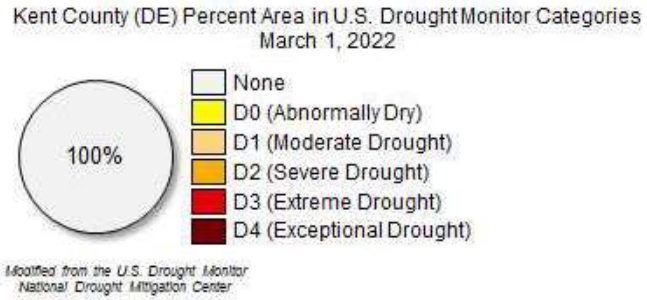
Delaware Geological Survey
State of Delaware
University of Delaware • Delaware Geological Survey Building
Newark, Delaware 19716-7501

Kent County Hydrologic Conditions – February 28, 2022

PRECIPITATION
Dover - running surplus/deficit
12-month: -1.90" 6-month: -5.16" 5-month: -6.15"

STREAMFLOW
St. Jones at Dover – 30-day moving average (Jan. 30 - Feb. 28)
23 mgd
Status: below normal

GROUNDWATER
Well Mc51-01a
13.1 fbls
Status: normal
(normal for February is between 10.5 fbls and 13.3 fbls

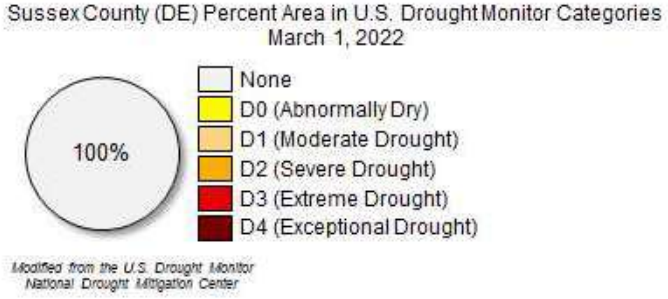


Sussex County Hydrologic Conditions – February 28, 2022

PRECIPITATION
Georgetown - running surplus/deficit
12-month: -4.33" 6-month: -5.53" 5-month: -5.48"

STREAMFLOW
Nanticoke River at Bridgeville – 30-day moving average (Jan. 30 - Feb. 28)
60 mgd
Status: normal

GROUNDWATER
Pe54-51 (Jones Crossroads)
2.61 fbls
Status: above normal
(normal for February is between 5.9 fbls and 7.0 fbls



NOTES FOR EXPLORATION LOGS

KEY TO USCS TERMINOLOGY AND GRAPHIC SYMBOLS

MAJOR DIVISIONS (BASED UPON ASTM D 2488)				SYMBOLS GRAPHIC	SYMBOLS LETTER
COARSE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 15% PASSING THE NO. 200 SIEVE)			GW
					GP
		GRAVELS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)			GM
					GC
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LESS THAN 15% PASSING THE NO. 200 SIEVE)			SW
					SP
		SANDS WITH FINES (MORE THAN 15% PASSING THE NO. 200 SIEVE)			SM
					SC
FINE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILT OR CLAY (<15% RETAINED ON THE NO. 200 SIEVE) SILT OR CLAY WITH SAND OR GRAVEL (15% TO 30% RETAINED ON THE NO. 200 SIEVE) SANDY OR GRAVELLY SILT OR CLAY (>30% RETAINED ON THE NO. 200 SIEVE)		SILTS AND LEAN CLAYS LIQUID LIMIT LESS THAN 50		ML
					CL
					OL
			ELASTIC SILTS AND FAT CLAYS LIQUID LIMIT GREATER THAN 50		MH
					CH
					OH
HIGHLY ORGANIC SOILS					PT

NOTE: DUAL SYMBOLS ARE USED TO INDICATE COARSE-GRAINED SOILS WHICH CONTAIN AN ESTIMATED 5 TO 15% FINES BASED ON VISUAL CLASSIFICATION OR BETWEEN 5 AND 12% FINES BASED ON LABORATORY TESTING; AND FINE-GRAINED SOILS WHEN THE PLOT OF LIQUID LIMIT & PLASTICITY INDEX VALUES FALLS IN THE PLASTICITY CHART'S CROSS-HATCHED AREA. FINE-GRAINED SOILS ARE CLASSIFIED AS ORGANIC (OL OR OH) WHEN ENOUGH ORGANIC PARTICLES ARE PRESENT TO INFLUENCE ITS PROPERTIES. LABORATORY TEST RESULTS ARE USED TO SUPPLEMENT SOIL CLASSIFICATION BY THE VISUAL-MANUAL PROCEDURES OF ASTM D 2488.

