0033	22		

16

Sieve Name Sieve Size, mm Percent Finer Spec. Percent | Complies

<u>Coefficients</u>				
D <sub>85</sub> =0.0928 mm	$D_{30} = 0.0066 \text{ mm}$			
D <sub>60</sub> = 0.0239 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0163 mm	$D_{10} = N/A$			
Cu =N/A	$C_c = N/A$			

<u>Classification</u> Elastic SILT with Sand (MH) **ASTM** 

AASHTO Clayey Soils (A-7-5 (24))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

0.0014



Location: Project No: GTX-310685 Boring ID: PDI-115SPT Sample Type: bag Tested By: ckg

527584

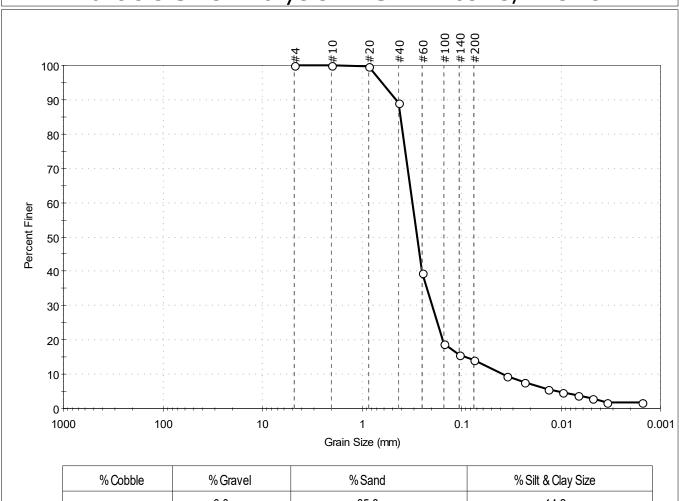
Sample ID: 06-11-191009 Test Date: 11/07/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	85.8	14.2

_		•		
Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	89		
#60	0.25	40		
#100	0.15	19		
#140	0.11	16		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0349	9		
	0.0235	8		
	0.0135	6		
	0.0096	5		
	0.0068	4		
	0.0048	3		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.4072 mm	$D_{30} = 0.1974 \text{ mm}$			
D <sub>60</sub> = 0.3113 mm	$D_{15} = 0.0918 \text{ mm}$			
D <sub>50</sub> = 0.2796 mm	$D_{10} = 0.0380 \text{ mm}$			
C <sub>11</sub> =8.192	$C_c = 3.294$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-115SPT Sample Type: bag Tested By: ckg

527585

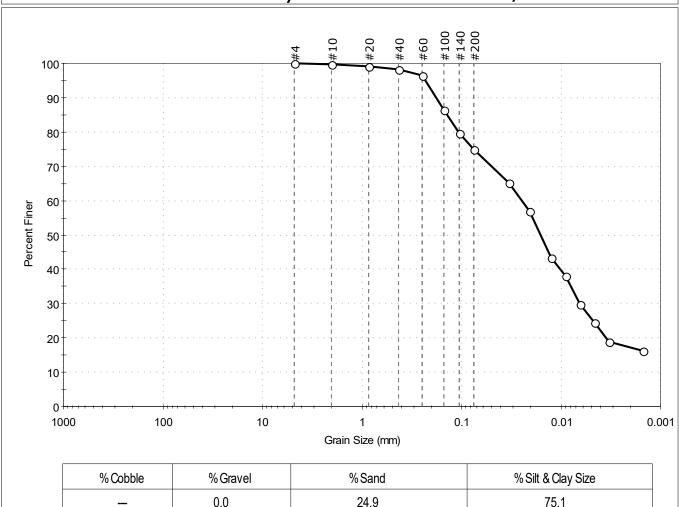
10/29/19 Checked By: bfs Test Date: Sample ID: 18.6-20.6-191009 Test Id:

Depth: Test Comment:

Visual Description: Moist, dark olive brown silt with sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	96		
#100	0.15	87		
#140	0.11	80		
#200	0.075	75		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0335	65		
	0.0209	57		
	0.0125	43		
	0.0089	38		
	0.0064	30		
	0.0046	24		
	0.0033	19		
	0.0015	16		

<u>Coefficients</u>		
D <sub>85</sub> = 0.1387 mm	$D_{30} = 0.0065 \text{ mm}$	
D <sub>60</sub> = 0.0249 mm	$D_{15} = N/A$	
D <sub>50</sub> = 0.0160 mm	$D_{10} = N/A$	
$C_u = N/A$	$C_C = N/A$	

<u>Classification</u> Elastic SILT with Sand (MH)

AASHTO Clayey Soils (A-7-5 (22))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

<u>ASTM</u>

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: GTX-310685 Project No: Boring ID: PDI-115SPT Tested By: ckg

527586

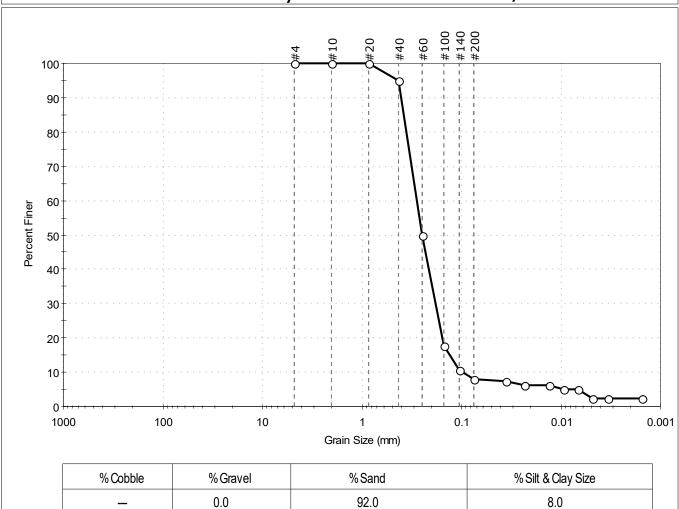
Sample Type: bag Test Date: 10/29/19 Checked By: bfs Sample ID: 23-28.1-191009

Test Id: Depth: Test Comment:

Visual Description: Moist, very dark olive brown sand with silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	95		
#60	0.25	50		
#100	0.15	18		
#140	0.11	11		
#200	0.075	8.0		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0360	7		
	0.0233	6		
	0.0133	6		
	0.0095	5		
	0.0067	5		
	0.0048	2		
	0.0034	2		
	0.0015	2		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3780 mm	$D_{30} = 0.1827 \text{ mm}$	
D <sub>60</sub> = 0.2820 mm	$D_{15} = 0.1316 \text{ mm}$	
D <sub>50</sub> = 0.2508 mm	$D_{10} = 0.0970 \text{ mm}$	
C <sub>11</sub> =2.907	$C_{c} = 1.220$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Fine Sand (A-3 (1))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-115SPT Sample Type: bag Tested By: ckg

527587

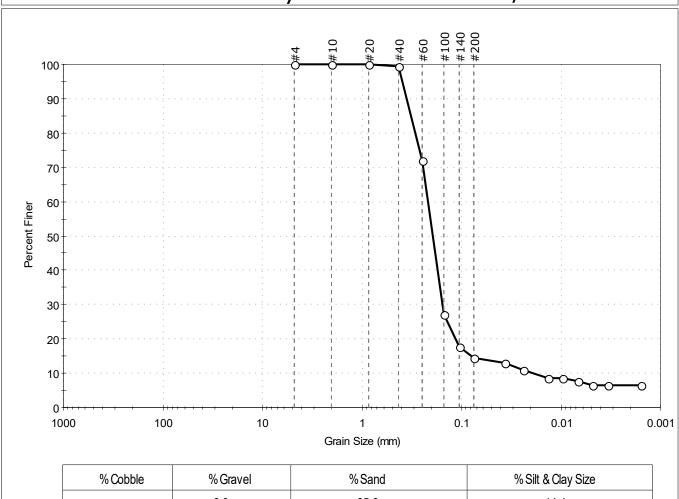
Test Date: 10/29/19 Checked By: bfs Sample ID: 41.5-49.3-191009 Test Id:

Depth: Test Comment:

Visual Description: Moist, olive brown silty sand

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	85.6	14.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	72		
#100	0.15	27		
#140	0.11	18		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0370	13		
	0.0237	11		
	0.0136	9		
	0.0096	9		
	0.0068	8		
	0.0048	6		
	0.0034	6		
	0.0016	6		

<u>Coefficients</u>			
D <sub>85</sub> = 0.3216 mm	$D_{30} = 0.1552 \text{ mm}$		
D <sub>60</sub> = 0.2181 mm	D <sub>15</sub> = 0.0799 mm		
D <sub>50</sub> = 0.1947 mm	$D_{10} = 0.0193 \text{ mm}$		
C <sub>11</sub> =11.301	$C_c = 5.722$		

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-116SPT Sample Type: bag Tested By: ckg

527588

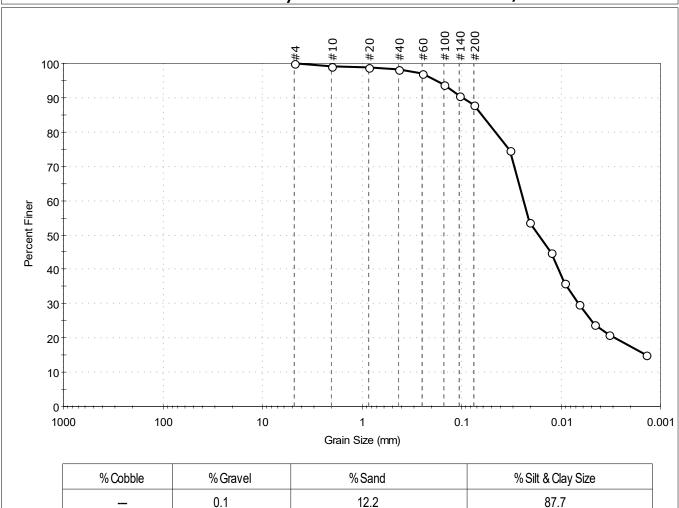
10/30/19 Checked By: bfs Sample ID: 00-4.5-190926 Test Date: Test Id:

Depth: Test Comment:

Visual Description: Wet, olive brown silt

Sample Comment:

# Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	97		
#100	0.15	94		
#140	0.11	91		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0322	75		
	0.0209	54		
	0.0127	45		
	0.0091	36		
	0.0065	30		
	0.0047	24		
	0.0033	21		
	0.0014	15		

<u>Coefficients</u>			
D <sub>85</sub> = 0.0627 mm	$D_{30} = 0.0066 \text{ mm}$		
D <sub>60</sub> = 0.0238 mm	$D_{15} = 0.0014 \text{ mm}$		
D <sub>50</sub> = 0.0169 mm	$D_{10} = N/A$		
Cu =N/A	$C_c = N/A$		

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (40))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-116SPT Sample Type: bag Tested By: ckg

527589

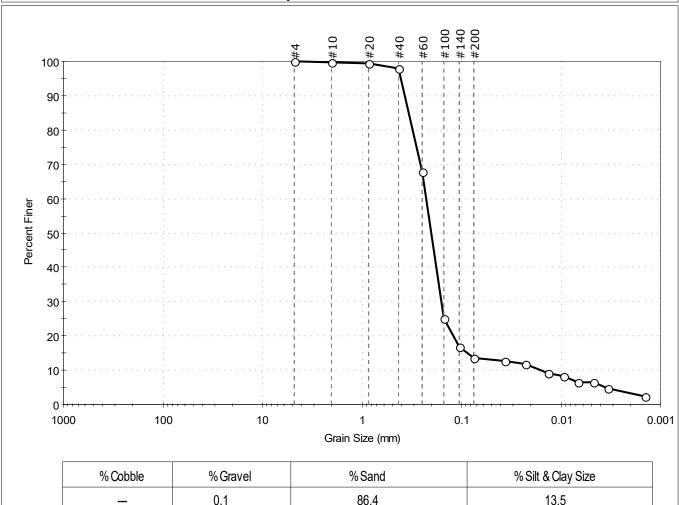
Sample ID: 20-26.7-190927 Test Date: 10/30/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size	
	0.1	86.4	13.5	

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	98		
#60	0.25	68		
#100	0.15	25		
#140	0.11	17		
#200	0.075	14		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0368	13		
	0.0227	12		
	0.0134	9		
	0.0095	8		
	0.0067	6		
	0.0048	6		
	0.0034	5		
	0.0014	2		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3380 mm	$D_{30} = 0.1591 \text{ mm}$			
D <sub>60</sub> = 0.2276 mm	$D_{15} = 0.0881 \text{ mm}$			
D <sub>50</sub> = 0.2020 mm	$D_{10} = 0.0157 \text{ mm}$			
C <sub>11</sub> =14.497	$C_c = 7.084$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location:Project No:GTX-310685Boring ID:PDI-116SPTSample Type: bagTested By: ckg

 Boring ID: PDI-116SPI
 Sample Type: bag
 Tested By: ckg

 Sample ID: 26.7-28.6-190926
 Test Date: 10/30/19
 Checked By: bfs

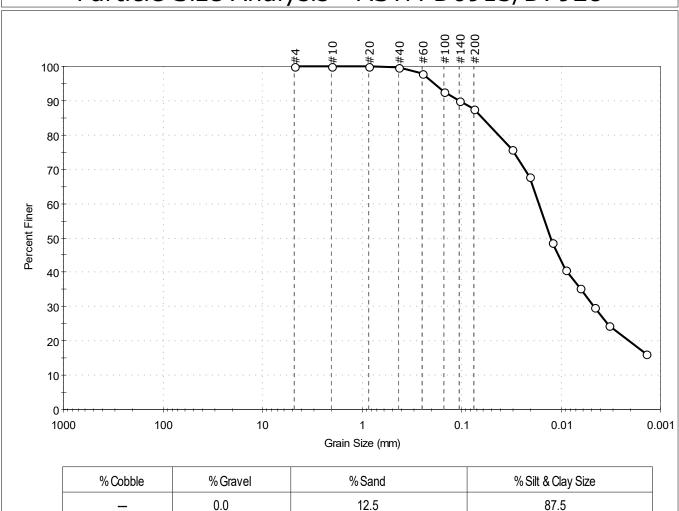
 Depth: -- Test Id: 527590

Depth: ---Test Comment: ---

Visual Description: Wet, grayish brown silt

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	98		
#100	0.15	93		
#140	0.11	90		
#200	0.075	87		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0310	76		
	0.0206	68		
	0.0124	49		
	0.0090	41		
	0.0064	35		
	0.0046	30		
	0.0033	24		
	0.0014	16		

<u>Coefficients</u>				
D <sub>85</sub> = 0.0620 mm	$D_{30} = 0.0046 \text{ mm}$			
D <sub>60</sub> = 0.0167 mm	$D_{15} = N/A$			
D <sub>50</sub> = 0.0128 mm	$D_{10} = N/A$			
$C_u = N/A$	$C_c = N/A$			

ASTM Elastic SILT (MH)

AASHTO Clayey Soils (A-7-5 (15))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: PDI-116SPT Sample Type: bag Tested By: ckg

527591

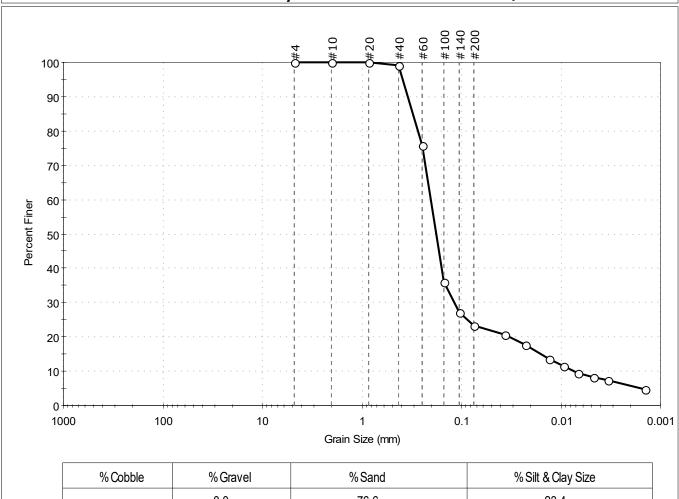
Test Date: 10/30/19 Checked By: bfs Sample ID: 51.5-54.2-190927 Test Id:

Depth: Test Comment:

Visual Description: Moist, olive brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	76.6	23.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	76		
#100	0.15	36		
#140	0.11	27		
#200	0.075	23		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0368	21		
	0.0228	18		
	0.0133	13		
	0.0094	11		
	0.0067	9		
	0.0048	8		
	0.0034	7		
	0.0014	5		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3086 mm	$D_{30} = 0.1182 \text{ mm}$			
D <sub>60</sub> = 0.2041 mm	D <sub>15</sub> =0.0163 mm			
D <sub>50</sub> = 0.1794 mm	$D_{10} = 0.0075 \text{ mm}$			
C <sub>11</sub> =27.213	$C_c = 9.127$			

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685
Boring ID: PDI-117SPT Sample Type: bag Tested By: ckg

Boring ID: PDI-117SPT Sample Type: bag Tested By: ckg
Sample ID: 11-29.1-191002 Test Date: 10/31/19 Checked By: bfs
Depth: --- Test Id: 527592

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

# Particle Size Analysis - ASTM D6913

<u>Coefficients</u>					
$D_{85} = N/A$	$D_{30} = N/A$				
$D_{60} = N/A$	$D_{15} = N/A$				
$D_{50} = N/A$	$D_{10} = N/A$				
$C_{II} = N/A$	$C_C = N/A$				

ASTM N/A

AASHTO ()

#### Sample/Test Description



Location: Project No: GTX-310685 Boring ID: PDI-117SPT Sample Type: bag Tested By: ckg

Test Date: 10/24/19 Checked By: bfs Sample ID: 29.1-32-191002 527593

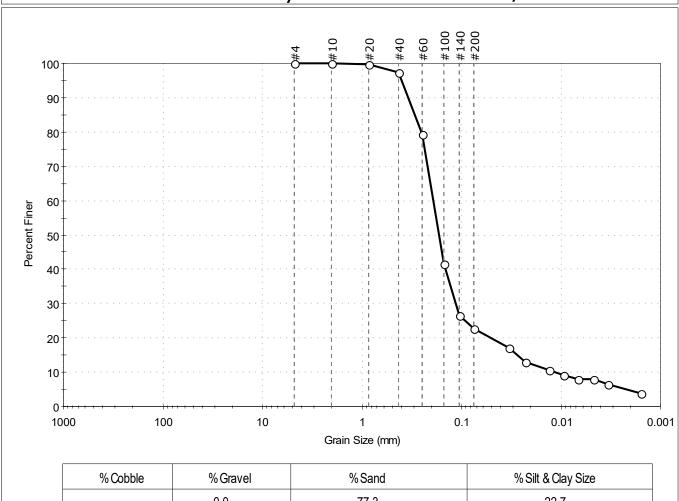
Test Id: Depth:

Visual Description: Moist, dark gray silty sand

Sample Comment:

Test Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	77.3	22.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	79		
#100	0.15	42		
#140	0.11	27		
#200	0.075	23		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0331	17		
	0.0225	13		
	0.0132	10		
	0.0094	9		
	0.0067	8		
	0.0047	8		
	0.0034	7		
	0.0016	4		

<u>Coefficients</u>						
D <sub>85</sub> = 0.2955 mm	$D_{30} = 0.1146 \text{ mm}$					
D <sub>60</sub> = 0.1923 mm	D <sub>15</sub> =0.0271 mm					
D <sub>50</sub> = 0.1680 mm	$D_{10} = 0.0117 \text{ mm}$					
C <sub>11</sub> =16.436	$C_c = 5.837$					

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

printed 12/24/2019 9:45:37 AM



Location: Project No: GTX-310685
Boring ID: PDI-117SPT Sample Type: bag Tested By: ckg

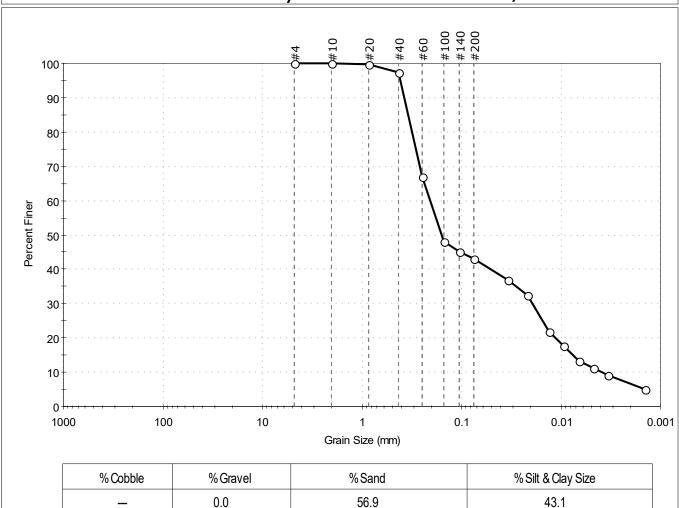
Boring ID: PDI-117SPT Sample Type: bag Tested By: ckg
Sample ID: 44.1-53.5-191002 Test Date: 10/31/19 Checked By: bfs
Depth: --- Test Id: 527594

