

Russel and Axon 1965 Borings





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	DESCRIPTION	BY	ск
	REVISIONS		52 li
	RUSSELL & AXON		
******	Consulting Engineers, Incorporated	**************************************	4612
CF	i, FLA. St.	Louis.	Мо
W H	ATER WORKS PROJECT OAM & GATED SPILL	WAY	si ini Seliya Seliya Seliya
	PART B EMBANKMENT BORINGS COUNTY. F	LOR	
	FILE NO. S.	EAL	
	6353-3-4-I-B		
	SHEET	1 9050. A	N. C. e c d
	NO. OF 35 SHEETS	NR .	
	SCALE: NOTE	PED 61	

Bromwell Borings (1979)

DROJECT: Lake Manatee Dam Project So: 275 Project So: 105 CLIENT: Manatee County SAMPLER Project So: 1 of 2 County CONTRACTOR: GeoData Services, Inc. Correlation +16.0 Start 1/50, -140' ct. Correlation +16.0 Start 1/50, -140' ct. TVPE S Sample Start 1/7/79 Start 7/7/79 Start 7/7/79 Start 7/7/79 SIDE ID 1.5" Sample Project So: 7.5 Distart 7/7/79 Start 7/7/79 Sample SFT Loos Starts Finits 7/7/79 Start 7/7/79 Start 7/7/79 Sample SFT Loos Starts Finits 7/7/79 Start 7/7/79 Start 7/779 Sample SFT Loos Starts Finits 7/7/79 Start 7/779 Start 7/779 1 12 2 Start 7/79 Start 7/779 Start 7/779 1 12 Same Start 7/79 Start 7/79 Start 7/779 1 12 Same Same 78 Start 7/779 1 12 Same Same 78 Start 7/779 1 16 Same Same<										HOLE NO. B-2			T C
CASING SAMPLER CORE BARREL Firstith Firs	_ F _ C	ROJE	CT: - T: ACTOR:	Lake I Manat GeoDa	Manate ee Cou ta Se	e Dam inty rvices	, I	nc.		Project No. 275 Sheet No. 1 of 2 Location 17+50, -1	40'cL		POF
TYPE Start 1/7/73 Constraint GIZE ID 140 lbs J0" Driller J7/73 G HAMMER FAIL 30" Tinspector J. Brownell Series G No. Depth Blows fc Filler J.S. Series No. Depth Blows fc Filler J.S. Series 1 12 3 Brown fine sand Sieve 2 21 6 Same Same 3 16 6 Same Same 3 16 6 Same 7% 4 5 5 3 Grayish brown fine sand 7% 5 9 3 Same 7% 6 7 3 Same 7% 6 7 3 Same 7% 6 7 3 Same 7% 10 6 3 Same 7% 8 24 10 Gray fine sand 7% 8 24 10 Gray fine sand 0% 9 14 Gray fine sand 0% 0% 15 5 14 6%				CASI	NG	SAMPLI	ER	CORE BARRI	파	Elevation +18.0			
SIZE ID 1.5 ⁿ Diller Diller J.5 ⁿ B.F. IAMMER W2. 140.1bs Inspector J. Brownell Ins	T	YPE				S				Start 7/7/79			
HAMMER WT. 130" Inspector J. Bromwill HAMMER PAIL Sample Parth Blows Strata No. Papth Blows (raches branches fried can be shared from the same from the s	5	IZE	ID			$\frac{1.5"}{140.11}$	25		-	Driller J.B. & B.	R.		Zatra
Sample SPT Blows Strata FIELD CLASSIFICATION AND REMARKS S-#200 1 12 2 6 Same Sieve 2 21 6 Same Same Same 3 16 8 Same Same Same 4 5 5 2 Same 7% Same 5 9 3 Same 7% Same 7% 6 7 3 Same 7% Same 7% 6 7 3 Same 7% Same 7% 6 7 3 Same 7% Same 7% 7 10 6 3 Same 7% Same 8 24 10 Same 7% Same 7% 8 24 14 Gray fine sand Si Split Spoon 0% 9 14 Soft Si Split Spoon 0% 0% 8 24 14 Soft Si Split Spoon 0% 8 15 5.5 Soft Si Split Spoon 0% 9 10 10 10 Si Split Spoon 0% 10<	H	IAMME	R WT.			30"				Inspector J. Brom	WEIT		
No. Depth BLOWS /6 /rt Change FIELD CLASSIFICATION AND REALIZE SLEVE One 1 12 2 21 6 Same 1 1 12 9 Same 1 1 12 9 Same 1 12 12 6 Same 11 12 12 12 12 12 12 12 13 16 6 8 Same 7% 10 11 12 13 Same 7% 10 <	Sa	mple		SPT	Blows	Strata				REM	ARKS	-#200	Ö
1 12 2 2 21 6 3 16 8 4 5 5 5 9 3 5 9 3 6 7 3 6 7 3 7 10 6 3 14 3 15 9 3 5 9 3 3 6 7 3 3 6 7 7 10 6 3 8 24 14 3 9 3 9 3 9 3 9 3 9 3 9 3 10 6 3 15 15 5 16 3 15 5 16 3 17 10 10 3	ľ	10.	Depth	Blows	/6 Inches	Change		FIELD C	LAS	SSIFICATION AND INFI		STEVE	m
1 12 3 12 3 Same Same 3 16 8 Same Same Same Same 4 5 5 3 Grayish brown fine sand 7% Same 5 9 3 Same 7% Same 7% Same 6 7 3 Same 7% Same 7% Same 6 7 3 Same Same 7% Same 7% Same 7 10 6 3 Same Same 7% Same 7% Same 8 24 10 Gray fine sand Same	F			10	2		Br	own fine sa	and	. Th			
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3 16 8 Same F 4 5 5 3 Grayish brown fine sand F 5 9 3 Same 7% F 6 7 3 Same 7% F 6 7 3 Same 7% F 6 7 3 Same 7% F 7 10 6 3 Same 7% F 8 24 10 3 Same 7% F 8 24 10 Gray fine sand 7% F F 8 24 10 Gray fine sand		2		21	6]	Sa	me					Ш
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3 16 8 Grayish brown fine sand 7% 4 5 5 3 Grayish brown fine sand 7% 5 9 3 Same 7% Ju 6 7 3 Same 7% Ju 7 10 6 3 Same 7% Ju 7 10 6 3 Same 7% Ju 8 24 10 Gray fine sand 7% Ju Ju Ju 8 24 10 Gray fine sand Gray fine sand Ju Ju <t< td=""><td></td><td></td><td></td><td></td><td>6</td><td>_</td><td>6</td><td>mo</td><td></td><td></td><td></td><td></td><td></td></t<>					6	_	6	mo					
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5 9 3 Same 7% 6 7 3 Same 7% 7 10 6 3 Same 7% 7 10 6 3 Same 7% 7 10 6 3 Same 7% 8 24 10 Gray fine sand 7% 8 24 10 Gray fine sand 5% 9 0 to 2 Very Soft 5% Split Spon 10 to 30 Compact 8 to 15 Stiff 30 to 50 Dense 15 to 30 Very Stiff 5 Very Dense 15 to 30 Very Stiff		4	5	5	3		Gr	ayish brow	n 1	ine sand			a
5 9 3 Same 7% Jo 6 7 3 Same 7% Jo 7 10 6 3 Same 7% Jo 8 24 10 Same 7% Jo Jo 8 24 10 Gray fine sand Same Jo BLOWS/FT DENSITY BLOWS/FT CONSISTENCY SAMPLE IDENTIFICATION SUMMARY 0 to 4 Very Loose 0 to 2 Very Soft S: Split Spon Samples: 10 to 30 Compact 8 to 15 Stiff U: Undisturbed Piston Samples: 30 to 50 Dense 8 to 15 Stiff W: Wash Sample GO					$\frac{2}{3}$	-							D i
5 9 3 Same 6 7 3 Same 7% 7 10 6 3 Same 7% 7 10 6 3 Same 7% 7 10 6 3 Same 7% 8 24 10 Same 7% 7% 8 24 10 Gray fine sand Some Some 8 24 10 Gray fine sand Some Some 8 24 10 Gray fine sand Some Some 9 14 Gray fine sand Some Some Some 9 14 Gray fine sand Some Some Some 10 to 10 2 Very Soft S: Split Spoon Some Some 10 to 30 Compact 8 to 15 Stiff U: Undisturbed Piston Somples: Somples: Some Some 30 to 50 Dense 15 to 30 Very Stiff W: Wash Sample Somples Some Some					1							78	or
6 7 3 Same 7% 7% 7% 7 10 6 3 Same 7%		5		9	3	_	Sa	ame					I.
3 3		6		7	3		Sa	ame					-
7 10 6 3 Same Shelby Tube 10.5' to 12.5' (No recovery - too sandy) 7% 7% 8 15 5 Gray fine sand 0 0 0 0 8 24 10 6 3 Gray fine sand 0 0 0 8 24 14 0 Gray fine sand 0<		0			3								
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8 24 10 Gray fine sand Gray fine sand 8 24 10 Gray fine sand Gray fine sand BLOWS/FT DENSITY BLOWS/FT CONSISTENCY SAMPLE IDENTIFICATION SUMMARY 0 to 4 Very Loose 0 to 2 Very Soft S: Split Spoon OB: Rock: Samples: Hole No. 10 to 30 Compact 4 to 8 Firm D: Undisturbed Piston OB: Rock: Samples: Hole No. OB: Rock: Samples: Hole No.		7	10	6	3		S	ame	10	5' to 12.5'			C
8 24 10 Gray fine sand 00 8 24 10 Image: Gray fine sand 00 BLOWS/FT DENSITY BLOWS/FT CONSISTENCY SAMPLE IDENTIFICATION SUMMARY 00 0 to 4 Very Loose 0 to 2 Very Soft S: Split Spon OE: Rock: Samples: Hole No. 10 to 30 Compact 4 to 8 Firm 0: Open End Rod Nock: Samples: Hole No. Samples: Hole No.							5.	(No recove	ery	- too sandy)			a X
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8 24 10 Gray fine sand 5000000000000000000000000000000000000						_							
8 24 10 Gray fine sand 5 8 24 10 Gray fine sand 90 8 24 14 14 90 8 14 14 14 90 8 14 14 14 90 9 14 14 14 90 9 14 14 14 90 9 14 14 14 90 9 14 14 14 90 9 14 14 14 90 9 14 14 14 90 9 14 14 14 14 14 14 14 14 14 14 14 14 14 14 15 15 15 15 15 10													
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10 to 30Compact4 to 8FirmU:U:Undisturbed PistonSamples:Display:30 to 50Dense8 to 15StiffO:Open End RodHole No.U50+Very Dense15 to 30Very StiffW:Wash SampleUU		0 to	54 Ve	oose	2	to 4	Sc	oft	T:	Thin Wall Tube	Rock:	s :	
30 to 50 Dense 0 to 15 Still 50+ Very Dense 15 to 30 Very Stiff W: Wash Sample		10 to	30 C	ompact	4	to 8	Fi C+	rm tff		Open End Rod	Hole N	0.	G
	1	30 to	50 D + V	ense ery Den	se 15	to 30	Ve	ery Stiff	W :	Wash Sample	й. 		