ADDITIONAL TERMINOLOGY AND GRAPHIC SYMBOLS

	DESCRIPTION		GRAPHIC SYMBOLS
ADDITIONAL DESIGNATIONS	TOPSOIL		
	MAN MADE FILL		
	GLACIAL TILL		
	COBBLES AND BOULDERS		
RESIDUAL SOIL DESIGNATIONS	DESCRIPTION	"N" VALUE	
	HIGHLY WEATHERED ROCK	50 TO 50/1"	
	PARTIALLY WEATHERED ROCK	MORE THAN 50 BLOWS FOR 1" OF PENETRATION OR LESS, AUGER PENETRABLE	

COARSE-GRAINED SOILS
(GRAVEL AND SAND)

DESIGNATION	BLOWS PER FOOT (BPF) "N"
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	>50

NOTE: "N" VALUE DETERMINED AS PER ASTM D 1586

FINE-GRAINED SOILS
(SILT AND CLAY)

CONSISTENCY	BPF "N"
VERY SOFT	<2
SOFT	2 - 4
MEDIUM STIFF	5 - 8
STIFF	9 - 15
VERY STIFF	16 - 30
HARD	>30

NOTE: ADDITIONAL DESIGNATIONS TO ADVANCE SAMPLER INDICATED IN BLOW COUNT COLUMN:
WOH = WEIGHT OF HAMMER
WOR = WEIGHT OF ROD(S)

SAMPLE TYPE

DESIGNATION	SYMBOL
SOIL SAMPLE	S-
SHELBY TUBE	U-
ROCK CORE	R-

WATER DESIGNATION

DESCRIPTION	SYMBOL
ENCOUNTERED DURING DRILLING	▽
UPON COMPLETION OF DRILLING	▽
24 HOURS AFTER COMPLETION	▼

NOTE: WATER OBSERVATIONS WERE MADE AT THE TIME INDICATED. POROSITY OF SOIL STRATA, WEATHER CONDITIONS, SITE TOPOGRAPHY, ETC. MAY CAUSE WATER LEVEL CHANGES.

LOG OF BORING NO. SWM-1

PROJECT: **PODS Bridgeville**
PROJECT NO.: **31211931**
PROJECT LOCATION: **Sussex County, Delaware**

WATER LEVEL (ft): 13.0 | | 12.6
DATE: 2/16/22 | | 2/28/22
CAVED (ft): - | | -

DATE STARTED: **2/16/2022**
DATE COMPLETED: **2/16/2022**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **D. Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **13.0**
GROUND SURFACE ELEVATION: **41.3**
DATUM: **Survey**
EQUIPMENT: **Diedrich D-50**
LOGGED BY: **KMM**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					41.3	0	TS		Topsoil: 10 inches	
1	0.0	16	1-1-1-1	2	40.5		SM		Brown, moist, very loose, Silty SAND USDA: Sandy Loam	
2	2.0	20	2-3-3-3	6	39.3	3	SC		Brown, moist, loose, Clay SAND USDA: Sandy Clay Loam	
3	4.0	20	2-3-5-4	8	37.3		SM		Brown, moist, very loose to medium dense, Silty SAND USDA: Sandy Loam	
4	6.0	20	3-4-7-7	11		6				
5	8.0	24	1-1-3-4	4	32.3	9	CL		Orange-gray, moist, soft to stiff, Lean CLAY USDA: Clay Loam	
6	10.0	24	4-6-5-5	11		12				
7	12.0	20	6-5-4-5	9	28.3		SP		Gray-orange, wet, loose, Poorly-graded SAND USDA: Sand	▼
					27.3				Bottom of hole 14 feet	
						15				
						18				

NOTES: **Air Temp.: 57, 48 Hr. Precip.: 0.0 in., Coords: N: 266210.30, E: 605724.87**
ASTM 1586

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

LOG OF BORING NO. SWM-1

LOG OF BORING NO. SWM-2

PROJECT: **PODS Bridgeville**
PROJECT NO.: **31211931**
PROJECT LOCATION: **Sussex County, Delaware**

WATER LEVEL (ft): 8.3 | | 9.2
DATE: 2/16/22 | | 2/28/22
CAVED (ft): - | | -

DATE STARTED: **2/16/2022**
DATE COMPLETED: **2/16/2022**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **D. Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft): **8.3**
GROUND SURFACE ELEVATION: **40.8**
DATUM: **Survey**
EQUIPMENT: **Diedrich D-50**
LOGGED BY: **KMM**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					40.8	0	TS		Topsoil: 4 inches	
1	0.0	20	1-2-1-2	3	40.5		SM		Brown-orange, moist, very loose to medium dense, Silty SAND USDA: Sandy Loam	
2	2.0	18	2-3-4-5	7		3				
3	4.0	20	2-3-5-7	8						
4	6.0	16	6-6-5-6	11		6				
5	8.0	24	2-4-3-4	7	32.8	9	SP-SM		Orange-gray, moist to wet, loose, Poorly-graded SAND with Silt USDA: Loamy Sand	▼ ▼
6	10.0	18	2-2-3-1	5						
7	12.0	20	1-1-1-2	2	28.8	12	SM		Gray, wet, very loose, Silty SAND USDA: Sandy Loam	
					26.8				Bottom of hole 14 feet	
						15				
						18				

NOTES: **Air Temp.: 57, 48 Hr. Precip.: 0.0 in., Coords: N: 266225.19, E: 605811.63**
ASTM 1586