Depth: ---Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	97		
#60	0.25	67		
#100	0.15	48		
#140	0.11	45		
#200	0.075	43		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0340	37		
	0.0218	33		
	0.0131	22		
	0.0093	18		
	0.0067	13		
	0.0047	11		
	0.0034	9		
	0.0014	5		

<u>Coeff</u>	<u>icients</u>
$D_{85} = 0.3430 \text{ mm}$	$D_{30} = 0.0193 \text{ mm}$
$D_{60} = 0.2072 \text{ mm}$	$D_{15} = 0.0076 \text{ mm}$
$D_{50} = 0.1576 \text{ mm}$	$D_{10} = 0.0039 \text{ mm}$
$C_u = 53.128$	$C_c = 0.461$

<u>Classification</u> <u>ASTM</u> Silty SAND (SM)

AASHTO Clayey Soils (A-7-6 (3))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

cana, craver randed chape :

Sand/Gravel Hardness : ---

 $\label{eq:Dispersion Device: Apparatus A - Mech Mixer} \end{\mbox{\sf Dispersion Device: Apparatus A - Mech Mixer}}$ 



Location: GTX-310685 Project No: Boring ID: PDI-117SPT Sample Type: bag Tested By: ckg

527595

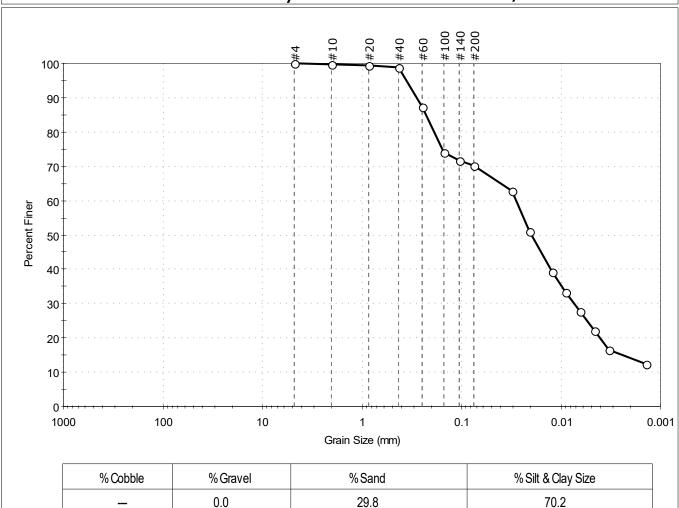
Test Date: Sample ID: 53.5-63.5-191002 10/24/19 Checked By: bfs Test Id:

Depth: Test Comment:

Wet, dark grayish brown silt with sand Visual Description:

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	87		
#100	0.15	74		
#140	0.11	72		
#200	0.075	70		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0310	63		
	0.0205	51		
	0.0123	39		
	0.0089	33		
	0.0064	28		
	0.0046	22		

17

12

Sieve Name | Sieve Size, mm | Percent Finer | Spec. Percent | Complies

<u>Coefficients</u>			
D <sub>85</sub> = 0.2293 mm	$D_{30} = 0.0073 \text{ mm}$		
D <sub>60</sub> = 0.0281 mm	D <sub>15</sub> =0.0024 mm		
D <sub>50</sub> = 0.0196 mm	$D_{10} = N/A$		
$C_u = N/A$	$C_c = N/A$		

<u>Classification</u> SILT with Sand (ML) **ASTM** 

AASHTO Clayey Soils (A-7-5 (9))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

0.0033

0.0014



Location: Project No: GTX-310685 Boring ID: PDI-118SPT Sample Type: bag Tested By: ckg

527596

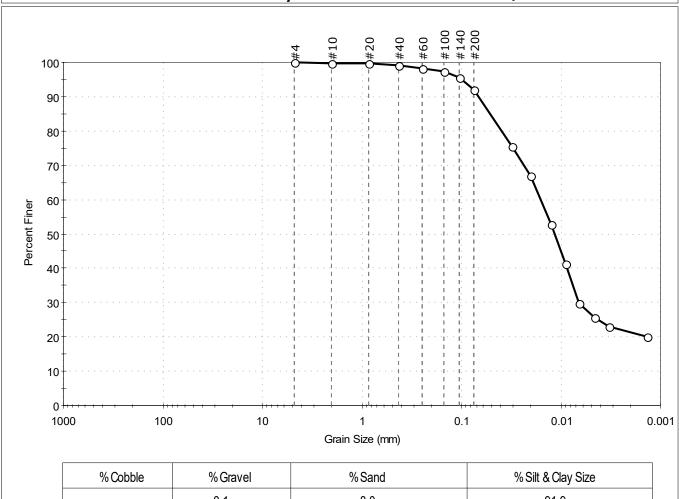
Sample ID: 00-4.5-191014 Test Date: 10/24/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	8.0	91.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	98		
#100	0.15	97		
#140	0.11	95		
#200	0.075	92		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0313	76		
	0.0204	67		
	0.0125	53		
	0.0091	41		
	0.0065	30		
	0.0047	26		
	0.0033	23		
	0.0014	20		

<u>Coeffic</u>	<u>cients</u>
D <sub>85</sub> = 0.0518 mm	$D_{30} = 0.0066 \text{ mm}$
D <sub>60</sub> = 0.0161 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0116 mm	$D_{10} = N/A$
Cu =N/A	$C_c = N/A$

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (37))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve printed 12/24/2019 9:45:41 AM



Location: Project No: GTX-310685

Boring ID: PDI-118SPT Sample Type: bag Tested By: ckg

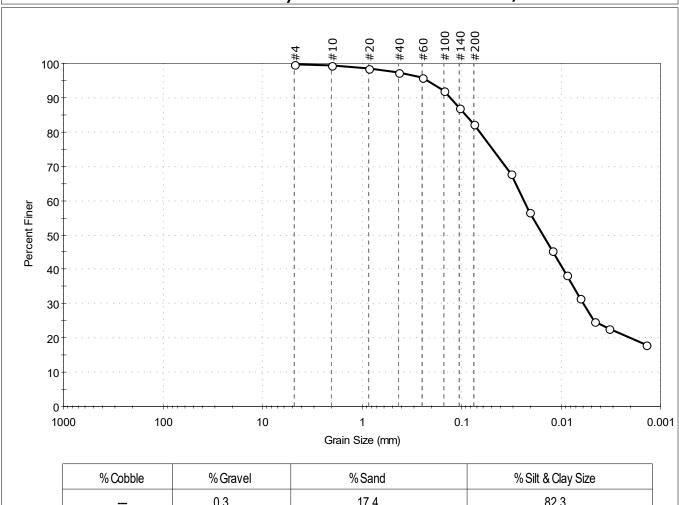
Boring ID: PDI-118SPT Sample Type: bag Tested By: ckg Sample ID: 4.5-15-191014 Test Date: 10/24/19 Checked By: bfs

Depth: --- Test Id: 527597
Test Comment: ---

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment: ---

# Particle Size Analysis - ASTM D6913/D7928



	% Cobb	le	% Gravel		% Sand		% Silt 8	& Clay Size
	_		0.3		17.4		{	82.3
Sieve Name   Sieve Size, mm   Percent Finer   Spec. Percent		Complies	]		<u>Coeffi</u>	<u>cients</u>		
						$D_{85} = 0.09$	14 mm	$D_{30} = 0.0059 \text{ mm}$

				·
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	97		
#60	0.25	96		
#100	0.15	92		
#140	0.11	87		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0316	68		
1	0.0206	57		
	0.0206	57 45		
	0.0123	45		
	0.0123 0.0088	45		
	0.0123 0.0088 0.0064	45 38 32		
	0.0123 0.0088 0.0064 0.0046	45 38 32 25		

D <sub>85</sub> = 0.0914 mm	$D_{30} = 0.0059 \text{ mm}$
D <sub>60</sub> = 0.0234 mm	$D_{15} = N/A$
D <sub>50</sub> = 0.0152 mm	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

ASTM Classification
Elastic SILT with Sand (MH)

AASHTO Clayey Soils (A-7-5 (34))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sarra, States talking Strape :

Sand/Gravel Hardness : ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-118SPT Sample Type: bag Tested By: ckg

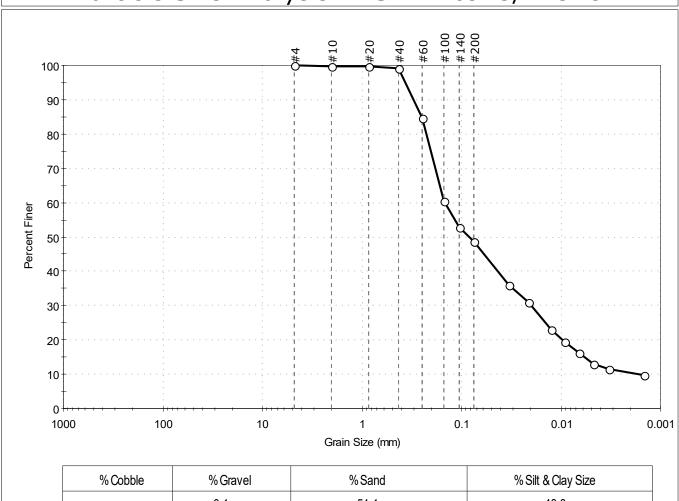
Sample ID: 46.5-61-191014 Test Date: 10/24/19 Checked By: bfs Test Id: 527598

Depth: Test Comment:

Visual Description: Wet, dark grayish brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	51.1	48.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	85		
#100	0.15	60		
#140	0.11	53		
#200	0.075	49		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0337	36		
	0.0210	31		
	0.0127	23		
	0.0092	20		
	0.0065	16		
	0.0047	13		
	0.0033	11		
	0.0015	10		

<u>Coeff</u>	<u>icients</u>
D <sub>85</sub> = 0.2537 mm	$D_{30} = 0.0197 \text{ mm}$
D <sub>60</sub> = 0.1474 mm	D <sub>15</sub> =0.0057 mm
D <sub>50</sub> = 0.0832 mm	$D_{10} = 0.0016 \text{ mm}$
C <sub>11</sub> =92.125	$C_{c} = 1.646$

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Soils (A-4 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-119SPT Sample Type: bag Tested By: ckg

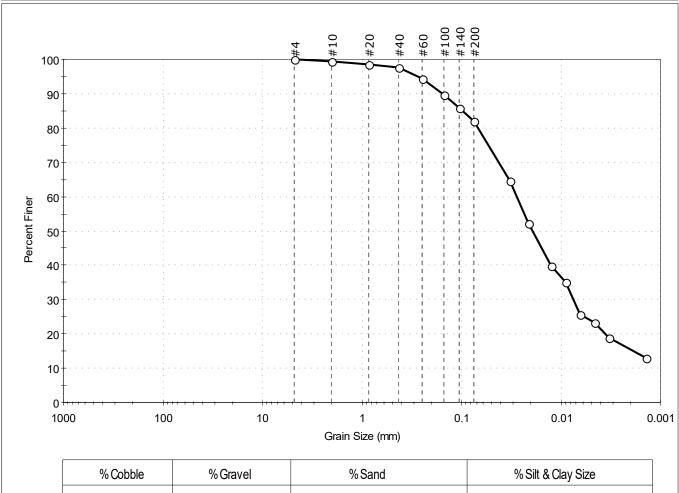
Sample ID: 00-4.5-191001 Test Date: 10/25/19 Checked By: bfs

Depth: Test Id: 527599 Test Comment:

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	18.1	81.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	98		
#60	0.25	95		
#100	0.15	90		
#140	0.11	86		
#200	0.075	82		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0329	64		
	0.0210	52		
	0.0126	40		
	0.0090	35		
	0.0065	26		
	0.0046	23		
	0.0033	19		
	0.0014	13		

<u>Coeffic</u>	<u>cients</u>
D <sub>85</sub> =0.0981 mm	$D_{30} = 0.0075 \text{ mm}$
D <sub>60</sub> = 0.0279 mm	D <sub>15</sub> =0.0019 mm
D <sub>50</sub> = 0.0191 mm	$D_{10} = N/A$
$C_u = N/A$	$C_c = N/A$

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (37))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: PDI-119SPT Sample Type: bag Tested By: ckg

527600

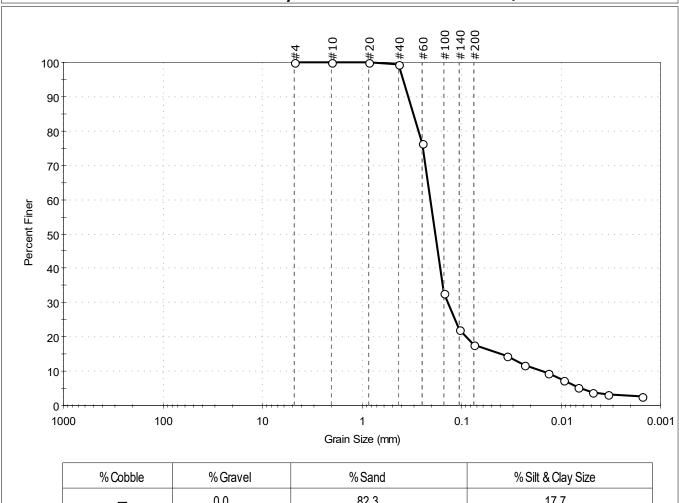
Test Date: 10/29/19 Checked By: bfs Sample ID: 18.3-31-191001 Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	82.3	17.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	76		
#100	0.15	33		
#140	0.11	22		
#200	0.075	18		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0350	15		
	0.0231	12		
	0.0134	10		
	0.0095	7		
	0.0067	5		
	0.0048	4		
	0.0034	3		
	0.0015	3		

Coe	efficients
D <sub>85</sub> = 0.3051 mm	$D_{30} = 0.1369 \text{ mm}$
D <sub>60</sub> = 0.2063 mm	$D_{15} = 0.0393 \text{ mm}$
D <sub>50</sub> = 0.1835 mm	$D_{10} = 0.0149 \text{ mm}$
C <sub>11</sub> =13.846	$C_c = 6.097$

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-119SPT Sample Type: bag Tested By: ckg

527601

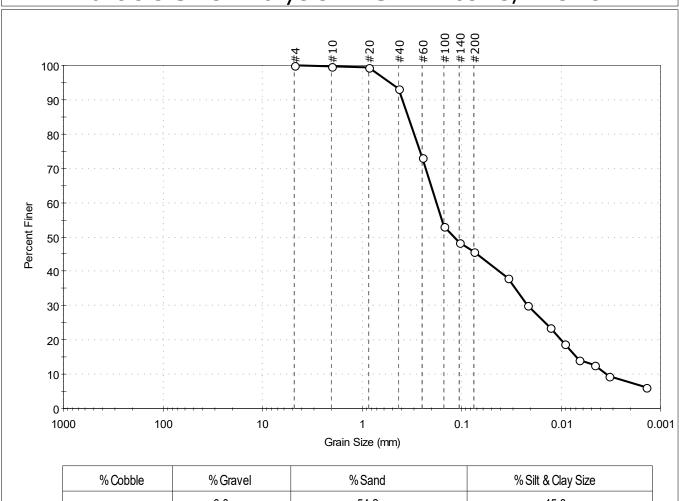
Sample ID: 47-52-191001 Test Date: 10/25/19 Checked By: bfs

Depth: Test Id: Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	54.2	45.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	93		
#60	0.25	73		
#100	0.15	53		
#140	0.11	48		
#200	0.075	46		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0339	38		
	0.0216	30		
	0.0127	24		
	0.0092	19		
	0.0066	14		
	0.0047	13		
	0.0033	9		
	0.0014	6		

<u>Coeff</u>	<u>icients</u>
D <sub>85</sub> = 0.3420 mm	$D_{30} = 0.0214 \text{ mm}$
D <sub>60</sub> = 0.1784 mm	$D_{15} = 0.0069 \text{ mm}$
D <sub>50</sub> = 0.1186 mm	$D_{10} = 0.0035 \text{ mm}$
Cu =50.971	$C_c = 0.733$

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Soils (A-4 (1))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: GTX-310685 Project No: Boring ID: PDI-119SPT Sample Type: bag Tested By: ckg

527602

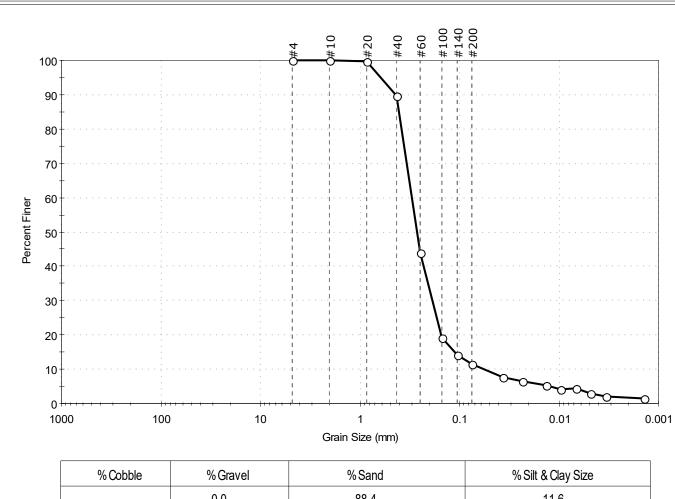
Test Date: Sample ID: 9.5-18.3-191001 10/25/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	88.4	11.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	90		
#60	0.25	44		
#100	0.15	19		
#140	0.11	14		
#200	0.075	12		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0370	8		
	0.0233	7		
	0.0135	5		
	0.0096	4		
	0.0067	4		
	0.0048	3		
	0.0034	2		
	0.0014	2		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.4029 mm		$D_{30} = 0.1875 \text{ mm}$	
$D_{60} = 0.3010 \text{ mm}$ $D_{15} = 0.11$		$D_{15} = 0.1128 \text{ mm}$	
D <sub>50</sub> = 0.2679 mm		$D_{10} = 0.0555 \text{ mm}$	
	Cu =5.423	$C_c = 2.104$	

<u>Classification</u> Poorly graded SAND with Silt (SP-SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-121SPT Sample Type: bag Tested By: ckg

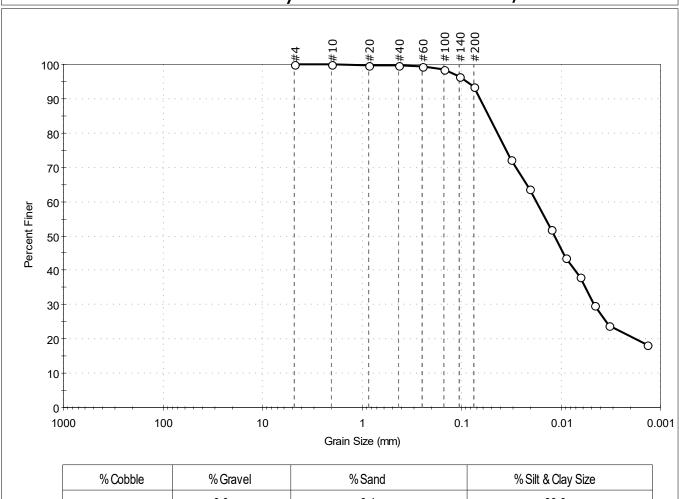
Sample ID: 00-06-190930 Test Date: 10/29/19 Checked By: bfs 527603 Test Id: Depth:

Test Comment:

Visual Description: Moist, olive brown silt

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	6.4	93.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	99		
#100	0.15	99		
#140	0.11	97		
#200	0.075	94		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0319	72		
	0.0209	64		
	0.0125	52		
	0.0090	44		
	0.0064	38		
	0.0046	30		
	0.0033	24		
	0.0014	18		

<u>eo cirreients</u>			
D <sub>85</sub> = 0.0532 mm	$D_{30} = 0.0046 \text{ mm}$		
D <sub>60</sub> = 0.0178 mm	$D_{15} = N/A$		
D <sub>50</sub> = 0.0115 mm	$D_{10} = N/A$		
$C_u = N/A$	$C_C = N/A$		

Coefficients

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (38))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve



Location: Project No: GTX-310685 Boring ID: PDI-121SPT Sample Type: bag Tested By: ckg

