EGSci consulting inc
Engineering, Geophysics & Geosciences

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July 12, 2022

Arcadis US, Inc.
2839 Paces Ferry Road
Suite 900
Atlanta, GA 30339

RE: ADDENDUM TO PRELIMINARY GEOTECHNICAL EXPLORATION DATA REPORT
ADDITIONAL BORING DATA
GDOT PI NOS. 0017219 & 0018363
SR 12/US 278 FROM WILLOW SPRINGS CHURCH ROAD TO SHIRE PARKWAY AND I-20 FRONTAGE ROAD FROM SR 12/US 278 TO CR 249/OLD MILL ROAD
NEWTON, WALTON, AND MORGAN COUNTIES, GEORGIA

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EGSci Consulting Inc. (EGSci) is pleased to submit to Arcadis US, Inc. (Arcadis) this addendum to the preliminary geotechnical exploration data report dated June 14, 2022, which is in support of proposed improvements to SR 12/US 278 from Willow Springs Church Road to Shire Parkway and a proposed frontage road parallel to I-20 from SR 12/US 278 to CR 249/Old Mill Road (GDOT PI Nos. 0017219 and 0018363) in Newton, Walton, and Morgan Counties, Georgia. This addendum includes data from three additional Standard Penetration Test (SPT) borings completed on July 5, 2022. The approximate locations of the three borings (B-6, B-7, and B-8) were selected based on an updated mainline profile for the proposed frontage road provided by Arcadis. The elevations and locations of borings at the site were not surveyed and should be considered approximate. For additional information, please refer to the preliminary geotechnical exploration data report dated June 14, 2022.

The information included in this addendum should be considered preliminary as part of the pre-let phase of this project. During the post-let phase of this project, additional geotechnical investigations (Soil Survey, Wall Foundation, and Bridge Foundation Investigations) and analyses will be required by others in accordance with GDOT guidelines based on the final project design.

EGSci appreciates the opportunity to work with Arcadis on this project. If you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,
EGSci Consulting Inc.

Nathan Thompson, M.Sc., P.E.
Senior Geotechnical Engineer

Kal Vencill, MCE, P.E.
Principal Engineer

Attachments
Boring Location Plan
Key to Soil Classification
Boring Logs

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ATTACHMENTS

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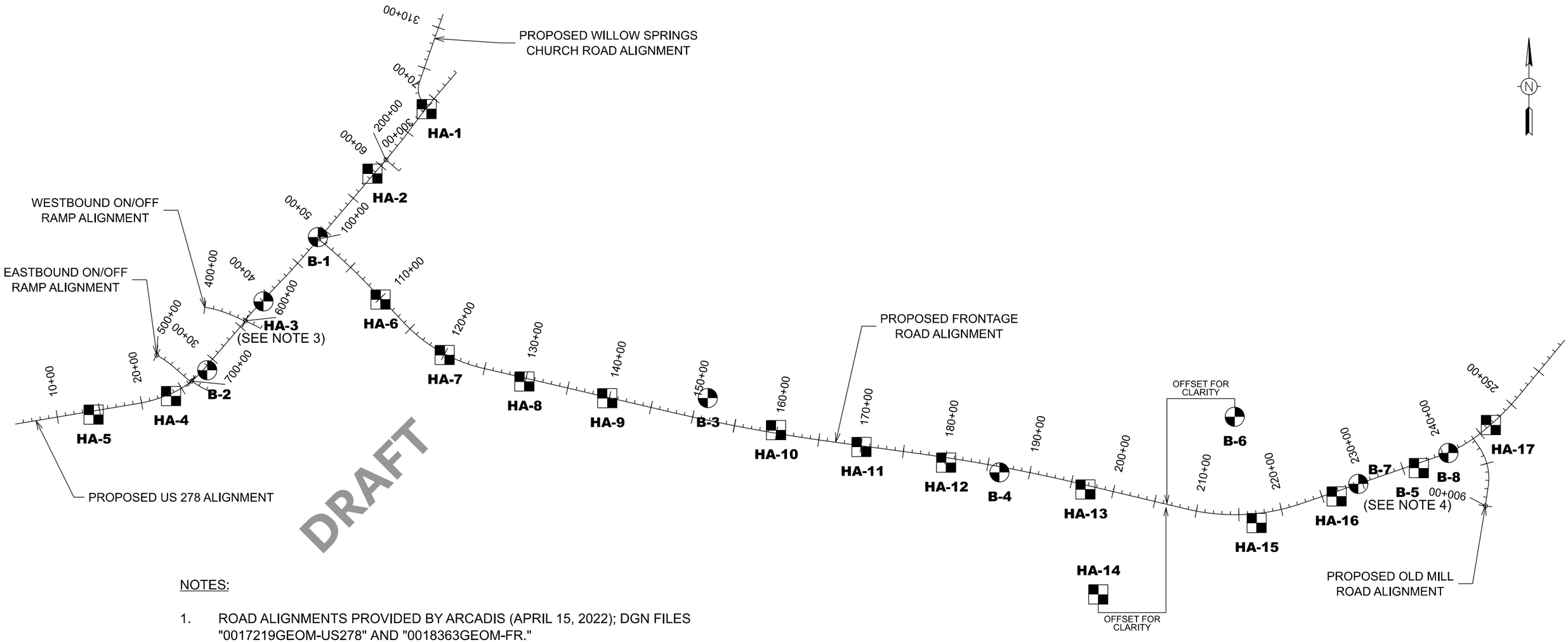