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

LOG OF BORING NO. SWM-2

LOG OF BORING NO. SWM-3

PROJECT: **PODS Bridgeville**
PROJECT NO.: **31211931**
PROJECT LOCATION: **Sussex County, Delaware**

WATER LEVEL (ft):	10.2		9.4
DATE:	2/16/22		2/28/22
CAVED (ft):	-		-

DATE STARTED: **2/16/2022**
DATE COMPLETED: **2/16/2022**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **D. Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **10.2**
GROUND SURFACE ELEVATION: **40.8**
DATUM: **Survey**
EQUIPMENT: **Diedrich D-50**
LOGGED BY: **KMM**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					40.8	0	TS		Topsoil: 6 inches	
1	0.0	16	1-1-1-1	2	40.3		SC		Brown, moist, very loose to loose, Clayey SAND USDA: Sandy Clay Loam	
2	2.0	24	2-3-4-4	7		3				
3	4.0	24	2-2-3-4	5	36.8		SM		Orange-gray, moist, very loose to loose, Silty SAND USDA: Sandy Loam	
4	6.0	20	3-3-4-4	7		6				
5	8.0	24	2-2-1-3	3		9				▽
6	10.0	24	2-2-4-5	6	30.8		SP		Orange-gray, moist to wet, loose, Poorly-graded SAND USDA: Sand	▽
7	12.0	24	2-2-1-2	3	28.8	12	SM		Gray, wet, very loose, Silty SAND USDA: Sandy Loam	
					26.8				Bottom of hole 14 feet	
						15				
						18				

NOTES: **Air Temp.: 57, 48 Hr. Precip.: 0.0 in., Coords: N: 266240.07, E: 605898.37**
ASTM 1586

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

LOG OF BORING NO. SWM-3

LOG OF BORING NO. SWM-4

PROJECT: **PODS Bridgeville**
PROJECT NO.: **31211931**
PROJECT LOCATION: **Sussex County, Delaware**

WATER LEVEL (ft): 11.0 | | 10.8
DATE: 2/16/22 | | 2/28/22
CAVED (ft): - | | -

DATE STARTED: **2/16/2022**
DATE COMPLETED: **2/16/2022**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **D. Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **11.0**
GROUND SURFACE ELEVATION: **41.7**
DATUM: **Survey**
EQUIPMENT: **Diedrich D-50**
LOGGED BY: **KMM**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					41.7	0	TS		Topsoil: 6 inches	
1	0.0	24	1-1-1-2	2	41.2		SM		Brown, moist, very loose, Silty SAND USDA: Sandy Loam	
2	2.0	18	2-1-2-4	3	39.7	3	SP-SM		Orange, moist, very loose, Poorly-graded SAND with Silt USDA: Loamy Sand	
3	4.0	24	2-3-3-5	6	37.7		SC		Orange-gray, moist, loose, Clayey SAND USDA: Sandy Clay Loam	
4	6.0	18	3-6-6-7	12	35.7	6	SP-SM		Brown-gray, moist to wet, loose to medium dense, Poorly-graded SAND with Silt USDA: Loamy Sand	▽
5	8.0	20	1-2-3-4	5		9				
6	10.0	24	3-5-5-5	10						
7	12.0	24	4-5-6-6	11		12				
					27.7				Bottom of hole 14 feet	
						15				
						18				

NOTES: **Air Temp.: 57, 48 Hr. Precip.: 0.0 in., Coords: N: 266148.37, E: 605771.24**
ASTM 1586

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

LOG OF BORING NO. SWM-4

LOG OF BORING NO. SWM-5

PROJECT: **PODS Bridgeville**
PROJECT NO.: **31211931**
PROJECT LOCATION: **Sussex County, Delaware**

WATER LEVEL (ft):	8.5		9.7
DATE:	2/16/22		2/28/22
CAVED (ft):	-		-

DATE STARTED: **2/16/2022**
DATE COMPLETED: **2/16/2022**
DRILLING CONTRACTOR: **Geo-Technology Associates, Inc.**
DRILLER: **D. Hans**
DRILLING METHOD: **Hollow Stem Auger**
SAMPLING METHOD: **Splitspoon**

WATER ENCOUNTERED DURING DRILLING (ft) ▽ **8.5**
GROUND SURFACE ELEVATION: **41.0**
DATUM: **Survey**
EQUIPMENT: **Diedrich D-50**
LOGGED BY: **KMM**
CHECKED BY: **TPC**