527604

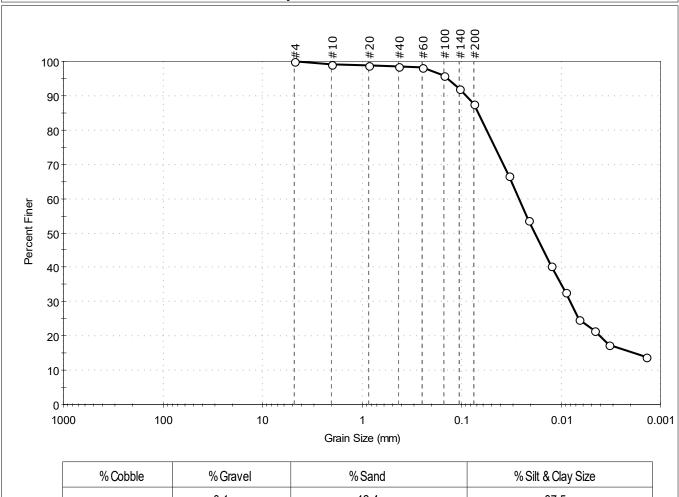
Test Date: 10/30/19 Checked By: bfs Sample ID: 11-20.7-190930

Test Id: Depth: Test Comment:

Visual Description: Moist, dark olive brown silt

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.1	12.4	87.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	96		
#140	0.11	92		
#200	0.075	88		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0331	67		
	0.0212	54		
	0.0126	41		
	0.0091	33		
	0.0065	25		
	0.0046	21		
	0.0033	18		
	0.0014	14		

<u> </u>	<u> </u>		
D <sub>85</sub> = 0.0679 mm	$D_{30} = 0.0081 \text{ mm}$		
D <sub>60</sub> = 0.0264 mm	$D_{15} = 0.0018 \text{ mm}$		
D <sub>50</sub> = 0.0184 mm	$D_{10} = N/A$		
C <sub>u</sub> =N/A	$C_c = N/A$		

Coefficients

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (26))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-121SPT Sample Type: bag Tested By: ckg

527605

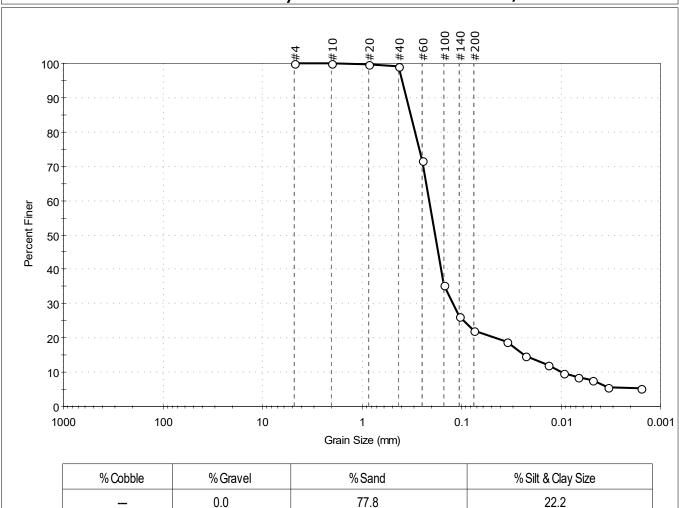
10/29/19 Checked By: bfs Test Date: Sample ID: 21-38-190930

Depth: Test Id: Test Comment:

Visual Description: Moist, dark olive gray silty sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	72		
#100	0.15	35		
#140	0.11	26		
#200	0.075	22		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0352	19		
	0.0226	15		
	0.0135	12		
	0.0095	10		
	0.0068	9		
	0.0048	8		
	0.0034	6		
	0.0016	5		

	<u>Coefficients</u>		
D <sub>85</sub> = 0.3231 mm D <sub>30</sub> = 0.1227 m		$D_{30} = 0.1227 \text{ mm}$	
D <sub>60</sub> = 0.2122 mm D <sub>15</sub> = 0.0231 mm		$D_{15} = 0.0231 \text{ mm}$	
D <sub>50</sub> = 0.1844 mm D <sub>10</sub>		$D_{10} = 0.0098 \text{ mm}$	
	Cu =21.653	$C_c = 7.240$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Silty Gravel and Sand (A-2-4 (0))

# <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-121SPT Sample Type: bag Tested By: ckg

527606

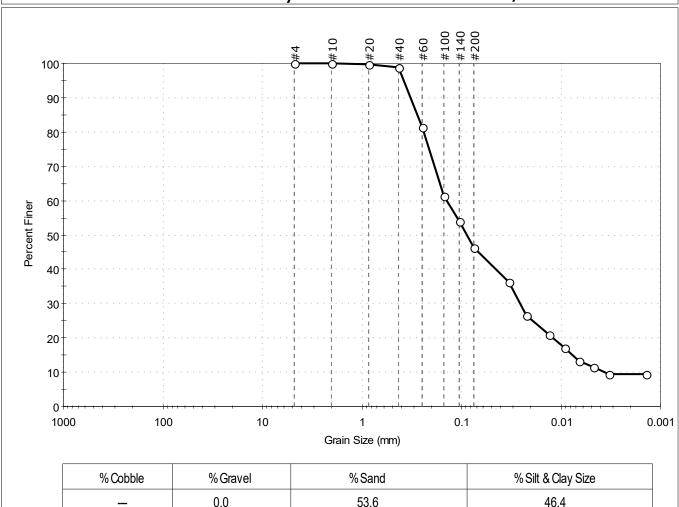
Test Date: Sample ID: 49.4-54-190930 10/25/19 Checked By: bfs Test Id:

Depth: Test Comment:

Moist, dark grayish brown silty sand Visual Description:

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Diete manne	D.010 0.20,		opeci i ci cont	
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	81		
#100	0.15	61		
#140	0.11	54		
#200	0.075	46		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0337	36		
	0.0220	27		
	0.0131	21		
	0.0093	17		
	0.0066	13		
	0.0047	11		

10

10

Sieve Name | Sieve Size, mm | Percent Finer | Spec. Percent | Complies

<u>Coefficients</u>		
D <sub>85</sub> = 0.2788 mm	$D_{30} = 0.0256 \text{ mm}$	
D <sub>60</sub> = 0.1404 mm	$D_{15} = 0.0077 \text{ mm}$	
D <sub>50</sub> = 0.0886 mm	$D_{10} = 0.0036 \text{ mm}$	
$C_u = 39.000$	$C_c = 1.297$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Clayey Soils (A-7-5 (3))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

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0.0033

0.0014



Location: Project No: GTX-310685 Boring ID: PDI-122SPT Sample Type: bag Tested By: ckg

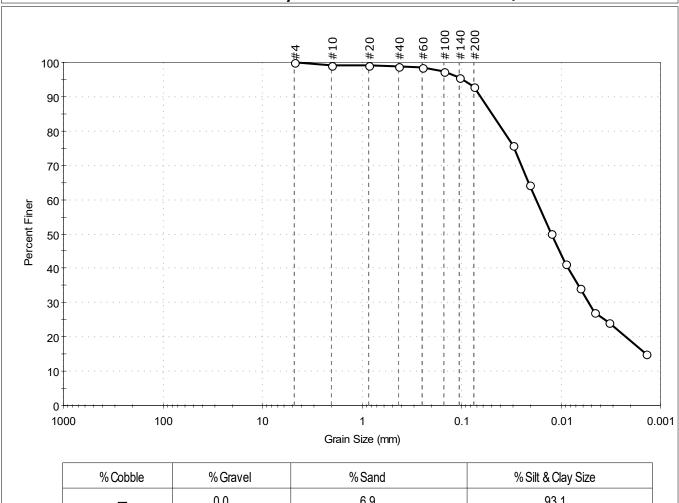
Sample ID: 04-09-190925 Test Date: 11/07/19 Checked By: bfs

Test Id: 527607 Depth:

Test Comment:

Visual Description: Wet, olive brown silt Sample Comment: Sample contains organics

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	6.9	93.1

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	99		
#20	0.85	99		
#40	0.42	99		
#60	0.25	98		
#100	0.15	97		
#140	0.11	96		
#200	0.075	93		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0306	76		
	0.0209	64		
	0.0124	50		
	0.0089	41		
	0.0064	34		
	0.0046	27		
	0.0033	24		
	0.0014	15	<del>                                     </del>	

<u>Coefficients</u>		
D <sub>85</sub> = 0.0494 mm	$D_{30} = 0.0053 \text{ mm}$	
D <sub>60</sub> = 0.0178 mm	$D_{15} = N/A$	
D <sub>50</sub> = 0.0124 mm	$D_{10} = N/A$	
C <sub>u</sub> =N/A	$C_c = N/A$	

<u>Classification</u> Elastic SILT (MH) <u>ASTM</u> AASHTO Clayey Soils (A-7-5 (40))

<u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-122SPT Sample Type: bag Tested By: ckg

527608

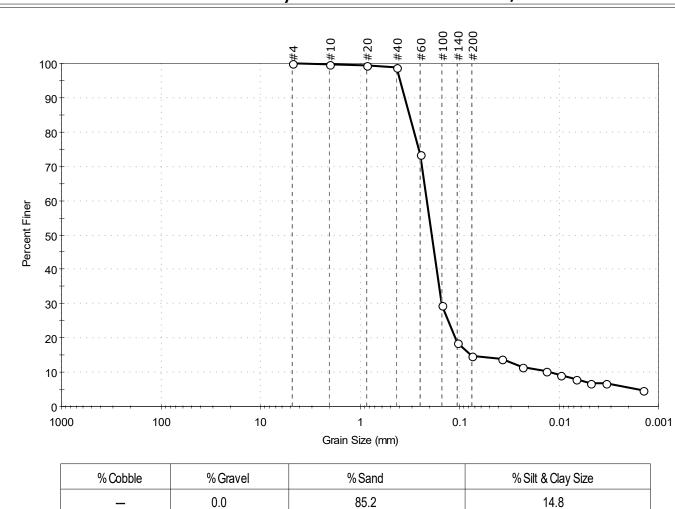
11/07/19 Checked By: bfs Test Date: Sample ID: 16.6-24-190925 Test Id:

Depth: Test Comment:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



1e	Sieve Size, mm Percen	t Finer Spec. Percent C	Complies	Coefficients	-
	_	0.0	85.2	14.8	
	% Cobble	% Gravel	%Sand	% Silt & Clay Size	

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	74		
#100	0.15	30		
#140	0.11	19		
#200	0.075	15		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0377	14		
	0.0232	12		
	0.0135	10		
	0.0095	9		
	0.0068	8		
	0.0048	7		
	0.0034	7		
	0.0014	5		

Coefficients			
D <sub>85</sub> = 0.3182 mm	$D_{30} = 0.1506 \text{ mm}$		
D <sub>60</sub> = 0.2136 mm	$D_{15} = 0.0767 \text{ mm}$		
D <sub>50</sub> = 0.1901 mm	$D_{10} = 0.0120 \text{ mm}$		
C <sub>11</sub> =17.800	$C_{c} = 8.848$		

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65

Separation of Sample: #200 Sieve

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Location: Project No: GTX-310685 Boring ID: PDI-122SPT Sample Type: bag Tested By: ckg

527609

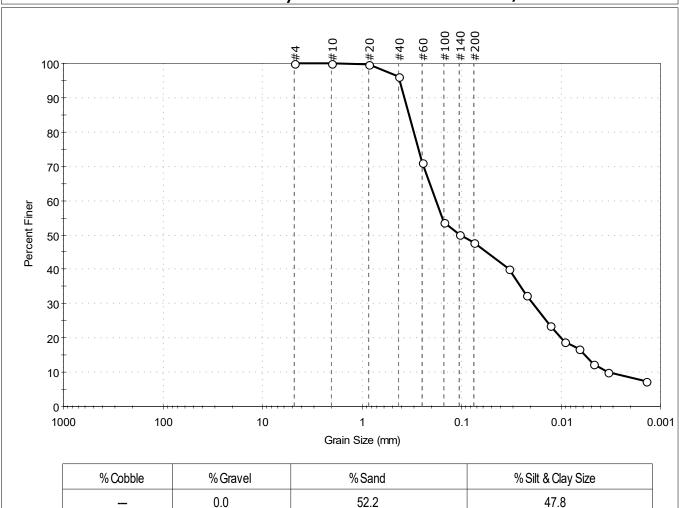
10/30/19 Checked By: bfs Test Date: Sample ID: 61-66-190926 Test Id:

Depth: Test Comment:

Visual Description: Wet, olive brown silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	96		
#60	0.25	71		
#100	0.15	54		
#140	0.11	50		
#200	0.075	48		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0332	40		
	0.0222	32		
	0.0130	23		
	0.0093	19		
	0.0066	17		
	0.0047	12		
	0.0034	10		
	0.0014	7		

<u>Coefficients</u>		
D <sub>85</sub> = 0.3352 mm	$D_{30} = 0.0192 \text{ mm}$	
D <sub>60</sub> = 0.1803 mm	$D_{15} = 0.0058 \text{ mm}$	
D <sub>50</sub> = 0.1049 mm	$D_{10} = 0.0033 \text{ mm}$	
Cu =54.636	$C_c = 0.620$	

<u>Classification</u> Silty SAND (SM) **ASTM** 

AASHTO Clayey Soils (A-6 (3))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-123SPT Sample Type: bag Tested By: ckg

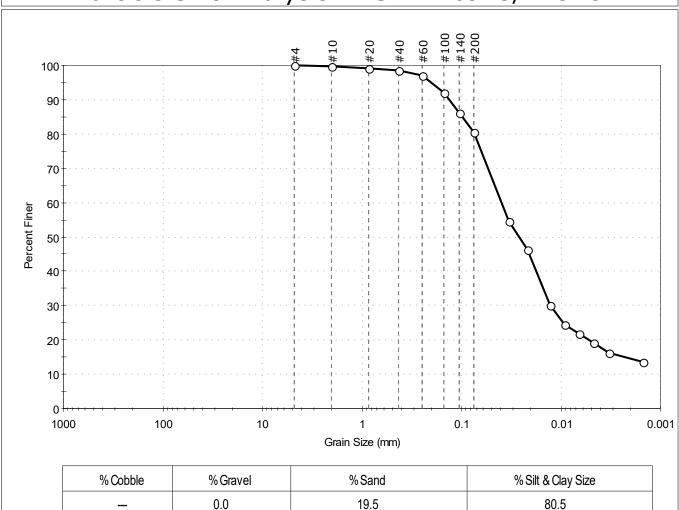
10/29/19 Checked By: bfs Sample ID: 00-4.5-190924 Test Date: Test Id: 527610

Depth: Test Comment:

Visual Description: Wet, dark olive silt with sand

Sample Comment:

## Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	99		
#60	0.25	97		
#100	0.15	92		
#140	0.11	86		
#200	0.075	80		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0335	54		
	0.0217	46		
	0.0129	30		
	0.0092	25		
	0.0066	22		
	0.0047	19		
	0.0033	16		
	0.0015	14		

<u>Coefficients</u>			
D <sub>85</sub> = 0.0992 mm	$D_{30} = 0.0129 \text{ mm}$		
D <sub>60</sub> = 0.0398 mm	$D_{15} = 0.0022 \text{ mm}$		
D <sub>50</sub> = 0.0264 mm	$D_{10} = N/A$		
$C_u = N/A$	$C_c = N/A$		

<u>Classification</u> Elastic SILT with Sand (MH) <u>ASTM</u>

AASHTO Clayey Soils (A-7-5 (23))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device : Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

printed 12/24/2019 9:45:59 AM



Location: Project No: GTX-310685 Boring ID: PDI-123SPT Sample Type: bag Tested By: ckg

527611

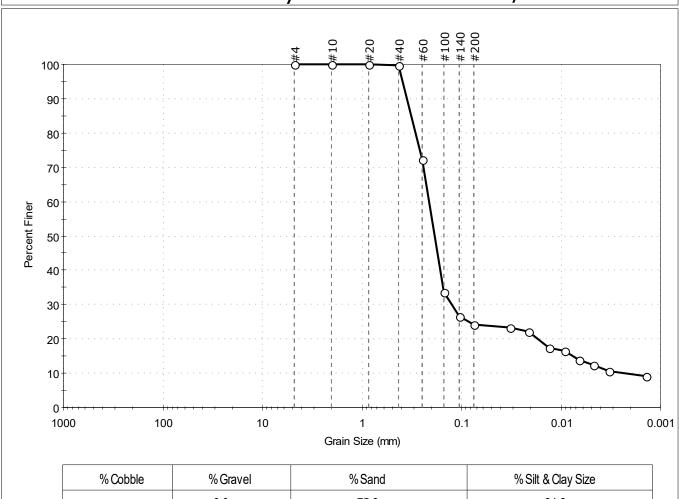
Test Date: 11/11/19 Checked By: bfs Sample ID: 25.5-30.5-190925 Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
_	0.0	75.8	24.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	72		
#100	0.15	34		
#140	0.11	27		
#200	0.075	24		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
	0.0326	23		
	0.0211	22		
	0.0131	17		
	0.0093	16		
	0.0066	14		
	0.0047	12		
	0.0033	11		
	0.0014	9		

<u>Coefficients</u>				
D <sub>85</sub> = 0.3204 mm	$D_{30} = 0.1255 \text{ mm}$			
D <sub>60</sub> = 0.2128 mm	$D_{15} = 0.0076 \text{ mm}$			
D <sub>50</sub> = 0.1865 mm	$D_{10} = 0.0023 \text{ mm}$			
C <sub>11</sub> =92.522	$C_c = 32.180$			

<u>Classification</u> Silty SAND (SM) <u>ASTM</u>

AASHTO Silty Gravel and Sand (A-2-4 (0))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape: ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer



Location: Project No: GTX-310685 Boring ID: PDI-123SPT Sample Type: bag Tested By: ckg

527612

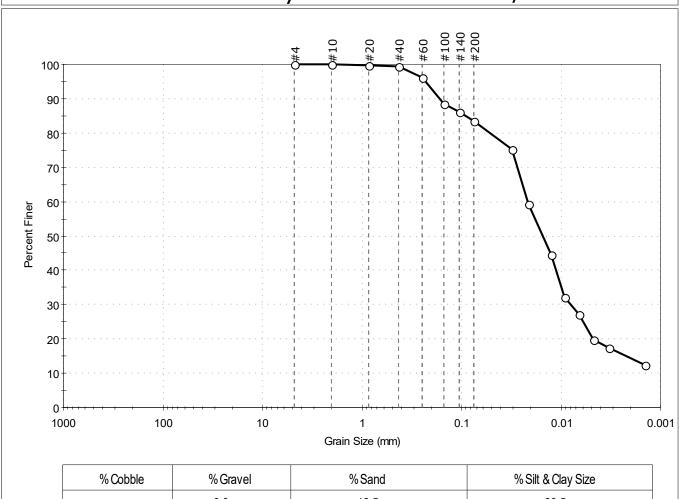
Test Date: 11/05/19 Checked By: bfs Sample ID: 63.2-65.5-190925 Test Id:

Depth: Test Comment:

Visual Description: Moist, dark olive brown silt with sand

Sample Comment:

#### Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size		
_	0.0	16.5	83.5		

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies		
#4	4.75	100				
#10	2.00	100				
#20	0.85	100				
#40	0.42	99				
#60	0.25	96				
#100	0.15	89				
#140	0.11	86				
#200	0.075	83				
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies		
	0.0313	75				
	0.0210	59				
	0.0125	44				
	0.0091	32				
	0.0065	27				
	0.0047	20				
	0.0033	17				
	0.0014	12				

<u>Coe</u> t	<u>fficients</u>
D <sub>85</sub> = 0.0911 mm	$D_{30} = 0.0079 \text{ mm}$
D <sub>60</sub> = 0.0214 mm	$D_{15} = 0.0022 \text{ mm}$
D <sub>50</sub> = 0.0152 mm	$D_{10} = N/A$
Cu =N/A	$C_c = N/A$

<u>Classification</u> SILT with Sand (ML) **ASTM** 

AASHTO Clayey Soils (A-7-5 (13))

## <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness: ---

Dispersion Device: Apparatus A - Mech Mixer

Dispersion Period: 1 minute Est. Specific Gravity: 2.65 Separation of Sample: #200 Sieve

printed 12/24/2019 9:46:01 AM



Location:Project No:GTX-310685Boring ID:PDI-19SC-BSample Type: bagTested By: ckg

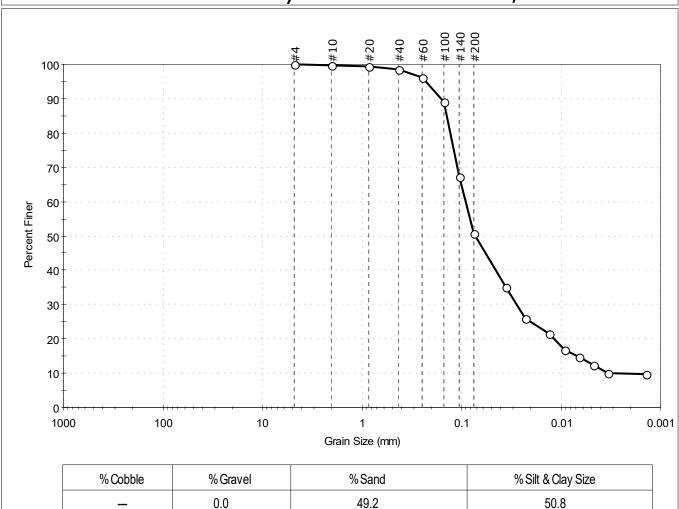
Boring ID: PDI-19SC-B Sample Type: bag Tested By: ckg
Sample ID: 05-07-191008 Test Date: 10/29/19 Checked By: bfs
Depth: --- Test Id: 527549