NOTES:

1. ROAD ALIGNMENTS PROVIDED BY ARCADIS (APRIL 15, 2022); DGN FILES "0017219GEOM-US278" AND "0018363GEOM-FR."
2. THE LOCATION OF BORINGS SHOWN WERE ESTIMATED USING HANDHELD GLOBAL POSITIONING SYSTEM (GPS) DEVICES AND/OR FIELD MEASUREMENTS, AND SHOULD BE CONSIDERED APPROXIMATE (NOT SURVEYED).
3. HAND AUGER BORING LOCATION WAS PERFORMED AS A STANDARD PENETRATION TEST (SPT) BORING.
4. STANDARD PENETRATION TEST (SPT) BORING LOCATION WAS PERFORMED AS A HAND AUGER BORING.

LEGEND:

STANDARD PENETRATION TEST (SPT) BORING LOCATION
B-1

HAND AUGER BORING LOCATION
HA-1

Consultant	EGSci consulting inc 1455 Lincoln Parkway- Suite 500 Atlanta, GA 30346	Client	ARCADIS	PROJECT NUMBER	PI 0017219 AND PI 0018363	LOCATION	NEWTON, WALTON, AND MORGAN COUNTIES, GEORGIA	BORING LOCATION PLAN	FIGURE 4
				PROJECT	SR 12/US 278 FROM WILLOW SPRINGS CHURCH ROAD TO SHIRE PARKWAY AND I-20 FRONTAGE ROAD FROM SR 12/US 278 TO CR 249/OLD MILL ROAD				SCALE NOT TO SCALE

KEY TO SOIL CLASSIFICATION

SOIL CLASSIFICATION CHART (ASTM D2487-17$^{\varepsilon 1}$, TABLE 1)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification	
				Group Symbol	Group Name[B]
COARSE-GRAINED SOILS	Gravels (More than 50 % of coarse fraction retained on No. 4 sieve)	Clean Gravels (Less than 5 % fines[C])	Cu ≥ 4.0 and 1 ≤ Cc ≤ 3.0[D]	GW	Well-graded gravel[E]
			Cu < 4.0 and/or [Cc < 1 or Cc > 3.0][D]	GP	Poorly graded gravel[E]
		Gravels with Fines (More than 12 % fines[C])	Fines classify as ML or MH	GM	Silty gravel[E,F,G]
			Fines classify as CL or CH	GC	Clayey gravel[E,F,G]
More than 50 % retained on No. 200 sieve	Sands (50 % or more of coarse fraction passes No. 4 sieve)	Clean Sands (Less than 5 % fines[H])	Cu ≥ 6.0 and 1.0 ≤ Cc ≤ 3.0[D]	SW	Well-graded sand[I]
			Cu < 6.0 and/or [Cc < 1.0 or Cc > 3.0][D]	SP	Poorly graded sand[I]
		Sands with Fines (More than 12 % fines[H])	Fines classify as ML or MH	SM	Silty sand[F,G,I]
			Fines classify as CL or CH	SC	Clayey sand[F,G,I]
FINE-GRAINED SOILS	Silts and Clays	inorganic	PI > 7 and plots on or above "A" line[J]	CL	Lean clay[K,L,M]
	Liquid limit less than 50		PI < 4 or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	$\frac{\text{Liquid limit – oven dried}}{\text{Liquid limit – not dried}} < 0.75$	OL	Organic clay[K,L,M,N] / Organic silt[K,L,M,O]
50 % or more passes the No. 200 sieve	Silts and Clays	inorganic	PI plots on or above "A" line	CH	Fat clay[K,L,M]
	Liquid limit 50 or more		PI plots below "A" line	MH	Elastic silt[K,L,M]
		organic	$\frac{\text{Liquid limit – oven dried}}{\text{Liquid limit – not dried}} < 0.75$	OH	Organic clay[K,L,M,P] / Organic silt[K,L,M,Q]
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor			PT	Peat