SAMPLE NUMBER	SAMPLE DEPTH (ft.)	SAMPLE RECOVERY (in.)	SAMPLE BLOWS/6 inches	N (blows/ft.)	ELEVATION (ft.)	DEPTH (ft.)	USCS	GRAPHIC SYMBOL	DESCRIPTION	REMARKS
					41.0	0	TS		Topsoil: 8 inches	
1	0.0	20	1-2-1-2	3	40.3		SC		Brown, moist, very loose to loose, Clayey SAND USDA: Sandy Clay Loam	
2	2.0	20	2-2-4-4	6		3				
3	4.0	24	1-4-3-4	7	37.0		SM		Brown-gray, moist, loose, Silty SAND USDA: Sandy Loam	
4	6.0	20	4-4-4-4	8	35.0	6	SP-SM		Orange-gray, moist, loose, Poorly-graded SAND with Silt USDA: Loamy Sand	
5	8.0	18	4-4-3-4	7		9	SP-SM		Orange-gray, moist to wet, loose, Poorly-graded SAND with Silt and Gravel USDA: Loamy Sand	▽ ▽
6	10.0	18	4-3-3-3	6	31.0		SM		Gray, wet, loose, Silty SAND USDA: Sandy Loam	
7	12.0	24	2-2-3-3	5	29.0	12	SP-SM		Orange-gray, wet, loose, Poorly-graded SAND with Silt and Gravel USDA: Loamy Sand	
					27.0				Bottom of hole 14 feet	
						15				
						18				

NOTES: **Air Temp.: 57, 48 Hr. Precip.: 0.0 in., Coords: N: 266166.61, E: 605877.69**
ASTM 1586

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

LOG OF BORING NO. SWM-5

Geo-Technology Associates, Inc.

Single Ring Falling Head Infiltration Testing

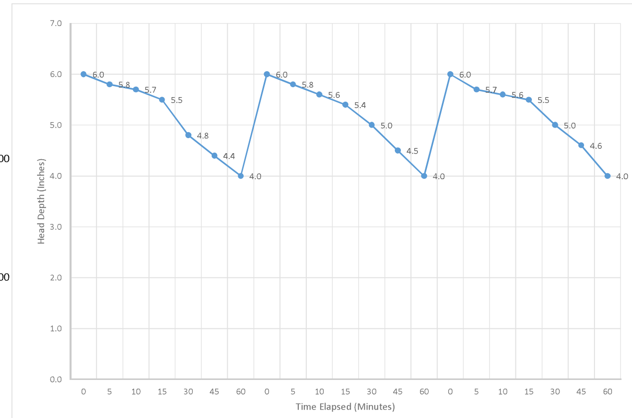
Name: Mitchell
I. D. of Pipe: 12 in.
Test Depth: 4.2 / 37.1 ft. / EL
Depth of Casing Penetration: 1"
Soil Type Tested: Sandy Loam

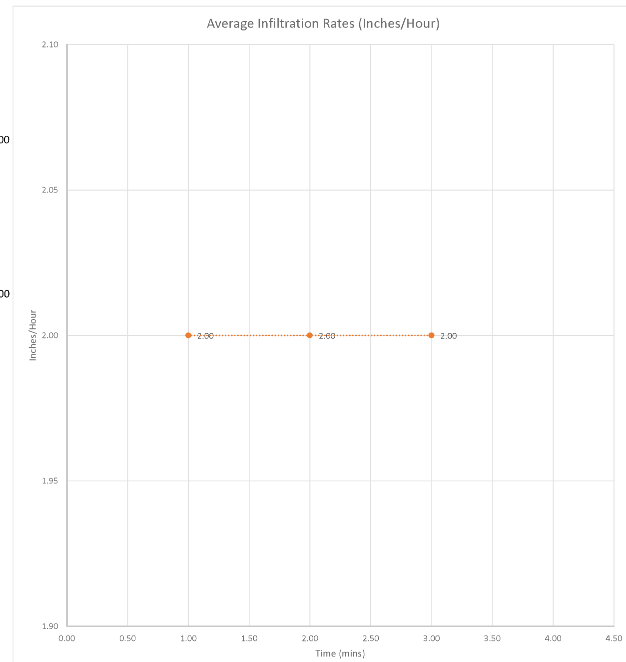
Date 3/7/2022
Temp _76^{0}F_ Weather: Sunny
Rainfall Last 24 hrs. __0.0"___
Location: ___SWM-1____
Presoak : 12" drop / 1+ hour

Date	Time	Δt (min.)		Head of Water (in.)	Comments
3/7/2022	10:40	0		6.0	
	10:45	5		5.8	
	10:50	10		5.7	
	10:55	15		5.5	
	11:10	30		4.8	
	11:25	45		4.4	
	11:40	60		4.0	Rate: 2 in/hr"
	11:40	0		6.0	
	11:45	5		5.8	
	11:50	10		5.6	
	11:55	15		5.4	
	12:10	30		5.0	
	12:25	45		4.5	
	12:40	60		4.0	Rate: 2 in/hr"
	12:40	0		6.0	
	12:45	5		5.7	
	12:50	10		5.6	
	12:55	15		5.5	
	1:10	30		5.0	
	1:35	45		4.6	
	1:50	60		4.0	Rate: 2 in/hr"

Average Infiltration Rate: 2.00

2.00 0.00
2.00 1.00
2.00 2.00
2.00 3.00
4.00





PODS Bridgeville
31211931

Location: SWM-1
Test Depth 4.2

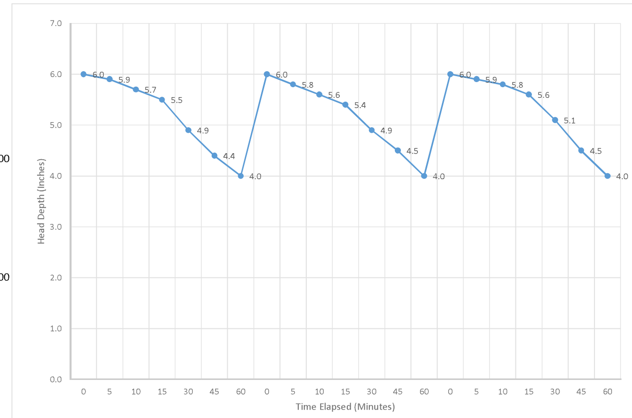
Geo-Technology Associates, Inc.

