

Closure Plan for Water Recycle Ponds

Entergy Arkansas, LLC White Bluff Plant Redfield, Jefferson County, Arkansas

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Prepared For Entergy Arkansas, LLC

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TRC Environmental Corporation | Entergy Arkansas, LLC Closure Plan for Water Recycle Ponds Entergy White Bluff Plant, Redfield, Jefferson County, Arkansas

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Section 1 Introduction

Entergy Arkansas, LLC (Entergy) operates the White Bluff Steam Electric Station (Plant), located at 1100 White Bluff Road, Redfield, AR 72132. This Plant operates two Water Recycle Ponds: A and B (Ponds), as part of its process water system for bottom ash transport. Pursuant to United States Environmental Protection Agency (USEPA) Disposal of Coal Combustion Residuals (CCR) From Electric Utilities Final Rule (CCR Rule) Section 40 Code of Federal Regulations (CFR) § 257.102, this Closure Plan (Plan) describes the steps to close the Ponds through removal of CCR per 40 CFR § 257.102(c). Section 40 CFR § 257.102(b) identifies the content of written closure plans, which must include for closure by removal of CCR the following information:

- A description of how the CCR unit will be closed;
- A description of procedures to remove the CCR and decontaminate the CCR unit;
- An estimate of the maximum inventory of CCR ever onsite over the active life of the CCR unit;
- An estimate of the largest area of the CCR unit ever requiring a final cover; and
- A general schedule for closure

1.1 Site Information

The Plant is located near Redfield, Jefferson County, Arkansas (Figure 1). The Plant is located at approximate latitude 34°25′11.4″ N, longitude 92°9′20.60″ W (front gate). The area surrounding the Ponds is approximately 19 acres.

Entergy's current active National Pollutant Discharge Elimination System (NPDES) Permit AR0036331 has two designated Outfalls 001 and 002. Outfall 001 is used for cooling tower blowdown. Outfall 002 is used for overflow from the clear water holding pond. The receiving water is the Arkansas River in Segment 3C of the Arkansas River Basin. The following coordinates for the outfalls are as listed below:

- Outfall 001: Latitude: 34°25′11.3″ N; Longitude: 92°7′14.1″ W
- Outfall 002: Latitude: 34°25'10.7" N; Longitude: 92°7'15.7" W

Water contained in the Ponds is part of the facility's bottom ash transport system.

1.2 Site Characteristics

The Plant began commercial operation in 1980 (Unit 1) and 1981 (Unit 2). The water recycle ponds were part of the original design for the Plant and have been in service since the period of initial commercial operation. During operations, the bottom ash from the boilers is removed from the hopper by a sluicing

process and transported to four dewatering bins. After the water is drained from the bins, the ash is unloaded into trucks and taken to the on-site landfill for disposal or sold as a product for beneficial reuse. The water drained from the dewatering bins is routed to the recycle ponds for intermediate storage prior to being returned to the bottom ash transport system for reuse in the sluicing operations.

1.3 Hydrogeologic Setting

There are two main subsurface strata below the Ponds (boring logs and geotechnical data are included on Figure 2 and in Appendix A and B):

- Stratum II is generally composed of stiff to very stiff fat and lean clay that ranges from 4 ft to 28 ft in thickness with elevations from 280 feet above mean sea level (ft amsl) to 261 ft amsl. Flex-wall permeability testing performed on the on-site clay soils show hydraulic conductivities ranging from 4.7 x 10-6 to 1.4 x 10-8 (FTN 2014).
- Stratum III is heterogeneous in composition and generally exhibits an increase in coarse fraction compared to Stratum II. Stratum III is composed of medium dense to dense clays sand with alternating layers of silty sand, sand, and/or clay. Stratum III ranges in thickness from 9 ft to 30 ft with typical elevations ranging from 272 to 252 ft bgs. *In-situ* hydraulic conductivities in Stratum III range from 2.53 x 10-4 cm/s to 4.18 x 10-7 cm/s (TRC 2018).
- Lower Confining Unit below Stratum III is a very dark grey, fat clay that is highly laminated with light grey silt and very fine-grained sand. The unit was penetrated in nine borings across the permitted landfill area during the 2014 Geotechnical and Hydrogeological Investigation and has also been documented in the 1984 Geraghty and Miller report as being upwards of 30 ft in thickness and present across the footprint of the permitted landfill area. *In-situ* permeability testing of this unit determined a vertical hydraulic conductivity of 3.7 x 10⁻⁸ cm/s. This Lower Confining Unit was encountered during aquifer characterization efforts around the recycle ponds conducted in 2018 and does extend to this area.



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Fig02_302967-002WB.mxd

2.1 Closure Description

The Ponds will be closed in accordance with 40 CFR § 257.102(c) through the removal of CCR such that no residual materials remain visible, plus over-excavation of approximately 6-inches of subsoils. Certification of the closure will be provided by both an Arkansas registered professional engineer and registered professional geologist. Anticipated closure steps and estimated timing for each Pond are described below in Section 2.2.

Water flows to Pond A from the bottom ash handling system and other on-site sources were diverted away from the pond on October 5, 2018 to initiate closure. Similarly, water flows to Pond B will be diverted prior to the time of anticipated closure of Pond B.

The Ponds will be dewatered of surface and pore water and closed through the removal of CCR materials. The procedure proposed to remove the CCR and decontaminate the CCR Unit as required by 257.102(c) will consist of excavation and removal by mechanical dredging and/or excavation. As with previously approved pond sediment removal efforts, CCR sediments will be placed in the on-site CCR landfill. The facility's on-site CCR landfill (Permit Number 0199-S3N-R3) provides for disposal of removed materials as described in Condition 10 below:

This permit is for the disposal of solid waste generated by Entergy Arkansas, Inc. at the White Bluff plant. The authorized waste streams include fly, bottom and economizer ash, cooling water sediments, coal mill rejects, nonhazardous sand blast media, cooling water screenings, construction debris, waste coal, sump pit sediments, water treatment sediments and resins, fire brick and refractory materials, and sediments from dredging operations of facility stormwater ditches and facility NPDES units, as indicated in the permit application documentation. Additional waste items not mentioned above may be authorized by the Department for disposal at the facility on a case-by-case basis when requested by the permittee. "Hazardous waste" as defined by Regulation Number 23 is not authorized for disposal in the facility.

The Ponds will be over-excavated by six inches (beyond visible CCR) to ensure removal of residual CCR material. The Ponds will be backfilled with clean on-site borrow source material to surrounding ground elevations as necessary. Final fill and grading may be determined as closure proceeds based on financial and timing considerations. However, the final grade will be designed to promote positive drainage. Groundwater monitoring will be performed in accordance with 40 CFR § 257, Subpart D to demonstrate that the monitored groundwater concentrations will not exceed the groundwater protection standards

for constituents listed in Appendix IV of 40 CFR § 257, in accordance with 40 CFR § 257.102(c). Upon completion of the groundwater monitoring program specified, the groundwater monitoring system will be decommissioned.

2.2 Closure Timeframe

Closure activities for Pond A and Pond B are anticipated to commence no later than October 2020 and to be completed in 2023. The table below provides estimated major milestone dates of closure activities.

MILESTONE	APPROXIMATE ANTICIPATED START DATE	APPROXIMATE ANTICIPATED END DATE
Verify permanent diversion of flows away from Ponds	October 2020	N/A
Consultation/coordination with ADEQ	October 2020	January 2021
Engineering/Procurement	January 2021	June 2021
Dewater Pond A and B	July 2021	October 2021*
Remove CCR from Pond A and B	September 2021*	February 2022*
Backfill Pond A and B and implement stabilization and site grading	March 2022*	August 2022*
Completion of construction activities for Pond A	N/A	October 2023
Completion of construction activities for Pond B	N/A	October 2025

 Table 1

 Closure Construction Summary Ponds A and B

*Actual Dates are dependent upon field condition encountered during earlier steps.

2.3 CCR Removal Volume and Area Estimate

Pond A is approximately 7.1 acres (768' X 403') and has a capacity (volume) of 190,600 cubic yards (CY). Pond B is approximately 6.6 acres (750' X 385') and has a capacity (volume) of 153,400 CY. The total combined volume for the Ponds is 344,000 CY and is the maximum potential volume on site at any time. Approximately 19 acres, including the pump station, is the largest area that will be affected by the closure operation.

2.4 Notifications

In accordance with 40 CFR § 257.102(g) and § 257.105(i), Entergy will post to the Plant's Facility Operating Record (FOR) the Closure Plan and an Intent to Initiate Closure notice. The Intent to Initiate Closure notice will be posted prior to initiating closure activities. A Notification of Completion of Closure with both an Arkansas registered professional engineer and registered professional geologist certification will be posted to the FOR within 30 days of completion of closure activities [40 CFR § 257.102(h)]. In addition, the Director of the Arkansas Department of Environmental Quality (ADEQ) will be notified of closure-

related actions and documents as per 40 CFR § 257.106(i). Notices and documents will be placed on Entergy's CCR website consistent with 40 CFR § 257.107(i).

2.5 Amendment of the Closure Plan

This Closure Plan is being submitted to ADEQ for approval prior to closure of these units. In accordance with 40 CFR § 257.102(b)(3), Entergy may amend this closure plan at any time. Specifically, Entergy will amend the written closure plan whenever there is a change in the operation of the CCR unit that would substantially affect the written closure plan in effect or after closure activities have commenced if unanticipated events necessitate a revision of the written closure plan. If unanticipated events during implementation of closure activities necessitate modification of this Plan, applicable Recordkeeping, Notification and Posting requirements of 40 CFR § 257.105, 257.106 and 257.107 will be followed.

Appendix A Recycle Pond Area Boring Logs





















	_		PR	OJECT:			BORING ID:									
			N	Nonitoring V	Vell Installations		B-1									
			LO	CATION:			WELL ID:									
	┋╒╹		E	Intergy Whit	te Bluff Plant		N/A									
			DR	ILLING CONTRAC	TOR:		NORTHING:		EASTING:							
water resourc	ASSC	CICITES	LICI. V	Valker-Hill E	nvironmental, Inc.		1949501.9		1272354.9							
mator rooourt	7007 ON THE ONLY	iontal ophoun		ILLING EQUIPMEI												
					JULJ											
FTN Pi R0792	roject # 0-1845-(001	S	Sonic with 4	in diameter core		10 ft bas		N/A							
			SA	MPLING METHOD	:		DATE STARTED:		DATE COMPLETED:							
	U D I .		Co	ontinuous with	10 ft 4 in diameter core	barrel	5/16/2018		5/16/2018							
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		FILL	****	₩												
			*****	₩												
1 –				WELL GRA	DED GRAVEL with sand, mediu	um to coar	se sand, fine to coarse	-grained ar	ngular to round gravel, medium	n						
			1	dense to lo	ose, dry.											
-	77			•												
		GW														
2 -		000														
3 —			····		Y CLAY, tan with orange oxide s	staining le	nses of fine sand stiff	moist								
				TATSAND	T CLAT, tail with brange bolde s	stanning, ie	nises of fille salid, suit,	, moist.								
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4 —																
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Ĭ				LEAN CLA	Y with fine-grained sand, silty ye	ellowish bro	own and gray, moist.									
-			////													
9 —		CL														
			/////													
10			/////	Boring term	inated at 10 ft bgs.											
NOTES	B: No	orthings	and easti	ngs recorded using	a Garmin eTrex30 and convert	ted to AR S	State Plane NAD83 Sou	uth								
	Bo	rehole b	backfilled	with bentonite to g	round surface.											

-			PROJE	CT:	BOR	BORING ID:						
_			Mor	nitoring Well Installations	B	B-2						
			LOCATI	ON:	WEL	L ID:						
	ᆿ귀		Ente	ergy White Bluff Plant	N/	/Α						
			DRILLIN	IG CONTRACTOR:	NOR	RTHING:	Eł	ASTING:				
	Assc	<u>iciates l</u>	td. Wal	ker-Hill Environmental, Inc.	19	949485.1		1272715.5				
water resourc	es / environm	iental consulta	DRILLIN	IG EQUIPMENT:	GRC	UND SURFACE E	LEV.:					
			Geo	probe 8150LS	28	280.2 ft NAVD88						
FTN Pr	oject #		DRILLIN	NG METHOD:	TOT	AL DEPTH:	DE	EPTH TO WATER:				
R07920	0-1845-0	001	Son	ic with 4 in diameter core	10) ft bgs		N/A				
LOGGE	D BY:		SAMPL	ING METHOD:	DAT	E STARTED:	DA	ATE COMPLETED:				
AJP			Contir	nuous with 10 ft 4 in diameter core	e barrel 5/	<u>16/2018</u>		5/16/2018				
Depth (feet)	% REC	nscs	Graphic Log		Descrip	otion						
	100	СН		EAT SANDY CLAY, light gray with orange @ 4.6 ft FAT CLAY with sand and some ro @ 5 ft FAT SANDY CLAY, light gray with o	and red oxide st	aining, fine grained	I sand, rootle	ts, very stiff, dry to moist.				
	Bo	rehole b	ackfilled with	bentonite to ground surface.	neu IU AR Slàie	FIANE NADOS SOUL	.11					



PROJECT: BORING ID:	BORING ID:						
Monitoring Well Installations B-4	B-4						
LOCATION: WELL ID:							
Entergy White Bluff Plant N/A							
DRILLING CONTRACTOR: NORTHING: EAST	fing:						
ASSOCIOTES LTO. Walker-Hill Environmental, Inc. 1948619 12	1948619 1272718.6						
GROUND SURFACE ELEV.:							
Geoprobe 8150LS 280.8 ft NAVD88							
FTN Project # DRILLING METHOD: TOTAL DEPTH: DEPT	TH TO WATER:						
LOGGED BY: DATE STARTED: DATE							
	17/2010						
FAT CLAY with sand, yellowish orange with orange to red oxide staining, sand content increase	sing with depth, stiff, moist.						
. @1.6-1.7 ft laver of white silt							
4 - 88 @ 4 ft FAT SANDY CLAY, light gray to olive gray, fine grained, sand content increases with de	lepth, stiff, moist.						
@ 5-5.3 ft small gravel							
6 –							
8 –							
Boring terminated at 10 ft bos							
NOTES: Northings and eastings recorded using a Garmin eTrex30 and converted to AR State Plane NAD83 South							
Borenole backfilled with bentonite to ground surface.							