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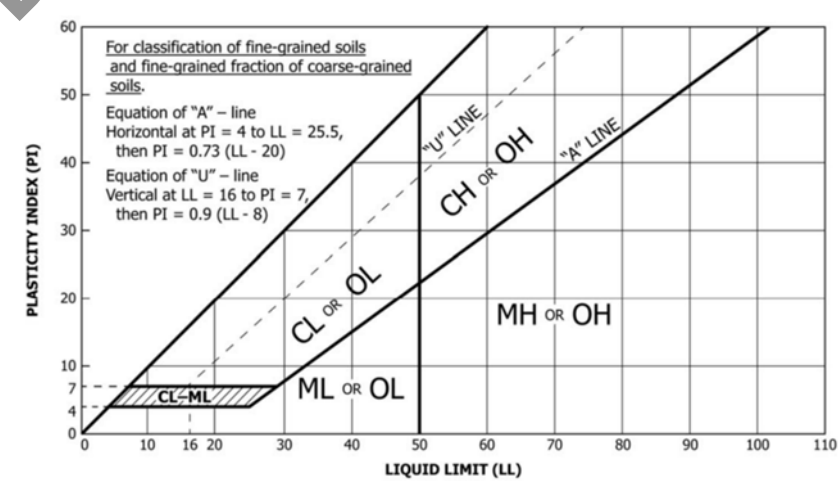
[A] Based on the material passing the min. (75-mm) sieve.
[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.
[C] Gravels with 5 to 12 % fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay
[D] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$
[E] If soil contains ≥15 % sand, add "with sand" to group name.
[F] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.
[G] If fines are organic, add "with organic fines" to group name.
[H] Sands with 5 to 12 % fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay
[I] If soil contains ≥ 15 % gravel, add "with gravel" to group name.
[J] If Atterberg limits plot in hatched area, soil is a CL-ML, silty clay.
[K] If soil contains 15 to <30 % plus No. 200. add "with sand" or "with gravel," whichever is predominant.
[L] If soil contains ≥30 % plus No. 200, predominantly sand, add "sandy" to group name.
[M] If soil contains ≥30 % plus No. 200, predominantly gravel, add "gravelly" to group name.
[N] PI ≥4 and plots on or above "A" line.
[O] PI < 4 or plots below "A" line.
[P] PI plots on or above "A" line.
[Q] PI plots below "A" line.
[R] Trace: < 5%. Few: 5 – 14%. (EGSci adaptation based on ASTM D2488).