Depth: ---Test Comment: ---

Visual Description: Moist, dark olive brown sandy silt

Sample Comment: ----

#### Particle Size Analysis - ASTM D6913/D7928



Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies		
#4	4.75	100				
#10	2.00	100				
#20	0.85	99				
#40	0.42	99				
#60	0.25	96				
#100	0.15	89				
#140	0.11	67				
#200	0.075	51				
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies		
	0.0357	35				
	0.0226	26				
	0.0130	21				
	0.0093	17				
	0.0066	15				
	0.0047	12				
	0.0033	10				
	0.0014	10				

<u>Coef</u>	<u>ficients</u>
D <sub>85</sub> = 0.1405 mm	$D_{30} = 0.0277 \text{ mm}$
D <sub>60</sub> = 0.0909 mm	$D_{15} = 0.0070 \text{ mm}$
D <sub>50</sub> = 0.0722 mm	$D_{10} = 0.0024 \text{ mm}$
C <sub>u</sub> =37.875	$C_c = 3.517$

<u>Classification</u> ASTM Sandy SILT (ML)

AASHTO Silty Soils (A-4 (0))

#### <u>Sample/Test Description</u> Sand/Gravel Particle Shape : ---

Sarra, States talking Strape :

Sand/Gravel Hardness : ---

 $\label{eq:Dispersion Device: Apparatus A - Mech Mixer} \end{\mbox{\sf Dispersion Device: Apparatus A - Mech Mixer}}$ 



Project: Gasco PD Location:

Test Comment:

Location: Project No: GTX-310685

Boring ID: PDI-016SC-B Sample Type: bag Tested By: cam

Sample ID: 06-08-191009 Test Date: 11/06/19 Checked By: bfs

527477

Depth: --- Test Id:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	06-08-191009	DI-016SC		35	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: PDI-018SC-A Sample Type: bag Tested By: cam Sample ID: 06-07-190926 Test Date: 10/08/19 Checked By: bfs

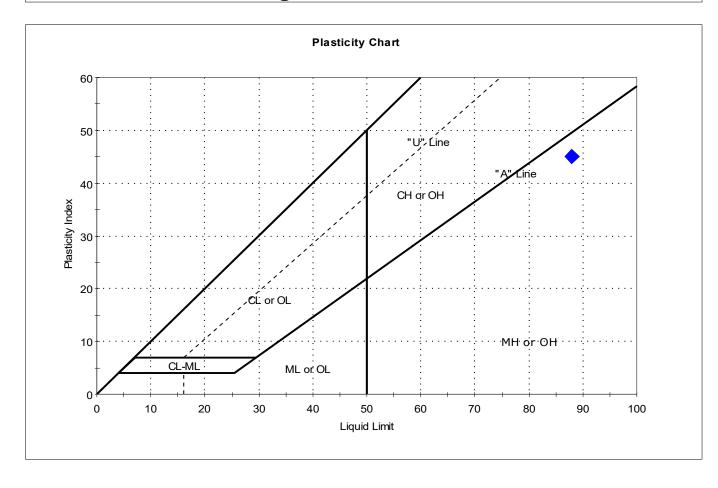
Test Id: Depth: 525962

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	06-07-190926	DI-018SC		77	88	43	45	0.8	Elastic SILT (MH)

Sample Prepared using the WET method

5% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: MEDIUM



Location:Project No:GTX-310685Boring ID: PDI-018SC-ASample Type: bagTested By: camSample ID: 08-09-190926Test Date: 10/09/19Checked By: bfs

Depth: --- Test Id: 525963

Test Comment: ---

Visual Description: Moist, very dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	08-09-190926	DI-018SC		23	n/a	n/a	n/a	n/a	

Dry Strength: LOW
Dilatancy: RAPID
Toughness: n/a



Location: Project No: GTX-310685

Boring ID: PDI-021SC-B Sample Type: bag Tested By: cam Sample ID: 7.7-9.7-190927 Test Date: 10/09/19 Checked By: bfs Test Id:

525964

Depth: Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	7.7-9.7-190927	)I-021SC		13	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

18% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID: PDI-022SC-BSample Type:bagTested By:camSample ID: 5.5-7.5-191016Test Date:11/18/19Checked By:bfs

Depth: --- Test Id: 529655

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	5.5-7.5-191016	)I-022SC		11	n/a	n/a	n/a	n/a	

Dry Strength: NONE Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: PDI-024SC-B Sample Type: bag Tested By: cam Sample ID: 10-12.1-190927 Test Date: 10/09/19 Checked By: bfs Test Id:

525965

Depth: Test Comment:

Visual Description: Moist, very dark gray sand with silt

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	10-12.1-190927	)I-024SC		38	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

0% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: PDI-027SC-B Sample Type: bag Tested By: cam

Boring ID: PDI-027SC-B Sample Type: bag Tested By: cam Sample ID: 11-13.5-191011 Test Date: 11/12/19 Checked By: bfs

527481

Depth: --- Test Id:
Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	11-13.5-191011	)I-027SC-		19	n/a	n/a	n/a	n/a	

Dry Strength: LOW
Dilatancy: RAPID
Toughness: n/a



Location:Project No:GTX-310685Boring ID: PDI-028SCSample Type: bagTested By: camSample ID: 10.7-12.7-191003Test Date: 10/14/19Checked By: bfs

Sample ID: 10.7-12.7-191003 Test Date: 10/14/19 (
Depth: --- Test Id: 526418

Test Comment: ---

Visual Description: Moist, very dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	10.7-12.7-191003	DI-028S0		15	n/a	n/a	n/a	n/a	

Dry Strength: NONE Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID: PDI-031SC-BSample Type:bagTested By:camSample ID: 8.9-10.9-191017Test Date:11/18/19Checked By:bfs

Depth: --- Test Id: 529653

Test Comment: ---

Visual Description: Moist, dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	8.9-10.9-191017	)I-031SC		16	n/a	n/a	n/a	n/a	

Dry Strength: NONE Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID: PDI-033SC-BSample Type:bagTested By:camSample ID: 8.7-10.7-191008Test Date:11/01/19Checked By:bfs

Depth: --- Test Id: 527480

Test Comment: ---

Visual Description: Moist, dark grayish brown sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	8.7-10.7-191008	)I-033SC		18	n/a	n/a	n/a	n/a	

Dry Strength: LOW
Dilatancy: RAPID
Toughness: n/a



Location: Project No:

Boring ID: PDI-036SC-B Sample Type: bag Tested By:

Boring ID: PDI-036SC-B Sample Type: bag Tested By: cam Sample ID: 4.2-6.2-190929 Test Date: 10/09/19 Checked By: bfs Depth: --- Test Id: 525966

GTX-310685

Test Comment: ---

Visual Description: Moist, very dark gray sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	4.2-6.2-190929	)I-036SC		14	n/a	n/a	n/a	n/a	

Dry Strength: LOW
Dilatancy: RAPID
Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-038SCSample Type: bagTested By: cam

Sample ID: B-7.1-9.1-191009 Test Date: 10/25/19 Checked By: bfs Depth: --- Test Id: 527478

Test Comment: --

Visual Description: Moist, dark gray sand with silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	B-7.1-9.1-191009	DI-038S0		20	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

35% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID: PDI-039SC-BSample Type:bagTested By:camSample ID: 7.8-9.8-190930Test Date:10/09/19Checked By:bfs

Depth: --- Test Id: 525970

Test Comment: ---

Visual Description: Moist, very dark gray sand with silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	7.8-9.8-190930	)I-039SC		40	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID: PDI-041SC-BSample Type:bagTested By:camSample ID: 8.2-10.2-191010Test Date:10/30/19Checked By:bfs

Depth: --- Test Id: 527475

Test Comment: ---

Visual Description: Moist, dark grayish brown sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	8.2-10.2-191010	DI-041SC		29	n/a	n/a	n/a	n/a	

Dry Strength: LOW
Dilatancy: RAPID
Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-046SC-BSample Type: bagTested By: cam

Sample ID: 9.8-11.8-191001 Test Date: 10/09/19 Checked By: bfs Depth: --- Test Id: 525968

Test Comment: ---

Visual Description: Moist, very dark gray silty sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	9.8-11.8-191001	)I-046SC		24	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Project: Gasco PD Location:

Test Comment:

Location: Project No: GTX-310685

Boring ID: PDI-049SC-B Sample Type: bag Tested By: cam

Sample ID: 06-08-191015 Test Date: 11/05/19 Checked By: bfs

527484

Depth: --- Test Id:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	06-08-191015	DI-049SC		32	n/a	n/a	n/a	n/a	Silty SAND (SM)

4% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Sample Type: bag Boring ID: PDI-052SC-B Tested By:

cam Sample ID: 06-08-191015 Test Date: 11/06/19 Checked By: bfs Test Id:

527485

Depth: Test Comment:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	06-08-191015	DI-052SC		45	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



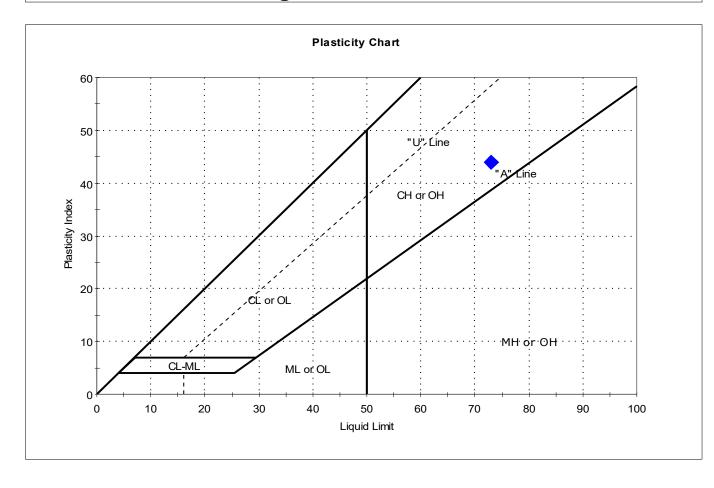
Location:Project No:GTX-310685Boring ID:PDI-057SC-BSample Type:bagTested By:camSample ID:06-08-191023Test Date:11/21/19Checked By:bfs

Depth: --- Test Id: 529650

Test Comment: ---

Visual Description: Wet, dark gray clay
Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	06-08-191023	)I-057SC <sup>.</sup>		77	73	29	44	1.1	Fat CLAY (CH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No:

Boring ID: PDI-059SC-B Sample Type: bag Tested By: cam Sample ID: 06-08-191016 Test Date: 11/19/19 Checked By: bfs Test Id:

529656

GTX-310685

Test Comment:

Depth:

Visual Description: Moist, dark grayish brown silty sand

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	06-08-191016	DI-059SC		38	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-064SC-BSample Type:bagTested By:camSample ID:04-06-190929Test Date:10/11/19Checked By:bfs

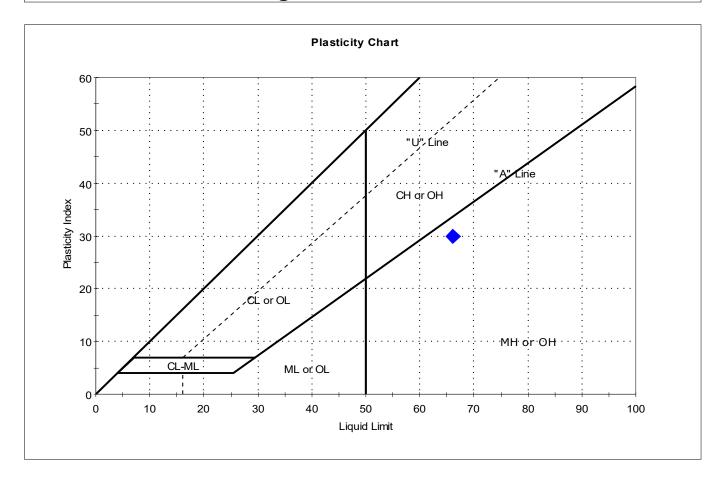
Depth: --- Test Id: 525967

Test Comment: ---

Visual Description: Moist, very dark gray silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	04-06-190929	DI-064SC		66	66	36	30	1	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



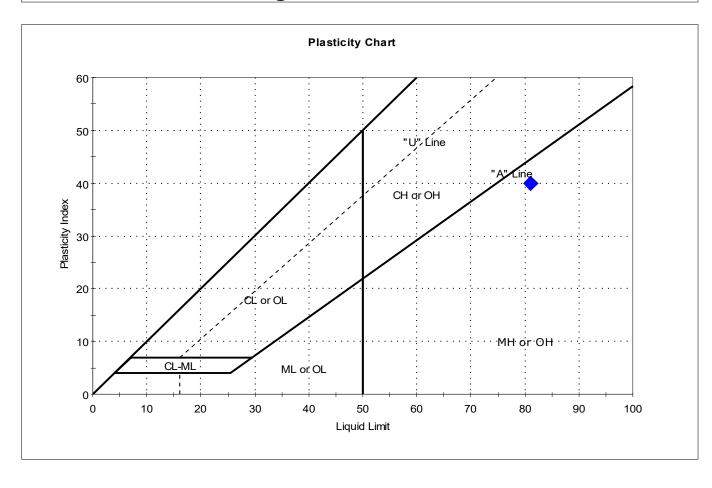
Location:Project No:GTX-310685Boring ID:PDI-066SC-BSample Type:bagTested By:camSample ID:06-08-191011Test Date:11/13/19Checked By:bfs

Depth: --- Test Id: 527482

Test Comment: ---

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symb	ol Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	06-08-191011	DI-066SC		68	81	41	40	0.7	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685
Boring ID: PDI-067SC-B Sample Type: bag Tested By: cam

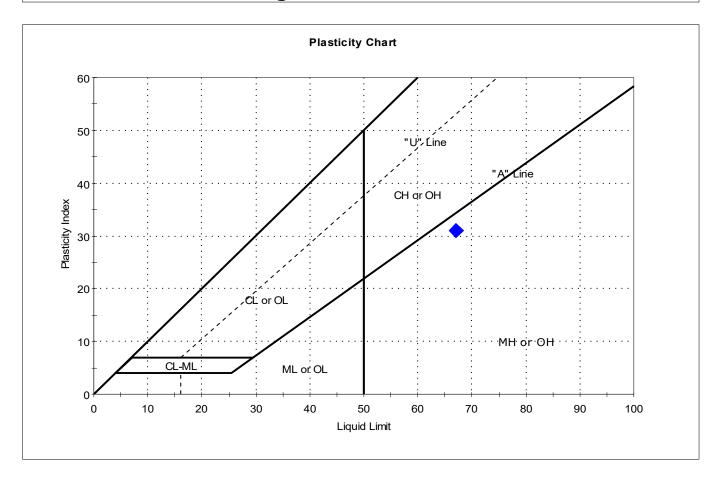
Boring ID: PDI-067SC-B Sample Type: bag Tested By: can Sample ID: 02-04-191010 Test Date: 11/11/19 Checked By: bfs Depth: --- Test Id: 527476

Depth: --- Test Id:
Test Comment: ---

Visual Description: Wet, dark olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	02-04-191010	DI-067SC		74	67	36	31	1.2	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: PDI-069SC-B Sample Type: bag Tested By: cam Sample ID: 10-12-191016 Test Date: 11/20/19 Checked By: bfs

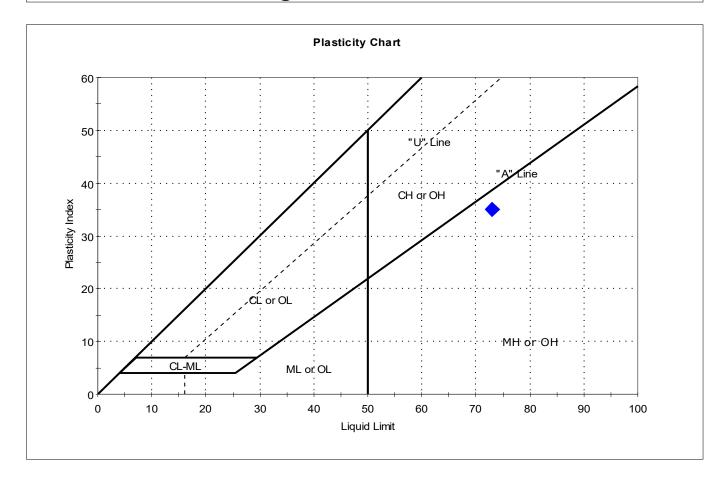
Test Id: 529657 Depth:

Test Comment:

Visual Description: Moist, very dark gray silt

Sample Comment:

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	10-12-191016	DI-069SC		67	73	38	35	0.8	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location:Project No:GTX-310685Boring ID:PDI-071SC-BSample Type: bagTested By: cam

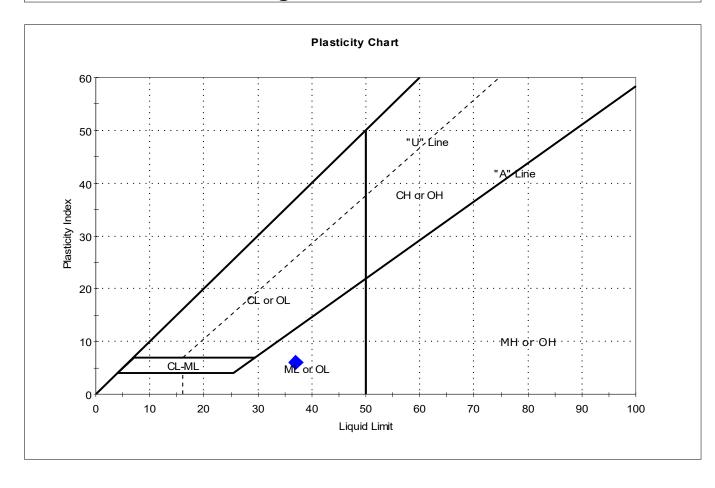
Sample ID: -08-10-191001 Test Date: 10/15/19 Checked By: bfs
Depth: --- Test Id: 525969

Test Comment: ---

Visual Description: Wet, very dark gray silty sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	-08-10-191001	)I-071SC		43	37	31	6	2	Silty SAND (SM)

Sample Prepared using the WET method

19% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location:Project No:GTX-310685Boring ID:PDI-077SC-BSample Type:bagTested By:camSample ID:04-06-191014Test Date:10/25/19Checked By:bfs

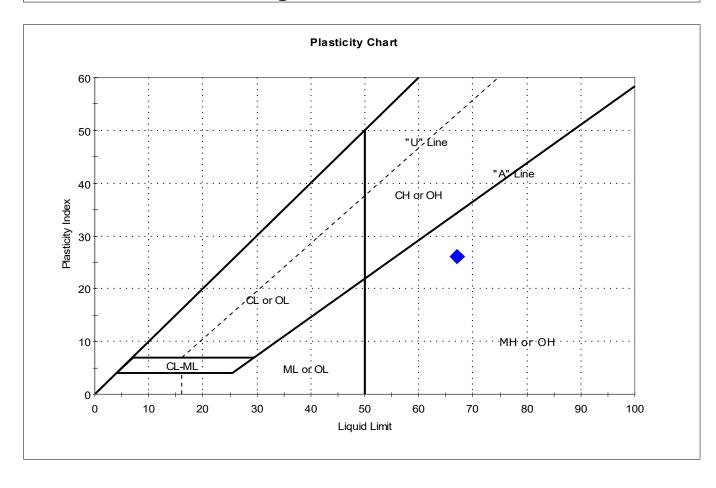
Depth: --- Test Id: 527473

Test Comment: ---

Visual Description: Wet, dark olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	04-06-191014	)I-077SC		81	67	41	26	1.6	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location:Project No:GTX-310685Boring ID:PDI-079SC-BSample Type:bagTested By:camSample ID:06-08-191014Test Date:11/18/19Checked By:bfs

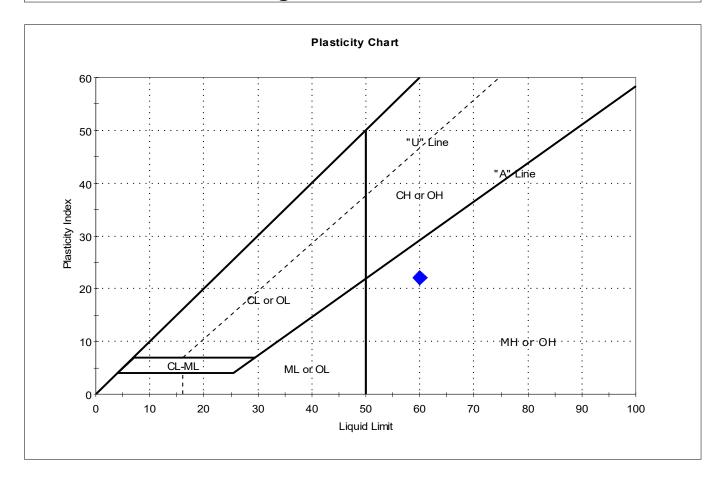
Depth: --- Test Id: 527474

Test Comment: ---

Visual Description: Wet, dark grayish brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	06-08-191014	DI-079SC		115	60	38	22	3.5	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