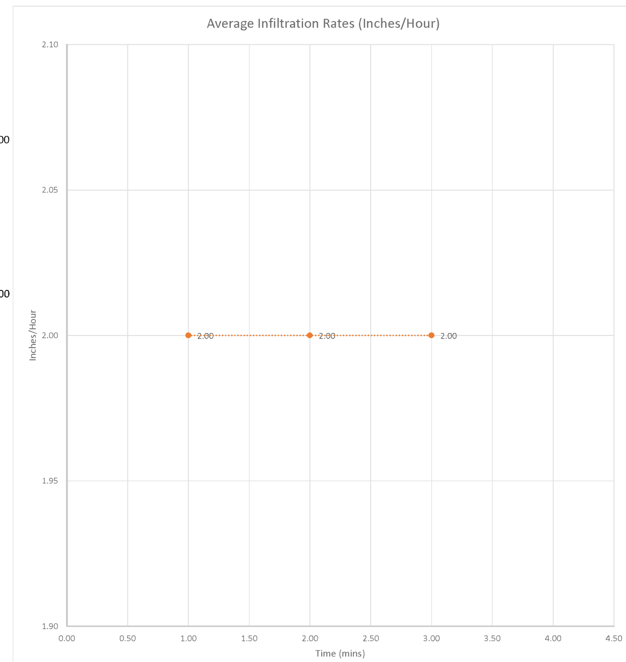
Single Ring Falling Head Infiltration Testing

Name: Mitchell
I. D. of Pipe: 12 in.
Test Depth: 2.8 / 38.0 ft. / EL
Depth of Casing Penetration: 1"
Soil Type Tested: Sandy Loam

Date 3/7/2022
Temp _76^{0}F_ Weather: Sunny
Rainfall Last 24 hrs. __0.0"___
Location: ___SWM-2___
Presoak : 12" drop / 1+ hour

Date	Time	Δt (min.)		Head of Water (in.)	Comments		
3/7/2022	10:43	0		6.0			0.00
	10:48	5		5.9			
	10:53	10		5.7			
	10:58	15		5.5			
	11:13	30		4.9			
	11:28	45		4.4			
	11:43	60		4.0	Rate: 2 in/hr"	2.00	1.00
	11:43	0		6.0			
	11:48	5		5.8			
	11:53	10		5.6			
	11:58	15		5.4			
	12:13	30		4.9			
	12:28	45		4.5			
	12:43	60		4.0	Rate: 2 in/hr"	2.00	2.00
	12:43	0		6.0			
	12:48	5		5.9			
	12:53	10		5.8			
	12:58	15		5.6			
	1:13	30		5.1			
	1:28	45		4.5			
	1:43	60		4.0	Rate: 2 in/hr"	2.00	3.00
							4.00
					Average Infiltration Rate:	2.00	





PODS Bridgeville
31211931

Location: SWM-2
Test Depth 2.8

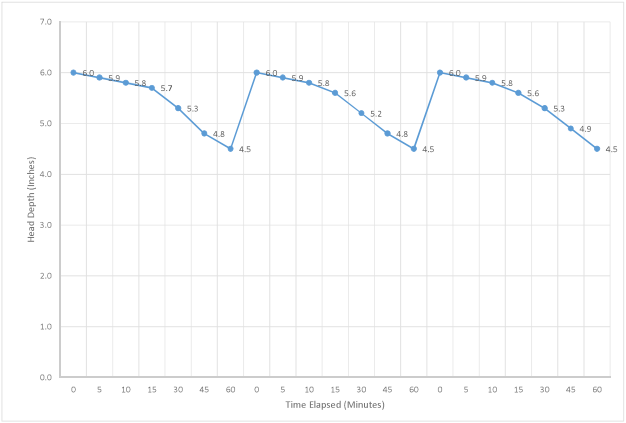
Geo-Technology Associates, Inc.