			PROJE	CT:	BORING ID:	BORING ID:									
			Мо	nitoring Well Installations	B-5										
			LOCAT	ION:	WELL ID:										
	≣ ⊧"		Ent	ergy White Bluff Plant	N/A										
				NG CONTRACTOR:	NORTHING:	EASTING:									
water resour	ASSC ces / environn	nental consult		Ker-Hill Environmental, Inc.		1948639.2 12/1950.5									
			Geo	probe 81501 S	281 0 ft NAVD	88									
			DRILLI	NG METHOD:	TOTAL DEPTH:	DEPTH TO WATER:									
R0792	roject # 0-1845-	001	Sor	ic with 4 in diameter core	12 ft bgs	N/A									
LOGGE	D BY:		SAMPL	ING METHOD:	DATE STARTED:	DATE COMPLETED:									
AJP)		Conti	nuous with 10 ft 4 in diameter core b	arrel 5/17/2018	5/17/2018									
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-	100														
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				FAT CLAY with sand, stiff, moist.											
9 —															
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10 —															
			(//////	LEAN CLAY, light brown, silty, some fine-grain	ned sand, trace fine-grained grav	el, moist.									
			//////												
11 —		CL	///////												
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-			[]]]]]]	Boring terminated at 12 ft bas.											
), NI-	nthin	nd cooting		to AD State Diana NADOO Court										
NOTES	s: NC Ro	orehole h	anu eastings backfilled with	bentonite to ground surface	IU AR SIBLE Plane NAD83 South										
				Sector to ground buildob.											

			PROJE	ECT:	BORING ID:											
_			Мо	nitoring Well Installations	B-6											
			LOCAT	TON:	WELL ID:											
	⊒ ď		Ent	ergy White Bluff Plant	N/A											
			DRILLI	NG CONTRACTOR:	NORTHING:	EASTING:										
water resourc	ASSO es / environm	CICICIES	LICI. Wa	Iker-Hill Environmental, Inc.	1949105.8	1271974.9										
inator roootaro		ionan oonoun		NG EQUIPMENT:	281 9 ft NAVD8	V.: R										
FTN Pr R07920	oject #)-1845-(001	Sol	nic with 4 in diameter core	30 ft bas	N/A										
			SAMPI		DATE STARTED:											
	DBT:		Conti	nuous with 10 ft 4 in diameter core barrel	6/14/2018	6/14/2018										
et)	C)		<u>.</u> 0													
ן (fe	RE(CS	g	Description												
Dept	%	NS	د ق													
0			*******	FILL												
1 -		FILL	******													
2 -			*****													
3				LEAN CLAY with sand, tan with lenses of sand and	greenish gray silt, soft, wet.											
-																
5 —	25															
6 —		CI														
7																
9 —																
10 —																
				SILTY SAND, tan with lenses of orange to yellow ox	idized sand.											
12 -																
-																
		SM														
14 —																
15 —	100			@ 15 ft color changes to tan and greenish gray, incr	easing clay content with dep	ih.										
16 -				EAT SANDY CLAY, brown to tan with grange evidet	on along condu longoo, fino	grained aged medium stiff maint										
17 -				FAT SANDT CLAT, DIOWIT to tait with orange oxidat	on along sandy lenses, line-	gramed sand, medium sun, moist.										
		СН		@ 18 ft color changes to olive grav												
ο δ -																
19 _		SC	[]]]]]]]]]]	CLAYEY SAND, olive gray, decreasing clay with dep	oth, medium stiff, moist to we	t.										
20 —				SILTY SAND, fine-grain, olive gray, medium stiff, sa	turated.											
21 -																
22 -																
22		~ ~														
		SM		@ 24.25 ft than language of dark array along												
				ע 24-25 וג נוופוז ופחצפא סד ממרא gray clay.												
25 -	100															
26 —																
27 –				FAT CLAY WITH SAND, ONVE GRAY TO GREENISH GRAY CLA	y with laminated lenses of w	nite slit to fine-grained sand, stiff.										
28		<u></u>														
		CH														
29 -				Borehole terminated at 30 ft bos.												
NOTES	· No	orthinge	and eastings	recorded using a Garmin eTrex30 and converted to AR	State Plane NAD83 South											
	. NO Bo	rehole h	ackfilled with	bentonite to ground surface												
	20															



Appendix B Summary of Soil Data

FTN/ENTERGY WHITE BLUFF/AR SUMMARY OF SOIL DATA

							_			Grain Size		_						
S	Gunda	G	Soil	Natural		Atte	erberg		01 E	Distribution		Compa	action	-	TT */ X1		n 1994	Additional
Identification	Type	Depth	Classi-	Moisture		L	imits		% Finer	% Finer	% Finer	Dry Density	Moisture	G	Unit V Moisture	Veight	Permeability (cm/sec)	Conducted
lucitimeation	Type	Deptin	neation	10	L.L.	P.L.	P.I.	L.I.	Sieve	Sieve	mm	(lb/cuft)	woisture %	05	%	(lb/cuft)	(Chrsec)	(See Notes)
B-1	UD	3.0-5.0'	СН	29.0	63	17	46	0.27	100.0	88.9	59.5	-	-		29.0	92.8	1.6E-08	-
B-1	UD	8.0-10.0'	CL	25.0	44	15	29	0.35	100.0	- 53.8	40.4	-	-	2.57	25.0	93.9	-	T-CU w/pp
B-3	UD	5.0-7.0'	CL	24.1	37	17	20	0.37	100.0	73.3	47.7	-	-	-	24.1	98.7	2.2E-08	-
B-3	UD	10.0-12.0'	SC	21.6	32	20	12	0.18	100.0	41.9	31.0	-	-	2.58	21.6	100.9	-	T-CU w/pp
B-3	UD	15.0-17.0'	SC	19.0	34	15	19	0.23	100.0	28.2	22.0	-	-	-	19.0	110.5	6.3E-06	-
B-3	UD	20.0-22.0'	SM	31.5	NP	NP	NP	NP	100.0	18.1	9.5	-	-	-	31.5	79.2	-	DS
B-4	UD	8.0-10.0'	СН	33.5	59	30	29	0.13	100.0	94.7	51.5	-	-	-	33.5	86.1	4.6E-08	-
B-5	UD	3.0-5.0'	CL	26.6	42	21	21	0.28	95.4	73.1	28.0	-	-	2.69	26.6	91.7	-	T-CU w/pp
B-5	UD	10.0-12.0'	CL	17.1	35	16	19	0.07	97.6	90.3	46.0	-	-	-	17.1	113.8	1.5E-08	-
B-7	UD	5.0-7.0'	SM	20.5	34	26	8	-0.73	90.4	40.0	21.1			2.66	20.5	104.7	-	T-CU w/pp
B-7	UD	7.0-9.0'	CL	21.8	34	20	14	0.13	100.0	52.7	34.5	-	-	-	21.8	98.1	6.7E-07	-
B-7	UD	15.0-17.0'	SC	21.9	28	19	9	0.36	100.0	36.5	24.0	-	-	2.62	21.9	102.2	-	T-CU w/pp
RP-4	UD	20.0-22.0'	CL	22.2	44	15	29	0.24	93.0	66.9	39.5	-	-	2.67	22.2	101.8	-	T-CU w/pp
RP-4	UD	30.0-32.0'	СН	37.1	54	21	33	0.47	100.0	96.3	57.4			-	37.1	80.2	3.5E-07	-
RP-9	UD	30.0-32.0'	СН	30.2	54	24	30	0.19	100.0	98.8	44.0	-	-	2.67	30.2	88.9	-	С

ABBREVIATIONS: LIQUID LIMIT (LL) PLASTIC LIMIT (PL) PLASTICITY INDEX (P

PLASTICITY INDEX (PI) LIQUIDITY INDEX (LI) SPECIFIC GRAVITY (Gs) MOISTURE (Mc)

NOTES: T = TRIAXIAL TEST

U = UNCONFINED COMPRESSION TEST

C = CONSOLIDATION TEST

- **DS = DIRECT SHEAR TEST**
- **O** = **ORGANIC CONTENT**
- P = pH

18103173 7920-1845-001

FTN/ENTERGY WHITE BLUFF/AR SUMMARY OF SOIL DATA

	Sample								Grain Size									
Sample			Soll Classi-	Natural Moistura	Atterberg						Compaction Maximum						Additional	
Identification	Туре	Depth	fication	%			mits		No. 4	% Filler No. 200	% rmer .005	Dry Density	Moisture	Ge	Moisture	eight	Permeability	Tests
					L.L.	P.L.	P.I.	L.I.	Sieve	Sieve	mm	(lb/cuft)	%	03	%	(lb/cuft)	(Chirsee)	(See Notes)
B-2	Bag	5.0-7.5'	СН	24.7	52	21	31	0.13	100.0	86.0	55.0				÷ 7	÷		
B-3 (P2-5)	Bag	13.0-14.0'	CL	23.3	40	19	21	0.18	100.0	54.1	41.0			36	÷			
B-3 (P2-5)	Bag	23.0-24.0'	SM	30.0	NP	NP	NP	NP	100.0	28.1	16.5	(tec						
B-5	Bag	4.0-6.0'	ML	27.4	46	30	16	-0.17	100.0	70.7	33.0	20			•			5 ×
B-5	Bag	9.0-10.0'	ML	26.3	49	31	18	-0.27	100.0	89.1	45.0	5 9 8	(# 5				-	
B-6	Bag	11.0-12.0'	SM	12.4	NP	NP	NP	NP	100.0	27.6	20.0			. *	• /	-	(a)	-
B-6	Bag	16.0-17.0'	CL	21.3	36	23	13	-0.11	100.0	54.2	38.0		(#7		-	• 17	-	120
B-6	Bag	22.0-24.0'	SM	10.9	NP	NP	NP	NP	100.0	28.6	18.9	40		- ¥1	•	4	-	Зў
B-7	Bag	18.0-20.0	SM	22.8	NP	NP	NP	NP	100.0	21.4	15.0	1 4 7	141	щ.		4	10 ×	R
RP-3	Bag	18.0-20.0'	СН	27.1	56	27	29	0.02	100.0	95.6	44.0	4	20			(•)		-
RP-3	Bag	29.0-30.0'	SM	22.4	NP	NP	NP	NP	100.0	26.3	20.0	3		1				120
RP-4	Bag	8.0-9.0'	CL	13.4	30	16	14	-0.17	100.0	50.8	29.0	-	÷.					3.85
RP-4	Bag	25.0-26.0'	ML	37.7	48	30	18	0.40	100.0	98.7	43.0			-				(-))
RP-5	Bag	15.0-18.0'	SC-SM	24.4	28	22	6	0.51	100.0	34.0	25.9						-	3 4 3,
RP-7	Bag	16.6-17.4'	SC	22.3	36	19	17	0.20	100.0	46.7	34.0			-	(#)	×	-	

ABBREVIATIONS: LIQUID LIMIT (LL) PLASTIC LIMIT (PL) PLASTICITY INDEX (PI) LIQUIDITY INDEX (LI) SPECIFIC GRAVITY (Gs) MOISTURE (Mc)

NOTES: T = TRIAXIAL TEST

U = UNCONFINED COMPRESSION TEST

C = CONSOLIDATION TEST

DS = DIRECT SHEAR TEST

O = ORGANIC CONTENT

P = pH

18103173 7920-1845-001

FTN/ENTERGY WHITE BLUFF/AR SUMMARY OF SOIL DATA

				1	T	-				Grain Size								
			Soil	Natural	Atterberg		Distribution			Compaction						Additional		
Sample	Sample	Sample	Classi-	Moisture	1	Li	imits		% Finer	% Finer	% Finer	Maximum	Optimum		Unit V	√eight	Permeability	Tests
Identification	Туре	Depth	fication	%					No. 4	No. 200	.005	Dry Density	Moisture	Gs	Moisture	Dry	(cm/sec)	Conducted
					L.L.	P.L.	P.I.	L.I.	Sieve	Sieve	mm	(lb/cuft)	%		%	(lb/cuft)		(See Notes)
RP-9	Bag	9.0-10.0'	SC-SM	4.2	20	15	5	-2.35	67.7	16.4	9.5	(a)	-	4	<u> </u>	(a)	1	-
RP-9	Bag	26.0-27.0	СН	31.3	50	20	30	0.36	100.0	98.1	54.0			×	-	ж		1 - 2
							T											
		:[e:																