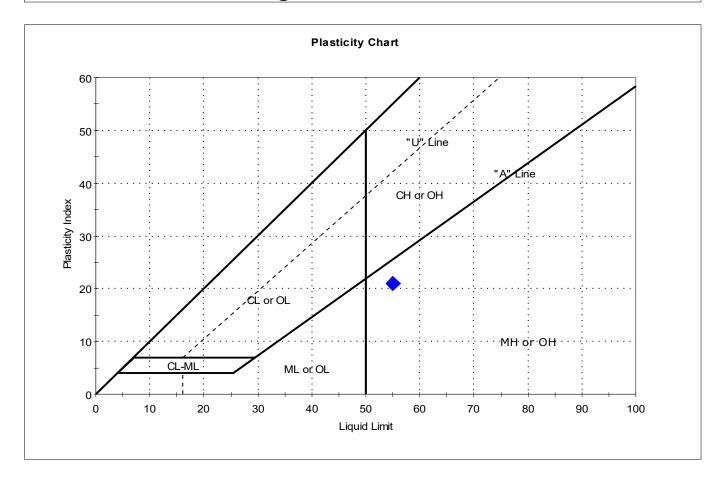
Project No: GTX-310685 Sample Type: bag Boring ID: PDI-081SC-B Tested By: cam Sample ID: 08-10-191002 Test Date: 10/14/19 Checked By: bfs

Test Id: Depth: 526419

Test Comment:

Visual Description: Wet, dark grayish olive silt with sand Sample Comment:

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	08-10-191002	DI-081SC		64	55	34	21	1.4	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



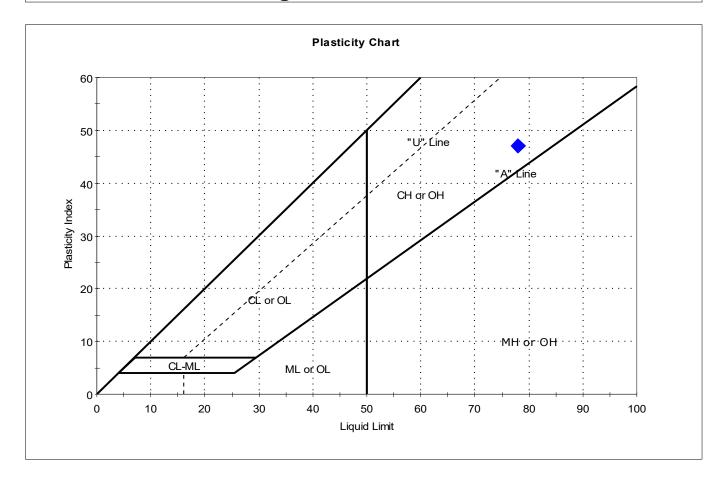
Location:Project No:GTX-310685Boring ID:PDI-083SC-BSample Type:bagTested By:camSample ID:08-10-191022Test Date:11/20/19Checked By:bfs

Depth: --- Test Id: 529651

Test Comment: ---

Visual Description: Moist, dark gray clay
Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	08-10-191022	)I-083SC		76	78	31	47	1	Fat CLAY (CH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



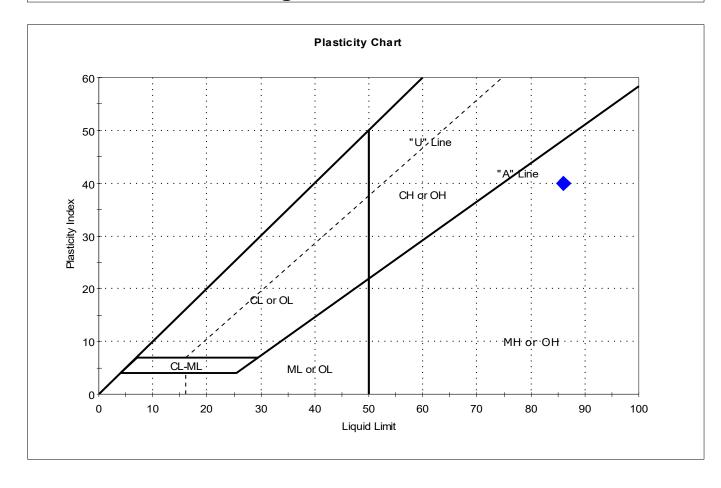
Location:Project No:GTX-310685Boring ID:PDI-090SC-BSample Type:bagTested By:camSample ID:06-08-191012Test Date:11/11/19Checked By:bfs

Depth: --- Test Id: 527483

Test Comment: ---

Visual Description: Moist, dark olive brown silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	06-08-191012	DI-090SC		82	86	46	40	0.9	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

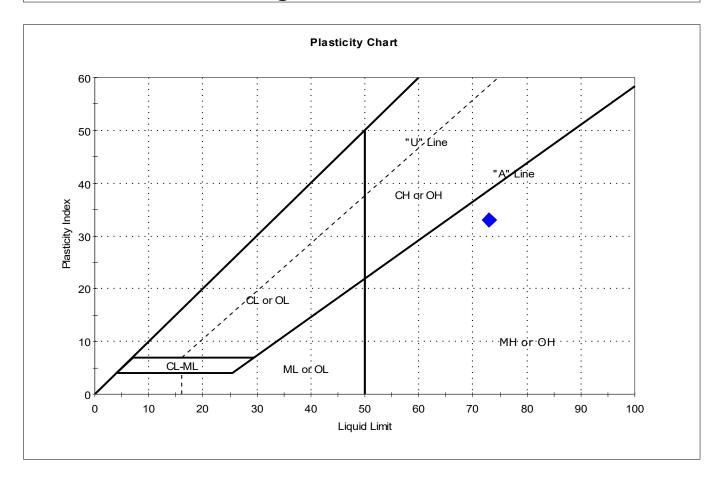
Project No: GTX-310685 Sample Type: bag Boring ID: PDI-097SC-B Tested By: cam Sample ID: 02-04-191017 Test Date: 11/19/19 Checked By: bfs

Test Id: 529654 Depth:

Test Comment:

Visual Description: Wet, dark gray silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	02-04-191017	DI-097SC		87	73	40	33	1.4	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location:Project No:GTX-310685Boring ID: PDI-099SC-BSample Type: bagTested By: camSample ID: 02-04-191022Test Date: 11/20/19Checked By: bfs

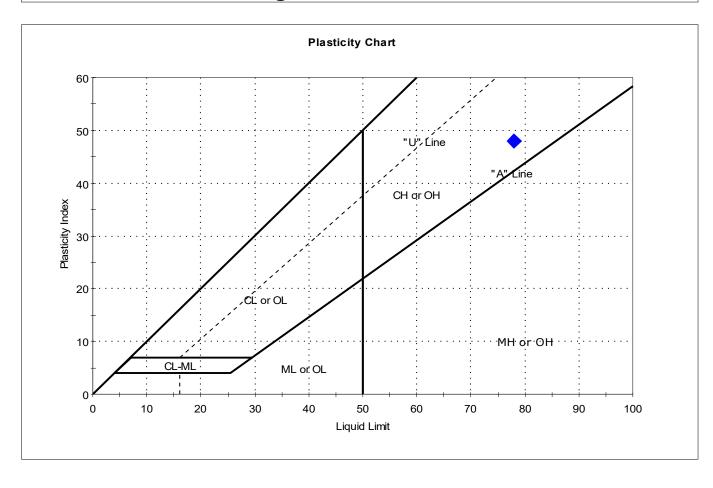
Depth: --- Test Id: 529652

Test Comment: ---

Visual Description: Moist, very dark gray clay

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	02-04-191022	)I-099SC		80	78	30	48	1	Fat CLAY (CH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location:Project No:GTX-310685Boring ID:PDI-107SPTSample Type:bagTested By:camSample ID:00-04-190923Test Date:11/12/19Checked By:bfs

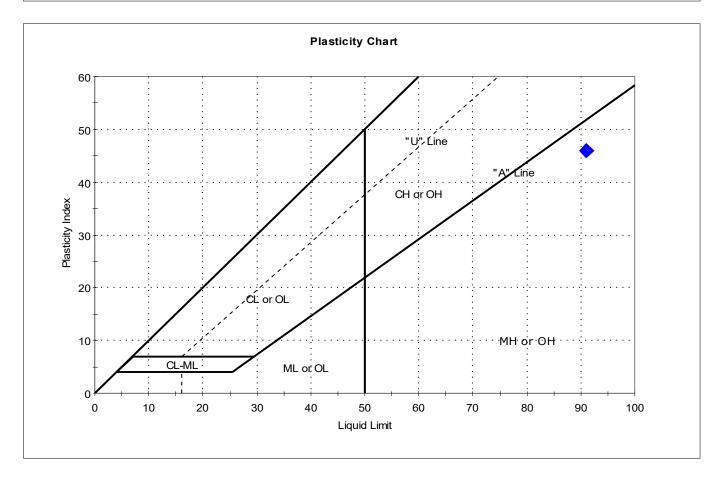
Depth: --- Test Id: 527486

Test Comment: ---

Visual Description: Wet, dark olive brown silt

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	00-04-190923	DI-107SP		108	91	45	46	1.4	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: SLOW Toughness: MEDIUM



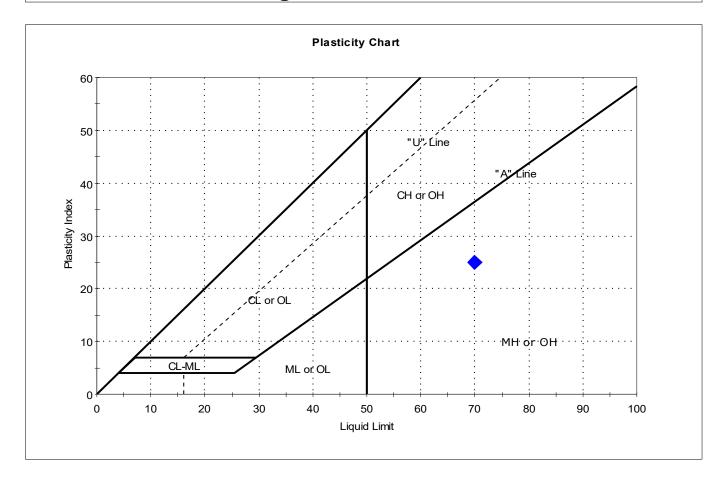
Location:Project No:GTX-310685Boring ID:PDI-107SPTSample Type:bagTested By:camSample ID:04-09-190923Test Date:11/18/19Checked By:bfs

Sample ID: 04-09-190923 Test Date: 11/18/1 Depth: --- Test Id: 527487

Test Comment: ---

Visual Description: Wet, dark olive brown silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	04-09-190923	DI-107SP		84	70	45	25	1.6	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685 Boring ID: PDI-107SPT Sample Type: bag Tested By: cam

Sample ID: 17-18-190923 Test Date: 11/11/19 Checked By: bfs 527488 Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	17-18-190923	DI-107SP		42	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685
Boring ID: PDI-107SPT Sample Type: bag Tested By: cam

Boring ID: PDI-107SPT Sample Type: bag Tested By: cam Sample ID: 62-64-190923 Test Date: 10/28/19 Checked By: bfs Depth: --- Test Id: 527489

Test Comment: ---

Visual Description: Moist, dark olive brown silty sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	62-64-190923	DI-107SP		27	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-108SPTSample Type:bagTested By:camSample ID:00-6.4-191007Test Date:11/11/19Checked By:bfs

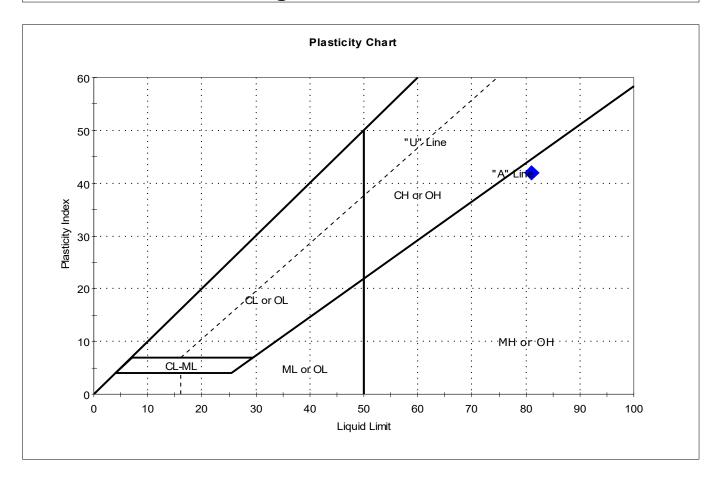
Depth: --- Test Id: 527490

Test Comment: ---

Visual Description: Wet, olive brown silt with sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	00-6.4-191007	DI-108SP		95	81	39	42	1.3	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

8% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location:Project No:GTX-310685Boring ID: PDI-108SPTSample Type: bagTested By: camSample ID: 14-33.5-191007Test Date: 10/23/19Checked By: bfs

Depth: --- Test Id: 527491

Test Comment: ---

Visual Description: Moist, dark olive brown sand

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	14-33.5-191007	DI-108SP		39	n/a	n/a	n/a	n/a	

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-108SPTSample Type:bagTested By:camSample ID:33.5-66.5-191007Test Date:10/28/19Checked By:bfs

Depth: --- Test Id: 527492

Test Comment: ---

Visual Description: Moist, dark gray sand with silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	33.5-66.5-191007	DI-108SP		30	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

26% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: PDI-109SPT Sample Type: bag Tested By: cam

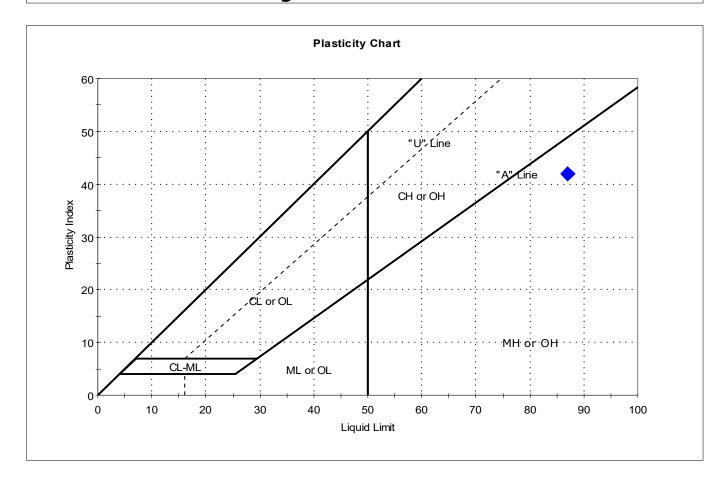
Sample ID: 00-6.5-191004 Test Date: 11/18/19 Checked By: n/a

Depth: --- Test Id: 527493

Test Comment: ---

Visual Description: Wet, very dark olive silt Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	00-6.5-191004	DI-109SP		93	87	45	42	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

3% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Location:Project No:GTX-310685Boring ID:PDI-109SPTSample Type: bagTested By: cam

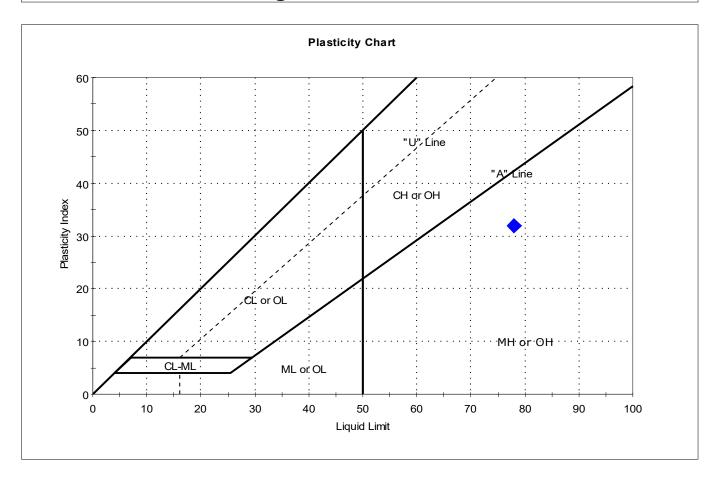
Boring ID: PDI-109SPT Sample Type: bag Tested By: can Sample ID: 16.5-18.1-191004 Test Date: 11/18/19 Checked By: bfs Depth: --- Test Id: 527494

Depth: --Test Comment: ---

Visual Description: Moist, dark olive brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	16.5-18.1-191004	DI-109SP		80	78	46	32	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685
Boring ID: PDI-109SPT Sample Type: bag Tested By: cam

Boring ID: PDI-109SPT Sample Type: bag Tested By: cam Sample ID: 22-30-191004 Test Date: 10/25/19 Checked By: bfs Depth: --- Test Id: 527495

Test Comment: ---

Visual Description: Moist, olive brown sand with silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	22-30-191004	DI-109SP		35	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685
Boring ID: PDI-109SPT Sample Type: bag Tested By: cam

Boring ID: PDI-109SPT Sample Type: bag Tested By: can Sample ID: 35.5-48.3-191004 Test Date: 10/24/19 Checked By: bfs Depth: --- Test Id: 527496

Depth: ---Test Comment: ---

Visual Description: Moist, olive brown sand with silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	35.5-48.3-191004	DI-109SP		26	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685 Sample Type: bag Tested By: cam

527497

Boring ID: PDI-109SPT Sample ID: 48.3-51-191004 Test Date: 11/12/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark olive brown silt with sand

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	48.3-51-191004	DI-109SP		48	n/a	n/a	n/a	n/a	SILT with Sand (ML)

0% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685
Boring ID: PDI-110 B Sample Type: bag Tested By: cam

Sample ID: 54-64.5-191015 Test Date: 10/24/19 Checked By: bfs
Depth: --- Test Id: 527498

Test Comment: ---

Visual Description: Moist, black sand with silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	54-64.5-191015	PDI-110 B		18	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

38% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Sample Type: bag Boring ID: PDI-110SPT Tested By: cam Sample ID: 21-32-191010 Test Date: 10/24/19 Checked By: bfs Test Id:

527499

Test Comment:

Depth:

Visual Description: Moist, dark gray sand

Sample Comment:

## Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	21-32-191010	DI-110SP		24	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

6% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID: PDI-110SPTSample Type: bagTested By: camSample ID: 32-45-191010Test Date: 10/24/19Checked By: bfs

Sample ID: 32-45-191010 Test Date: 10/24/19
Depth: --- Test Id: 527500

Test Comment: ---

Visual Description: Moist, black sand

Sample Comment: ---

#### Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	32-45-191010	DI-110SP		28	n/a	n/a	n/a	n/a	

Dry Strength: LOW
Dilatancy: RAPID
Toughness: n/a



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Sample Type: bag Boring ID: PDI-112SPT Tested By: cam Sample ID: 00-6.5-191003 Test Date: 11/11/19 Checked By: bfs

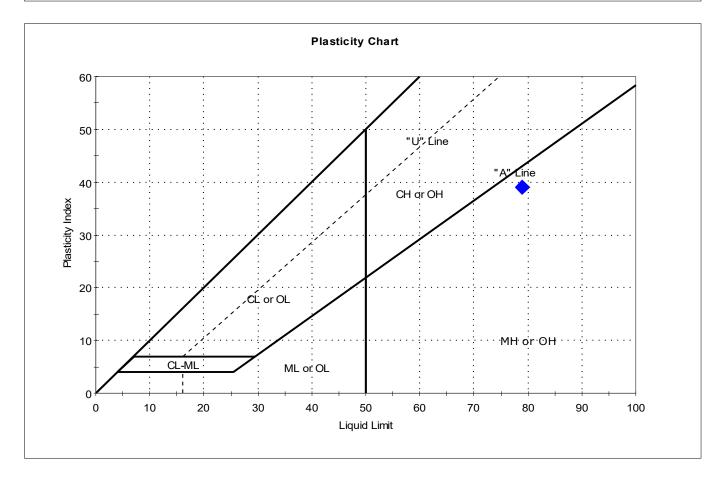
Test Id: 527501 Depth:

Test Comment:

Visual Description: Moist, dark brown silt

Sample Comment:

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	00-6.5-191003	DI-112SP		77	79	40	39	0.9	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685
Boring ID: PDI-112SPT Sample Type: bag Tested By: cam