		o Man	atee D	am		HOLE NO. B-2		F
PROJEC		natee	County			SHEET NO. 2 of 2		L L
CUTRU.		SPT	Blows	Ctrata			8-#200	
Sample	Depth	Blows	/6	Change	FIELD CLA	ASSIFICATION AND REMAR	KS Sieve	
No.	1	/Ft	Inches	Change			-	
	20	_	4		Damle amout modi	ium sand with pieces		
9		1	3	-	Dark gray meus	Lum Bana witch pittin	3.8	O
			4		OI WOOD			Ž
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	_ 25 _							in
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			2	-				•
10		9	2		Grav clav		83%	
10			6	1				
					End of Hole -	28'		
					Installed P-8	in bottom		
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PROJE CLIEN CONTE	ECT: La NT: Ma RACTOR	ake Mar anatee : Buddy	natee Count ZSyst	Dam -y :ems				HOLE NO. B-3 Project No. 275 Sheet No. 1 of 5			ORT
		CASI	NG	SAMPL	ER	CORE BAI	RREL	Location 12+00 Elevation 52			Ш
TYPE SIZE HAMME	ID R WT.			SS 2" 140 11 30"	os			Start 7/9/79 Finish Driller Pete Inspector B. Kesh	lian		NG RI
Sample		SPT	Blows	Ctrata	<u> </u>	L					m
No.	Depth	Blows /Ft	/6 Inches	Change		FIELD	CLA	SSIFICATION AND REM	IARKS	sieve	ŝ
l		24	8 13 11		Da Ci Da	ark brown rushed li ark brown	fin mest fin	ie sand ione ie sand			TESTE
2	_ 5 _	30	8 13 17		Co	ompact da	rk b	prown fine sand			Ø
3 UD-1	_ 10 _	17	798		V S	ery stiff clay helby Tub	gre e 10	eenish gray silty)' to 12' (24" recov	very)	83%	Lakeland, Florid
4	_ 15 _	11	3 5 6 3		G	ray silty	r cla	ay			ervices, Inc.
5 _	20	13	7 6	-	S	ame				82%	S
BLOWS	/FT DE	ENSITY	BLOW	S/FT (CON	SISTENCY	SAMI	PLE IDENTIFICATION	SUMM	ARY	t a
0 to 4 4 to 2 10 to 2 30 to 5 50+	4 Very 10 Loos 30 Comj 50 Dens Very	y Loose se pact se y Dense	0 t 2 t 4 t 8 t 15 t	o 2 o 4 o 8 c 15 o 30	Very Soft Firm Stif Very	y Soft	S: T: U: O: W:	Split Spoon C Thin Wall Tube F Undisturbed Piston S Open End Rod H Wash Sample	DB: Rock: Samples Hole No	5: D.	GeoDa

DROTE	ст.	Lake M	anatee	Dam		HOLE NO. B-3	
CLIEN'	r:	Manate	e Coun	ty		SHEET NO. 2 of 5	15
		SPT	Blows	Strata		8-#20	
Sample	Depth	Blows	/6	Change	FIELD CLA	ASSIFICATION AND REMARKS Siev	
INO.	20	/Ft	Inches		Shelby Tube 20	to 22' (24" recovery)	
00-2	20				bliciby rube		
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6	25	15	8		Same		F
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7		10	3		Same		
			5		Last airculat	ion at 30'	J ·č
	↓ ³⁰ .	4	5		Shelby tube -	no recovery;	Ī
UD-3					brown sand in	n tube holder	
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			2		Cray cand and	clay	O
8			2	-	Gray Sand and	Ciay	X
	35		5		Stopped and g	routed hole; moved to	
		1			4' off cente:	r line and washed to	
					30' for Shell	by l'ube	
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PROJE	CT: L	ake Ma	anatee	Dam		HOLE NO.	B-3			
CLIEN'	Г: М	anatee	e Count	У		SHEET NO.	3 of	5		15
Sample No.	Depth	SPT Blows /Ft	Blows /6 Inches	Strata Change	FIELD CLA	SSIFICATION	AND	REMARKS	%-#200 Sieve	E P (
UD-4	30				Washed to 30' Pushed 18" - (12" recovery	for Shelby T too hard to)	'ube; push			ING R
9	25	16	5		Stiff gray sil	ty clay			888	T BOR
	_ 35 _									LES.
10		22	8		Very stiff gra	y silty clay			.)	ida
UD-5	_ 40 _				Shelby tube 40)' to 41.5' ((18" :	recovery		and, Flor
11	_ 45 _	16	3 7 9		Same					Lakela
12 UD-6	50	46	7 11 35		Same Shelby Tube 5	0' t0 52' (2	4" re	covery)	84%	es, Inc.
					Wash to 58'					Jata Service
)			ı	I	A-10				1	Geol

DROTE	ידי• L	ake Ma	natee	Dam		HOLE NO. B-3		
CLIEN	<u>г:</u> М	anatee	Count	y		SHEET NO. 4 of 5		L L
Sample No.	Depth	SPT Blows /F+	Blows /6 Inches	Strata Change	FIELD CLA	%. ASSIFICATION AND REMARKS	-#200 Sieve	EPO
	55							
								(5
								3
UD-7					Shelby Tube 58	3'4" to 60' (20" recovery)		
			L		very stiff			
	60							
			7					S
13		25	8		Gray compact s	sandy clay		Ш
			17				÷	
								B
								G
	65				Wash to 68'			1
								0
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UD-8					Shelby Tube 68	8' to 69.5'		g
								O
								X
	70						010	0
14			2.0		Very dense gra	ay clayey silt with	813	
			50/1"		715 - yory ba	ard		
					/1.J Very ne			
					71.5-76 - Soft	ter, with lenses		
						3		
					76-78.5 - Hard	d. with soft lenses		-
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	I	ake M	anatee	Dam		HOLE NO. B-3		R
PROJEC	$r \cdot N$	lanate	e Coun	ty		SHEET NO. 5 OF 5		0
Sample	Depth	SPT Blows	Blows /6	Strata Change	FIELD CL4	ASSIFICATION AND REMARKS	%-#200 5 Sieve	П
No.		/Ft	Inches		Light gray, ve	ry hard slightly		ſĽ
15	80	TOP			silty coarse	sand		(5
				1	79.5-83 - Very	hard gray limestone		7
		1		1				
					Wash to 00 5'	with rock bit		E C
			L	4	83-86 - firm 1	imestone		0
				-				
				1				
	85]				S
	-	1			00 00 5 - Vory	, hard gray limestone		Ш
				4	86-88.5 - Very			
				-				
				-				
				-				
]				3
16					NO Sample	5.		D D
			50/1	-				2
	90	_		-				<u> </u>
								T
								Ĭč
-2				_	Soft from 93'	to		3
				_	BOIC HOM SO			e
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	95							
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							91%	
17		20) 5					l s
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		-	13		End of Hole -	- 100'		0
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PROJE CLIEN	ECT: L NT: M	ake Ma anatee • Budd	natee Coun	Dam ty tems			-	HOLE NO. B-4 Project No.275 Sheet No. 1 of	5		ORT
CONT	MCION	CASI	NG	SAMPL	ER	CORE BA	RREL	Location 17+50,	cL ≃ 4		
TYPE SIZE HAMME	ID CR WT.			SS 2" 140 1	bs			Start Finish Driller Pete			C R R
HAMME	R FAL	-		30				Inspector B. Ke	shian		Z
Sample No.	Depth	SPT Blows /Ft	Blows /6 Inches	Strata Change		FIELD	CLA	SSIFICATION AND R	EMARKS	%-#200 Sieve	30RI
l		23	5 10 13		Da	ark brown	, fin	ne sand			TESTE
2	_ 5 _	20	5 9 11		Sa	ame	,				rida
UD-14	_ 10 _				Sł Wo	nelby Tub ood in dr	e 8' ill	to 10' (18" reco cuttings	very)		eland, Flo
3		2	2		Gı	ray claye	ey sa	and		24%	Lak
4	_ 15 _	8	2 4 4		Sa	ame					, Inc.
UD-15					_ SI	helby Tuk	be 18	3' to 20' (18" rec	overy)		Services
BLOWS	/FT DE	NSITY	BLOWS	S/FT (CONS	SISTENCY	SAME	LE IDENTIFICATION	SUMM	ARY	ta
0 to 4 4 to 1 10 to 3 30 to 5 50+	Very LO Loos LO Comp Comp O Dens Very	y Loose se pact se y Dense	0 to 2 to 4 to 8 to 15 to	2 1 5 2 5 4 5 8 5 15 5 30	Very Soft Firm Stif: Very	Soft f Stiff	S: T: U: O: W:	Split Spoon Thin Wall Tube Undisturbed Piston Open End Rod Wash Sample	OB: Rock: Samples Hole No	:	GeoDa