ABBREVIATIONS: LIQUID LIMIT (LL) PLASTIC LIMIT (PL) PLASTICITY INDEX (PI) LIQUIDITY INDEX (LI) SPECIFIC GRAVITY (Gs) MOISTURE (Mc)

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- P = pH



							FLEXIB	LE WALL	PERMEAE 9 5084	BILITY		÷					
						1	METHODI	D, CONSTAL	NT RATE	OF FLOW	· .						
PROJECT TITLE FTN/ENTERGY WHITE BLUFF/AR							Board #	12	COMMENTS							10	1
ROJECT NUMBER 18103173							Flow Pump	2									
SAMPLE ID B-1 3.0-5.0'					Flow J	Flow Pump Speed 11											
SAMPLE TY	YPE	UD				.	Technician	FT	J								1
ample Data	Initial					Sample Da	ta Final				2						
leight, inche		3.114	B-Value f	0.97	1	Height inches		3 142	1				Sample		5	S	
iameter, ind	ches	2.836	Cell Pres.	88.0	1	Diameter.	inches	2.858	1	H WATER C	ONTENTS		Initial			Sample	
rea, cm²		40.75 Bot. Pres. 80.0		Area, cm ²	Area, cm ² 41 30		Wt Soil & Tare, i o			g	618.40			715.61	1		
'olume, cm ³		322.35	Top Pres.	80.0	1	Volume, cr	Volume, cm ³		1	Wt Soil &	Fare, f	g	479.25			562.37	- ×
Mass, g 618.40 Tot. B.P.		Tot. B.P.	80.0		Mass, g		632.58	1	Wt Tare		g	0.00			83.41	1	
Moisture Content, % 29.04 Head,		Head, max.	137.16		Moisture C	Content, %	31.99]	Wt Moistu	re Lost	g	139.15			153.24	1	
Dry Density, pcf 92.77 Head, r		Head, min.	137.16		Dry Density, pcf		90.54	1 I I I	Wt Dry Soi	il	g	479.25			478.96		
Spec. Gravity (assumed) 2.720		2.720	Max. Grad.	17.19		Volume So	lids, cm ²	176.19	1	Water Con	tent	%	29.04%			31.99%	
Volume Solids, cm ³ 176.19		Min. Grad.	17.19	5	Volume Vo	oids, cm ³	154.12	> X									
Volume Voids, cm ³		146.15	4			Void Ratio		0.87			-						
		0.83	-			Saturation	, % (s	99.5%		DESCRIPT	FION	odium condu	vollowich brow				1
aturation, 7	/0	95.2%								CLAT, SOI	le nne to m	conum sand;	yenowish brow	vn.		1	
		Flow Pum	p Rate	1.18E-05	cm ³ /sec		USCS	СН	1								
															_		
			TIM	E FUNCTIO	ONS, SECO	NDS			dP							1	
	DATE	DAY	HOUR	MIN	ТЕМР	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient	Per	meability			
	07/33/19	41104	0		(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)	18.10		cm/sec)		-	
	07/23/18	43304	9	5	20.5	5	5	200	0	1.95	137.16	17.19		1.6E-08			
	07/23/18	43304	9	10	20.5	5	10	300	500	1.95	137.16	17.19		L.0E-98			
	07/23/18	43304	9	15	20.5	5	15	300	900	1.95	137.16	17.19		L6E-08	*		
	07/23/18	43304	9	20	20.5	5	20	300	1200	1.95	137.16	17.19		6E-08	*		
	07/23/18	43304	9	25	20.5	5	25	300	1500	1.95	137.16	17.19	1.5	L6E-08	*	1	
	07/23/18	43304	9	30	20.5	5	30	300	1800	1.95	137.16	17.19		.6E-08	*		
	*TRANSCI	RIBED FRO	OM ORIGINA	AL DATA S	HEETS			11		PEI	RMEABIL	TY REPOR	TED AS **	.6E-08 c	m/sec **		2
			15	8										1		DATE	7/23
																CHECK	L.
							8									REVIEW	n



		SPECIFIC GRAV	ITY OF SOI	LS		
		ASTM	D-854			
		PYCNOMETE	R METHOD		-	
PROJECT TITLE	FTN	VENTERGY WHITE BLU	FF/AR]		
PROJECT NUMBER		18103173		SAMPLE		B-1
TESTED FOR		Gs		SAMPLE IS SAMPLE DEP	TH	8.0-10.0'
MOISTURE CONTENT	OF MATER	RIAL PASSING THE #4 SI	EVE		e	
Weight Soil and Tare, In Weight Soil and Tare, Fin Weight Of Tare (gm) Weight Of Moisture (gm) Weight Of Dry Soil (gm) Hygroscopic Moisture In	itial (gm) nal (gm)) (%)		203.53 203.11 51.24 0.42 151.87 0.3%	-		ίλ Φ
Test Method				Method	- B	4. T
Pycnometer Number				24		
	Weight Pyc Volume of D Weight Pyc Mass of Pyc Observed T	nometer Empty (gm) Pycnometer (gm) cnometer and Water (gm) cnometer and Water at the tes emperature (Tb), for (Mb) In	t Temperture Degrees C	181.79 499.61 680.37 (A) 679.99 24.50		2
Weight of Soil, Water & Temperature, C	Density of v	r (gm) water @ tested temperature (g	/ml)	(B) 710.61 24.5 1.00		
Tare Number Weight of Dry Soil Slur Weight of Tare	ry plus Tare Weight of I	Dry Soil (gm)		(C) 		*
	Temperature	Coefficient		0.9990		
	SPEC G @ 20 ⁰ C =	IFIC GRAVITY (G) [C/(A-(B - C))]*(K)		2.575		2
METHOD - A METHOD - B	•	WET METHOD OVEN-DRIED METHOD		METHOD OF AIR F VACUU	REMOVAL M	
		Recommended	Mass for Test S	pecimen		
	-	Soil Type SP, SP-SM SP-SC, SM , SC SILT OR CLAY	Speci when P	men Dry Mass a using 500 ml ycnometer 100 75 50		с А
- · ·					TECH DATE CHECK REVIEW APPROVE	TJ 7/20/18

Boring or Test Pit: B-1 Boring	or Test Pit:	B-1 -		Boring or Test Pit:	B-1		
Sample: UD	Sample:	UD		Sample:	UD		
Depth: 8.0-10.0' ft	Depth:	8.0-10.0	ft	Depth:	8.0-10.0	ft	
Point No.: 1	Point No.:	2		Point No.:	3		
			2				
Initial		Initial			Initial		
Length = 6.234 in	Length =	6.070	in	Length =	6 0 3 4	in	
Diameter = 2.856 in	Diameter =	2.869	in	Diameter =	2.870	in	
Wet Mass = 2.835 lb	Vet Mass =	2.565	lb	Wet Mass =	2.631	16	
Area = 6.406 in ²	Area =	6.465	in ²	Area =	6.469	in ²	
Volume = 39.937 in ²	Volume =	39.241	in'	Volume =	39.035	in'	
Specific Gravity = 2.57 (ASTM D854) Specific	C Gravity =	2.57	(ASTM D854)	Specific Gravity =	2.57	(ASTM E	0854)
Dry Mass of Solids = 2.291 1b Dry Mass	of Solids =	2.079	lb	Dry Mass of Solids =	2.060	lb	:+:
Molsture Content = 23.8% Molsture	Content =	23.4%	C	Moisture Content =	27.7%		
Wet Unit Weight = 122.7 pcf Wet Unit	t weight =	112.9	pet	Wet Unit Weight =	116.5	pct	
Void Patie = 0.62	id Detie -	91.5	per	Dry Unit weight =	91.2	pet	
Percent Saturation = 0.02 VI	nu Kano -	0.75		Void Ratio =	0.76		
recent Saturation - 99% Fercent S	aturation -	80%		Percent Saturation =	94%		
After Consolidation	After	Consolie	lation	After	r Concolid	ation	
Length = 6173 in	Length =	5 950	in	Anter Length =	5.800	in	
Diameter = 2.917 in	Diameter =	2 847	in	Diameter =	2 858	in in	
Area = 6.682 in ² (Method B)	Area =	6 365	in ² (Method B)		6.415	in ² (Meth	nd B)
$Volume = 41249 \text{ in}^3$	Volume =	37 868	in ³	Volume =	37 784	in ³	100 B)
Moisture Content = 26.1% Moisture	Content =	26.9%	114	Moisture Content ≃	27.3%		
Wet Unit Weight = 121.0 ncf Wet Unit	t Weight =	120.3	pcf	Wet Unit Weight =	119.9	ncf	
Dry Unit Weight = 96.0 pcf Dry Uni	t Weight =	94.8	ncf	Dry Unit Weight =	94.2	ncf	
Void Ratio = 0.67 Vo	oid Ratio =	0.69	Per	Void Ratio =	0.70	por	
Percent Saturation = 100% Percent Saturation	aturation =	100%		Percent Saturation =	100% -		
			÷				
B Parameter = 0.99 B P	arameter =	1.00		B Parameter =	0.97		1
Shear Rate = 0.012% /min Sh	ear Rate =	0.012%	/min.	Shear Rate =	0.012%	/min.	
t ₅₀ = 5.84 min.	t ₅₀ =	14.95	min.	$t_{50} =$	9.87	min.	1
Strain at Failure = 3.2% Strain a	t Failure =	3.3%		Strain at Failure =	2.3%		
Cell Pressure = 89.0 psi Cell	Pressure =	98.0	psi	Cell Pressure =	107.0	psi	
Back Pressure = 80.0 psi Back	Pressure =	80.0	psi	Back Pressure =	80.0	psi	
Confining Pressure = 9.0 psi Confining	Pressure =	18.0	psi	Confining Pressure =	27.0	psi	
Notes: Sample description: (CL) SILTY CLAY and SANI), fine to coa	arse; yello	owish brown and gra	iy.			
Atterberg limits: $LL = 44$ $PL =$	1000/	= 19	29 (ASTM)	D4318)			
Percent Inter: $3/4 \text{ in.} = 100\%$ No. 4 =	100%	NO 200 =	54% (ASIMI	D422, refer to separate	e report for	gradation	curve)
Maisture from:	Fating	ted					
Saturation methods	Dentire spec	imen					
Failure criterion:			1% storin				
Membrane effect: X Corrected	Not Corres	tod	70 Suam				
	Inter Contee	licu					
	Title						
Golder Associates Inc.	Titue.			STM DATCT			s - 1
Atlanta, Georgia	CONSC		ED LINDO AINED :	TRIAVIAL COMPR	FEELON	FROT DE	DODT
ah Chave Titla	CONSC	OLIDAI	ED UNDRAINED	TRIANIAL COMPR	E2210 N	IESI KE	PORI
FTN/ENTEDCV WHITE DI HEE/AD			SAMPL	E AND TEST DATA			
FINENIEKGI WHITE BLUFF/AK			3 31				
ampie:	Technician	n:	Reviewed	Start Date:	Job Numi	ber:	Figure:
	PWM	/FT	on				
	Check;		Approved:				
B-1 UD 8.0-10.0'	100	Ay		7/17/2018	1810.	3173	1














*c						FLEXIB	LE WALL I	PERMEAB	ILITY					
			95				ASTM D	5084						
2					Γ	METHOD D	, CONSTAN	NT RATE C	OF FLOW					
					-			1						_
PROJECT TITLE	FTN/ENT	ERGY WHIT	'E BLUFF/A	AR		Board #	9	C	OMMENTS					
PROJECT NUMBER	18103173	3			4	Flow Pump	2							
SAMPLE ID	B-3	A	5.0	-7.0	Flow I	Pump Speed	10							
SAMPLE TYPE	UD				J	Technician	ET	l.				*		
						-					-			
0														
Sample Data, Initial	-			1	Sample Da	ta, Final		r i						
Height, inches	3.147	B-Value, f	1.00		Height, inc	hes	3.139					Sample	Samp	le
Diameter, inches	2.854	Cell Pres.	88.0	1	Diameter,	inches	2.837		WATER C	ONTENTS		Initial	Final	<u> </u>
Area, cm ²	41.27	Bot. Pres.	80.0		Area, cm ²		40.78		Wt Soil & 7	Гаге, i	g	647.92	736.3	3
Volume, cm ³	329.91	Top Pres.	80.0	1	Volume, cr	n ³	325.16		Wt Soil & 7	Гаге, f	g	522.03	601.8	4
Mass, g	647.92	Tot. B.P.	80.0		Mass, g		656.52	2	Wt Tare		g	0.00	79.81	
Moisture Content, %	24.12	Head, max.	187.10		Moisture C	Content, %	25.76		Wt Moistu	re Lost	g	125.89	134.4	9
Dry Density, pcf	98.74	Head, min.	187.10		Dry Densit	y, pcf	100.18	- <u> </u>	Wt Dry Soi	1	g	522.03	522,0	3
Spec. Gravity (assumed)	2.750	Max. Grad.	23.47		Volume So	lids, cm ⁻	189.83		Water Con	tent	%	24.12%	25.76	/a
Volume Solids, cm ³	189.83	Min. Grad.	23.47		Volume Vo	oids, cm ³	135.33							
Volume Voids, cm ³	140.08		0		Void Ratio		0.71							
Void Ratio	0.74				Saturation	,%	99.4%		DESCRIPT	TION				17
Saturation, %	89.9%								sandy SILT	Y CLAY,	fine to media	um; yellowish brown, gr	ay, and brown.	
														2
	Flow Pum	p Rate	2.25E-05	cm ³ /sec		USCS	CL				90 - 10 -			
											_	×	14	
		TIM	E FUNCTIO	ONS, SECO	NDS			dP						
DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient	Permeability	y	
				(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)	1	(cm/sec)		