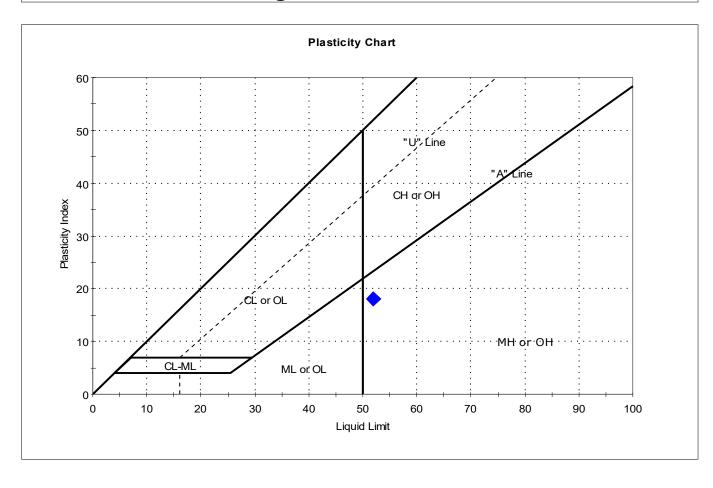
Sample ID: 07-11.5-191003 Test Date: 11/15/19 Checked By: bfs
Depth: --- Test Id: 527502

Depth: ---Test Comment: ---

Visual Description: Moist, dark gray sandy silt

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	07-11.5-191003	DI-112SP		53	52	34	18	1.1	Sandy Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location:Project No:GTX-310685Boring ID:PDI-112SPTSample Type: bagTested By: cam

Sample ID: 11.5-26.5-191003 Test Date: 11/12/19 Checked By: bfs
Depth: --- Test Id: 527503

Depth: ---Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	11.5-26.5-191003	DI-112SP		37	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location: Project No: GTX-310685 cam

527504

Boring ID: PDI-112SPT Sample Type: bag Tested By: Sample ID: 37.5-58-191003 Test Date: 10/28/19 Checked By: bfs Test Id:

Test Comment:

Depth:

Visual Description: Moist, very dark olive gray silty sand

Sample Comment:

## Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	37.5-58-191003	DI-112SP		19	n/a	n/a	n/a	n/a	Silty SAND (SM)

20% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: PDI-113SPT Sample Type: bag Tested By: cam Sample ID: 06-16-191011 Test Date: 11/13/19 Checked By: bfs

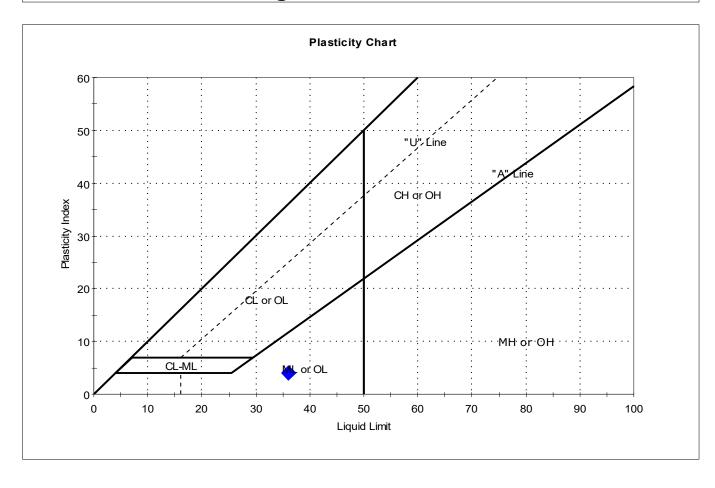
Test Id: 527505 Depth:

Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	06-16-191011	DI-113SP		43	36	32	4	2.7	Silty SAND (SM)

Sample Prepared using the WET method

3% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: MEDIUM



Location: Project No:

Boring ID: PDI-113SPT Sample Type: hag Tested By: 0

Boring ID: PDI-113SPT Sample Type: bag Tested By: cam Sample ID: 16-22-191011 Test Date: 10/23/19 Checked By: bfs Depth: --- Test Id: 527506

GTX-310685

Depth: ---Test Comment: ---

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	16-22-191011	DI-113SP		37	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-113SPTSample Type: bagTested By: cam

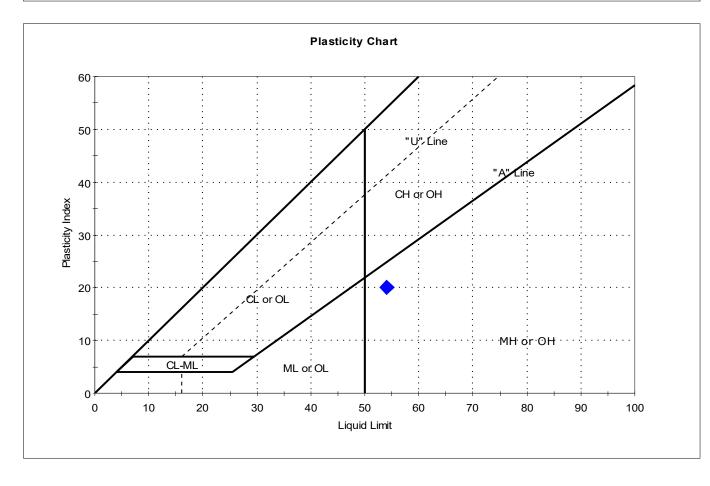
Sample ID: 22-25.2-191011 Test Date: 11/12/19 Checked By: bfs
Depth: --- Test Id: 527507

Depth: ---Test Comment: ---

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	22-25.2-191011	DI-113SP		61	54	34	20	1.3	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: PDI-113SPT Sample Type: bag Tested By: cam Sample ID: 31.9-39.4-191011 Test Date: 10/23/19 Checked By: bfs Test Id:

527508

Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	31.9-39.4-191011	DI-113SP		33	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-114SPTSample Type:bagTested By:camSample ID:00-7.5-191008Test Date:11/11/19Checked By:bfs

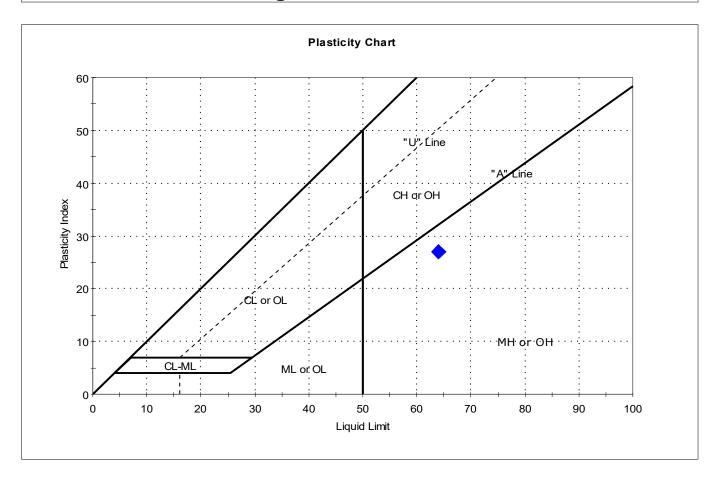
Depth: --- Test Id: 527509

Test Comment: ---

Visual Description: Wet, olive brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Sym	bol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
		00-7.5-191008	DI-114SP		73	64	37	27	1.3	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685 Boring ID: PDI-114SPT Sample Type: bag Tested By: cam

Sample ID: 25.5-28-191008 Test Date: 10/30/19 Checked By: bfs Test Id:

527510

Test Comment:

Depth:

Visual Description: Moist, dark olive brown silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	25.5-28-191008	DI-114SP		31	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-114SPTSample Type: bagTested By: cam

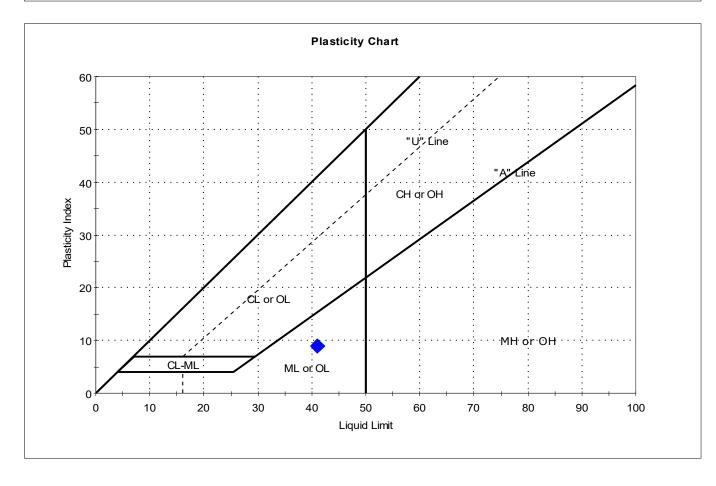
Boring ID: PDI-114SPT Sample Type: bag Tested By: can Sample ID: 42-50.5-191008 Test Date: 11/15/19 Checked By: bfs Depth: --- Test Id: 527511

Test Comment: ---

Visual Description: Wet, olive brown sandy silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	42-50.5-191008	DI-114SP		50	41	32	9	2	Sandy SILT (ML)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: PDI-114SPT Sample Type: bag Tested By: cam Sample ID: 50.5-55-191008 Test Date: 10/28/19 Checked By: bfs Test Id:

527512

Test Comment:

Depth:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	50.5-55-191008	DI-114SP		37	n/a	n/a	n/a	n/a	Silty SAND (SM)

4% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-114SPTSample Type: bagTested By: cam

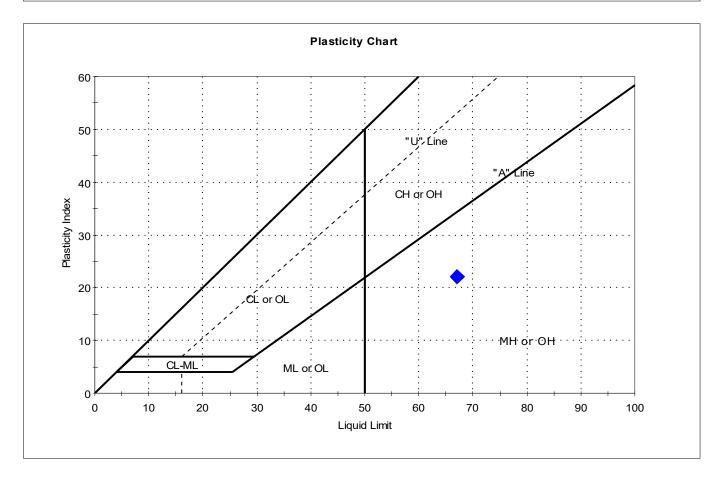
Boring ID: PDI-114SPT Sample Type: bag Tested By: can Sample ID: 7.5-12.5-191008 Test Date: 11/18/19 Checked By: bfs Depth: --- Test Id: 527513

Test Comment: ---

Visual Description: Moist, olive brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	7.5-12.5-191008	DI-114SP		65	67	45	22	0.9	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location:

Project No: GTX-310685 Boring ID: PDI-115SPT Sample Type: bag Tested By: cam Sample ID: 06-11-191009 Test Date: 10/24/19 Checked By: bfs Test Id:

527514

Depth: Test Comment:

Visual Description: Moist, very dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	06-11-191009	DI-115SP		17	n/a	n/a	n/a	n/a	Silty SAND (SM)

11% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685
Boring ID: PDI-115SPT Sample Type: bag Tested By: cam

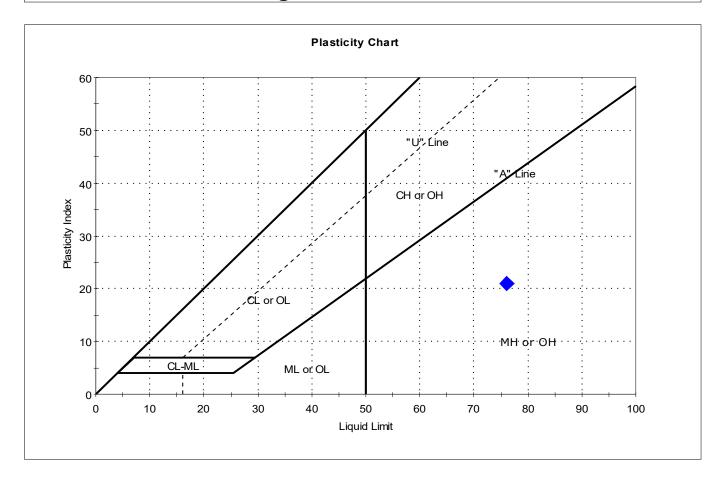
Boring ID: PDI-115SPT Sample Type: bag Tested By: can Sample ID: 18.6-20.6-191009 Test Date: 11/13/19 Checked By: bfs Depth: --- Test Id: 527515

Test Comment: ---

Visual Description: Moist, dark olive brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	18.6-20.6-191009	DI-115SP		72	76	55	21	0.8	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Location: Project No: GTX-310685

Boring ID: PDI-115SPT Sample Type: bag Tested By: cam

Boring ID: PDI-115SPT Sample Type: bag Tested By: can Sample ID: 23-28.1-191009 Test Date: 10/24/19 Checked By: bfs

527516

Depth: --- Test Id:
Test Comment: ---

Visual Description: Moist, very dark olive brown sand with silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	23-28.1-191009	DI-115SP		28	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

5% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685

Boring ID: PDI-115SPT Sample Type: hag Tested By: cam

Boring ID: PDI-115SPT Sample Type: bag Tested By: cam Sample ID: 41.5-49.3-191009 Test Date: 10/25/19 Checked By: bfs Depth: --- Test Id: 527517

Depth: ---Test Comment: ---

Visual Description: Moist, olive brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	41.5-49.3-191009	DI-115SP		39	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location: Project No: GTX-310685
Boring ID: PDI-116SPT Sample Type: bag Tested By: cam

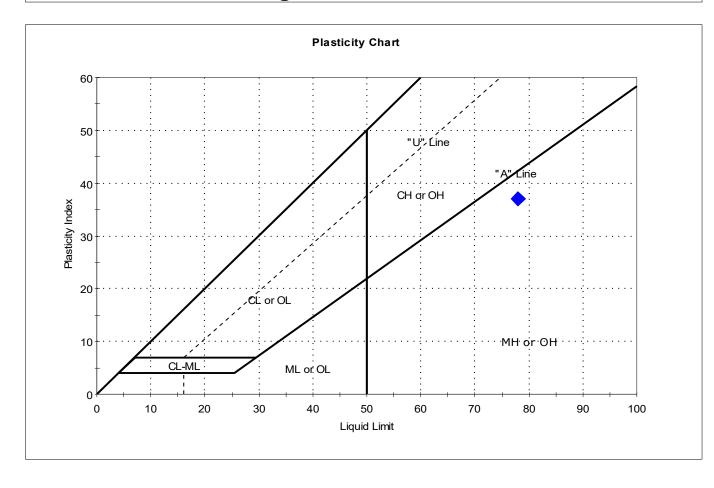
Boring ID: PDI-116SPT Sample Type: bag Tested By: can Sample ID: 00-4.5-190926 Test Date: 11/11/19 Checked By: bfs Depth: --- Test Id: 527518

Depth: --Test Comment: ---

Visual Description: Wet, olive brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbo	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	00-4.5-190926	DI-116SP		83	78	41	37	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location: Project No: GTX-310685

Boring ID: PDI-116SPT Sample Type: hag Tested By: cam

Boring ID: PDI-116SPT Sample Type: bag Tested By: cam Sample ID: 20-26.7-190927 Test Date: 11/01/19 Checked By: bfs Depth: --- Test Id: 527519

Depth: ---Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	20-26.7-190927	DI-116SP		26	n/a	n/a	n/a	n/a	Silty SAND (SM)

2% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-116SPTSample Type:bagTested By:camSample ID:26.7-28.6-190926Test Date:11/11/19Checked By:bfs

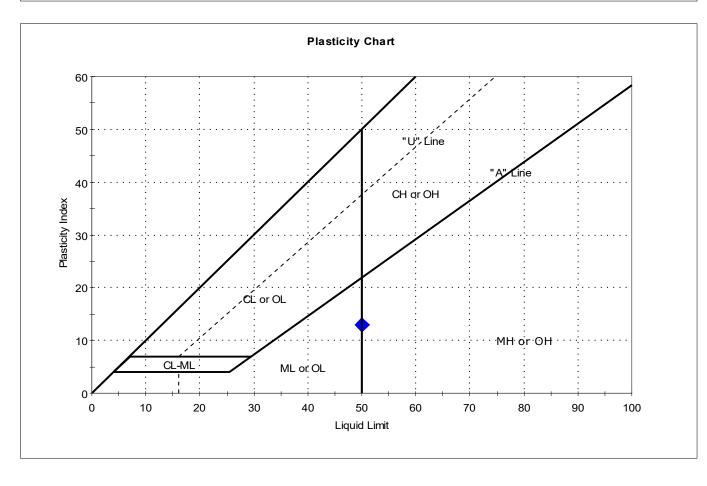
Sample ID: 26.7-28.6-190926 Test Date: 11/11/1
Depth: --- Test Id: 527520

Test Comment: ---

Visual Description: Wet, grayish brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	26.7-28.6-190926	DI-116SP		64	50	37	13	2.1	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685 Boring ID: PDI-116SPT Sample Type: bag Tested By:

cam Sample ID: 51.5-54.2-190927 Test Date: 10/25/19 Checked By: bfs Test Id:

527521

Depth: Test Comment:

Visual Description: Moist, olive brown silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	51.5-54.2-190927	DI-116SP		27	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Tested By: cam

527522

Sample Type: bag Boring ID: PDI-117SPT Sample ID: 11-29.1-191002 Test Date: 10/28/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	11-29.1-191002	DI-117SP		38	n/a	n/a	n/a	n/a	

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID: PDI-117SPTSample Type: bagTested By: camSample ID: 29.1-32-191002Test Date: 11/05/19Checked By: bfs

Sample ID: 29.1-32-191002 Test Date: 11/05/1
Depth: --- Test Id: 527523

Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	29.1-32-191002	DI-117SP		45	n/a	n/a	n/a	n/a	Silty SAND (SM)

3% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-117SPTSample Type:bagTested By:camSample ID:44.1-53.5-191002Test Date:11/11/19Checked By:bfs

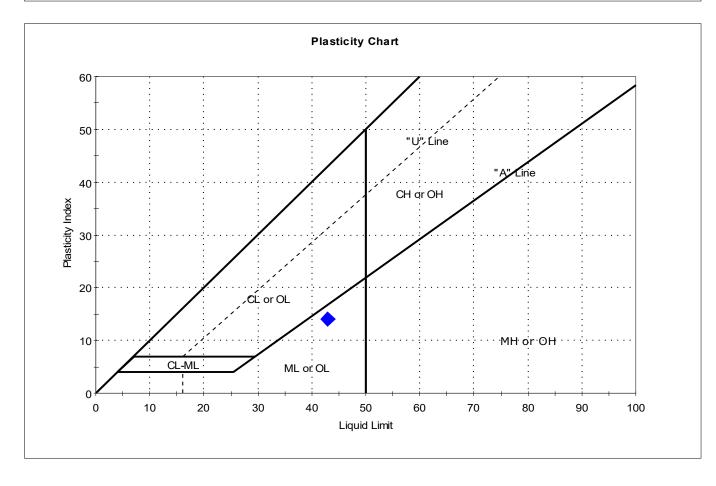
Depth: --- Test Id: 527524

Test Comment: ---

Visual Description: Moist, dark gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	44.1-53.5-191002	DI-117SP		46	43	29	14	1.2	Silty SAND (SM)

Sample Prepared using the WET method

3% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Client: Anchor QEA, LLC Gasco PDI Project:

Location: Project No: GTX-310685 Boring ID: PDI-117SPT Sample Type: bag Tested By: cam

Sample ID: 53.5-63.5-191002 Test Date: 11/12/19 Checked By: bfs Test Id:

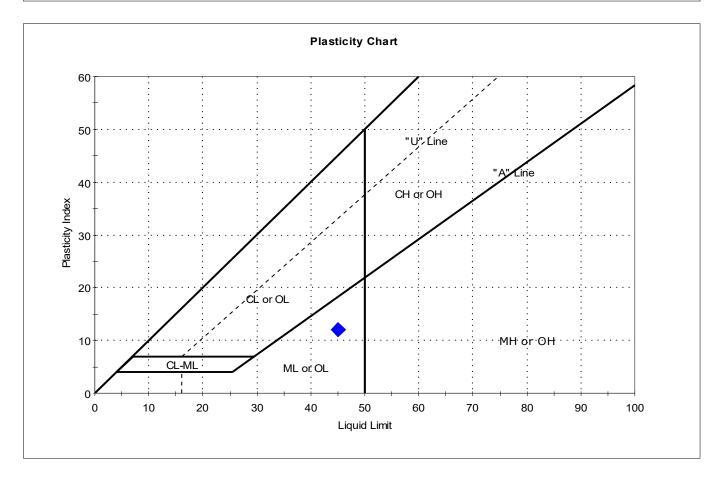
527525

Depth: Test Comment:

Visual Description: Wet, dark grayish brown silt with sand

Sample Comment:

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	53.5-63.5-191002	DI-117SP		83	45	33	12	4.2	SILT with Sand (ML)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Client: Anchor QEA, LLC Gasco PDI Project:

Location:

Project No: GTX-310685 Boring ID: PDI-118SPT Sample Type: bag Tested By: cam Sample ID: 00-4.5-191014 Test Date: 11/18/19 Checked By: bfs

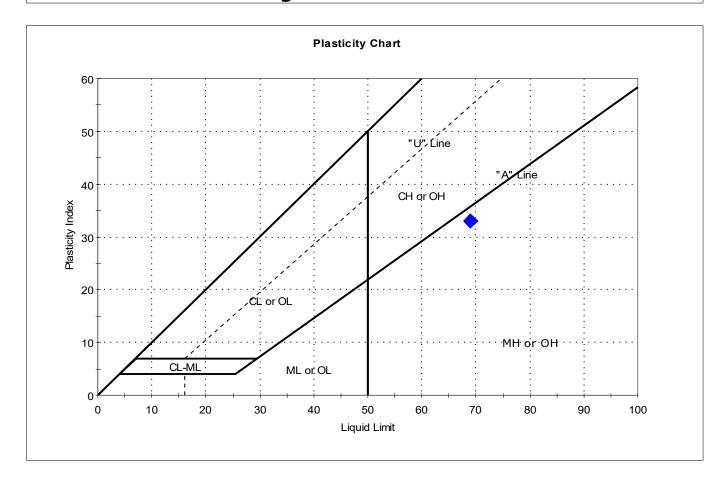
Test Id: Depth: 527526

Test Comment:

Visual Description: Wet, dark grayish brown silt

Sample Comment:

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	00-4.5-191014	DI-118SP		113	69	36	33	2.3	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: MEDIUM



Location: Project No: GTX-310685
Boring ID: PDI-118SPT Sample Type: bag Tested By: cam

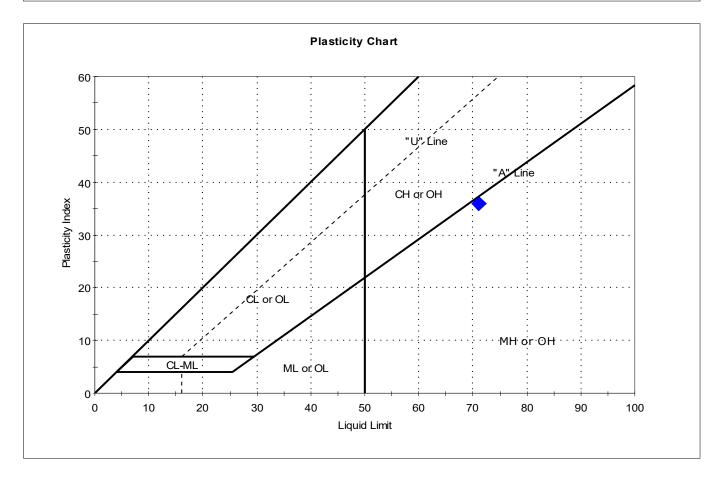
Sample ID: 4.5-15-191014 Test Date: 11/12/19 Checked By: bfs
Depth: --- Test Id: 527527

Test Comment: ---

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	4.5-15-191014	DI-118SP		70	71	35	36	1	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

3% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685
Boring ID: PDI-118SPT Sample Type: bag Tested By: cam

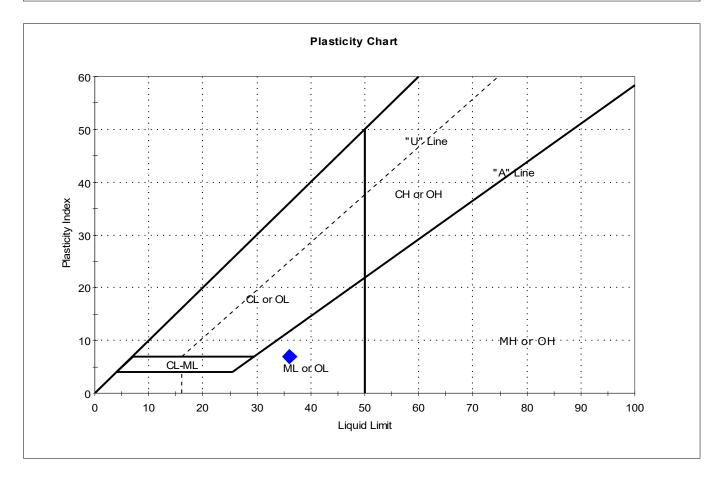
Sample ID: 46.5-61-191014 Test Date: 11/11/19 Checked By: bfs
Depth: --- Test Id: 527528

Test Comment: ---

Visual Description: Wet, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	46.5-61-191014	DI-118SP		62	36	29	7	4.7	Silty SAND (SM)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Location:Project No:GTX-310685Boring ID:PDI-119SPTSample Type: bagTested By: cam

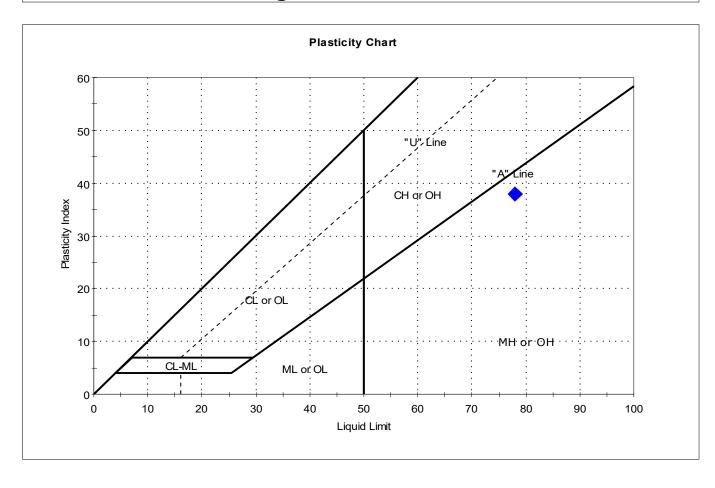
Boring ID: PDI-119SPT Sample Type: bag Tested By: can Sample ID: 00-4.5-191001 Test Date: 11/12/19 Checked By: bfs Depth: --- Test Id: 527529

Depth: --- Test Id: 5
Test Comment: ---

Visual Description: Moist, dark grayish brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	00-4.5-191001	DI-119SP		77	78	40	38	1	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

2% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685

527530

Boring ID: PDI-119SPT Sample Type: bag Tested By: cam Sample ID: 18.3-31-191001 Test Date: 10/25/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	18.3-31-191001	DI-119SP		30	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-119SPTSample Type: bagTested By: cam

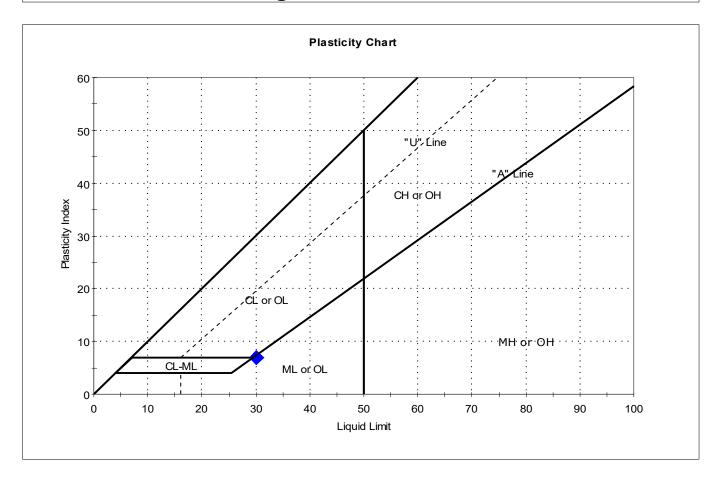
Boring ID: PDI-119SPT Sample Type: bag Tested By: cam Sample ID: 47-52-191001 Test Date: 11/11/19 Checked By: bfs Depth: --- Test Id: 527531

Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	47-52-191001	DI-119SP		33	30	23	7	1.5	Silty SAND (SM)

Sample Prepared using the WET method

7% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: LOW



Location:

Project No: GTX-310685 Boring ID: PDI-119SPT Sample Type: bag Tested By: cam Sample ID: 9.5-18.3-191001 Test Date: 11/12/19 Checked By: bfs Test Id:

527532

Depth: Test Comment:

Visual Description: Moist, dark grayish brown sand with silt

Sample Comment:

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	9.5-18.3-191001	DI-119SP		37	n/a	n/a	n/a	n/a	Poorly graded SAND with Silt (SP-SM)

10% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-121SPTSample Type:bagTested By:camSample ID:00-06-190930Test Date:11/15/19Checked By:bfs

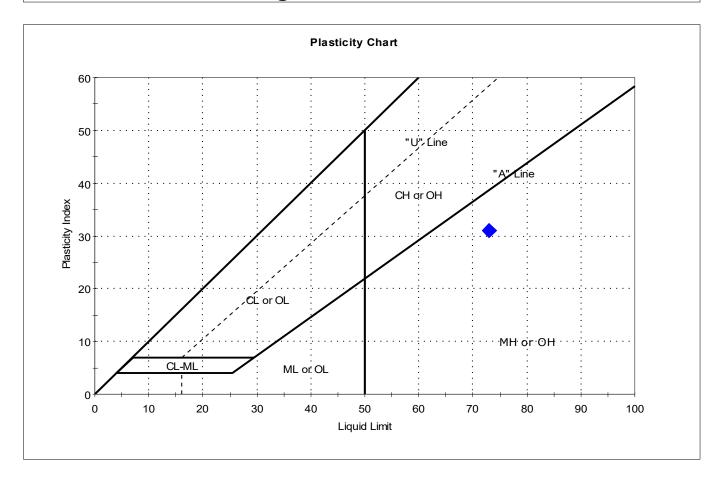
Depth: --- Test Id: 527533

Test Comment: ---

Visual Description: Moist, olive brown silt

Sample Comment: ---

## Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	00-06-190930	DI-121SP		76	73	42	31	1.1	Elastic SILT (MH)

Sample Prepared using the WET method

0% Retained on #40 Sieve Dry Strength: VERY HIGH



Location:Project No:GTX-310685Boring ID: PDI-121SPTSample Type: bagTested By: camSample ID: 11-20.7-190930Test Date:11/11/19Checked By: bfs

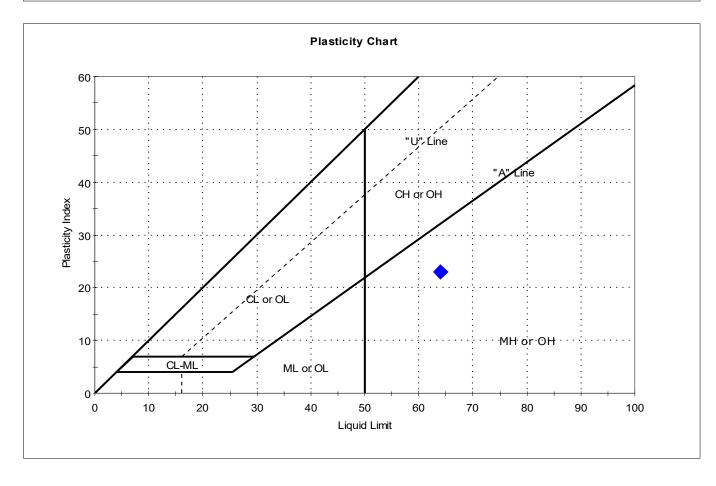
Depth: --- Test Id: 527534

Test Comment: ---

Visual Description: Moist, dark olive brown silt

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	11-20.7-190930	DI-121SP		60	64	41	23	0.8	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Location: Project No: GTX-310685
Boring ID: PDI-121SPT Sample Type: bag Tested By: cam

Boring ID: PDI-121SPT Sample Type: bag Tested By: cam Sample ID: 21-38-190930 Test Date: 10/28/19 Checked By: bfs Depth: --- Test Id: 527535

Test Comment: ---

Visual Description: Moist, dark olive gray silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	21-38-190930	DI-121SP		43	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a



Location:Project No:GTX-310685Boring ID:PDI-121SPTSample Type:bagTested By:camSample ID:49.4-54-190930Test Date:11/18/19Checked By:bfs

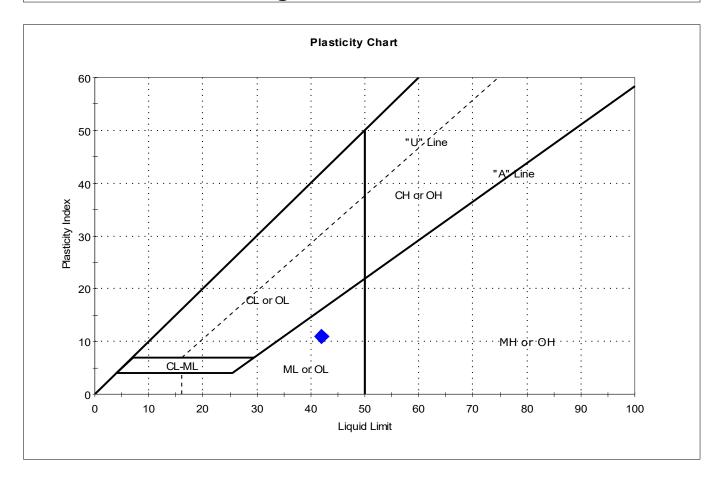
Depth: --- Test Id: 527536

Test Comment: ---

Visual Description: Moist, dark grayish brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	49.4-54-190930	DI-121SP		45	42	31	11	1.2	Silty SAND (SM)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: HIGH Dilatancy: SLOW Toughness: MEDIUM



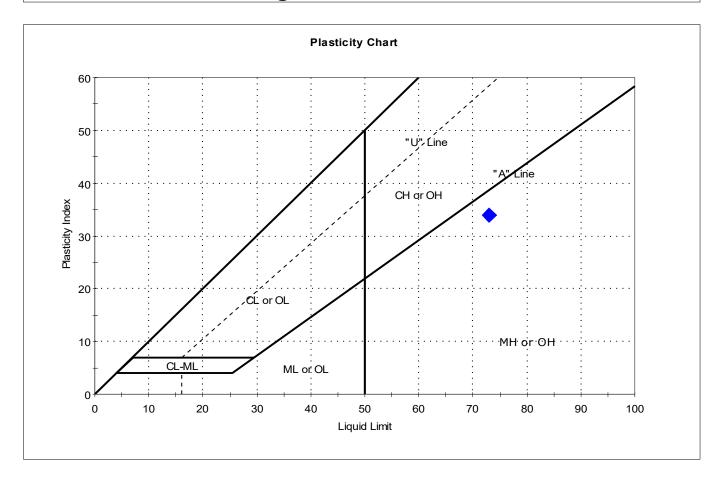
Location:Project No:GTX-310685Boring ID:PDI-122SPTSample Type:bagTested By:camSample ID:04-09-190925Test Date:11/12/19Checked By:bfs

Depth: --- Test Id: 527537

Test Comment: ---

Visual Description: Wet, olive brown silt
Sample Comment: Sample contains organics

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	04-09-190925	DI-122SP		80	73	39	34	1.2	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH



Client: Anchor QEA, LLC Project: Gasco PDI

Location:Project No:GTX-310685Boring ID: PDI-122SPTSample Type: bagTested By: camSample ID: 16.6-24-190925Test Date: 11/11/19Checked By: bfs

Depth: --- Test Id: 527538

Test Comment: ---

Visual Description: Moist, dark olive brown silty sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318

### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	16.6-24-190925	DI-122SP		49	n/a	n/a	n/a	n/a	Silty SAND (SM)

1% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a

The sample was determined to be Non-Plastic



Client: Anchor QEA, LLC Project: Gasco PDI

Location:Project No:GTX-310685Boring ID:PDI-122SPTSample Type: bagTested By: cam

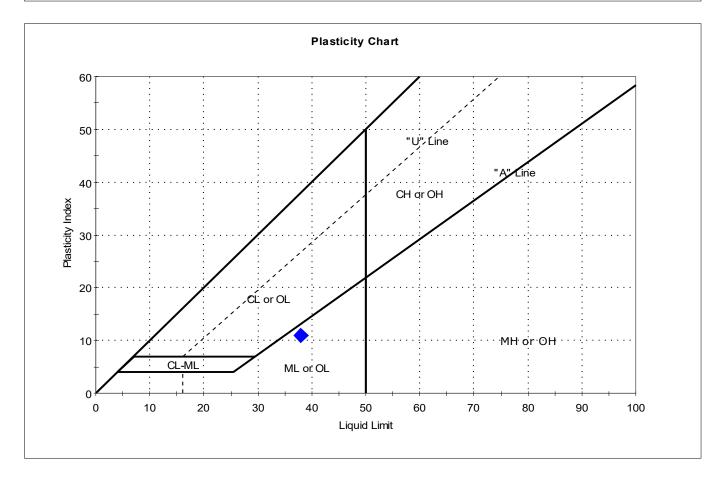
Boring ID: PDI-122SPT Sample Type: bag Tested By: can Sample ID: 61-66-190926 Test Date: 11/08/19 Checked By: bfs Depth: --- Test Id: 527539

Test Comment: ---

Visual Description: Wet, olive brown silty sand

Sample Comment: ---

### Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	61-66-190926	DI-122SP		42	38	27	11	1.3	Silty SAND (SM)

Sample Prepared using the WET method

4% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Client: Anchor QEA, LLC Project: Gasco PDI

Location: Project No: GTX-310685

Boring ID: PDI-123SPT Sample Type: bag Tested By: cam

Sample ID: 00-4.5-190924 Test Date: 11/11/19 Checked By: bfs

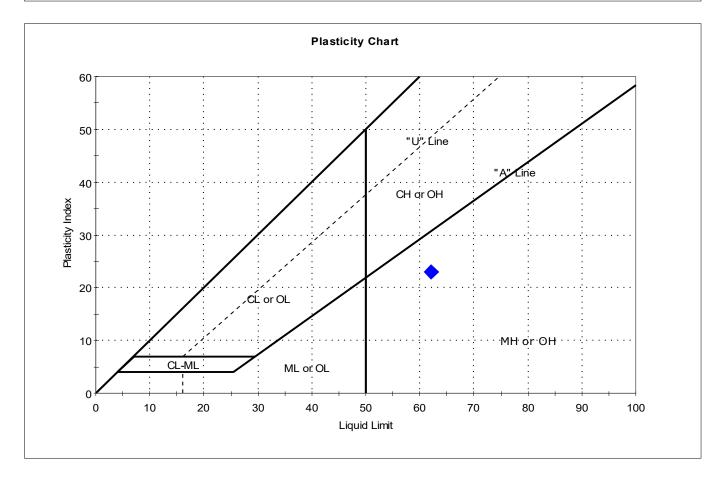
Depth: --- Test Id: 527540

Test Comment: ---

Visual Description: Wet, dark olive silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
<b>•</b>	00-4.5-190924	DI-123SP		72	62	39	23	1.4	Elastic SILT with Sand (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW Toughness: LOW



Client: Anchor QEA, LLC Project: Gasco PDI

Location: Project No: GTX-310685 cam

527541

Boring ID: PDI-123SPT Sample Type: bag Tested By: Sample ID: 25.5-30.5-190925 Test Date: 10/25/19 Checked By: bfs Test Id:

Depth: Test Comment:

Visual Description: Moist, dark gray silty sand

Sample Comment:

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	25.5-30.5-190925	DI-123SP		19	n/a	n/a	n/a	n/a	Silty SAND (SM)

0% Retained on #40 Sieve

Dry Strength: LOW Dilatancy: RAPID Toughness: n/a

The sample was determined to be Non-Plastic



Client: Anchor QEA, LLC Project: Gasco PDI

Location:Project No:GTX-310685Boring ID:PDI-123SPTSample Type:bagTested By:camSample ID:63.2-65.5-190925Test Date:11/13/19Checked By:bfs

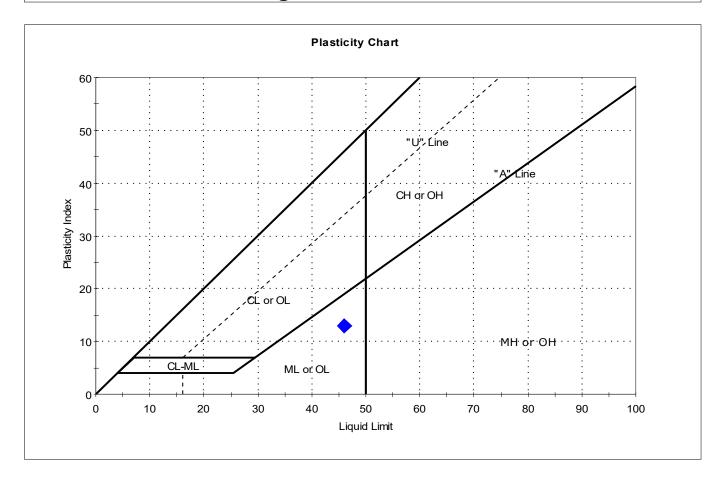
Depth: --- Test Id: 527542

Test Comment: ---

Visual Description: Moist, dark olive brown silt with sand

Sample Comment: ---

# Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	63.2-65.5-190925	DI-123SP		48	46	33	13	1.2	SILT with Sand (ML)

Sample Prepared using the WET method

1% Retained on #40 Sieve Dry Strength: VERY HIGH

Dilatancy: SLOW
Toughness: MEDIUM



Client: Anchor QEA, LLC Project: Gasco PDI

Location:Project No:GTX-310685Boring ID:PDI-19SC-BSample Type: bagTested By: cam

Boring ID: PDI-19SC-B Sample Type: bag Tested By: can Sample ID: 05-07-191008 Test Date: 11/05/19 Checked By: bfs Depth: --- Test Id: 527479

Test Comment: ---

Visual Description: Moist, dark olive brown sandy silt

Sample Comment: ----

# Atterberg Limits - ASTM D4318

#### **Sample Determined to be non-plastic**

Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
•	05-07-191008	DI-19SC-		61	n/a	n/a	n/a	n/a	Sandy SILT (ML)

1% Retained on #40 Sieve Dry Strength: MEDIUM Dilatancy: RAPID

Toughness: n/a

The sample was determined to be Non-Plastic

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Dobroslav Znidarčić

Seepage Induced Consolidation Test results for slurry samples for the Gasco Sediments project

Prepared for:

Anchor QEA, LLC 1201 3<sup>rd</sup> Avenue, Suite 2600 Seattle, WA 98101-1847

#### Introduction

This report presents the results of the consolidation testing for slurry samples for the Gasco Sediments project.