PROJE	CT:	Lake M	lanatee	Dam		HOLE NO. B-4] ۲
CLIEN	Т:	Manate	e Coun	ty		SHEET NO. 2 of 5		
Sample No.	Depth	SPT Blows /Ft	Blows /6 Inches	Strata Change	FIELD CLA	SSIFICATION AND REMARKS	3-#200 <u>Sieve</u>	
5		9	2 4 5		Gray sandy cla	У	43%	
								INC
			2					
6	_ 25 _	8	5		Greenish gray	clayey sand		LS
UD-16					Shelby Tube 28	' to 30' (18" recovery)		F
7	_ 30 _	4	2 2 2		Greenish gray	clayey sand		Florida
8		7	15		Same			akeland
UD-17	_ 35 _				Shelby Tube 38	' to 40'		С.
9	_ 40 _	12	1.4		Same		30%	ices. In
10		14	8		Same with grav	el		ta Serv
	45		6 8		-			Da

) 1 5

Geo

PROJE	CT:	Lake N	lanatee	e Dam	HOLE NO. B-4		
CLIEN	Т:	Manate	ee Cour	nty	SHEET NO. 3 of 5		
Sample	Depth	SPT Blows	Blows /6	Strata	FIELD CLASSIFICATION AND REMARKS	%-#200 Sieve	D d
NO.		/Ft	Inches	change		1	Ш
UD-18	50				Loss of circulation at 48' Pushed sampler by hand 48.5' to 50'		T BORING F
11			0 0 2		Soft greenish gray clayey sand	36%	TES
12		4	2		Greenish gray slightly clayey sand	5%	
13	_ 55 _	19	6		Change from clayey sand to medium sand with organic debris Had the contact in the spoon		·lorida
UD-19					Shelby Tube 58' to 60'		akeland, F
14	_ 60 _	37	4 6 31		Greenish gray clayey sand		
	_ 65 _						Services, Inc.
15	70	66	18 28 38		Gray clayey sand with muck gravel and rock	29%	Data
					A-15		Geo

Sample No. Depth SITE Blows /Ft Blows /ft Strata Change FIELD CLASSIFICATION AND REMARKS %=#200 Sleve 75 - <th>PROJE CLIEN</th> <th><u>CT: I</u> F: M</th> <th>lanate</th> <th>anatee e Count</th> <th>Dam y</th> <th>HOLE NO. B-4</th> <th></th>	PROJE CLIEN	<u>CT: I</u> F: M	lanate	anatee e Count	Dam y	HOLE NO. B-4	
16 17 50/" 50 blows in very stiff clayey sand 16 80 17 50/" 80 80 80 80 17 9 8 80 76/" Same	Sample No.	Depth	SPT Blows /Ft	Blows /6 Inches	Strata Change	FIELD CLASSIFICATION AND REMARKS S	#200 ieve
16 17 50/" 9 80 17 50/" 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 80 8 85 8 85 8 90 76/" 90 8 80 8 80 8 80 8 85 8 85 8 85 8 85 8 85 8 85 8 85 8 90 8 90 8 8 8 8 8 8 8 8 8 8 8 8 8 8		75 _				Hit hard rock at 72', ran NX barrel from 72-77	
17 85 3ame 5ame 60	16	80	17	50/" 9 8		50 blows in very stiff clayey sand	i
17 90 Same	-	85_					
	17	90 _		76/"		Same	
95		95				·	

ł

PRO	JECT: ENT:	: :	<u>Lake M</u> Manate	lanatee e Coun	Dam tv		HOLE NO. B-4			
Sam <u>r</u> NO.	ple De	pth	SPT Blows /Ft	Blows /6 Inches	Strata Change	FIELD CLA	SHEET NO. 5 O	f 5 ID REMARK	s ^{%-#20}	° POR
18 UD-2	0_10	0_	37	10 16 21		Greenish gray c Shelby Tube 100	layey sand ' to 102'		32%	TEST BORING RE
	_ 105	5 -								d, Florida
19	_ 110	_	5	0/"		Greenish gray sa	ndy clay			Lakelan
	_ 115									Services, Inc.
20	120	4	0 1	. <u>3</u> 27	Gr. End	ay clayey sand d of Hole - 120'			33%)ata

GeoD

PROJ CLIE CONT TYPE SIZE HAMME	ECT: NT: RACTC	Lake M Manate DR: Gec CAS	Manatee ee Coun Data S SING	Dam ty ervices, SAMPLEI S 1.5" 140 lbs	Inc. R CORE 1	BARREL	HOLE NO. Project No. Sheet No. Location Elevation Start Finish Driller	B-5 275 1 05 17 + 5 37 7/18 7/18 JB 8	5 50 -60c: 5 3/79 9/79 8 BR	Ľ.	G REPORT
Sample	CR FAI	LL	Blowe	30"			Inspector	J. E	Bromwell		ĨŽ
No.	Depth	Blows /Pt	/6 Inches	Strata Change	FIEI	D CLAS	SSIFICATION	I AND	REMARKS	%-#200 Sieve	ORI
l		9	2 5	ם	ark brow	n fine	sand				m
2		15	4	S	ame						ESJ
3		24	6 10	S	ame						F
4	5	17	4	S	ame						
5		32	10 10 14 18	В	rown fine	e sand				88	Florida
6	10 <u>-</u>	19	5 10 9	B] Sł	lack fine Nelby Tub (No reco	e sand be from overy)	n 10'6" to	11'8"			akeland,
7	15 _	23	9 10 13	Da	rk brown	fine	sand			88	es, Inc. L
BLOWS/I 0 to 4 4 to 10 10 to 30 30 to 50	FT DE Very Loos Comp	NSITY Loose e act	BLOWS/ 0 to 2 2 to 4 4 to 8	FT CONS 2 Very 4 Soft 8 Firm	SISTENCY Soft	SAMPLI S: Sp T: Th U: Un	E IDENTIFI(Dit Spoon in Wall Tube disturbed Page	CATION	SUMMA1 OB: Rock: Samples	<u>RY</u>	oData Servic
50+	Dens Very	e Dense	8 to 1 15 to 1	15 Stiff 30 Very	E Stiff	O: Op W: Wa	en End Rod sh Sample	5001	Hole No.		Gec

PROJE	CT: L	ake Ma	anatee	Dam	HOLE NO. B-5		
CLIEN	Т: М	lanatee	e Count	у	SHEET NO. 2 of 3		
Sample	Depth	SPT Blows	Blows /6	Strata	FIELD CLASSIFICATION AND REMARKS	8-#200 Siowo	
NO.		/Ft_	Inches	Change		DIEVE	ΙL
	20		9		Shelby Tube 20' to 21'3" (15" recovery, wood in bottom)		ם כי
8		55	33		Dense dark brown fine sand		NIACA
9	_ 25 _	47	10 17 30		Same		TEST
							R
10	_ 30 _	36	10 11 25		Could not push Shelby 1" Dense dark brown fine sand	10%	Florid
11	_ 35 _	22	11 13 9		Gray medium sand		lakeland
	40_		14			ж х	es luc
12		32	19 13		Gray coarse sand		ata Servic