				(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)
07/26/18	43307	13	0	22.3	0	0	0	0	2.66	187.10	23.47	2.2E-08
07/26/18	43307	13	5	22.3	5	5	300	300	2.66	187.10	23.47	2.2E-08
07/26/18	43307	13	10	22.3	5	10	300	600	2.66	187.10	23.47	2.2E-08
07/26/18	43307	13	15	22.3	5	15	300	900	2.66	187.10	23.47	2.2E-08 *
07/26/18	43307	13	20	22.3	5	20	300	1200	2.66	187.10	23.47 -	2.2E-08 *
07/26/18	43307	13	25	22.3	- 5	25	300	1500	2.66	187.10	23.47	2.2E-08 *
07/26/18	43307	13	30	22.3	5	30	300	1800	2.66	187.10	23.47	2.2E-08 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 2.2E-08 cm/sec **

DATE

CHECK REVIEW

APPROVE

7/26/18

ilu

	Boring or Test Pit:	B-3			Boring o	or Test Pit:	B-3			Boring or Test Pit:	B-3		
	Sample:	UD				Sample:	UD			Sample:	UD		
	Depth:	10.0-12.0) ft			Depth:	10.0-12.0	ft		Depth:	10.0-12.0) ft	
	Point No.:	1				Point No.:	2			Point No.:	3		
													i
		Initial					Initial				Initial		
	Length =	6 001	in			I enoth =	5 995	in		Length =	5 996	in	
	Diameter =	2 820	in		г	Diameter =	2 871	in		Diameter =	2.858	in	
	Wet Mass -	2.629	116		11		2.071	111 115		Wet Mess -	2.030	111	
	wet was -	2.010	:2		**	et iviass -	2.730	. 2		wet wass =	2.195	10	
	Area =	0.280	. 3			Area =	0.4/4	in . 3		Area =	6.415	in . 3	
	Volume =	37.721	in			Volume =	38.810	m		Volume =	38,466	in	
	Specific Gravity =	2.58	(ASTM I	0854)	Specific	Gravity =	2.58	(ASTM I	0854)	Specific Gravity =	2.58	(ASTM D	0854)
	Dry Mass of Solids =	2.117	lb		Dry Mass of	of Solids =	2.316	lb	I	Dry Mass of Solids =	2.285	lb	
	Moisture Content =	23.3%			Moisture	Content =	19.1%			Moisture Content =	22.2%		
	Wet Unit Weight =	119.6	pcf		Wet Unit	t Weight =	122.8	pcf		Wet Unit Weight =	125.5	pcf	
	Dry Unit Weight =	97.0	pcf		Dry Unit	t Weight =	103.1	pcf		Dry Unit Weight =	102.7	pcf	
	Void Ratio =	0.65			Vo	id Ratio =	0.56			Void Ratio =	0.56		
	Percent Saturation =	92%			Percent Sa	turation =	88%			Percent Saturation =	102%		
	After	Consoli	dation			After	Consolic	lation		After	Consolic	lation	
	Length =	5.941	in			Length =	5.957	in		Length =	5.930	in	-
	Diameter =	2.844	in		Γ	Diameter =	2.884	in		Diameter =	2.879	in	
	Area =	6 3 5 3	in ² (Meth	od B)	-	Area =	6 533	in ² (Meth	nod B)	A rea =	6 508	in ² (Meth	od B)
	Volume =	37 747	in ³			Volume =	38 920	in ³	104 2)	Volume	38 503	in ³	00 D)
	Moisture Content =	25 5%			Moisture	Content -	21.80/			Moistura Contant =	22 10/		
	Wet Unit Weight =	121.6	nof		Wat Unit	Woight -	125.2	nof		Wet Unit Weight =	124.0	- of	
	Dry Unit Weight -	06.0	per		Dres Unit	Weight -	123.2	per		Wet Unit Weight =	124.9	per	
	Dry Ulit weight -	90.9	per		Dry Unit	weight =	102.8	pci		Dry Unit weight =	102.3	рст	
	void Ratio =	0.00			VO D	id Ratio =	0.56			Void Ratio =	0.57		
	Percent Saturation =	100%			Percent Sa	ituration =	100%			Percent Saturation =	100%		
	D D	0.07			D D		0.07			D D	0.00		
	B Parameter =	0.97	ÿ .		BPa	arameter =	0.97	, .		B Parameter =	0.99	•	
	Shear Rate =	0.012%	/min.		Sh	ear Rate =	0.090%	/min.		Shear Rate =	0.090%	/min.	
	t ₅₀ =	28.79	min.		a	τ ₅₀ =	2.39	min.		t ₅₀ =	1.03	min,	
	Strain at Failure =	2.3%			Strain a	t Failure =	4.3%			Strain at Failure =	4.7%		
	Call Deserves	00.0			0.11	D	100.0				110.0	2	
	Cell Pressure =	90.0	psi		Cell	Pressure =	100.0	psi		Cell Pressure =	110.0	psi	
	Back Pressure =	80.0	psi		Back	Pressure =	80.0	psi		Back Pressure =	80.0	psi	
	Confining Pressure =	10.0	psı		Confining	Pressure =	20.0	psı	C	Contining Pressure =	30.0	psi	
			(0.0) 0.13										
	Notes: Sample de	scription	(SC) SAN	D and SI	LTY CLAY	, fine to co	arse; ligh	t gray and	yellow.				
	Atterberg	imits:		32	PL=	20	PI=	12	(ASIM D	4318)	-		
	Percent fin	ler:	3/4 in. =	100%	No. 4 =	100%	No. 200 =	42%	(ASTM D	422, refer to separate	report for	r gradation	curve)
	Specimen	type:	<u> </u>	Intact		Reconstitu	ited						
	Moisture f	rom:		Cuttings	X	Entire spec	cimen						
	Saturation	method:	X	Wet		Dry		1					
	Failure cri	terion:	<u> </u>	$(\sigma'_{1}/\sigma'_{3})_{max}$	،	$(\sigma'_1 - \sigma'_3)_{max}$		% strain					
	Membrane	effect:	X	Corrected	d	Not Correc	cted						
_													
	Golder A	Associ	ates Inc			Title:							
	Atlan	ta. Ge	orgia						A	STM D4767			
		,	v. 814			CONS	OLIDAT	ED UNDI	RAINED T	RIAXIAL COMPR	ESSION	TEST RE	PORT
Job Sh	ort Title:								SAMPLE	AND TEST DATA			
	FTN/ENTERC	SY WHI	FE BLUFI	F/AR									
Sample	:					Technicia	n:	Reviewee	d;	Start Date:	Job Num	ber:	Figure:
						PWN	1/FT						
						Check:		Approve	d:				
	B-3	UD 10.0	-12.0'			111	M			8/24/2018	1810	3173	
_						1.00	121						









10.0 psi	20.0 psi			30.0 psi	
Golder Associates Inc.	Title:	P	ASTM D4767		
Atlanta, Georgia	 CONS	OLIDATED UNDRAINEI	TRIAXIAL COMPRESS	ION TEST REPORT	٦.
JOD SNOTT HILE: FTN/ENTERGY WHITE BLUFF/AR		SPECIMENS PHO	TUGRAPH - 10.0	20.0 30.0	psi
Sample:	Technician: PWM/FT Check:	Reviewed: Approved:	Start Date:	Job Number:	Figure:
D-5 OD 10,0-12,0	 run		8/24/2018	18105175	0







8

	5						FLEXIB	LE WALL I	PERMEAB	ILITY					
						I	METHOD [, CONSTAL	V SUG4 NT RATE (OF FLOW			/5/		
PROFECT	TTLE	ETN/ENT	EDCV WHIT		D	г	Deerd	<u> </u>	1						
ROJECT	IIMPED	19102172	EKGI WHII	E DLUFF/A	R	-	Board #	3		OMMENTS	1				
AMPLEID		B-3		15.0-	17.0'	Flow F	riow rump Pump Speed	5	ł		2				
AMPLE T	YPE	UD	-			1	Technician	FT	1						
						-	Technician		1	-					
amnle Data	Initial					Sample Do	to Final	523					<u>.</u>		
eight, inche	25	3.008	B-Value f	0.99		Height inc	la, rmai hes	3 000	1				Sample		6l-
iameter. in	ches	2.839	Cell Pres.	88.0		Diameter i	nches	2.848		WATER	ONTENTS	1	Juitial		Sample
rea, cm²		40.84	Bot. Pres.	80.0		Area. cm ²		41.10		Wt Soil & 1	Gare, j	σ	657.54		7,12 00
olume, cm ³		312.03	Top Pres.	80.0		Volume. cn	n ³	314.12		Wt Soil & 1	are. f	s g	552.54		634.47
lass, g		657.54	Tot. B.P.	80.0		Mass, g		660.77		Wt Tare		g	0.00		85.52
1oisture Co	ntent, %	19.00	Head, max.	33.76		Moisture C	ontent, %	19.59		Wt Moistur	e Lost	g	105.00		107.53
ry Density,	pcf	110.50	Head, min.	33.76		Dry Densit	y, pcf	109.76	- R	Wt Dry Soi	L	g	552.54		548.95
pec. Gravity	y (assumed)	2.700	Max. Grad.	4.42		Volume So	lids, cm°	204.64		Water Cont	ent	%	19.00%		19.59%
olume Solic	ls, cm³	204.64	Min. Grad.	4.42		Volume Vo	ids, cm ³	109.47	0						
'olume Void	ls, cm ³	107.39				Void Ratio		0.53							
oid Ratio		0.52				Saturation,	%	98.9%		DESCRIPT	ION	_			
aturation, %	0	97.8%			85 					CLAYEY S	AND, fine	to coarse; lig	ht brown,		
			_						i -						li -
		Flow Pump	o Rate	1.17E-03	cm*/sec		USCS	SC							
	1	h										_			at sames
		-	TIM	E FUNCTIC	NS, SECO	NDS			dP						1
	DATE	DAY	HOUR	MIN	темр	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient	Permeability	,	
					(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)		
	06/19/18	43270	10	0	20.9	0	0	0	0	0.48	33.76	4.42	6.3E-06		
	06/19/18	43270	10	5	20.9	5	5	300	300	0.48	33.76	4.42	6.3E-06		1
	06/19/18	43270	10	10	20.9	5	10	300	600	0.48	33.76	4.42	6.3E-06		
	06/19/18	43270	10	15	20.9	5	15	300	900	0.48	33.76	4.42	6.3E-06	*	
	06/19/18	43270	10	20	20.9	5	20	300	1200	0.48	33.76	4.42	6.3E-06	*	1.
	06/19/18	43270	10	25	20.9	5	25	300	1500	0.48	33.76	4.42	6.3E-06	*	
	06/19/18	43270	10	30	20.9	5	30	300	1800	0.48	33.76	4.42	6.3E-06	*	1
	*TRANSCI	KIBED FRO	OM ORIGINA	L DATA SI	IEETS			2		PEF	RMEABILI	TY REPOR	TED AS ** 6.3E-06	cm/sec **	
		2													DATE
															CHECK
	<i>2</i>			9											REVIEW
															APPROVE



Boring or Test Pit: B-3 Sample: UD Depth: 20.0-22.0' Point No.: 1 Boring or Test Pit: B-3 Sample: UD Depth: 20.0-22.0' ' Point No.: 2

Boring or Test Pit: B-3 Sample: UD Depth: 20.0-22.0' Point No.: 3

	Initial			Initial			Initial	
Thickness =	0.750	in	Thickness =	0.750	in	Thickness =	0.750	in
Diameter =	2.500	in	Diameter =	2.500	in	Diameter =	2.500	in
Wet Mass =	0.220	lb	Wet Mass =	0.211	lb	Wet Mass =	0.235	lb
Area =	4.909	in ²	Area =	4.909	in ²	Area =	4.909	in ²
Volume =	3.682	in ³	Volume =	3.682	in ³	Volume =	3.682	in ³
Specific Gravity =	2.67	(Assumed)	Specific Gravity =	2.67	(Assumed)	Specific Gravity =	2.67	(Assumed)
Dry Mass of Solids =	0.167	lb	Dry Mass of Solids =	0.160	lb	Dry Mass of Solids =	0.179	lb
Moisture Content =	31.5%		Moisture Content =	31.5%		Moisture Content =	31.5%	
Wet Unit Weight =	103.1	pcf	Wet Unit Weight =	99 .0	pcf	Wet Unit Weight =	110.4	pcf,
Dry Unit Weight =	78.4	pcf	Dry Unit Weight =	75.3	pcf	Dry Unit Weight =	83.9	pcf
Void Ratio =	1.12		Void Ratio =	1.21		Void Ratio =	0.98	
Percent Saturation =	75%	1	Percent Saturation =	70%		Percent Saturation =	86%	