We received the samples in the form of slurries and process water. The samples had following designations:

Sample	Specific gravity
PDI-107SPT-00-04-190923	2.65
PDI-113SPT-06-16-191011	2.73
PDI-114SPT-7.5-12.5-191008	2.66
PDI-118SPT-4.5-15-191014	2.53

The specific gravity values listed in the table were also provided and used in all the calculations.

The samples had the following initial water contents, solids contents and the corresponding void ratios:

Sample	Water content	Solids content	Void ratio
PDI-107SPT-00-04-190923	75.3%	57.0%	1.996
PDI-113SPT-06-16-191011	47.1%	68.0%	1.285
PDI-114SPT-7.5-12.5-191008	66.0%	60.2%	1.755
PDI-118SPT-4.5-15-191014	69.9%	58.8%	1.769

The samples had relatively stiff consistency, unsuitable for SIC testing. The samples were thoroughly mixed and additional site water was added to each sample to achieve suitable consistency for SIC testing. The following water contents, solids contents and corresponding void ratios were obtained:

Sample	Water content	Solids content	Void ratio
PDI-107SPT-00-04-190923	178.0%	36.0%	4.716
PDI-113SPT-06-16-191011	62.5%	61.6%	1.705
PDI-114SPT-7.5-12.5-191008	144.1%	41.0%	3.832
PDI-118SPT-4.5-15-191014	176.2%	36.2%	4.458

The samples were then placed into the testing cells for seepage induced consolidation and step loading tests.

#### Seepage induced consolidation test

The Seepage Induced Consolidation Tests (SICT) and the step loading tests were performed on the samples. The SICT and analysis procedures are described in the attachment to this report.

#### **Material Characteristics**

The void ratio corresponding to zero effective stress was measured and the following values were obtained for the samples:

Sample	Void ratio (a) $\sigma'=0$
PDI-107SPT-00-04-190923	4.583
PDI-113SPT-06-16-191011	1.486
PDI-114SPT-7.5-12.5-191008	3.564
PDI-118SPT-4.5-15-191014	4.458
1 101-11031 1-4.3-13-171014	T.T30

The test results are presented in Tables 1 through 6 and in Figures 1 through 8.

The model parameters A, B, Z, C and D in Tables define the compressibility and hydraulic conductivity relationships given by the following expressions, and presented in the figures

Compressibility 
$$e = A (\sigma' + Z)^B$$

Hydraulic Conductivity  $k = C e^{D}$ 

where e is the void ratio and k is the hydraulic conductivity. The values for the parameters A, Z and C depend on the system of units and are given for SI units.

**Table 1 – Consolidation model parameters (SI units)** 

Sample	A	В	Z(kPa)	C(m/day)	D
PDI-107SPT-00-04-190923	2.90	-0.142	0.039	2.33*10 <sup>-5</sup>	5.05
PDI-113SPT-06-16-191011	1.30	-0.109	0.284	5.08*10 <sup>-4</sup>	3.74
PDI-114SPT-7.5-12.5-191008	2.46	-0.128	0.055	$3.62*10^{-5}$	3.91
PDI-118SPT-4.5-15-191014	2.76	-0.152	0.043	$1.27*10^{-5}$	4.11

Since the samples were tested at increased water contents, the obtained parameters are modified to account for the lower in situ values. This is accomplished by changing the parameter Z. The modified values are presented in Table 2 and should be used for settlement analyses of undisturbed materials in the field.

**Table 2 – Consolidation model parameters for in situ conditions (SI units)** 

Sample	A	В	Z(kPa)	C(m/day)	D
PDI-107SPT-00-04-190923	2.90	-0.142	13.90	2.33*10 <sup>-5</sup>	5.05
PDI-113SPT-06-16-191011	1.30	-0.109	1.07	5.08*10-4	3.74
PDI-114SPT-7.5-12.5-191008	2.46	-0.128	14.25	$3.62*10^{-5}$	3.91
PDI-118SPT-4.5-15-191014	2.76	-0.152	18.50	$1.27*10^{-5}$	4.11

Table 3 – SICTA and Step Loading Results for Tailing Sample PDI-107SPT-00-04-190923 (SI units)

SICTA	Input	Results	
	2.04		
Unit weight of water	9.81	<b>A</b> 2.898	
Specific gravity	2.65	B -0.142	
Initial height	0.0430696	<b>Z</b> 0.039	
Void ratio @ 0	<mark>4.583399</mark>		
Top effective stress	0.1	C 2.33E-05	
Darcian velocity	6.60E-03	<b>D</b> 5.047	
Final height	<mark>0.0346858</mark>		
Bottom effective stress	<mark>0.4030493</mark>	Final calculated	
		Bottom	
		effective	
		Height stress	
Void ratio	1.5019888	0.0346998 0.4028701	
Effective stress	103.14684	Normalized errors	
Hydraulic conductivity	1.81E-04	0.0004031 0.0004448	
		Total error 0.0008479	

Table 4 – SICTA and Step Loading Results for Tailing Sample PDI-113SPT-06-16-191011 (SI units)

SICTA	Input	Results	
Unit weight of water	9.81	<b>A</b> 1	1.295
Specific gravity	2.73	В -(	0.109
Initial height	0.0314094	<b>Z</b> (	0.284
Void ratio @ 0	1.4856753		
Top effective stress	0.1	<b>C</b> 5.08	3E-04
Darcian velocity	1.32E-03	D	3.741
Final height	0.0299766		
Bottom effective stress	<mark>0.5491758</mark>	Final calculated	
		Bottor effecti	
		Height stress	
Void ratio	0.7807111	0.0299766 0.549	1754
Effective stress	103.14684	Normalized errors	
Hydraulic conductivity	2.01E-04	0.0000004 0.000	8000
		Total error 0.000	0012

Table 5 – SICTA and Step Loading Results for Tailing Sample PDI-114SPT-7.5-12.5-191008 (SI units)

SICTA	Input	Results	
Unit weight of water	9.81	Α	2.463
Specific gravity	2.66	В	-0.128
Initial height	0.0326351	Z	0.055
Void ratio @ 0	3.5635533		
Top effective stress	0.1	С	3.62E-05
Darcian velocity	6.60E-03	D	3.911
Final height	0.0260427		
Bottom effective stress	1.2975076	Final calculate	ed
		E	Bottom
			effective
		Height	stress
Void ratio	1.3632204	0.0260763	1.2930993
Effective stress	103.14684	Normalized errors	
Hydraulic conductivity	1.22E-04	0.0012878	0.0034090
		Total error	0.0046968

Table 6 – SICTA and Step Loading Results for Tailing Sample PDI-118SPT-4.5-15-191014 (SI units)

SICTA	Input	Results	
Unit weight of water	9.81	A 2.760	
Specific gravity	2.53	В -0.152	
Initial height	0.0362815	<b>Z</b> 0.043	
Void ratio @ 0	4.4575085		
Top effective stress	0.1	C 1.27E-05	
Darcian velocity	1.32E-03	D 4.111	
Final height	<mark>0.0290542</mark>		
Bottom effective stress	0.4037612	Final calculated	
		Bottom effective Height stress	
Void ratio	1.3616118	0.0290565 0.4037617	
Effective stress	103.14684	Normalized errors	
Hydraulic conductivity	4.52E-05	0.0000758 0.0000012	
		Total error 0.0000770	

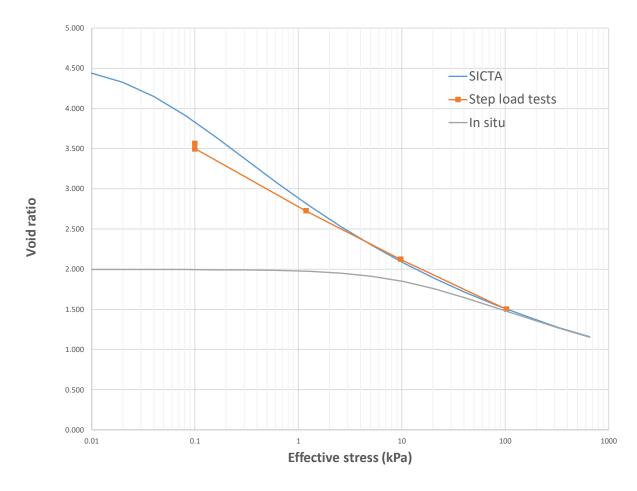


Figure 1 – Compressibility Characteristics for Tailing Sample PDI-107SPT-00-04-190923 (SI units)

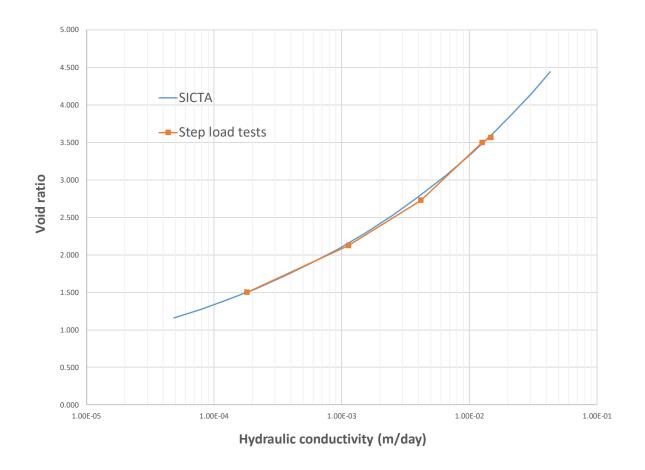


Figure 2- Permeability Characteristics for Tailing Sample PDI-107SPT-00-04-190923 (SI units)

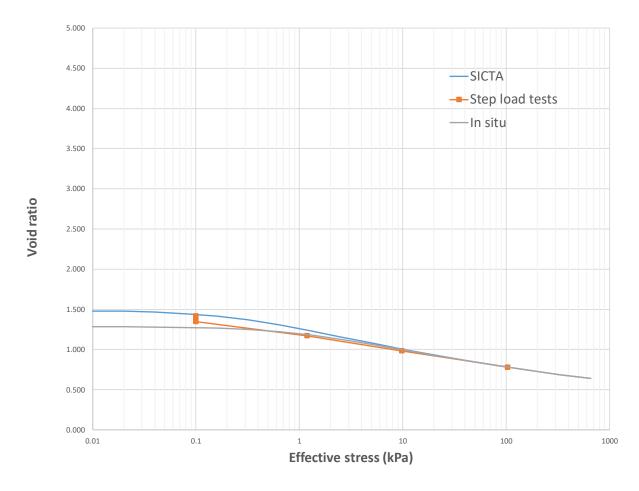


Figure 3 – Compressibility Characteristics for Tailing Sample PDI-113SPT-06-16-191011 (SI units)

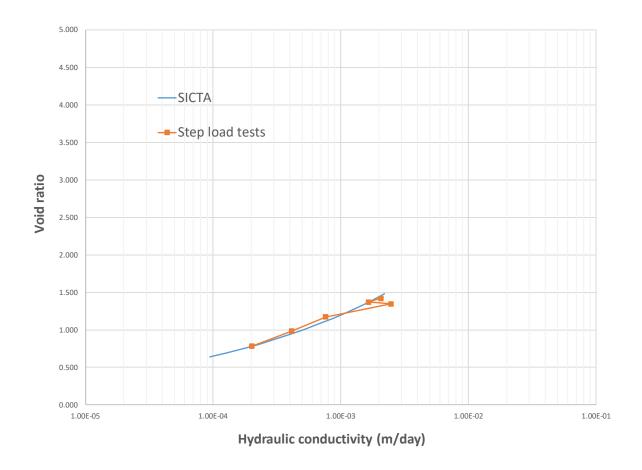


Figure 4– Permeability Characteristics for Tailing Sample PDI-113SPT-06-16-191011 (SI units)

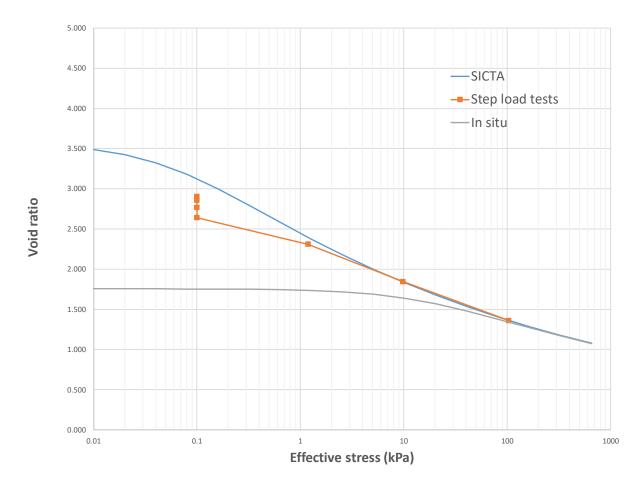


Figure 5 – Compressibility Characteristics for Tailing Sample PDI-114SPT-7.5-12.5-191008 (SI units)

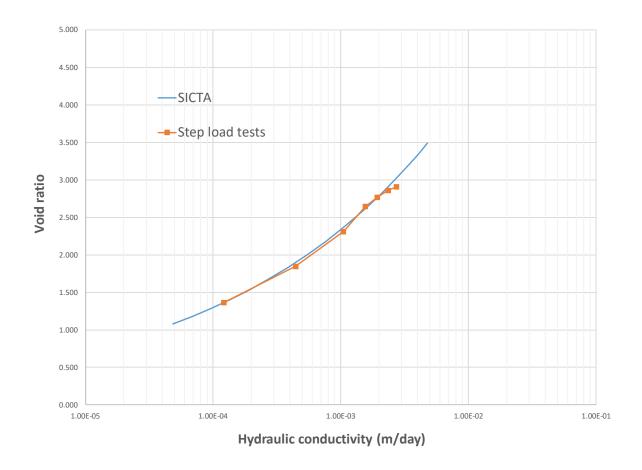


Figure 6- Permeability Characteristics for Tailing Sample PDI-114SPT-7.5-12.5-191008 (SI units)

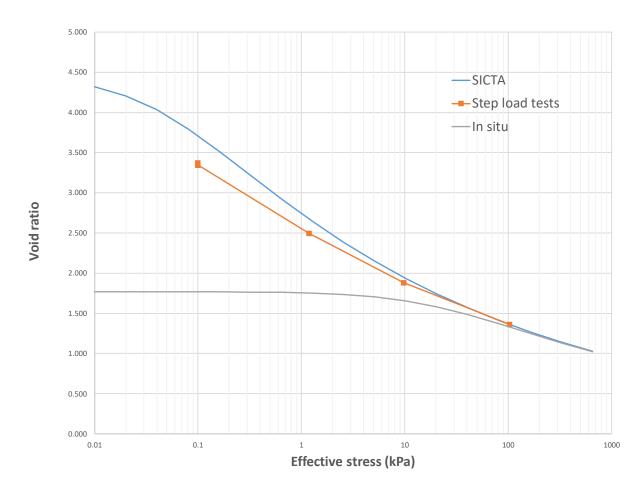


Figure 7 – Compressibility Characteristics for Tailing Sample PDI-118SPT-4.5-15-191014 (SI units)

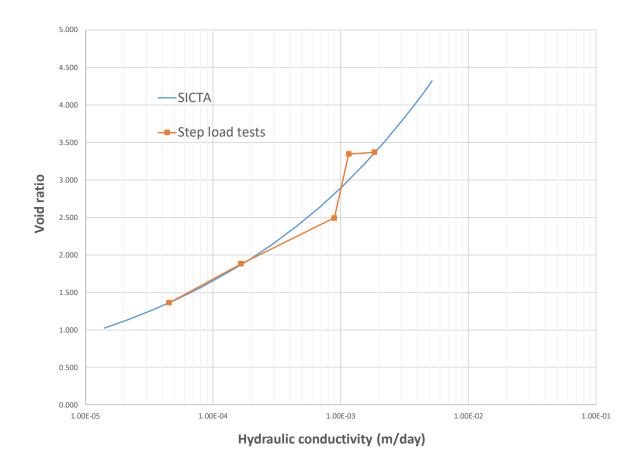


Figure 8– Permeability Characteristics for Tailing Sample PDI-118SPT-4.5-15-191014 (SI units)

#### Seepage Induced Consolidation Test (SICT)

The seepage induced consolidation test is an experimental procedure used for determining the consolidation characteristics of soft soils and soil like materials (slurry mine waste, dredged spoils, sludge from waste water treatment plants etc.). The testing procedure consists of three steps.

In the first step the void ratio at the effective stress zero is determined by allowing a slurry column about 0.05 m high to consolidate under its own weight. The average void ratio of the settled slurry is considered the void ratio at the effective stress of zero, or the void ratio at which the soil is formed and the consolidation theory, as opposed to the sedimentation theory, applies.

In the second step, seepage at a constant flow rate is applied through the soil by means of a flow pump and the sample is allowed to consolidate completely, i.e. until the steady state is reached. The steady state is determined from the pressure difference across the sample that is continuously monitored during the test. At steady state, the pressure difference and the final height of the sample are recorded. It is recognized that during this phase of the test the void ratio within the sample is non-uniform and this is correctly accounted for in the test analysis.

In the third step the sample is consolidated under the maximum desired stress level and the hydraulic conductivity is measured with the flow pump using a low flow rate to maintain sample uniformity during the test. At the end of the test the sample is dried and the total volume of solids is determined.

The analysis of the test is performed using the software package SICTA (Seepage Induced Consolidation Test Analysis). The procedure is based on the inverse problem solution approach and the theory used is compatible with the finite strain nonlinear consolidation theory (i.e. no simplifying or restrictive assumptions are made in the analysis). The input data for the SICTA program are all obtained from the described test. The output gives five parameters A, B, Z, C and D that define the consolidation properties for the sample. The compressibility and hydraulic conductivity relations with the five parameters are defined as:

Compressibility  $e = A (\sigma' + Z)^B$ 

Hydraulic Conductivity  $k = C e^{D}$ 

The more detailed description of the testing equipment and testing and analysis procedures can be found in the following publications:

Abu-Hejleh, A.N., and Znidarcic, D., 1992, User Manual for Computer Program SICTA, Prepared for Florida Institute of Phosphate Research, University of Colorado, Boulder, 122 pp.

Znidarcic, D., Abu-Hejleh, A.N., Fairbanks, T. and Robertson A., 1992, Seepage-Induced Consolidation Test; Equipment Description and Users Manual, Prepared for Florida Institute of Phosphate Research, University of Colorado, Boulder, 52 pp.

Abu-Hejleh, A.N. and Znidarcic, D., 1994, Estimation of the Consolidation Constitutive Relations, <u>Computer Methods and Advances in Geomechanics</u>, Siriwardane & Zaman (eds) Balkema, Rotterdam, pp. 499-504.

Abu-Hejleh, A. N. and Znidarcic, D., 1996, Consolidation Characteristics of Phosphatic Clays, <u>Journal of Geotechnical Engineering</u>, ASCE, New-York, Vol. 122, No. 4. pp. 295-301.