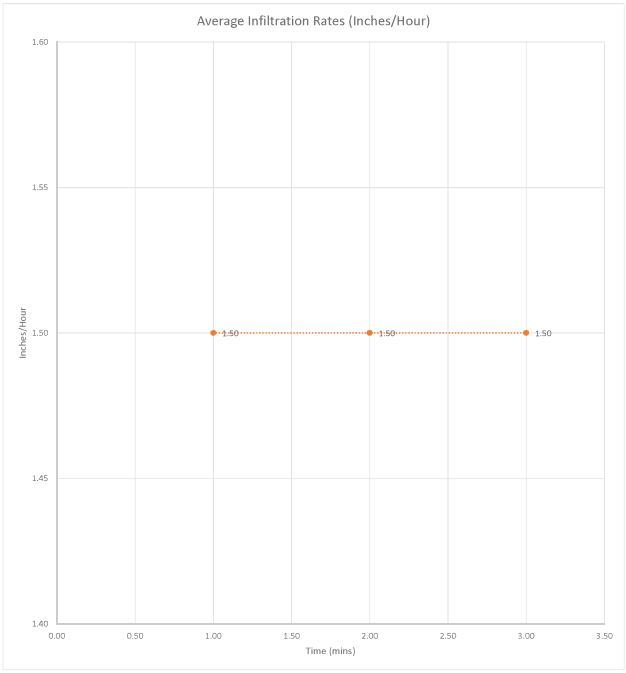
Single Ring Falling Head Infiltration Testing

Name: Mitchell
I. D. of Pipe: 12 in.
Test Depth: 5.0 / 35.8 ft. / EL
Depth of Casing Penetration: 1"
Soil Type Tested: Sandy Loam

Date 3/7/2022
Temp _76°F_ Weather: Sunny
Rainfall Last 24 hrs. __0.0"___
Location: ___SWM-3_____
Presoak : 12" drop / 1+ hour

Date	Time	Δt (min.)		Head of Water (in.)	Comments		
3/7/2022	10:45	0		6.0			0.00
	10:50	5		5.9			
	10:55	10		5.8			
	11:00	15		5.7			
	11:15	30		5.3			
	11:30	45		4.8			
	11:45	60		4.5	Rate: 1.5 in/hr"	1.50	1.00
	11:45	0		6.0			
	11:50	5		5.9			
	11:55	10		5.8			
	12:00	15		5.6			
	12:15	30		5.2			
	12:30	45		4.8			
	12:45	60		4.5	Rate: 1.5 in/hr"	1.50	2.00
	12:45	0		6.0			
	12:50	5		5.9			
	12:55	10		5.8			
	13:00	15		5.6			
	1:15	30		5.3			
	1:30	45		4.9			
	1:45	60		4.5	Rate: 1.5 in/hr"	1.50	3.00
					Average Infiltration Rate:	1.50	





PODS Bridgeville
31211931

Location: SWM-3
Test Depth 5

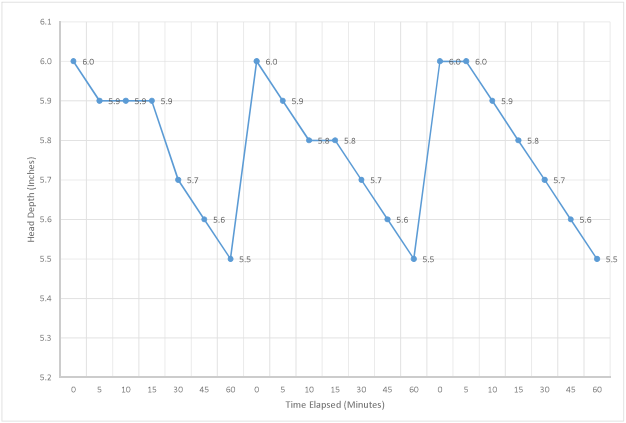
Geo-Technology Associates, Inc.

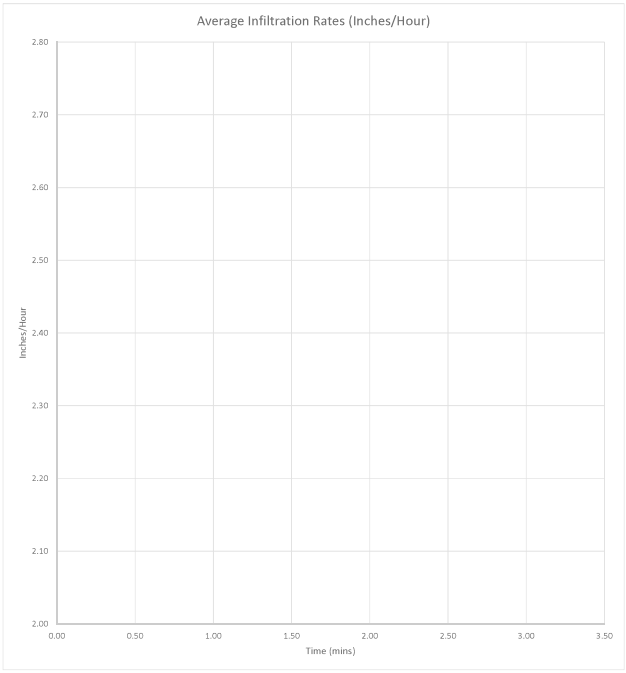
Single Ring Falling Head Infiltration Testing

Name: Mitchell
I. D. of Pipe: 12 in.
Test Depth: 6.5 / 35.2 ft. / EL
Depth of Casing Penetration: 1"
Soil Type Tested: Loamy Sand