Pre-Shear	Pre-Shear	Pre-Shear
Thickness = 0.739 in	Thickness = 0.663 in	Thickness = 0.641 in
Diameter = 2.500 in	Diameter = 2.500 in	Diameter = 2.500 in
$Area = 4.909 in^2$	Area = 4.909 in^2	$Area = 4.909 in^{2}$
Volume = 3.628 in ³	Volume = 3.254 in ³	Volume = 3.147 in^3
Moisture Content = 35.1%	Moisture Content = 42.1%	Moisture Content = 28.2%
Wet Unit Weight = 107.4 pcf	Wet Unit Weight = 121.0 pcf	Wet Unit Weight = 125.9 pcf
Dry Unit Weight = 79.5 pcf	Dry Unit Weight = 85.2 pcf	Dry Unit Weight = 98.2 pcf
Void Ratio = 1.09	Void Ratio = 0.95	Void Ratio = 0.70
Percent Saturation = 100%	Percent Saturation = 100%	Percent Saturation = 100%

Shear Rate =	0.001	in/min	Shear Rate =	0.001	in/min	Shear Rate =	0.001	in/min
Normal Stress =	18	psi	Normal Stress =	36	psi	Normal Stress =	54	psi

Notes:

Sample description:(SM) SILTY SAND, fine to medium; light yellowish brown.Atterberg limit:LL = NPPL = NPPI = NP(ASTM D4318)Percent finer:3/4 in. = 100%No. 4 = 100%No. 200 = 18%(ASTM D422, refer to separate report)Specimen type:XIntactReconstitutedInundation:At seating load of approximately 100 psfApparatus:2.5 - inch nominal diameter box, Humboldt Material Testing Software and Equipment.

Golder Associates Inc. Atlanta, Georgia Job Short Title:	Title: CONSOL	IDATED DRAI SAMP	ASTM D3080 INED DIRECT LE AND TEST	' SHEAR TEST ' DATA	REPORT
FTN/ENTERGY WHITE BLUFF/AR		Checked:			_
Sample: B-3 UD 20.0-22.0'	Technician: FT	f WA Reviewed:	Date: 7/16/2018	Job Number: 18103173	Figure: 1













							FLEXIB	LE WALL	PERMEAB	ILITY							
								ASTM D	5084			*;					
						P	NETHOD I	, CONSTAL	NT RATE	OF FLOW							
								21									
PROJECT 1	TITLE	FTN/ENT	ERGY WHIT	TE BLUFF/A	R	5	Board #	2	с	OMMENTS							
PROJECT N	NUMBER	18103173					Flow Pump	2									
AMPLE II)	B-4		8.0-	10.0'	Flow F	ump Speed	9	*								
AMPLE T	YPE	UD]	Technician	FT									
									i.					. // //			
ample Data	a, Initial				v	Sample Da	ta, Final		n e o								
leight, inch	es	2.999	B-Value, f	0.99		Height, inc	hes	3.002		a			Sample			Sample	
)iameter, in	ches	2.869	Cell Pres.	88.0		Diameter, i	nches	2.899		WATER C	ONTENTS		Initial	-		Final	57
rea, cm ²		41.71	Bot. Pres.	80.0		Area, cm ²		42.58		Wt Soil & T	Гаге, і	g	585.31			686.79	
/olume, cm	3	317.71	Top Pres.	80.0		Volume, cn	n ^J	324.71		Wt Soil & 1	l'are, f	g	438.55	4		528.69	
Aass, g		585.31	Tot. B.P.	80.0		Mass, g		596.72	1 ¹⁰	Wt Tare		g	0.00	4		90.33	
Moisture Co	ontent, %	33.46	Head, max.	162.49		Moisture C	ontent, %	36.07		Wt Moistu	e Lost	g	146.76			158.10	
Dry Density	, pcf	86.13	Head, min.	162.49	-	Dry Densit	y, pcf	84.28		Wt Dry Soi	1	g	438.55	4		438.36	
pec. Gravit	y (assumed)	2.700	Max. Grad.	21.31		volume So.	nas, cm	162.43		Water Con	tent	%	33.46%			36.07%	
'olume Soli	ds, cm'	162.43	Min. Grad.	21.31		Volume Vo	ids, cm'	162.29									
olume Voi	ds, cm'	155.28	4			Void Ratio		1.00									
oid Ratio		0.96				Saturation,	%	97.5%	ie.	DESCRIPT	ION					<u> </u>	
Saturation,	%	94.5%								CLAY, SOR	ie fine to co	arse sand; y	ellowish bi	own.			
		Flow Pum	n Rate	4 26E-05	cm ³ /sec		USCS	Сн	1								
				4.202-03	ciii /sec		0303		1	L							
			(D) h d	E DUNCTIO		NDO				1		1				7	
			TIM	E FUNCTIO	JNS, SECO	I		r	dP	4				_		÷ .	
	DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient		Permeability			
		124.50			(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)			(cm/sec)		4	
	06/08/18	43259	13	0	20.9	0		0	0	2.31	162.49	21.31		4.6E-08			
8	0 4 10 0 14 0	1 100000		1 5	20.9	5	5	300	I 300	2.31	162.49	21.31	· · · · ·	4.6E-08			
2	06/08/18	43259	13	10	30.0	-	10	100	200	2.21	161.40	91.21		(3. Ph N		1	
2	06/08/18	43259 43259 43350	13	10	20.9	5	10	300	600	2.31	162.49	21.31	2	4.0E-00	*	1	
ž	06/08/18 06/08/18 06/08/18	43259 43259 43259	13 13 13	10	20.9 20.9	5 5	10 15	300 300	600 900	2.31	162.49 162.49	21.31 21.31	-	4.6E-08	*		
2	06/08/18 06/08/18 06/08/18 06/08/18	43259 43259 43259 43259 43259	13 13 13 13	10 15 20	20.9 20.9 20.9	5 5 5	10 15 20	300 300 300	600 900 1200	2.31 2.31 2.31	162.49 162.49 162.49	21.31 21.31 21.31	2	4.6E-08 4.6E-08	*		
2	06/08/18 06/08/18 06/08/18 06/08/18 06/08/18	43259 43259 43259 43259 43259 43259	13 13 13 13 13	10 15 20 25	20.9 20.9 20.9 20.9	5 5 5 5	10 15 20 25	300 300 300 300 300	600 900 1200 1500	2.31 2.31 2.31 2.31 2.31	162.49 162.49 162.49 162.49	21.31 21.31 21.31 21.31 21.31	-	4.6E-08 4.6E-08 4.6E-08	* *		
č	06/08/18 06/08/18 06/08/18 06/08/18 06/08/18 06/08/18	43259 43259 43259 43259 43259 43259 43259	13 13 13 13 13 13	10 15 20 25 30	20.9 20.9 20.9 20.9 20.9 20.9	5 5 5 5 5 5	10 15 20 25 30	300 300 300 300 300 300	600 900 1200 1500 1800	2.31 2.31 2.31 2.31 2.31 2.31	162.49 162.49 162.49 162.49 162.49 162.49	21.31 21.31 21.31 21.31 21.31 21.31	TED 49	4.6E-08 4.6E-08 4.6E-08 4.6E-08 4.6E-08	* * *		
÷	06/08/18 06/08/18 06/08/18 06/08/18 06/08/18 06/08/18 *TRANSC	43259 43259 43259 43259 43259 43259 43259 RIBED FRO	13 13 13 13 13 13 0M ORIGIN	10 15 20 25 30 AL DATA S	20.9 20.9 20.9 20.9 20.9 20.9 HEETS	5 5 5 5 5	10 15 20 25 30	300 300 300 300 300 300	600 900 1200 1500 1800	2.31 2.31 2.31 2.31 2.31 2.31 2.31 PE	162.49 162.49 162.49 162.49 162.49 162.49 RMEABIL	21.31 21.31 21.31 21.31 21.31 21.31 TY REPOR	TED AS *	4.6E-08 4.6E-08 4.6E-08 4.6E-08 4.6E-08 ★ 4.6E-08 c	* * * m/sec **		
ė	06/08/18 06/08/18 06/08/18 06/08/18 06/08/18 06/08/18 *TRANSC	43259 43259 43259 43259 43259 43259 43259 43259 RIBED FR(13 13 13 13 13 13 0M ORIGIN	10 15 20 25 30 AL DATA S	20.9 20.9 20.9 20.9 20.9 20.9 HEETS	5 5 5 5 5	10 15 20 25 30	300 300 300 300 300 300	600 900 1200 1500 1800	2.31 2.31 2.31 2.31 2.31 2.31 PEI	162.49 162.49 162.49 162.49 162.49 162.49 RMEABIL	21.31 21.31 21.31 21.31 21.31 21.31 TY REPOR	TED AS *	4.6E-08 4.6E-08 4.6E-08 4.6E-08 ★ 4.6E-08 c	* * * m/sec **	DATE	6/8/1
2	06/08/18 06/08/18 06/08/18 06/08/18 06/08/18 06/08/18 *TRANSC	43259 43259 43259 43259 43259 43259 43259 81BED FRO	13 13 13 13 13 13 13 0M ORIGIN	10 15 20 25 30 AL DATA S	20.9 20.9 20.9 20.9 20.9 20.9 HEETS	5 5 5 5	10 15 20 25 30	300 300 300 300 300 300	600 900 1200 1500 1800	2.31 2.31 2.31 2.31 2.31 2.31 PE	162.49 162.49 162.49 162.49 162.49 162.49 RMEABIL	21.31 21.31 21.31 21.31 21.31 21.31 ITY REPOR	TED AS *	4.6E-08 4.6E-08 4.6E-08 4.6E-08 * 4.6E-08 c	* * * m/sec **	DATE	6/8/1
2	06/08/18 06/08/18 06/08/18 06/08/18 06/08/18 06/08/18	43259 43259 43259 43259 43259 43259 43259 RIBED FRO	13 13 13 13 13 13 13 0M ORIGIN	10 15 20 25 30 AL DATA S	20.9 20.9 20.9 20.9 20.9 20.9 HEETS	5 5 5 5	10 15 20 25 30	300 300 300 300 300 300	600 900 1200 1500 1800	2.31 2.31 2.31 2.31 2.31 2.31 PE	162.49 162.49 162.49 162.49 <u>162.49</u> RMEABIL	21.31 21.31 21.31 21.31 21.31 21.31 ITY REPOR	TED AS *	4.6E-08 4.6E-08 4.6E-08 4.6E-08 * 4.6E-08 c	* * * m/sec **	DATE CHECK REVIEW	6/8/1