(ASTM D2487-17$^{\varepsilon 1}$, Figure 4)

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KEY TO SOIL CLASSIFICATION

TERMS AND DESCRIPTIONS

Relative Density of Cohesionless Soils	SPT N-value
Very Loose	Less than 4
Loose	4 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	Over 50

Consistency of Cohesive Soils	Undrained Shear Strength (psf)
Very Soft	Less than 250
Soft	250 to 500
Firm	500 to 1,000
Stiff	1,000 to 2,000
Very Stiff	2,000 to 4,000
Hard	Over 4,000

Particle Type	Particle Size
Clays and Silts	Passes #200 Sieve (0.075 mm)
Sands	#200 to #4 Sieve (0.075 mm to 4.75 mm)
Gravels	#4 Sieve to 3 in. (4.75 mm to 75 mm)
Cobbles	3 in. to 12 in. (75 mm to 300 mm)
Boulders	Over 12 in. (300 mm)

SAMPLE TYPES

AS	Auger Sample
DO	Drive Open
DS	Denison Sample
PS	Pitcher Sample
RC	Rock Core
TO	Thin-Walled, Open
TP	Thin-walled, Piston
US	Undisturbed Sample
WS	Wash Sample

PENETRATION RESISTANCE

Standard Penetration Resistance (ASTM D1586) “N-value” = the number of blows required to drive a 2-inch outer-diameter split spoon sampler one foot, using a 140-pound hammer falling 30 inches.

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Project Number: **PI No. 0017219 / PI No. 0018363** Project: **SR 12/US 278 from Willow Springs Church Road to Shire Parkway and I-20 Frontage Road from SR 12/US 278 to CR 249/Old Mill Road** Location: **Newton, Walton, and Morgan Counties, Georgia**		BORING B-6 Sheet 1 of 1
Drilling Date(s): **7/5/2022**	Drill Rig and Hammer Type: **Mobile B-57 with Automatic Hammer**	Station and Offset: **206+44, 9.0' L (approx.)**
Drilling Company: **Dodd Drilling**	Hammer Efficiency: **84%**	Latitude, Longitude: **33.604362, -83.663151 (approx.)**
Driller: **J. Dodd**	Drilling Method(s): **2 1/4 in. ID Hollow Stem Auger**	Elevation: **742 ft. (approx.)**
Logged By: **A. Johnson**	Completion Depth: **20.0 ft**	Benchmark: **N/A**
Reviewed By: **K. Vencill**	Boring Location: **Grass field west of Old Mill Road, north of I-20**	

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample Number	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6 inches	N-Value (bpf) (field measured)	Moisture (%)	q_u (PP) (tsf)	Additional Remarks
742	0					POSSIBLE FILL SANDY LEAN CLAY: hard, dry, red brown, with trace Organics.	CL					
			DO	S1	13			13-18-15	33			No groundwater encountered during drilling.
			DO	S2	18	RESIDUAL SANDY SILT: medium dense, dry, light brown, red, gray, slightly micaceous.	ML	6-9-14	23			
737	5											
			DO	S3	15	S3: loose, moist, light brown, red, pink, white		3-5-4	9			
			DO	S4	18	SILTY SAND: medium dense, moist, light gray, white, pink, tan, fine to coarse, slightly micaceous.	SM	3-7-8	15			
732	10											
			DO	S5	18	SANDY SILT: loose, moist, brown, white, tan, slightly micaceous.	ML	3-4-5	9			
727	15											Borehole caved in at approximately 17.5 ft. BGS upon drilling completion.
			DO	S6	18	S6: medium dense, gray, tan brown, moderately micaceous		4-5-7	12			
722	20					Boring terminated at 20.0 ft. BGS. Backfilled with cuttings upon completion.						
717	25											

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The locations of borings were estimated using handheld Global Positioning System (GPS) devices and/or field measurements,and ground surface elevations at boring locations were estimated based on data from the U.S. Geological Survey National Geospatial Program. The stations and offsets of boring locations were estimated based on information provided by Arcadis on April 15, 2022. Elevations and locations of borings and site observations were not surveyed and should be considered approximate.

Project Number: **PI No. 0017219 / PI No. 0018363** Project: **SR 12/US 278 from Willow Springs Church Road to Shire Parkway and I-20 Frontage Road from SR 12/US 278 to CR 249/Old Mill Road** Location: **Newton, Walton, and Morgan Counties, Georgia**		# BORING B-7 Sheet 1 of 2
Drilling Date(s): **7/5/2022**	Drill Rig and Hammer Type: **Mobile B-57 with Automatic Hammer**	Station and Offset: **229+50, 0.0' (approx.)**
Drilling Company: **Dodd Drilling**	Hammer Efficiency: **84%**	Latitude, Longitude: **33.604962, -83.655793 (approx.)**
Driller: **J. Dodd**	Drilling Method(s): **2 1/4 in. ID Hollow Stem Auger**	Elevation: **723 ft. (approx.)**
Logged By: **A. Johnson**	Completion Depth: **33.9 ft**	Benchmark: **N/A**
Reviewed By: **K. Vencill**	Boring Location: **Grass field west of Old Mill Road, north of I-20**	