Geo

PROJE	CT: L	ake Ma	anatee	Dam	[]	HOLE NO. B-5		
CLIEN	Т: М	lanatee	e Count	y		SHEET NO. 3 Of 3		
Sample	Donth	SPT	Blows	Strata				
NO.	Depth	/Ft	Inches	Change	FIELD CLAS	SIFICATION AND REMARKS		
13	45	13	3		Soft gray clayey	y sand		
			8					0
								Ž
								m
	50							
	_ 30 _		10					S I
14			100		Same with grave	1 av with limestone		Ш
					fragments; cha	anged to rock bit	21%	
								g
								id
ŀ	- 55 -		50		No sample			0
		ļ						Ĩ
		-				-		-
								р
		-						ອີ
R.		t in the second s						O
		F						AE
	60 -	H						
		ļ			P-17 installed i	in hole		
		ŀ						
		-						20
		F	-					
								ທົ
	-							Ü
		Ē						<u>0</u>
1.11		-						۲<
		Ľ						Ð
		F						0
		-						3
		F						a
Chill I								0
10-10-1 								e
					a-20			G

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ENGINEERING SERVICES INCORPORATED

Proje	Project No. DES 116753 BORING NO. B-1									
Locat	tion S	nua See	Plate I	Forema	n .	J.R.				
Comp	oletior	٦	Depth To		Data	E 10	14.4			
De	pth		50.9" Date Water	1 Ime		5/3/	/11			
DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION SURF. EL: +36.7+/-'	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP					
0		Í	Dark brown Fine SAND (SP)							
- 5 -			Dark brown silty Fine SAND							
			with finely divided organic material (SM)							
- 10 -			Dark brown Fine SAND with trace of roots (SP)	-						
				2/3/2						
- 15 -			Loose dark brown Fine SAND with pockets of brown clayey Fine SAND (SP/SC)	2/2/3 3/4/4						
- 20 -		7	Loose grayish-brown Fine SAND (SP)	2/2/3						
- 25 -		7	with trace of finely divided organic material (SP-SM)	3/3/3	•					
- 30 -		/	Stiff to very stiff green phosphatic, sandy CLAY (CH)	2/3/10						
Ren	narks	**	Water Table not encountered within depth of 10.0'							
		Во	rehole Grouted	Casi	ng Length	35.0'				
					·····					



Proje	ct No	<u>]</u>	DES 116753 BORING NO. B	8-1	ty Florido	
Loca	tion 3	See	e Plate I	Journ	Forema	n J.R.
Com De	pletioi pth	ו	Depth To 60.9' Date 5/3/11 Water **	٦	Time	Date 5/3/11
DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION SURF. EL: +36.7+/-'		BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP 10 20 40 60 80
- 35 -			Stiff to very stiff green phosphatic, sandy CLAY (CH)		7/40/40	
40					7/10/12	
		/	Medium dense green phosphatic,		5/5/5	
- 45 -			Loose dark gray phosphatic Fine SAND (SP)		5/6/7	
- 50 -			Loose green phosphatic, silty Fine SAND (SM)		4/4/8	······································
- 55 -			Very stiff green phosphatic CLAY (CH)		8/7/7	
			Medium dense to very dense dark gray phosphatic Fine SAND (SP)			
00					19/50* * 	0.4' Penetration
- 65 -						
Ren	narks	** Bo	Water Table not encountered within depth of 10.0' rehole Grouted		Casir	ig Length 35.0'

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Proje	ct No	. <u>[</u>	BORING NO. B-2	ntu Elorido			
Loca	tion S	inu See	Plate I	Forema	in .	J.R.	
Com	oletio	า	Depth To				
De	ptn _	; 	51.5 Date 5/2/11 Water	Time	Date	5/2/	11
DEPTH , FT	SYMBOL	SAMPLES	SOIL DESCRIPTION	NO STANDARD NO STANDARD PENETRATION TE BLOWS/FT. ON 2" (SAMPLER-140 LE HAMMER, 30" DR			
		\mathbf{F}	Dark brown Fine SAND with trace of roote (SP)	9	10 20	40	60 80
- 5			Dark brown Fine SAND (SP) Dark brown Fine SAND (SP) Grayish-brown Fine SAND (SP) Brown Fine SAND (SP)				
- 10 -			Grayish-brown Fine SAND (SP) Loose dark brown Fine SAND (SP)	3/4/4	•		
			Very loose grayish-brown Fine SAND with trace of silty, slightly clayey Fine SAND (SP)	1/2/2			
- 15 -			Very loose to loose dark brown slightly silty Fine SAND with trace of finely divided organic material (SP-SM)	2/1/1	•		
- 20 -		/		2/3/2			
- 25 -			Loose grayish-brown Fine SAND (SP)	6/5/3	•		
- 30 -			Stiff green phosphatic, sandy CLAY (CH)	3/4/5	• • • • • • • • • • • • • • • • • • •		
	17						
Ren	narks	** Bo	Water Table not encountered within depth of 10.0' rehole Grouted	Casi	ng Length	30.0'	



Proje	ct No	. <u>C</u>	DES 116753	n Lake Mana	BORING N	IO. B-2	ty Florida					
Locat		See	e Plate I	I, Lake Mane	alee Dam, ma		Forema	n	J.R.			
Comp	letio	า	Ed El Doto	5/0/11	Depth To	**	Timo		Data	5/C		
De	ptn			5/2/11							./	
DEPTH, FT	SYMBOL	SAMPLES	SURF. EL: +30.	OIL DESC	RIPTION		BLOWS ON SAMPLER PER 6" OR PEN. STR.	PEN BLOV SAI HAM 10	STANDA ETRATIC VS/FT. OI VPLER-1 MER, 30 20	RD N TE N 2" (40 LI " DR 40	ST O.D. 3. OP 60	80
0.5	7.7	łŕ	Stiff green phose	hatic CLAY	(CH)						T	ТТ
- 35 -					(2.1)		4/4/5	•				
- 40 -							3/4/8	•				
- 45			Very stiff green p with gray phosph	ohosphatic Cl atic Fine SAI	_AY ND lenses(C	:H/SP)	9/12/13					
- 50 -			Medium dense g	ray phosphat	ic Fine SAND	(SP)	11/11/13					
	•··•·											
55												
- 60 -												
			:									
- 65 -												
	aarke	<u> </u>	Water Table pet	anountarad	within donth	of 10.0'						
ĸen	агкѕ	Bo	rehole Grouted	encountered	within depth (0.01 IC	Casi	na Lenath		30.0'		



Proje	Project No. DES 116753 BORING NO. B-3 Project Appual Dam Inspection Lake Manatee Dam Manatee County Florida											
Loca	tion S	See	Plate I	Lake Man	latee Dam, Mo		Forem	an	J.F			····
Com	pletio	า		- 10 / / /	Depth To	.11.						
De	epth	(60.8' Date	5/2/11	Water	**	Time		Date	5/2	/11	
DEPTH , FT	SYMBOL	SAMPLES	SURF. FL : +24.8	DIL DESC	RIPTION		BLOWS ON SAMPLER PER 6" OR PEN. STR.	PEN BLOV SA HAM	STAND ETRATIO VS/FT. C MPLER- MER, 3	ARD ON TE ON 2" (140 LI 0" DR	ST D.D. 3. OP	
0	1. 2. 76. 7	┢	Dark brown Fine S	SAND with	some roots (S	SP)				40		
			Dark brown Fine S	SAND WIT)	ЭГ) 						
- 5	1.1		Gray and orangisl	n-brown ph	osphatic, sanc	ly CLAY						
- 10			(CH) Green phosphatic Very loose light br (SP) Very loose dark bu of finely divided or Loose to very loos with trace of finely (SM) Very loose brown	, sandy CL own phosp rown Fine S ganic mate ganic mate divided or divided or	AY (CH) hatic Fine SAI SAND with trac erial (SP) wn silty Fine S ganic material	ND ce AND	1/1/2 3/3/4 1/1/2 1/0/0					
- 30			Stiff green phosph	atic CLAY	(CH)		3/5/4 3/5/5					
Rer	narks		vvater Table not e rehole Grouted	ncountered	a within depth o	DT 10.0'	Cas	ing Lenath)	26.0'		-
	Borehole Grouted Casing Length 26.0'											



Proje	ct No.	<u>]</u>	BORING NO. B-3 BORING NO. B-3	nty Elorida	
Local	tion S	See	Plate I	Forem	an J.R.
Comp De	pletion pth	3	Depth To 50.8' Date 5/2/11 Water **		Date5/2/11
DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION SURF. EL: +24.8+/-'	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TEST BLOWS/FT. ON 2" O.D. SAMPLER-140 LB. HAMMER, 30" DROP 10 20 40 60 80
- 35 -	[].		Stiff green phosphatic CLAY (CH)		
- 40 -		/	Hard green phosphatic, sandy CLAY with seams of dark gray phosphatic Fine to Medium Fine SAND (CL/SP)	4/4/6 5/19/50*	* 0.1' Penetration
- 45 -		7	Very dense gray phosphatic Fine to Medium Fine SAND (SP)	31/50*	* 0.4' Penetration
- 50 -		Z	Hard light gray cemented, dolomitic SILT (ML)	50*	* 0.3' Penetration
- 55 -			Hard green phosphatic, sandy CLAY (CL)	48/42/36	
	//		Very stiff green phosphatic CLAY (CH)		
- 60 -			Hard gray cemented, dolomitic SILT (ML)		* 0.3' Penetration
- 65 -					
Ren	narks	**	Water Table not encountered within depth of 10.0'		
	- 46	Bo	brehole Grouted	Cas	ing Length 26.0'