2						
Boring or Test Pit' B.5	Boring	or Test Pity		Boring or Test Pit:		
Samplar 1	Dornig	Somela:		Doring of Test Fit.		
Deaths 2.0.5.0	6	Sample.		Sample.		e
Deptn: 3.0-5.0	. ⁿ	Deptn:		Deptn:		
Point No.: 1	72	Point No.:		Point No.:		
1						
Initial						
Length = 6.012	în	Length = 6.009		Length =	5.925	
Diameter = 2.877	in	Diameter = 2.842		Diameter =	2.863	
Wet Mass = 2.625	16V	Wet Mass =	÷.,	Wet Mass =		
Area = 6.501	in ²	Area =		Area =		
Volume = 39.083	in ³	Volume =		Volume =		
Specific Gravity = 2.69	(ASTM D854) Specifi	c Gravity =		Specific Gravity =		
Dry Mass of Solids = 2.073	lb Dry Mass	of Solids =		Dry Mass of Solids =		
Moisture Content = 26.6%	Moisture	Content =		Moisture Content =	15	
Wet Unit Weight = 1161	ncf Wet Un	it Weight =		Wet Unit Weight =		
Dry Unit Weight = 01.7	por veron	it Weight -	7 4	De Unit Weight -		
Veid Detin = 0.82	per biyon	-id Batia -		Diy Olit Weight -		
Volu Ralio = 0.83		old Ratio =		void Ratio =		
Percent Saturation = 86%	Percent S	aturation =		Percent Saturation =		
After Consoli	dation	After Consolid	lation	After	r Consolidation	
Length = 6.009	in	Length = 5.925	in	Length =	5.849 in	
Diameter = 2.842	in	Diameter = 2.863	in	Diameter =	2.881 in	
Area = 6.345		Area = 6.436		Area =	6.519 in ² (Meth	iod B)
Volume = 38.129		Volume = 38.129	5	Volume =	38.129 in ³	
Moisture Content =	Moisture	e Content =		Moisture Content =	29.2%	
Wet Unit Weight =	Wet Un	it Weight =		Wet Unit Weight =	121.4 pcf	
Dry Unit Weight =	Dry Un	it Weight =		Dry Unit Weight =	94.0 ncf	
Void Ratio =	V	oid Ratio =		Void Ratio =	0.78	
Percent Saturation =	Percent S	aturation =		Percent Saturation =	100%	
I ciccil Suturation	T ciccin 5	aturation	2 0	recent Saturation -	10070	
				· .		
B Parameter = 0.99	ВР	'arameter =		B Parameter =	575	
Shear Rate = 0.089%	/min. Sl	hear Rate = 0.099%	/min	Shear Rate =	0.092% /min.	
$t_{50} = 0.3$	min.	$t_{50} = 0.6$	min.	t ₅₀ =	0 I min	
Strain at Failure = 1.3%	Strain a	at Failure = 2.7%		Strain at Failure =	4.3%	
Cell Pressure = 74.0	psi Cell	Pressure = 80.0	psi	Cell Pressure =	85.0 psi	
Back Pressure = 70.0	psi Back	Pressure = 70.0	psi	Back Pressure =	70.0 psi	
Confining Pressure = 4.0	psi Confining	Pressure = 10.0	psi	Confining Pressure =	15.0 psi	
Notes: Sample description	: (CL) SAND and SILTY CLA	Y, fine to medium; da	rk brown.			
Atterberg limits:	LL = 42 PL=	= 21 PI =	21 (ASTM I	04318)		
Percent finer	3/4 in = 100.0% No.4 =	95.4% No 200 =	73.1% (ASTM I)477 refer to senarate	e report for gradation	(urve)
Specimen type:	X Intact	Reconstituted	(151111		report for gradation	
Moisture from:	Cuttings V	Estisa specimen				
Saturation mathed	V Wat	Draw Draw				
Saturation method:	X Wet					
Panule chierton.	A (01/03/max	101-03)max	76 Strain			
Memorane effect:	Corrected	INOT Corrected				
		L				
Golder Associ	ates Inc.	Title:				
Atlanta C	orgia		MODIFIED (M	lulti-Stage) - ASTM	D4767	
Atlauta, G	or gra	CONSOLIDAT	ED UNDRAINED	FRIAXIAL COMPR	ESSION TEST RE	PORT
Job Short Title:			SAMPLI	E AND TEST DATA		
FTN/ENTERGY WHI	TE BLUFF/AR					
Sample:	9.	Technician	Reviewed:	Start Data	Job Number	Figure
		ET/DU/M	BL	Start Date.	SOD INMINEL:	ingure:
			4	1		
	0.5.01	Check	Approved:			
B-5 UD 3.	.0-5.0'	1.1002		7/10/2018	18103173	









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							FLEXIE	BLE WALL	PERMEAB	ILITY							
								ASTM E	0 5084								
	14.00					1	METHODI	D, CONSTAL	NT RATE O	JF FLOW							
PROJECT T	TTLE	FTN/ENT	ERGY WHIT	E BLUFF/A	AR]	Board #	# 8] c	OMMENTS						***	1
PROJECT N	UMBER	18103173	1				Flow Pump	2	1								
SAMPLE ID	1	B-5		10.0	-12.0'	Flow I	Pump Speed	1 11									
SAMPLE TY	/PE	UD	ž.	11			Technician	FT]							_	
																	_
Sample Data,	, Initial	جــــــــــــــــــــــــــــــــــــ			5	Sample Da	ta, Final									*	
Height, inche	×s	3.000	B-Value, f	1.00		Height, inc	hes	3.004]			- X	Sample			Sample	
Diameter, inc	ches	2.836	Cell Pres.	88.0		Diameter, i	inches	2.898		WATER C	ONTENTS		Initial	_		Final	
Area, cm²		40.75	Bot. Pres.	80.0	1	Area, cm ²		42.56		Wt Soil & 1	l'are, i	g	663.16	14 C		756.65	
Volume, cm ³		310.55	Top Pres.	80.0	1	Volume, cr	n ³	324.70		Wt Soil & 1	lare, f	g	566.46			648.69	
Mass, g		663.16	Tot. B.P.	80.0		Mass, g		674.45		Wt Tare		g	0.00			82.40	
Moisture Con	ntent, %	17.07	Head, max.	135.05	Į.	Moisture C	Content, %	19.06		Wt Moistu	re Lost	g	96.70			107.96	
Dry Density,	pcf	113.82	Head, min.	135.05		Dry Densit	y, pcf	108.86		Wt Dry Soi	l	g	566.46			566.29	
spec. Gravity	(assumed)	2,700	Max. Grad.	17.70		volume So	uds, cm	209.80		Water Con	tent	%	17.07%			19.06%	
olume Solid	ls, cm	209.80	Min. Grad.	17.70		Volume Vo	oids, cm ³	114.90									
Volume Void	s, cm'	100.75	-			Void Ratio		0.55									
Void Ratio		0.48	-			Saturation,	,%	94.0%	(DESCRIPT	ION						r.
saturation, %	6	96.0%	ļ							SILIYCL	AY, some ti	ne to coarse	sand, trace	tine gravel; l	ight brown	n.	
		Flow Purp	n Data	1 195 05	3/1000		LISCS		r -								
		Flow I din	PRAte	1.100-03	Jem /see		USCS										1
			TING	E EUNOPU						-	()						
	DATE	DAY		E FUNCTIO	JNS, SECU		· · ·	r	dP								
	DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient		Permeability			
	0(15/10	42276	12	-	(()	(min)	(mm)	(sec)	(sec)	(psi)	(cm)			(cm/sec)		5	÷-
	06/25/18	43270			21.7			0	10	1.92	135.05	17.70		1.5E-08			
	06/25/18	43276	12	10	21.7	5		300	500	1.92	135.05	17.70		1.5E-08			1.9
	06/25/18	43276	12	15	21.7	5	15	300	900	1.92	135.05	17.70	-	1.5E-08	*		
	06/25/18	43276	12	20	21.7	5	20	300	1200	1.02	135.05	17.70		1.512-00			
	06/25/18	43276	12	25	21.7	5	25	300	1500	1.74	135.05	17.70		1.56-08	*		
	06/25/18	43276	12	30	21.7	5	30	300	1800	1.72	135.05	17.70		1.3E-08			
44	*TRANSCI	RIBED FRO	OM ORIGINA	AL DATA S	HEETS	<u>v</u>			1000	PEI	MEABIL	TY REPOR	TED AS **	1.5E-08	cm/sec **	1	
														1.52-00		DATE	6/25/1
										×						CHECK	0/20/1
					3											REVIEW	IN.I
																APPROVE	J. W.K.









Boring or Test Pit: Sample:	B-7		Boring	or Test Pit: Sample:				Boring or Test Pit:			
Denth:	50-70	Ĥ		Depth:				Depth:			
Point No.:	1	II.		Point No.:				Point No.:			
	Initial										
Length =	6.041	in		Length =	6.023			Length =	5.966		
Diameter =	2.848	in	I	Diameter =	2.883			Diameter =	2.897		
Wet Mass =	2,811	lb	V	vet Mass =				Wet Mass =			
Area =	6.370	in ²		Area =				Area =			
Volume =	38.484	in ³		Volume =				Volume =			
Specific Gravity =	2.66	(ASTM D854)	Specific	Gravity =				Specific Gravity =			
Dry Mass of Solids =	2.332	lb	Dry Mass	of Solids =			I	Dry Mass of Solids =			
Moisture Content =	20.5%		Moisture	Content =				Moisture Content =			
Wet Unit Weight =	126.2	pcf	Wet Uni	t Weight =				Wet Unit Weight =			
Dry Unit Weight =	104.7	pcf	Dry Uni	t Weight =				Dry Unit Weight =			
Void Ratio =	0.58		Vo	oid Ratio =				Void Ratio =			
Percent Saturation =	94%		Percent Sa	aturation =				Percent Saturation =			
After	Consoli	dation		After	Consoli	lation		After	r Consoli	dation	
Length =	6.023	in		Length =	5.966	in		Lenoth =	5.920	in	
Diameter =	2.883	in	I	Diameter =	2.897	in		Diameter =	2.908	in	
Area =	6.529		-	Area =	6.592	•••		Area =	6.643	in ² (Meth	nod B)
Volume =	39.326			Volume =	39.326			Volume =	39 326	in ³	ilou D)
Moisture Content =			Moisture	Content =	0,1020			Moisture Content =	23.2%	•••	
Wet Unit Weight =			Wet Uni	t Weight =				Wet Unit Weight =	126.3	ncf	
Dry Unit Weight =			Dry Uni	t Weight =				Dry Unit Weight =	102.5	per	
Void Ratio =			V	oid Ratio =				Void Ratio =	0.62	Per	
Percent Saturation =			Percent Sa	aturation =				Percent Saturation =	100%		
D. Doctore store -	0.06		DD								
D Falailletet - Shear Rate =	0.90	min	D P Sh	arameter -	0.0870/	Imin		B Parameter =		Imin	
tro =	1.2	min.	31	tro =	0.08776	min.			0.090%	min.	
Strain at Failure =	0.5%		Strain a	t Failure =	1.9%			Strain at Failure =	2.8%		
					-0-0-				21070		
Cell Pressure =	66.0	psi	Cell	Pressure =	72.0	psi		Cell Pressure =	78.0	psi	
Back Pressure =	60.0	psi	Back	Pressure =	60.0	psi		Back Pressure =	60.0	psi	
Confining Pressure =	6.0	psi	Confining	Pressure =	12.0	psi	(Confining Pressure =	18.0	psi	
Notes: Sample de	scription	: (SM) SILTY SAN	D, fine to co	barse, some	fine grav	el; gray.		4210)			
Percent fir	ninito. 1er	3/4 in = 100.0%	$N_0 4 =$	90.4%	FI-	40.0%	(ASTM D	1210) 1277 refer to consente	report fo	r gradation	
Specimen	tune	X Intact	110.4-	Reconstitu	110. 200 -	40.070	(ASTN D	422, Telef to separate	report to	r gradatior	i curve)
Moisture f	type. From:	Cutting	s X	Entire spe	cimen						
Saturation	method.	X Wet		Dry	cincii						
Failure cri	terion:	\mathbf{X} $(\sigma'_1/\sigma'_2)_{-}$		(σ'1-σ'1)		1% strain					
Membrane	e effect:	X Correct	ed	Not Corre	cted	7,					
Golder	Associ	ates Inc.		Title:		MOD	IFIED (M	ulti-Stage) ASTM	D4767		
Atlan	ita, Ge	orgia		CONS	OLIDAT	ED UND	RAINED 7	RIAXIAL COMPR	ESSION	TEST PF	PORT
Job Short Title:	~V \$1/111				JUDAI		SAMPLE	AND TEST DATA		i loi NI	
F I N/EN I ERC	JI WHI	IE BLUFF/AK		Techelet		Desit	da	Stant Deter	T_E N	-have	E:
Sample:				FT/P	wM	Reviewe	u:	Start Date:	JOD NUM	ider:	rigure:
r =	110. 7	0 7 01		Check:	11-	Approve	ed:	0/20/2010		00150	
B- 7	UD 5.	U-/.U	2	1 74	1		j	8/29/2018	181	031/5	1 1

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	Golder Associates Inc. Atlanta, Georgia	Title:	MODIFIED (SOLIDATED UNDRAINEI	Multi-Stage) - ASTM D4 D TRIAXIAL COMPRES	767 SION TEST REPORT	
Job Short Title:	FTN/ENTERGY WHITE BLUFF/AR		SPECIMEN PHO	TOGRAPH - Single Spec	cimen	
Sample:		Technician: FT/PWM Check:	Reviewed: Approved:	Start Date:	Job Number:	Figure:



				_	_											
ž.							FLEXIB	LE WALL I ASTM D	PERMEAB 9 5084	ILITY			107 27 - 107		E.	
						- 1	METHOD I	D, CONSTAL	NT RATE (OF FLOW						
PROJECT T	ITLE	FTN/ENT	ERGY WHIT	E BLUFF/A	R	٦	Board t	15		OMMENTS						
PROJECT N	UMBER	18103173		B BBBTTH		1	Flow Pump	2		OMMENTS						
SAMPLE ID		B-7		7.0	-9.0'	Flow J	ump Speed	7	1			*				
SAMPLE TY	PE	UD				1	Technician	FT								
							2									
										3			3			
ample Data	, Initial	2 000	1	0.00	1	Sample Da	ta, Final		i							
leight, inche	S	3.000	B-Value, f	0.98	ł	Height, inc	hes	3.001		-			Sample		Sample	
rameter, ind	ines	42.12	Det Pres.	88.0	{	Diameter, i	nches	2.874		WATER C	ONTENTS		Initial		Final	
rea, cm [*]		42.12	Bot, Pres.	80.0	{	Area, cm ²	3	41.85		Wt Soil &	l'are, i	g	614.74		714.76	
Acces o		320.92	Top Pres.	80.0	{	volume, cr	n	319.03		Wt Soil & 1	l'are, f	g	504.72		586.83	
tass, g foisture Cor	stant 0/	014.74	Hoad may	61.00	{	Mass, g		6.32.69		Wt Tare		g	0.00		82.29	
ioisture Con	nent, 7	98.14	Head min	61.90	1	Moisture C	ontent, %	25.30		Wt Moistur	re Lost	g	110.02		127.93	
pec. Gravity	/ (assumed)	2.700	Max. Grad.	8.12	1	Volume So	y, per lids, cm'	186.93		Water Con	I tent	g %	21 90%		25 268/	
olume Solid	ls cm ³	186.03	Min Grad	8.12	1	Volume Ve	ide om ³	132.10		Water Cou	tem	78 X	21.00 /8		23.3076	
olume Void	s cm ³	133.00	Wini. Grau.	0.12	1	Void Patio	ius, cm	0.71								
oid Ratio	3, 011	0.72	1			Saturation	0/	0.71		DESCRIPT	ION					
aturation %	6	87 1%	1			Saturation	/0	90.9 /n		SILTY CL	AY and SA	ND fine to r	nedium: vellowish brown			
		044770	1											•		
		Flow Pum	p Rate	2.38E-04	cm ³ /sec		USCS	CL				. e				
										L						
	-		70184	E EUNCER	NE SECO	NDG						-	1		1	
	DATE	DAV		E FUNCTIO	JNS, SECO				dP							
	DATE	DAY	HOUR		TEMP	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient	Permeability			
	06/00/10	42350		20	(°C)	(min)	(min)	(sec)	(sec)	(psi)	(cm)		(cm/sec)		-	
	00/08/18	43239	14	30	21.8		U _		U	0.88	61.90	8.12	6.7E-07			
	06/08/18	43259	14	35	21.8	5	5	300	500	0.88	61.90	8.12	6.7E-07			
	00/00/18	43259	14	40	21.8	5	10	300	000	0.88	01.90 61.00	8.12	6.7E-07	*		
	1 116/11X/1X		1 17		21.0		13	200	500	0.00	01.90	0.12	0./E-U/		10	
	06/08/18	42250	14	50		1 3	20	1 1000	1200	0.88	61.90	8.12	6.7E-07	*		
	06/08/18	43259	14	50	21.8	5	35	300	1500	0.00	C1 00	0.12	(an an			
	06/08/18 06/08/18 06/08/18	43259 43259 43259	14 14 15	50 55	21.8	5	25	300	1500	0.88	61.90	8.12	6.7E-07	*		
г а	06/08/18 06/08/18 06/08/18 06/08/18	43259 43259 43259	14 14 15	50 55 0	21.8 21.8 21.8	5	25 30	300 300	1500 1800	0.88 0.88	61.90 61.90	8.12 8.12	6.7E-07 6.7E-07	*		
-	06/08/18 06/08/18 06/08/18 06/08/18 *TRANSCI	43259 43259 43259 RIBED FRO	14 14 15 DM ORIGIN	50 55 0 AL DATA S	21.8 21.8 21.8 HEETS	5	25 30	300 300	1500 1800	0.88 0.88 PE	61.90 61.90 RMEABILI	8.12 8.12 ITY REPOR	6.7E-07 6.7E-07 RTED AS ** 6.7E-07 c	* * m/sec **] 	
a N	06/08/18 06/08/18 06/08/18 06/08/18 *TRANSCI	43259 43259 43259 RIBED FRO	14 14 15 DM ORIGIN	50 55 0 AL DATA S	21.8 21.8 21.8 HEETS	5	25 30	300 300	1500 1800	0.88 0.88 PEI	61.90 61.90 RMEABILI	8.12 8.12 ITY REPOR	6.7E-07 6.7E-07 TED AS ** 6.7E-07 c	* * m/sec **	DATE	6/8/1
- - -	06/08/18 06/08/18 06/08/18 06/08/18 *TRANSCI	43259 43259 43259 RIBED FRO	14 14 15 DM ORIGIN	50 55 0 AL DATA S	21.8 21.8 21.8 HEETS	5	25 30	300 300	1500 1800	0.88 0.88 PEI	61.90 61.90 RMEABILI	8.12 8.12 ITY REPOR	6.7E-07 6.7E-07 TED AS ** 6.7E-07 c	* * m/sec **	DATE CHECK	6/8/1
-	06/08/18 06/08/18 06/08/18 06/08/18	43259 43259 43259 RIBED FRO	14 14 15 DM ORIGIN	50 55 0 AL DATA S	21.8 21.8 21.8 HEETS	5	25 30	300 300	1500 1800	0.88 0.88 PEI	61.90 <u>61.90</u> RMEABILI	8.12 8.12 ITY REPOR	6.7E-07 6.7E-07 TED AS ** 6.7E-07 c	* * m/sec **	DATE CHECK REVIEW	6/8/11 1



0	SPECIFIC GRAV ASTM 1 PYCNOMETE	TTY OF SOI D-854 R METHOD	LS	е
PROJECT TITLE PROJECT NUMBER	FTN/ENTERGY WHITE BLUI 18103173	FF/AR	SAMPLE ID	B-7 UD
TESTED FOR	Gs		SAMPLE DEPTH	15.0-17.0'
MOISTURE CONTENT	OF MATERIAL PASSING THE #4 SIEV	/E	- ·	-
Weight Soil and Tare, Init Weight Soil and Tare, Fin Weight Of Tare (gm) Weight Of Moisture (gm) Weight Of Dry Soil (gm) Hygroscopic Moisture In (ial (gm) al (gm) %)	166.24 165.14 42.93 1.10 122.21 0.9%		
Test Method		Ξ×.	Method - B	
Pycnometer Number	Weight Pycnometer Empty (gm) Volume of Pycnometer (gm) Weight Pycnometer and Water (gm) Mass of Pycnometer and Water at the test Observed Temperature (Tb), for (Mb) In 1	Temperture Degrees C	11 159.54 499.57 658.13 657.81 23.50	* *
Weight of Soil, Water & Temperature, C	Pycnometer (gm) Density of water @ tested temperature (g/	ml)	(B) 688.66 23.5 1.00	6
Tare Number Weight of Dry Soil Slurr Weight of Tare	y plus Tare Weight of Dry Soil (gm)	1	- 49.87 0.00 49.87	
	Temperature Coefficient		0.9992	2 I A
	SPECIFIC GRAVITY (G) G @ 20° C = [C/(A-(B - C))]*(K)		2.620	
METHOD - A METHOD - B	WET METHOD OVEN-DRIED METHOD		METHOD OF AIR REMO VACUUM	VAL
2 1	Recommende	d Mass for Test S	pecimen	*
	Soil Type SP, SP-SM SP-SC, SM , SC SILT OR CLAY	Spec whe	imen Dry Mass n using 500 ml Pycnometer 100 75 50	
in di se In a		9 9 9	Cl RE APPI	TECH FT DATE 7/31/18 HECK A VIEW //J/4 ROVE

Boring or Test Pit Sample Depth Point No.	: B-7 : 1 : 15.0-17.0 : 1) ft	Boring o	r Test Pit: Sample: Depth: Point No.:				Boring or Test Pit: Sample: Depth: Point No.:			
Length = Diameter = Wet Mass = Area = Volume = Specific Gravity = Dry Mass of Solids = Moisture Content = Wet Unit Weight = Dry Unit Weight = Void Ratio = Percent Saturation =	Initial 6.012 2.877 2.817 6.501 39.083 2.62 2.311 21.9% 124.5 102.2 0.60 96%	in in lb in ² in ³ (ASTM D854) lb E pcf pcf	D W Specific Dry Mass o Moisture (Wet Unit Dry Unit Voi Percent Sa	Length = iameter = et Mass = Area = Volume = Gravity = f Solids = Content = Weight = Weight = id Ratio = turation =	5.936 2.889		D	Length = Diameter = Wet Mass = Area = Volume = Specific Gravity = ry Mass of Solids = Moisture Content = Wet Unit Weight = Dry Unit Weight = Void Ratio = Percent Saturation =	5.798 2.923		
Afte Length = Diameter = Area = Volume = Moisture Content = Wet Unit Weight = Dry Unit Weight = Void Ratio = Percent Saturation =	r Consoli 5.936 2.889 6.556 38.914	dation in in	D Moisture (Wet Unit Dry Unit Voi Percent Sa	After Length = biameter = Area = Volume = Content = Weight = id Ratio = turation =	Consolid 5.798 2.923 6.712 38.914	ation in in	1	After Length = Diameter = Area = Volume = Moisture Content = Wet Unit Weight = Dry Unit Weight = Void Ratio = Percent Saturation =	Consolid 5.704 2.947 6.822 38.914 22.5% 125.8 102.6 0.59 100%	lation in in ² (Metho in ³ pcf pcf	od B)
B Parameter = Shear Rate = t ₅₀ = Strain at Failure =	= 1.00 = 0.094% = 1.0 = 1.0%	/min. min.	B Pa She Strain at	trameter = ear Rate = $t_{50} =$ t Failure =	0.100% 0.7 2.7%	/min. min.		B Parameter = Shear Rate = t_{50} = Strain at Failure =	 0.099% <mark>0.8</mark> 4.7%	/min. min.	
Cell Pressure = Back Pressure = Confining Pressure =	= 64.0 = 50.0 = 14.0	psi psi psi C	Cell I Back I Confining I	Pressure = Pressure = Pressure =	78.0 50.0 28.0	psi psi psi	C	Cell Pressure = Back Pressure = Confining Pressure =	92.0 50.0 42.0	psi psi psi	
Notes: Sample d Atterberg Percent f Specimen Moisture Saturatio Failure c Membran	lescription g limits: iner: n type: from: n method: riterion: ne effect:	$(SC) SAND and SILLL = 283/4 in. = 100.0%X IntactCuttingsX WetX (\sigma'_1/\sigma'_3)_{max}X Corrected$	TY CLAY PL = No. 4 =	, fine to con 19 100.0% N Reconstitu Entire spec Dry (o'1-o'3)max [Not Correct	arse; gray PI = No. 200 = ted cimen	ish brown 9 36.5% % strain	and yellow (ASTM D- (ASTM D-	4318) 422, refer to separate	report for	r gradation	curve)
Golder Atla Job Short Title:	Associ nta, Ge	ates Inc. corgia		Title: CONS	OLIDAT	MOD ED UNDF	IFIED (Ma RAINED T SAMPLE	ılti-Stage) - ASTM RIAXIAL COMPR AND TEST DATA	D4767 ESSION	TEST RE	PORT
FTN/ENTER Sample:	GY WHI	TE BLUFF/AR		Technicia FT/P Check:	n: WM	Reviewed	l: d:	Start Date:	Job Num	ıber:	Figure:
B-7	UD 15.0	-17.0'		1	NM			7/10/2018	1810	03173	1









	Golder Associates Inc. Atlanta, Georgia	Title:	MODIF NSOLIDATED UNDRA SDECIMEN	IED (Multi-Stage) - ASTM MNED TRIAXIAL COMPR	D4767 ESSION TEST REPORT	·
Job Short Title			SECTIVILIN	1 HOTOGRAFT - Shigle S	pecimen	
Job Short Title:	FTN/ENTERGY WHITE BLUFF/AR	71.1.1.1				







r Associates Inc.





		SPECIFIC GRAV	TTY OF SOI	LS	and the second
		PYCNOMETE	R METHOD	, ²	
PROJECT TITLE PROJECT NUMBER	FTI	N/ENTERGY WHITE BLU 18103173	FF/AR	SAMPLE ID	RP-4
TESTED FOR		Gs		SAMPLE TYPE SAMPLE DEPTH	20.0-22.0'
MOISTURE CONTENT	OF MATE	RIAL PASSING THE #4 SI	EVE	-	
Weight Soil and Tare, In Weight Soil and Tare, Fi Weight Of Tare (gm) Weight Of Moisture (gm) Weight Of Dry Soil (gm Hygroscopic Moisture In	itial (gm) - nal (gm)) (%)	-	196.37 192.05 51.66 4.32 140.39 3.1%		
Test Method				Method - B]
Pycnometer Number	Weight Pyo Volume of Weight Py Mass of Py Observed 1	cnometer Empty (gm) Pycnometer (gm) rcnometer and Water (gm) rcnometer and Water at the ter femperature (Tb), for (Mb) In	st Temperture a Degrees C	14 185.81 499.41 684.20 (A) 683.75 25.00	
Weight of Soil, Water & Temperature, C	2 Pycnomete Density of	er (gm) water @ tested temperature (j	g/ml)	(B) 714.40 25.0 1.00	-
Tare Number Weight of Dry Soil Slur Weight of Tare	ry plus Tare Weight of I	e Dry Soil (gm)			
	SPEC G @ 20 ⁰ C =	CIFIC GRAVITY (G) [C/(A-(B - C))]*(K)		2.674	1
METHOD - A METHOD - B		WET METHOD OVEN-DRIED METHOD		METHOD OF AIR REN	IOVAL
		Recommende	d Mass for Test S	Specimen]
2 40		Soil Type SP, SP-SM SP-SC, SM , SC SILT OR CLAY	Spec whe F	imen Dry Mass n using 500 ml Pycnometer 100 75 50	
				(RJ API	TECH BA DATE 7/18/18 CHECK 4 EVIEW AwA PROVE