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample Number	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6 inches	N-Value (bpf) (field measured)	Moisture (%)	q_u (PP) (tsf)	Additional Remarks
723	0					FILL LEAN CLAY: stiff to very stiff, moist, brown, red, orange, with few Sand, slightly micaceous.	CL					
			DO	S1	18			9-8-8	16			No groundwater encountered during drilling.
			DO	S2	12	SANDY SILT: loose, moist, brown, red, moderately micaceous.	ML	6-5-4	9			
718	5											
			DO	S3	14	S3: light brown, pink, white.		6-4-5	9			
			DO	S4	13	RESIDUAL SILTY CLAYEY SAND: medium dense, moist, light brown, red, gray, fine to coarse, moderately micaceous.	SC/SM	4-5-6	11			
713	10											
			DO	S5	18	SANDY SILT: loose, moist, brown, pink, red, white.	ML	3-4-6	10			
708	15											
			DO	S6	15	SILTY SAND: loose, moist, gray, brown, fine to coarse, highly micaceous.	SM	4-4-5	9			
703	20											
			DO	S7	18	POORLY GRADED SAND: medium dense, moist, gray, white, fine to coarse, with trace to few Fines, moderately to highly micaceous.	SP	3-6-7	13			
698	25											

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Project Number: **PI No. 0017219 / PI No. 0018363** Project: **SR 12/US 278 from Willow Springs Church Road to Shire Parkway and I-20 Frontage Road from SR 12/US 278 to CR 249/Old Mill Road** Location: **Newton, Walton, and Morgan Counties, Georgia**		# BORING B-7 Sheet 2 of 2
Drilling Date(s): **7/5/2022**	Drill Rig and Hammer Type: **Mobile B-57 with Automatic Hammer**	Station and Offset: **229+50, 0.0' (approx.)**
Drilling Company: **Dodd Drilling**	Hammer Efficiency: **84%**	Latitude, Longitude: **33.604962, -83.655793 (approx.)**
Driller: **J. Dodd**	Drilling Method(s): **2 1/4 in. ID Hollow Stem Auger**	Elevation: **723 ft. (approx.)**
Logged By: **A. Johnson**	Completion Depth: **33.9 ft**	Benchmark: **N/A**
Reviewed By: **K. Vencill**	Boring Location: **Grass field west of Old Mill Road, north of I-20**	

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample Number	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6 inches	N-Value (bpf) (field measured)	Moisture (%)	q_u (PP) (tsf)	Additional Remarks
698	25					POORLY GRADED SAND: medium dense, moist, gray, white, fine to coarse, with trace to few Fines, moderately to highly micaceous.	SP					
			DO	S8	15	SILTY SAND: dense, moist, gray, white, fine to coarse, moderately micaceous.	SM	12-13-20	33			Borehole caved in at approximately 29.5 ft. BGS upon drilling completion.
693	30					PARTIALLY WEATHERED ROCK sampled as: SILTY SAND: very dense, moist, brown, orange, tan, fine to coarse, highly micaceous.	SM					Increased drilling resistance at 31.0 ft BGS.
			DO	S9	5			50/5"	50/5"			
688	35					Boring terminated at 33.9 ft. BGS. Backfilled with cuttings upon drilling completion.						
683	40											
678	45											
673	50											