Proje	ect No.		DES 116753 BORING NO. B-4	ntv. Florida				
Loca	tion §	See	Plate I	Foreman		J.R.		
Com De	pletion pth	1	Depth To 55.0' Date 5/6/11 Water **	Time	Da	ate	5/6/1	1
DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION SURF. EL: +34.1+/-'	BLOWS ON SAMPLER PER 6" OR PEN. STR.	ST PENET BLOWS/ SAMP HAMME 10	ANDAR RATION FT. ON LER-140 ER, 30"	D TES 2" O.) LB. DRO 40	T D. P
0		ſ	Light brown Fine SAND with roots (SP)		v			
- 5			Dark brown Fine SAND (SP) Brown Fine SAND (SP)					
			Medium dense dark brown Fine SAND (SP)	3/8/4	•			
- 10 -			Loose to medium dense dark brown slightly silty Fine SAND with trace of finely divided organic material (SP-SM)	3/4/5				
				4/6/8				
- 15 -			Medium dense dark brown slightly silty Fine SAND (SP-SM)	8/12/12				
- 20 -			Dense to very loose dark brown slightly silty Fine SAND with trace of finely divided organic material (SP-SM)	12/19/24				
25			Firm to stiff green phosphatic, sandy CLAY, (CH)	5/1/2				
- 30 -			nim to sun green phosphatic, sandy CLAT (CH)	2/2/3	•			
Ren	narks	**	Water Table not encountered within depth of 10.0'	<u>، الم</u>		E		
		Bo	rehole Grouted	Casing	J Length	30	.0'	



Project No. DES 116753 BORING NO. B-4 Project Appual Dam Inspection Lake Manatee Dam Manatee County Florida									
Locat	tion §	See	Plate I			Forema	nJ.	R.	
Comp De	oletior pth	۱ ب	55.0' Date 5/6/11	pth To Water	**	Time	Date	5/6/11	
DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIF SURF. EL: +34.1+/-'	TION		BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANE PENETRAT BLOWS/FT. SAMPLER HAMMER, 10 20	DARD ION TEST ON 2" O.D. -140 LB. 30" DROP 40 60 80	
35			Firm to stiff green phosphatic, san Stiff green CLAY (CH)	ndy CLAY	(CH)	3/5/8			
- 40 -						3/5/7	• •		
- 45 -			Stiff dark green phosphatic CLAY	(CH)		3/5/5	•		
50						4/6/8			
- 55 -			Hard gray cemented, dolomitic SI	LT (ML)			* 0.0' Penetration		
- 60 -									
65 -									
Ren	narks	**	Water Table not encountered with	in depth of	10.0'		natonath		
		Bo	rehole Grouted			Casi	ng Length	30.0'	



Proje	ct No.)ES 11 al Dan	16753	l ake Man	BORING N atee Dam Ma	IO. <u>B-5</u> natee Coun	ity. Florida					
Locat	tion S	See	e Plate	I	, cano man			Forema	an	J.R.			
Comp De	oletior pth	1	50.4'	_ Date	5/4/11	Depth To Water	**	Time	Da	te	5/4/	'11	
DEPTH, FT	SYMBOL	SAMPLES	SURF	S(EL: +28.3	DIL DESC	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TES BLOWS/FT. ON 2" O. SAMPLER-140 LB. HAMMER, 30" DROI (AUTOMATIC HAMME				80		
0		Í	Brown	n and light b	orown Fine S	SAND (SP)							
- 5 -			Brown fragm Brown Dark	h Fine SAN hents (SP) h Fine SAN brown Fine	D with trace D (SP) SAND (SP)	M)						
- 10 -			Loose	e brown slig	htly silty Fin	e SAND with tr erial (SP-SM)	race	2/2/5	·				
	1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		Very I (SP-S	oose dark k SM)	prown slight	ly silty Fine SA	ND	1/2/1					
- 15 -			Loose slightl of fine	e to very loo ly silty Fine ely divided c	se dark bro SAND with organic mate	wn trace erial (SP-SM)		1/2/5					
- 20 -								WH/WH/ WH					
- 25 -			Very s	soft dark bro	own silty CL hatic, sandy	AY (CH) / CLAY (CH)		WH/4/9					
- 30 -			Firm (green to da	k green pho	osphatic CLAY	(CH)						
								2/3/4					
Rer	narks	** Bo	Wate	r Table not e Grouted	encountere WH = We	d within depth o ight of Hamme	of 10.0' er	Cas	ing Length	3	6.0'		



Proje	ct No.	. [DES 11	6753		BORING N	IO. <u>B-5</u>	h. Flavida		
Proje	tion S	inu See	al Dam Plate	Inspection	, Lake Man	atee Dam, Ma	natee Coun	Forema	an J.R.	
Comp	oletio	1	00.4	D-4-	FIAIAA	Depth To	** -		Data 5/4/	11
De	ptn _	r	60.4 ⁻	Date	5/4/11			I IIIIe		11
DEPTH, FT	SYMBOL	SAMPLES	SURF	SC 7. EL: +28.3	DIL DESC	RIPTION		BLOWS ON SAMPLER PER 6" OR PEN. STR.	STANDARD PENETRATION TES BLOWS/FT. ON 2" O. SAMPLER-140 LB. HAMMER, 30" DROI (AUTOMATIC HAMME 10 20 40	T D. R) 60_80
- 35 -	·/·		Firm g	green to dar	k green pho	osphatic CLAY	(CH)			
			Firm c	lark green p	phosphatic,	sandy CLAY	(CH)	2/3/4		
- 40 -								2/3/5	• •	
- 45 -			Firm c	lark green p	hosphatic (CLAY (CH)		2/3/3		
- 50 -			Dense (SP)	e gray phos	bhatic Fine	to Medium Fin	e SAND	27/13/19		
- 55 -			Hard (gray cemen	ted, dolomil	ic SILT (ML)		50*	* 0.2' Penetration	
- 60 -			Very d silty Fi	lense gray (ine SAND (cemented, p SM)	bhosphatic,		50*	* 0.4' Penetration	
- 65 -										
Rer	narks	** Bo	Water orehole	Table not of Grouted	encountered WH = We	d within depth o ight of Hamme	of 10.0' er	Cas	ing Length 30.0'	



Proje	ct No.	. <u>C</u>	ES 116753	Mar	BORING	NO.	B-6	ty Florida							
Locat	ion S	See	Plate I	IVICI		ianalee	Coun	Forema	in		J.R.				
Comp	oletion	า		4.4	Depth To	**	-		*************	Det		E	1 1 1 1	4	
De	ptn	;	5.5 Date 5/4/	11				Time	Γ		; 	رد	(4/ 1	1	
DEPTH, FT	SYMBOL	SAMPLES	SOIL D SURF. EL: +25.5+/-'	ESC	CRIPTION			BLOWS ON SAMPLER PER 6" OR PEN. STR.	Г В (А 1	STA PENETR/ LOWS/F SAMPLI AMMER, UTOMAT	NDA ATIO F. ON ER-14 30 TIC H 0	RD N TE N 2'' 40 L '' DF AMI 4(EST O.E .B. ROP MEI	- D. R) <u>60</u>	80
0			Brown Fine SAND (SP)												
- 5 -			- fabric at depth 3.0' Brown slightly silty Fine Brown Fine SAND with ((SP) Brown Fine SAND (SP) Brown Fine SAND with I	SAN	ID (SP-SM) e of clayey Fi stone fragme	ne SANI nts (SP)								
- 10 -	1.1.1		Very loose dark brown s	light	ly silty Fine S	SAND		1/0/1	•					+	┽┼┨
- 15 -			with trace of clayey Fine Loose dark brown slight with trace of finely divide (SP-SM)	ŠAI y sil d or	ND (ŚP-SM) ty Fine SANI ganic materi) al		1/1/1 2/3/2	•						
- 20 -			Very loose dark brown s with trace of finely divide (SM)	ilty F d or	Fine SAND rganic materi	al		WH/WH/1	•						
- 25 -		7	Firm green phosphatic,	and	ly CLAY (CF	(211)		2/2/4	•						
- 30 -			Firm green CLAY with tr	ace	of phosphate	(CH)		2/2/4	•						
Ren	narks	** Bc	Water Table not encoun rehole Grouted WH =	tere We	d within dept eight of Hamr	n of 10.0 ner)'	Casi	ing Len	gth		25.0)'		