Date 3/7/2022
Temp _76°F_ Weather: Sunny
Rainfall Last 24 hrs. __0.0"___
Location: ___SWM-4_____
Presoak : 12" drop / 1+ hour

Date	Time	Δt (min.)		Head of Water (in.)	Comments		
3/7/2022	10:49	0		6.0			0.00
	10:54	5		5.9			
	10:59	10		5.9			
	11:04	15		5.9			
	11:19	30		5.7			
	11:34	45		5.6			
	11:49	60		5.5	Rate: 0.5 in/hr"	0.50	1.00
	11:49	0		6.0			
	11:54	5		5.9			
	11:59	10		5.8			
	12:04	15		5.8			
	12:19	30		5.7			
	12:34	45		5.6			
	12:49	60		5.5	Rate: 0.5 in/hr"	0.50	2.00
	12:49	0		6.0			
	12:54	5		6.0			
	12:59	10		5.9			
	1:04	15		5.8			
	1:19	30		5.7			
	1:34	45		5.6			
	1:49	60		5.5	Rate: 0.5 in/hr"	0.50	3.00
					Average Infiltration Rate:	0.50	





PODS Bridgeville
31211931

Location: SWM-4
Test Depth 6.5

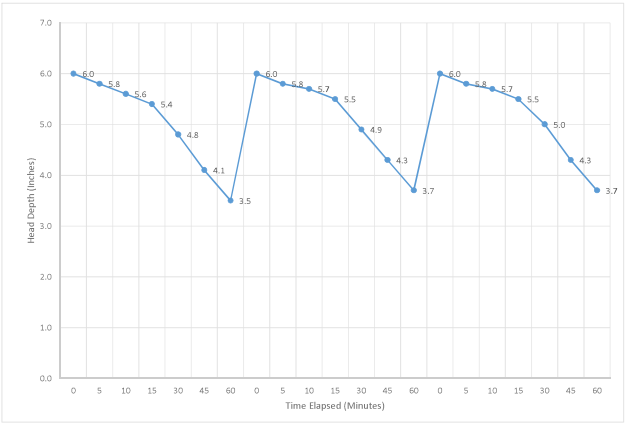
Geo-Technology Associates, Inc.

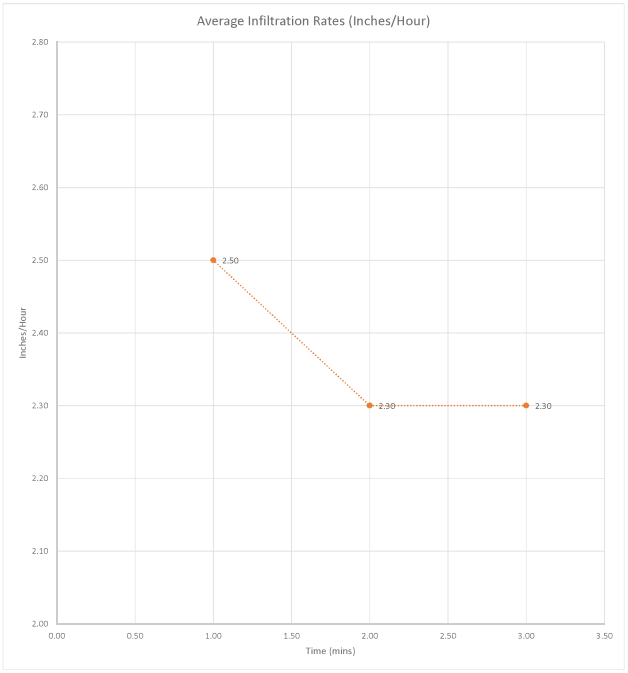
Single Ring Falling Head Infiltration Testing

Name: Mitchell
I. D. of Pipe: 12 in.
Test Depth: 4.8 / 36.2 ft. / EL
Depth of Casing Penetration: 1"
Soil Type Tested: Sandy Loam

Date 3/7/2022
Temp _76°F_ Weather: Sunny
Rainfall Last 24 hrs. __0.0"___
Location: ___SWM-5____
Presoak : 12" drop / 1+ hour

Date	Time	Δt (min.)		Head of Water (in.)	Comments		
3/7/2022	10:46	0		6.0			0.00
	10:51	5		5.8			
	10:56	10		5.6			
	11:01	15		5.4			
	11:16	30		4.8			
	11:31	45		4.1			
	11:46	60		3.5	Rate: 2.5 in/hr"	2.50	1.00
	11:46	0		6.0			
	11:51	5		5.8			
	11:56	10		5.7			
	12:01	15		5.5			
	12:16	30		4.9			
	12:31	45		4.3			
	12:46	60		3.7	Rate: 2.3 in/hr"	2.30	2.00
	12:46	0		6.0			
	12:51	5		5.8			
	12:56	10		5.7			
	1:01	15		5.5			
	1:16	30		5.0			
	1:31	45		4.3			
	1:46	60		3.7	Rate: 2.3 in/hr"	2.30	3.00
					Average Infiltration Rate:	2.37	