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Project Number: **PI No. 0017219 / PI No. 0018363** Project: **SR 12/US 278 from Willow Springs Church Road to Shire Parkway and I-20 Frontage Road from SR 12/US 278 to CR 249/Old Mill Road** Location: **Newton, Walton, and Morgan Counties, Georgia**		# BORING B-8 Sheet 1 of 2
Drilling Date(s): **7/5/2022**	Drill Rig and Hammer Type: **Mobile B-57 with Automatic Hammer**	Station and Offset: **240+64, 4.5' R (approx.)**
Drilling Company: **Dodd Drilling**	Hammer Efficiency: **84%**	Latitude, Longitude: **33.605943, -83.652325 (approx.)**
Driller: **J. Dodd**	Drilling Method(s): **2 1/4 in. ID Hollow Stem Auger**	Elevation: **720 ft. (approx.)**
Logged By: **A. Johnson**	Completion Depth: **45.0 ft**	Benchmark: **N/A**
Reviewed By: **K. Vencill**	Boring Location: **Grass field west of Old Mill Road, north of I-20**	

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample Number	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6 inches	N-Value (bpf) (field measured)	Moisture (%)	q_u (PP) (tsf)	Additional Remarks
720	0					FILL SANDY LEAN CLAY: stiff, moist, light brown, tan.	CL					
			DO	S1	18			5-6-9	15			
			DO	S2	18	S2: light brown, red, gray		5-5-6	11			
715	5											
			DO	S3	4	LEAN CLAY: firm, moist, light brown, tan, with trace Sand.	CL	4-2-2	4			
			DO	S4	10	RESIDUAL SILTY SAND: loose, moist, red brown, fine, highly micaceous.	SM	1-2-2	4			
710	10											12.5 ft. BGS upon completion
			DO	S5	18	S5: gray, brown, fine to coarse, with trace Gravel		3-4-3	7			
705	15											
			DO	S6	18	SILTY SAND WITH GRAVEL: loose, wet, red, fine to coarse.	SM	3-5-5	10			
700	20											
			DO	S7	18	SILTY CLAYEY SAND: loose, wet, gray, white, tan, fine to coarse.	SC/SM	3-2-3	5			
695	25											

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Project Number: **PI No. 0017219 / PI No. 0018363** Project: **SR 12/US 278 from Willow Springs Church Road to Shire Parkway and I-20 Frontage Road from SR 12/US 278 to CR 249/Old Mill Road** Location: **Newton, Walton, and Morgan Counties, Georgia**		BORING B-8 Sheet 2 of 2
Drilling Date(s): **7/5/2022**	Drill Rig and Hammer Type: **Mobile B-57 with Automatic Hammer**	Station and Offset: **240+64, 4.5' R (approx.)**
Drilling Company: **Dodd Drilling**	Hammer Efficiency: **84%**	Latitude, Longitude: **33.605943, -83.652325 (approx.)**
Driller: **J. Dodd**	Drilling Method(s): **2 1/4 in. ID Hollow Stem Auger**	Elevation: **720 ft. (approx.)**
Logged By: **A. Johnson**	Completion Depth: **45.0 ft**	Benchmark: **N/A**
Reviewed By: **K. Vencill**	Boring Location: **Grass field west of Old Mill Road, north of I-20**	

Elevation (feet)	Depth (feet)	Graphic Log	Sample Type	Sample Number	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	SPT Blows per 6 inches	N-Value (bpf) (field measured)	Moisture (%)	q_u (PP) (tsf)	Additional Remarks
695	25					SILTY CLAYEY SAND: loose, wet, gray, white, tan, fine to coarse.	SC/SM					Borehole caved in at approximately 28.0 ft. BGS upon drilling completion.
			DO	S8	18	S8: moist to wet, dark gray to gray, white, tan, fine		2-2-3	5			
690	30											
			DO	S9	18	S9: medium dense, wet, light gray to gray, white, fine to coarse		5-6-9	15			
685	35											
			DO	S10	18	S10: dark gray to light gray, white, tan, fine to medium, moderately micaceous		3-5-6	11			
680	40											
			DO	S11	18	S11: fine		4-5-6	11			
675	45					Boring terminated at 45.0 ft. BGS. Backfilled with cuttings upon drilling completion.						
670	50											

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The locations of borings were estimated using handheld Global Positioning System (GPS) devices and/or field measurements,and ground surface elevations at boring locations were estimated based on data from the U.S. Geological Survey National Geospatial Program. The stations and offsets of boring locations were estimated based on information provided by Arcadis on April 15, 2022. Elevations and locations of borings and site observations were not surveyed and should be considered approximate.