Proje	ct No.	<u>_</u>	B 116753 B	ORING NO. B-6				
Locat	ion S	See	Plate I	e Dam, Manatee Ooum	Forema	n	J.R.	
Comp	letion	١	55.5' Date 5/4/11	Depth To Water **]	Time	Date	a 5/4	/11
DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCR		BLOWS ON SAMPLER PER 6" OR PEN. STR.	STA PENETR/ BLOWS/F SAMPLI HAMMER, (AUTOMAT 10 2	NDARD ATION TES T. ON 2" O ER-140 LB 30" DRC FIC HAMMI 0 40	5T .D. .PP ER) 60_80
- 35 -	.//		Firm green CLAY with trace of	phosphate (CH)				
- 40 -		/ /	Firm dark green phosphatic CL	AY (CH)	2/2/4 2/2/3			
- 45 -		/	Dense to medium dense gray p Fine to Medium Fine SAND (S	hosphatic P)	6/21/20			
- 50 -		7			7/12/14		•	
- 55 -			Gray phosphatic LIMESTONE a of gray phosphatic Fine to Medi	and seams um Fine SAND	50*	* 0.5' Penetratio	on	
65								
Rer	narks	**	Water Table not encountered w	vithin depth of 10.0'	~	· · · · · · · · · · · · · · · · · · ·	05.01	
		Bo	prehole Grouted WH = Weigh	t of Hammer	Cas	ing Length	25.0'	

DRIGGERS ENGINEERING SERVICES INCORPORATED

Proje	ct No.	. <u>C</u>	BORING	NO. <u>B-7</u>							
Proje	ct <u>An</u>	inu See	al Dam Inspection, Lake Manatee Dam, I Plate I	lanatee Coun	Foreman	}	J.R				-
Com	oletio	า	Depth To				_				
De	pth		<u>31.5'</u> Date <u>5/5/11</u> Water		Time		Date	5/	5/1	1	
DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION SURF. EL: +26.6+/-'		BLOWS ON SAMPLER PER 6" OR PEN. STR.	PENE BLOW SAM HAMI	STANDA ETRATIC /S/FT. O MPLER-' MER, 30 20	ARD DN T N 2" I40 L D" DF 4(ES [.] 0. .B. ROI	T D. P 60 :	80
0	k:: Z	ſ	Brown Fine SAND with trace of roots (S	P)				\top	Ť	ĨT	Ť
- 5			Grayish-brown Fine SAND (SP) Light gray Fine SAND (SP) Dark brown slightly silty Fine SAND (SP) Brown to dark brown Fine SAND (SP) Grayish-green phosphatic, clayey Fine S Dark brown slightly silty Fine SAND with of finely divided organic material (SP-SM Medium dense dark brown silty Fine SAN	-SM) AND (SC) trace 1) ND	- 7/7/9		•				
		1	with finely divided organic material (SM)		7/12/15						
- 10 -			Medium dense dark brown slightly silty F with trace of finely divided organic materi (SP-SM) - trace of cemented sand at depth 12.0'	ine SAND al	5/8/12						
- 15 -			Meduim dense dark brown slightly silty F with trace of finely divided organic materi and small pockets of clayey Fine SAND (SP-SM/SC)	ne SAND al	9/12/10		•				
- 20 -			Loose brown Fine SAND (SP)		6/5/5						
- 25 -		7	Very stiff green phosphatic CLAY (CH)		6/9/12						
- 30 -		7	Stiff green phosphatic, sandy CLAY (CH)	3/4/6						
Ren	narks	** Bc	Water Table not encountered within dept rehole Grouted	h of 10.0'	Casin	ng Length		20.0	<u></u> 1		



Proje	ect No.		BORING NO. B-8 BORING NO. B-8	ty Florida				
Loca	tion S	See	Plate I	Foreman		J.R.		
Com De	pletion epth	ו 	Depth To 31.5' Date 5/6/11 Water ** **	Time	Dat	te	5/6/11	
DEPTH, FT	SYMBOL	SAMPLES	SOIL DESCRIPTION SURF. EL: +31.8+/-'	BLOWS ON SAMPLER PER 6" OR PEN. STR.	STA PENETR BLOWS/F SAMPL HAMMEF 10	NDARD ATION T. ON 2 ER-140 R, 30'' E 20 4) TEST " O.D. LB.)ROP 40 60 8	0
0	C N	Í	Dark brown Fine SAND with trace of roots (SP)					
- 5			Brown, dark brown and light brown Fine SAND (SP) Dark brown Fine SAND (SP) Dark brown Fine SAND (SP)					
			Dark grayish-brown Fine SAND (SP) Medium dense dark brown and gray Fine SAND (SP)	8/12/14		•		
		1.		6/8/15		• ·		
- 10			Medium dense dark orangish-brown to dark brown Fine SAND (SP)	7/10/10		¥		
				7/9/9	•			
- 15		/	Medium dense dark grayish-brown clayey Fine SAND (SC)	7/9/15				
- 20 -		7	Dense dark brown slightly silty Fine SAND with trace of finely divided organic material (SP-SM)	9/16/23				
- 25 -			Firm dark green CLAY (CH)	3/3/5				
30 -			Stiff green phosphatic, sandy CLAY (CH)	10/6/7				
Rer	narks	**	Water Table not encountered within depth of 10.0'		I			
		Bo	rehole Grouted	Casing	Length	20.	0'	_

AFW 2013 Borings
		ameo foste whee	er eler			WELL NUMBER B-01 PAGE 1 OF 2
CLIEN PROJ DATE DRILL DRILL LOGG NOTE	IT <u>Carol</u> ECT NUN STARTE ING CON ING MET ED BY _ S <u>STA</u>	lo Engineer IBER _300 D _12/12/1 ITRACTOR ITRACTOR ITRACTOR Star ND 14+77.4, L1	rs, Inc. 472x2.05 3 COMF Independent Drill adard Penetration / CHEC 45ft	PLETE ing, In Mud F :KED I	: D <u>12/12</u> c. Rotary (Ar BY <u>G</u> A	PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County 2/13 GROUND ELEVATION 25.6 ft HOLE SIZE 3 inches GROUND WATER LEVELS: utomatic Hammer) AT TIME OF DRILLING AT END OF DRILLING Y AFTER DRILLING 18.34 ft / Elev 7.26 ft
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION WELL DIAGRAM
	AU 1			SP		(SP) brown poorly graded fine grained quartz SAND with little cemented sand and gravel (FILL)
	AU 2 SS 1	1-2-1-2 (3)			2.0	(SP-SC) brown, dark brown, gray, poorly graded fine grained quartz SAND with CLAY, very loose to loose, with clayey nodules (FILL)
	ss 2	(-) 1-1-2-1 (3)				Grout
 10	SS 3	1-1-1-1 (2)		SP- SC		
	SS 4	1-2-2 (4)				
	SS 5	3-2-3 (5)			15	.0 10.6 (SM) dark brown, variably SILTY SAND, very loose (FILL) ← Bentonite
	SS 6	1-1-3 (4)		SM		Plug Sand Pack
	SS 7	0	WOH - 2 ft			- Screen
		1-2-1 (3)			21	.5 4.1 (SC) greenish gray, variably CLAYEY SAND, very loose to medium dense (FILL)
	SS 9	4-6-6 (12)		sc		
	SS 10	2-3-5 (8)			26	.0 -0.4 (CL) greenish gray, variably SANDY CLAY, firm to stiff, trace to little sand sized phosphate particles (NATIVE)
	SS 11	3-3-4 (7)				
	SS 12	1-4-5 (9)		CL		
35	SS 13	3-3-5 (8)				

		ameo foste whee	er eler			WEL	L NUMBER B-01 PAGE 2 OF 2
CLIEN	T Carol	lo Engineer	rs, Inc.			PROJECT NAME _Lake Manatee Dam Evalua	tion
PROJ		IBER _ 3004	472x2.05			PROJECT LOCATION Manatee County	
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 14 SS 15 SS 15 SS 16	3-4-5 (9) 2-4-5 (9) 2-4-5 (9)		CL		 (CL) greenish gray, variably SANDY CLAY, firm to stiff, trace to little sand sized phosphate particles (NATIVE) (continued) 1-inch sand lense at 37-ft 	7.4
5	$\angle \frac{33}{17}$	10-50/5"				44.4 mostly cemented sand and silt (NATIVE)	8.8