	Boring or Test Pit:	RP-4		Boring or T	est Pit:	RP-4			Boring or Test Pit:	RP-4		
	Sample:	UD		5	Sample:	UD			Sample:	UD		
	Depth:	20.0-22.0) ft		Depth:	20.0-22.0	ft		Depth:	20.0-22 () ft	
	Point No.:	1		Po	int No.:	2			Point No.:	3		
1 V.												
- A	I an ath m		-			Initial			T d			
	Length =	5.901	in	Die	ength = -	2 862	in :_		Length =	0.178	in m	
	Wet Mass =	2.001	lh	Dia. Wet	Mass -	2.803	ni Ib		Wat Mass =	2.019	in Ib	
	Area =	6519	in ²	WCL	Area =	6 4 3 8	in ²			6.241	in ²	= - 54
	Volume =	38 468	in ³	Vo	lume =	39 360	in ³		Volume =	38 559	in ³	
	Specific Gravity =	2.67	(ASTM D854)	Specific G	avity =	2.67	(ASTM D	0854)	Specific Gravity =	2.67	(ASTM E	0854)
	Dry Mass of Solids =	2.261	lb	Dry Mass of S	olids =	2.346	Ъ		Dry Mass of Solids =	2.253	lb	
	Moisture Content =	22.9%		Moisture Co	ntent =	20.9%			Moisture Content =	22.7%		×
	Wet Unit Weight =	124.8	pcf	Wet Unit W	eight =	124.5	pcf		Wet Unit Weight =	123.9	pcf	
	Dry Unit Weight =	101.5	pcf	Dry Unit W	eight =	103.0	pcf	5 - E	Dry Unit Weight =	100.9	pcf	
	Void Ratio =	0.64		Void	Ratio =	0.62			Void Ratio =	0.65		
()-	Percent Saturation =	95%		Percent Satur	ation =	91%			Percent Saturation =	93%		
1												
	1.6	C . P				C II						
	After Longth =	5 810	in	T.	Atter	Consolic	iation		Alter Langth =	Consoli	lation	
	Diameter =	2 862	in	Dia	meter =	2 841	in		Diameter =	2 814	in	
	Area =	6 4 3 1	in^2 (Method B)	Dia	Area ⇒	6 34 1	in^2 (Meth	od B)		6219	in ² (Meth	od B)
	Volume =	37.424	in ³	Vo	lume ≖	38.298	in ³	(d, D)	Volume =	38.050	in ³	00.01)
	Moisture Content =	22.3%		Moisture Co	ntent =	21.5%			Moisture Content =	23.5%		
	Wet Unit Weight =	127.7	pcf	Wet Unit W	eight =	128.6	pcf		Wet Unit Weight =	126.4	pcf	
	Dry Unit Weight =	104.4	pcf	Dry Unit W	eight =	105.8	pcf		Dry Unit Weight =	102.3	pcf	
	Void Ratio =	0.60		Void	Ratio =	0.57			Void Ratio =	0.63	-	
	Percent Saturation =	100%		Percent Satur	ation =	100%			Percent Saturation =	100%		
	D D	0.07				0.00						
	B Parameter =	0.96	/	B Parai	neter =	0.98	<i>i_:_</i>		B Parameter =	0.98	,	
	Shear Kale -	6 94	/min.	Snear	Rate =	37.68	/min.		Snear Kate =	20.00	/min.	
	Strain at Failure =	4 9%	611614.	Strain at Fo	-50 -	3 5%	IIIII		Strain at Failure =	10.5%		
		4,270		Juaniaria	mule –	2,270			Strain at Failure -	10.376		
	Cell Pressure =	68.0	psi	Cell Pre	ssure =	86.0	psi		Cell Pressure =	104.0	psi	
	Back Pressure =	50.0	psi	Back Pre	ssure ≕	50.0	psi		Back Pressure =	50.0	psi	
	Confining Pressure =	18.0	psi	Confining Pre	ssure =	36.0	psi 👘		Confining Pressure =	54.0	psi	
					12 C							
	Notes: Sample des	semption:	(UL) sandy SILTY	CLAY, fine to	coarse, s	some fine	to coarse	gravel; ye	llowish brown.			
	Atterberg I	nnus: er:	LL = 44 3/4 in = 100%	PL = 13 No. 4 - 02	% N	=14 - 000 ol	29 67% =	(ASIM L	14318) 1472 refer to concerta	report fo	r aradatio-	CURVA
	Specimen 1	vne	X Intact		20 constitut	10. 200 - ted	0770		2422, Teter to separate	Tepon to	grauation	cuive)
	Moisture fi	om:	Cuttines	X Fr	tire snee	imen						
	Saturation	method:	X Wet		v							
6	Failure crit	erion:	X (σ'1/σ'3)ma	(σ'	-σ' ₁) _{max}		% strain					
	Membrane	effect:	X Correcte	d No	ot Correc	ted						
												6 a
		_	-					-			~ 20	
	Golder A	Associa	ates Inc.	Ti	tle:							
	atlan	ta. Ge	orgia					A	STM D4767			
		,	8		CONSC	JLIDAT	ED UNDI	KAINED '	IRIAXIAL COMPR	ESSION	TEST RE	PORT
Job Shor	t Title:							SAMPLE	E AND TEST DATA			
	F IN/ENTERG	Y WHIT	E BLUFF/AR		1		n .					
Sample:				Te	chniciar	n:	Reviewed	CII.	Start Date:	Job Num	ber:	Figure:
					PWM	VF"C	ц. —	a	0			
	DD 4	UD 304	1 77 0/	CI	1eck;	2	Approve	d:	7/17/2010	101	1142	
	Kr-4	UD 20.	J-42.V		10	<u>.</u>			//1//2018	181(151/5	














							FLEXIE	BLE WALL	PERMEAB	BILITY					
								ASTM I	0 5084						
						1	METHOD I	D, CONSTA	NT RATE	OF FLOW					
ROJECT TIT	LE	FTN/ENT	ERGY WHIT	E BLUFF/A	R	1	Board #	¥ 7	1 0	OMMENTS					
ROJECT NUM	MBER	18103173				Flow Pump 2				Comments					
SAMPLE ID		RP-4		30.0-32.0'		Flow Pump Speed 7			1						
AMPLE TYPI	E	UD					Technician	FT	J						
ample Data Jr	itial					01.10									0
eight, inches	nnai	3 137	R-Value f	1.00	1	Sample Da	ta, Final bos	2 1 25	1				0		. .
iameter, inche	s	2.879	Cell Pres.	90.0		Diameter i	inches	2 878	1	WATER C	ONTENTS		Sample		Sample
rea, cm²		42.00	Bot. Pres.	80.0		Area. cm ²	Area. cm ²		WATER CONTENTS			σ	589.95		711 15
olume, cm ³		334.65	Top Pres.	80.0		Volume, cr	Volume, cm ³ 334		Wt Soil & Tare, f			в g	430.37		544.79
lass, g		589.95	Tot. B.P.	80.0		Mass, g		596.75	1	Wt Tare		g	0.00		114.47
loisture Conte	nt, %	37.08	Head, max.	123.80		Moisture Content, % 38.66		1	Wt Moistu	re Lost	159.58		166.36		
ry Density, pc	f	80.25	Head, min.	123.80		Dry Densit	y, pcf	80.36		Wt Dry Soi	l	g	430.37		430.32
bec. Gravity (a	issumed)	2.700	Max. Grad.	15.55		Volume So	lids, cm ⁻	159.40		Water Con	tent	%	37.08%		38.66%
olume Solids, (cm ³	159.40	Min. Grad.	15.55		Volume Vo	ids, cm'	174.81							
olume volds, (oid Patio	cm	175.25	1			Void Ratio		1.10							
aturation. %		91.1%				Saturation,	, % 0	95.2%	1	DESCRIPT	TION refine to co	arse sand: h	rown vellow and grav		
												ange sund, b	iown, yenow, and gray.		
		Flow Pump	o Rate	2.38E-04	cm ³ /sec		USCS	СН]			-			
-			TIM	E FUNCTIC	NS, SECO	NDS			dP				11		
	DATE	DAY	HOUR	MIN	TEMP	dt	dt,acc	dt	dt,acc	Reading	Head	Gradient	Permeability		
	08/07/18	43314	10	0	<u>(°C)</u>	(min)	(min)	(sec)	(sec)	(psi)	(cm)	15.88	(cm/sec)		
	08/02/18	43314	10	5	21.4	5	5	300	300	1.76	123.80	15.55	3.5E-07		
1	08/02/18	43314	10	10	21.4	5	10	300	600	1.76	123.80	15.55	5.5E-07 3.5E-07		
	08/02/18	43314	10	15	21.4	5	15	300	900	1.76	123.80	15.55	3.5E-07	*	
	08/02/18	43314	10	20	21.4	5	20	300	1200	1.76	123.80	15.55	3.5E-07	*	
	08/02/18	43314	10	25	21.4	5	25	300	1500	1.76	123.80	15.55	3.5E-07	*	
	08/02/18	43314	10	30	21.4	5		300	1800	1.76	123.80	15.55	3.5E-07	ŧ	
*1	FRANSCH	RIBED FRO	OM ORIGINA	AL DATA SI	HEETS					PEI	RMEABILI	TY REPOR	TED AS ** 3.5E-07 cm	n/sec **	
															DATE 8/2
															CHECK
															REVIEW
															AFFROVE











	I	nitial	I	Final	Notes						
Height =	1.000	in	0.988	in	Visual description (Golder procedure):	(CH) CLAY, tr	ace fine to coarse	e sand; olive gra	ıy.		
Diameter =	2.500	in	2.500	in	Atterberg Limits (ASTM D4318):	LL =	54	PL =	24	PI =	30
Area =	4.909	in ²	4.909	in ²	Percent Finer (ASTM D422):	3/4 in. =	100%	No. 4 =	100%	No. 200 =	99%
Volume =	4.909	in ³	4.848	in ³	Specimen Type:	Х	Intact		Reconstituted		
Water Content =	30.2%		34.0%		Remold Targets:						
Specific Gravity =	2.67	(ASTM D854)	2.67	(ASTM D854)	Water Content of Trimmings (ASTM D2216):	-					
Height of Solids =	0.5345	in	0.5345	in	Trimming Procedure:	Trimming ring					
Void Ratio =	0.871		0.848		Inundation:		Not inundated	Х	Inundated at	1.70	ksf
Degree of Saturation =	92.5%		100.0%		Test Method:		A	Х	В		
Wet Mass =	0.329	lb	0.338	lb	Apparatus:	GeoTac automa	ted consolidome	ter			
Dry Mass =	0.253	lb	0.253	lb	Final Water Content Specimen:	Х	Entire		Partial		
Wet Unit Weight =	115.7	pcf	120.6	pcf	Final Differential Height:	0.0000	in				
Dry Unit Weight =	88.9	pcf	90.0	pcf	Estimated Preconsolidation Stress:		ksf				

				At End of Prima	n Consolidatio	n		At End of Lo		[
						1				r	Time				
				Specimen							Deformation	Average Void	Coefficient of	Time to 50%	
	Axial Stress	Load Duration	Deformation	Height	Axial Strain	Void Ratio	Deformation	Specimen Height	Axial Strain	Void Ratio	Method	Ratio	Consolidation	Consolidation	
	(ksf)	(min)	(in)	(in)	(%)		(in)	(in)	(%)				(ft ^{-/} day)	(min)	
Seating*	1.70	60					0.0000	0.9925	0.00	0.857					
1	3.7	60					0.0082	0.9843	0.82	0.842					
2	1.0	60					0.0047	0.9877	0.47	0.848					
3	0.3	17					-0.0028	0.9953	-0.28	0.862					
4	0.5	60					-0.0029	0.9953	-0.29	0.862					
5	1.0	60					-0.0028	0.9953	-0.28	0.862					
6	2.0	60					0.0003	0.9922	0.03	0.856			1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -		
7	4.0	60					0.0080	0.9845	0.80	0.842					
8	8.0	240	0.0221	0.9704	2.21	0.816	0.0230	0.9695	2.30	0.814	2 (Root time)	0.822	0.322	1.3	
9	16.0	240	0.0429	0.9496	4.29	0.777	0.0468	0.9457	4.68	0.769	2 (Root time)	0.790	0.247	1.8	
10	4.0	240					0.0327	0.9597	3.27	0.796					
11	1.0	120					0.0147	0.9777	1.47	0.829					
12	0.3	27					0.0048	0.9877	0.48	0.848					
		I				I						I			
	-			_		Title:					1				
	G	older Ass	ociates In	с.						ASTM	D2435				
Atlanta, Georgia							ONF-DIMENSIONAL CONSOLIDATION TEST REPORT								
h Short Title	D +		<u> </u>					Ģ	SPEC	IMEN AND S		та			
5 SHOLL HU	FTN	V/ENTERGY V	VHITE BLUFF	/AR					SIEC	Inten And S	UNIMAKI DA				
mple:						Technician:		Checked:	Reviewed:	Approved:	Start Date:	Job Number:		Figure:	
		RP-9 UD	30.0-32.0'			PWN	/I/FT	INM	H		8/28/2018	1810	3173	1	