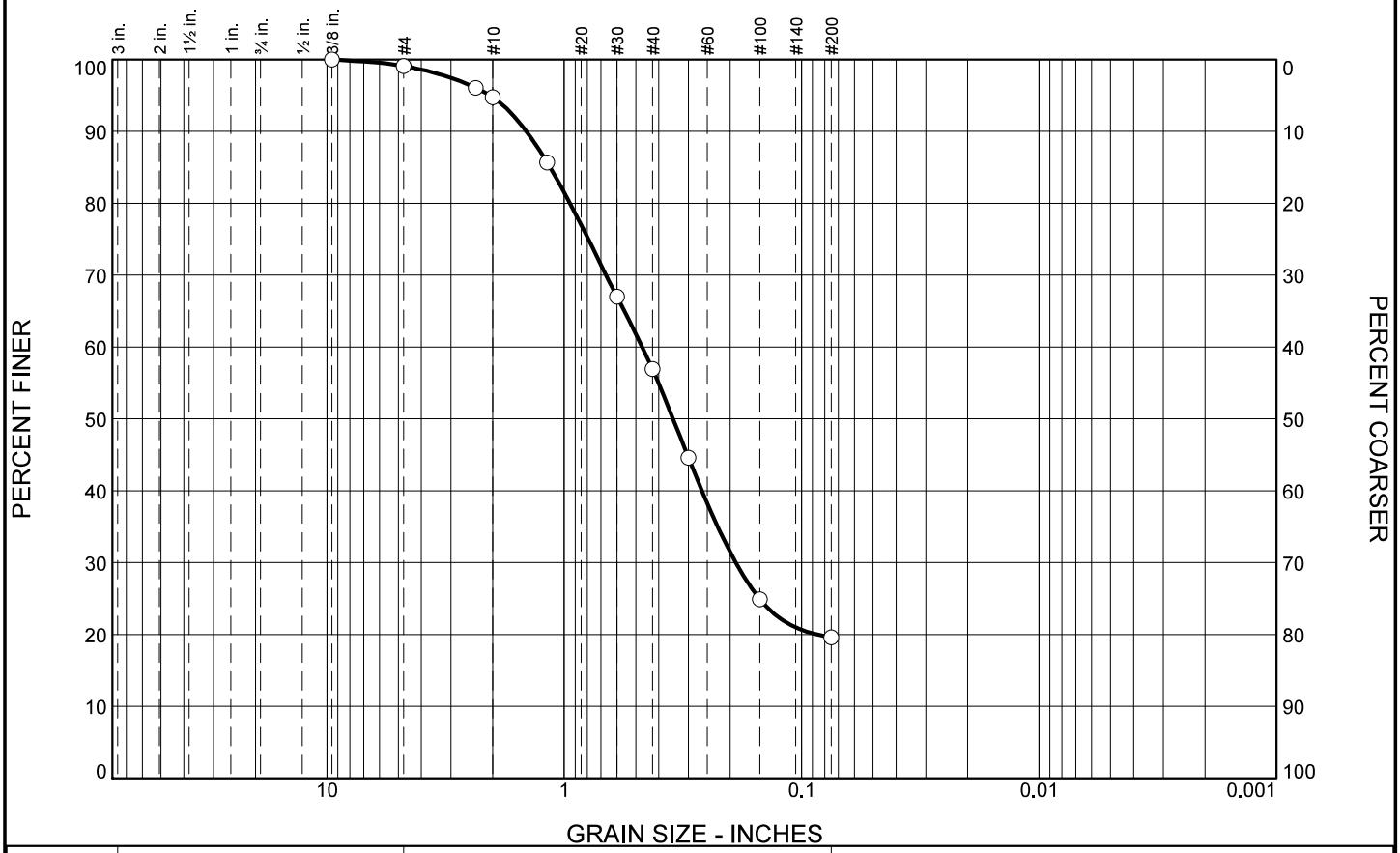




PODS Bridgeville
31211931

Location: SWM-5
Test Depth 4.8

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	0.9	4.3	37.9	37.3	19.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375 in	100.0		
#4	99.1		
#8	96.1		
#10	94.8		
#16	85.7		
#30	67.0		
#40	56.9		
#50	44.6		
#100	24.9		
#200	19.6		

* (no specification provided)

Soil Description

Orange, Silty SAND

Atterberg Limits

PL= NP LL= NP PI= NP NM= 14.2

Coefficients

D_{90}= 1.4428 D_{85}= 1.1463 D_{60}= 0.4690
D_{50}= 0.3480 D_{30}= 0.1893 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Location: SWM-1
Sample Number: S-3 **Depth:** 4.0-6.0 feet **Date:** 2/16/2022

GEO-TECHNOLOGY ASSOCIATES, INC.
21133 Sterling Avenue, Suite 7
Georgetown, DE 19947

Client: GED S. Main Dist. LLC
Project: PODS Bridgeville

Project No: 31211931 **Figure**

Tested By: J. Barrett **Checked By:** T. Caraway

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are <u>not</u> final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are <u>Not</u> Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will <u>not</u> of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are <u>not</u> building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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e-mail: info@geoprofessional.org www.geoprofessional.org