			ameo foste whee	c er eler			WELL	PAGE 1 OF 2
CLIE	ENT	Carol	lo Enginee IBER _300	rs, Inc 472x2			PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County	n
DAT	E ST/	ARTE	D <u>12/12/1</u>	3		<u> </u>	OMPLETED 12/13/13 GROUND ELEVATION 28.3 ft HOLE 3	SIZE 3 inches
	LLING	CON	ITRACTOR	Inde	epend	dent	Drilling, Inc. GROUND WATER LEVELS:	
DRIL	LLING	MET	HOD Star	ndard	Pene	trat	on / Mud Rotary (Automatic Hammer) AT TIME OF DRILLING	
	GED	ВҮ _! 9та 1	ND 14+77 4 1 1	12ft		_ C	HECKED BY GA AI END OF DRILLING	
			(+ · <i>i i</i> . +, E					
DEPTH (ft)	SAMPLE TYPE	NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC		MATERIAL DESCRIPTION	WELL DIAGRAM
		AU					(SP-SM) brown, pale brown, gray, poorly graded fine grained quartz	
	1	1					(FILL)	
		AU						
-	\downarrow	2		-			- brown trace clay	
5	-	SS 1	3-2-3-3 (5)	SP- SM			- brown, trace clay	
		SS 2	2-4-5-6 (9)					
	\mathbf{A}	SS 3	4-4-4-4 (8)	-				
5 <u>10</u> 5	-/ \	-	(0)			1(0 18.3 (SM) brown, dark brown, variably SILTY SAND, very loose to loose,	Grout
	\mathbf{M}	SS	2-3-4	-			trace clay (FILL)	
		4	(7)	-				
		SS	2-2-4					
15	μ	5	(6)	SM				
	\mathbf{H}	SS	2-2-2	-				
-		6	(4)	-				
-		<u> </u>	222	-				
20		33 7	2-3-2 (5)			20	0 8.	
2				SP-			(SP-SM) brown, light brown, poorly graded fine grained quartz SAND with SILT, very loose (FILL)	← Bentonite
	- X	SS 8	1-1-3 (4)	SM				Plug
-						2:	0 5.:	
25	-	SS 9	1-1-0 (1)	SP-			with CLAY, very loose, few silt (FILL)	
			. /	30		26	0 2.3	Screen
	\mathbf{M}	SS	2-3-1				(CL) greenish gray, variably SANDY CLAY, soft to stiff, trace sand sized phosphate particles (NATIVE)	
_		10	(ד)	-				
<u> </u>	-	SS	2-3-5	-				
30		11	(8)	CI				
-	\square	SS	2-4-4					
	-1/1	12	(8)	-				
		SS	2-4-5	-				
35	M	13	(9)		V///			

		ameo foste whee	e eler		WELL	PAGE 2 OF 2
CLIEN PROJI	T <u>Caroll</u>	lo Engineer	r <u>s, Inc</u> 472x2		PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County	
C DEPTH	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	SS 14	2-3-5 (8)			(CL) greenish gray, variably SANDY CLAY, soft to stiff, trace sand sized phosphate particles (NATIVE) <i>(continued)</i>	
	SS 15 SS 16	3-2-5 (7) 2-6-4 (10)	CL			
45	SS 17	2-4-5 (9)			45.016.7	

		ame foste whee	c er eler			WELL	PAGE 1 OF 2
CLIE	NT Carol	llo Enginee	rs, Inc.			PROJECT NAME Lake Manatee Dam Evaluatio	n
PRO		/BER 300	472x2.05			PROJECT LOCATION Manatee County	
DATE	E STARTE	D 12/13/1	3 COMF	LETE	D 12	/13/13 GROUND ELEVATION 25.2 ft HOLE \$	SIZE 3 inches
	LING CON	TRACTOR	Independent Drilli	ina. In	с.	GROUND WATER LEVELS:	
	LING MET	HOD Star	ndard Penetration /	Mud F	Rotarv	(Automatic Hammer) AT TIME OF DRILLING	
	GED BY		CHEC		BY G		
	ES STA	16+10.4 1 1	01120		<u> </u>	$\overline{\mathbf{V}}$ AFTER DRILLING 18.48 ft / Elev 6.72 ft	
		10+10.4, E1			1		
DEPTH O DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	_ AU			SP		(SP) brown, gray, poorly graded fine grained quartz SAND, trace silt (FILL)	
	AU 2			L		(SP-SM) dark gray, dark brown, brown, light brown, poorly graded fine grained quartz SAND with SILT,	
		4000	-			very loose to loose, few clayey nodules (FILL)	
		(4)		еD			
		1_1_3_2	-	SM-			
	2	(4)					
	1 ss	2-3-3-1					Grout
5 10	3	(6)				10.0 15.2	
	Ť `					(SM) brown, dark brown modeling, variably SILTY	
	SS SS	2-2-3				some cemented sand (FILL)	
	7 4	(5)	-				
		212	-	0.14			
15		(3)		SIVI			
2							
	SS SS	1-2-4					. Dontonito
CAR	<u>}</u>	(6)	-			18.0 7.2	Plug
	22	1-3-3	-			⊻ (SP-SC) gray, greenish gray, poorly graded fine to medium grained quartz SAND with CLAY, very	Sand Pack
20	7	(6)		SP-		loose to loose, trace organics (FILL)	
				SC			
		0	WOR - 1.5 ft			225	- Screen
1/23/1		2-1-3	1			22.5 (CL) greenish gray, variably SANDY CLAY, soft to	
	9	(4)	-		\////	stiff, few to some sand sized phosphate particles (NATIVE)	
25	_					·····/	
	\downarrow						
		3-3-4 (7)					
	-	(.,	1				
2 -	- ss	2-4-5		CL			
30	11	(9)	fluid circulation at				
			30-ft				
	-1 SS 12	(8)					
	-		1				
	- ss	3-6-7	1			- 2-inch sand lense at 34 5-ft	
35	/ 13	(13)			V/////		

CLENT Carolic Engineers, Inc. PROJECT NUMER 200472x2.05 PROJECT NAME Lake Manates Dam Evaluation PROJECT NUMER 300472x2.05 PROJECT CLCATION Manates County WELL DIAGRAY Image: State of the stat			ameo foste whee	c er eler				V	VELL	PAGE 2 OF 2
PROJECT NUMBER 3004724205 PROJECT LOCATION Manates County Image: Image	CLIEN	NT Carol	lo Enginee	rs, Inc.				PROJECT NAME Lake Manatee Dam	Evaluation	
Image: State of the state o	PROJ		IBER _300	472x2.05				PROJECT LOCATION Manatee Count	у	
(CL) greenish gray, variably SANDY CLAY, soft to (CL) greenish gray, variably SANDY CLAY, soft to (NATIVE) (continued) (NATIVE) (continued) (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill, some sand sized phosphate particles (NATIVE) (NATIVE) (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill, some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, cemented sand and sill some sand sized (SM) greenish gray, SILTY SAND, very dense, (SM)	HTAD	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	REMARKS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	Elevation	WELL DIAGRAM
40 155 3-3-5		SS 14	2-5-6 (11)	-	CL			(CL) greenish gray, variably SANDY CLAY, soft stiff, few to some sand sized phosphate particles (NATIVE) (<i>continued</i>)		
SM 3.8 .18.6 Bottom of borehole at 43.8 feet.	1000	SS 15 SS 16	3-3-5 (8) 28-50/2"	-			40.0	(SM) greenish gray, SILTY SAND, very dense, cemented sand and silt, some sand sized phosphate particles (NATIVE)	-14.8	
Bottom of borehole at 43.8 feet.					5101		40.0		10.0	
	¥	SS 17	50/4"	<u> </u>			43.8	Bottom of borehole at 43.8 feet.	-18.6	
	י ניידד טווו און און און טון טא גאפאיטטו - זיגאינא ואי ויין יוי ויאטאיז בא גארארגריבא איזאיא ובב אאוידב ארייאין גיז יעראידי									

		ame foste	c er eler		WELL	PAGE 1 OF 2
	NT <u>Carol</u> JECT NUN E STARTE LING CON	IIO Enginee IBER _300 D _12/13/1 ITRACTOR	rs, Inc 472x2 3 1 Inde	2.05 epende	PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County COMPLETED 12/13/13 GROUND ELEVATION 30.8 ft HOLE S attor / Mud Rotary (Automatic Hammer) AT TIME OF DRILLING	n
	GED BY _	ND	34ft		CHECKED BY GA AT END OF DRILLING AFTER DRILLING	
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
	AU 1 AU 2				(SM) brown, dark brown, SILTY SAND, very loose to loose, trace clay (FILL)	
5	SS 1 SS 2	1-1-1-1 (2) 1-1-1-1 (2)	-			
	SS 3	2-3-3-4 (6)			- brown light brown dark brown dark grav	Grout
	SS 4 	1-1-2 (3) 1-2-2 (4)	SM		- blown, light blown, dark blown, dark gray	
	SS 6 SS SS	1-1-2 (3) 2-3-2	-		- wood fragments at tip of sample at 17 ft	← Bentonite Plug
20	SS 8	(5) 2-3-5 (8)	-		23.0 7.8	Screen
25	SS 9	6-11-11 (22)	SP- SC		(SP-SC) gray, dark gray, poorly graded SAND with CLAY, medium dense, few clayey nodules, petroleum odor (FILL) 25.0 5.8	
	SS 10	1-1-5 (6)	sc		(SC) greenish gray, variably CLAYEY SAND, loose, few cemented sand (NATIVE) 28.0 (CL) greenish gray, variably SANDX CLAY, firm to yony stiff, trace to	
30	SS 11	7-5-4 (9) 2-3-5			few sand sized phosphate particles (NATIVE)	
35	- 12 - 12 - SS 13	(8) 2-3-4 (7)				
00	<u>v v .c</u>	1 1.7	1	<u>V/////</u>	(Continued Next Page)	APPENDIX A

		amed foste whee	c er eler		WELL	PAGE 2 OF 2
CLIEN	T Carol	lo Enginee	rs, Inc		PROJECT NAME Lake Manatee Dam Evaluation	I
PROJ		IBER _300	472x2	2.05	PROJECT LOCATION Manatee County	
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
35					(CL) greenish gray, variably SANDY CLAY, firm to very stiff, trace to	
	SS 14	3-4-5 (9)			tew sand sized phosphate particles (NATIVE) (continued)	
40	SS 15	4-4-8 (12)	CL			
	SS 16	10-10-8 (18)	-			
45	SS 17	2-4-5 (9)			45.0 -14.2	

			ame foste whee	er eler			BORING NUMBER B-05 PAGE 1 OF 1
	CLIEN	IT Card	llo Enginee	rs, Inc.			PROJECT NAME Lake Manatee Dam Evaluation
	PROJ	ECT NU	MBER 300	472x2.05			PROJECT LOCATION Manatee County
	DATE	START	D 2/19/14	COM	LETE	ED 2/*	19/14 GROUND ELEVATION 21.4 ft HOLE SIZE 3 inches
2	DRILL	ING CO	NTRACTOR	Independent Drill	ing, Ir	IC.	GROUND WATER LEVELS:
S.GP	DRILL	ING ME	THOD Star	ndard Penetration /	Mud F	Rotary	AT TIME OF DRILLING
SING	LOGO	ED BY	ND	CHEC	KED	BY G	AT END OF DRILLING
- BO	NOTE	S STA	20+10.6. L1	20ft			AFTER DRILLING
DAM							
2 - MANAEE COUNTY	o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
472X		V ss	2-4-5-12				(SC) light brown, brown, dark brown, CLAYEY fine grained quartz SAND, loose
X/300			(9)	MC = 13%			to dense, trace organics (FILL)
ENDI		SS SS	13-16-15-		SC		
APP		2	(31)	MC = 18%			40 2 inch groonigh grov SANDY CLAY longe at 2.5 ft 17
ORT	5	SS SS	7-10-9-6				(SM) brown, SILTY SAND, loose to medium dense (FILL)
LREI		3	(19)	MC = 10%	SM		
NICA		V ss	5-4-4-3	NO 15%			- some clayey nodules
LECH		4	(8)	MC = 15%	SP		7.5 13 8.0 (SP) white light gray, very nale brown, poorly graded fine grained guartz 13
GEO		V ss	5-3-2-2			000	SAND, loose (FILL)
ORT	 10	5	(5)			200	(GP) poorly graded GRAVEL with fine grained quartz SAND, loose to very dense, damp above 11 ft (FILL)
NEP					GP	00C	
EVAL		SS SS	16-27-35			000	- nale brown, light gray, gray, fine grained guartz SAND pocket below 11.5 ft
DAM		/ 0	(62)			000] 13.0 8
Ш		1 99	7-3-8		-		(SC) greenish gray, gray, dark gray, variably CLAYEY SAND, medium dense,
MANA	15	7	(11)	MC = 30%			
FLK							
OLLO		ss 🕺	5-6-8	MC = 36%	SC		
CAR		/ \ •	(14)	PL = 17			
72X2		l ss	4-6-10	#200 = 19%			
\3004	20	9	(16)	MC = 54%			20.0 - some phosphate pebbles
59 - T:							Bottom of borehole at 20.0 feet.
GENERAL BH / TP / WELL - C-44 GINT STD US LABS.GDT - 4/29/15 14:							

PAGE 1 OF 1
m Evaluation
inty
HOLE SIZE 3 inches
PTION
artz SILTY SAND, very loose to
AYEY fine grained quartz SAND ained quartz SAND, organic
ction rubble
IZ SILTY SAND, dense, rew sand
medium dense, few to some

	-						BORING NUMBER B-07
		ameo foste	۲ ۲				PAGE 1 OF 1
		whee	eler				
	Caral	- Erainoa					PRO IFOT NAME I also Manatas Dom Evoluction
			<u>'S, INC.</u> 172v2 05				
DATE S	TARTE	D 2/19/14	+/ ZAZ.03	PI ETE	2/ חי	19/14	GROUND FI FVATION 19.5 ft HOLE SIZE 3 inches
DRILLIN			Independent Dril	ling. Ir	IC.		GROUND WATER LEVELS:
DRILLIN	NG MET	HOD Star	Idard Penetration /	Mud F	Rotary	,	AT TIME OF DRILLING
LOGGE	D BY	ND	CHEC	KED	BY G	6A	AT END OF DRILLING
NOTES	STA 2	20+13.2, L1	55ft				AFTER DRILLING
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION
0	/	0.0.0.7		+	- 88:		(SM) brown, dark brown, very dark brown, gray, fine grained quartz SILTY
t 12	1	2-2-6-7 (8)	MC = 6%				SAND, loose to medium dense, slight organic odor (FILL)
	ss 2	12-15-14- 14 (29)	MC = 4%	SM			
5	SS 3	14-13-11- 11 (24)	MC = 11%			6.0	- possible construction debris 13.5
	ss 4	19-19-21- 19 (40)	MC = 6%				(SM) white, light gray, pale brown, fine grained quartz SILTY SAND, dense, few cemented sands, possible construction debris (POSSIBLE FILL)
10	SS 5	14-15-18- 16 (33)	MC = 22%	SM		10 5	- pockets of light gray and white fine to medium-grained quartz (SP-SM)
	SS 6	2-1-1 (2)	MC = 43%	-		10.5	(SC) greenish gray, variably CLAYEY SAND, very loose to loose, trace sand sized phosphate particles (NATIVE)
15	SS 7	6-5-5 (10)	MC = 28% LL = 41 PL = 23 #200 = 33%	sc			- light gray
 20	SS 8	4-5-5 (10)	MC = 43%	-		20.0	- coarser with larger phosphate particles below 18 ft
							Bottom of borehole at 20.0 feet.

		ameo foste whee	: !r !ler				BORING NUMBER B-08 PAGE 1 OF 1
CLIEN	IT Caro	llo Engineer	rs. Inc.				PROJECT NAME Lake Manatee Dam Evaluation
PROJ		MBER _3004	472x2. <u>05</u>				PROJECT LOCATION Manatee County
DATE	STARTE	D 2/19/14	СОМ	PLETE	ED _2/	19/14	GROUND ELEVATION 19.8 ft HOLE SIZE 3 inches
DRILL		NTRACTOR	Independent Dril	lling, Ir	IC.		GROUND WATER LEVELS:
DRILL	ING MET	THOD Star	ndard Penetration /	/ Mud I	Rotary	,	AT TIME OF DRILLING
LOGO	SED BY _	ND	CHEC	CKED	BY G	GA	AT END OF DRILLING
NOTE	STA	19+81.6, L1	<u>56ft</u>				AFTER DRILLING
o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION
	ss 1	3-4-8-7 (12)	MC = 5%			(SM) br dense, t	own, dark brown, gray, fine grained quartz SILTY SAND, medium trace organics, slight organic odor (FILL)
	ss 2	8-12-12-12 (24)	MC = 7%	SM		- trace o	clayey nodules
5	SS 3	10-9-5-4 (14)	MC = 7%			6.0 - trace o	cemented sand 13.8
	SS 4	7-10-14-11 (24)	MC = 8%	SM		(SM) lig pockets 8.0	ht brown, fine grained quartz SILTY SAND, medium dense, with of light gray and white silty sand (POSSIBLE FILL) 11.8
	SS 5	14-12-14-9 (26)	MC = 15%			(SP) wh medium	nite, light gray, very light gray, poorly graded fine grained quartz SAND, n dense (POSSIBLE NATIVE)
 				SP			
	SS 6	11-13-9 (22)	MC = 21%	_		13.0	6.8
	SS 7	5-5-5 (10)	MC = 35% LL = 40 PL = 20 #200 = 28%			(SC) gre sand siz	eenish gray, variably CLAYEY SAND, loose to medium dense, trace zed phosphate particles (NATIVE)
				SC			
20	SS 8	4-6-7 (13)	MC = 43%			- more o	clayey with larger phosphate particles below 18 ft -0.2
	* 1				1111-1-1	/	Bottom of borehole at 20.0 feet.

		ameo foste whee	er eler					BORING NUMBER B-09 PAGE 1 OF 1	
СП	ENT Caro	Ilo Enginee	rs, Inc.					PROJECT NAME Lake Manatee Dam Evaluation	
PR	DJECT NU	MBER _300	472x2.05					PROJECT LOCATION Manatee County	_
DA		D <u>2/19/14</u>	COM	PLETE	ED _2	/19/14		GROUND ELEVATION 19.7 ft HOLE SIZE 3 inches	_
			Independent Dril	ling, Ir Mud I	<u>IC.</u>	,			
	GED BY				RY (, 30			-
	TES STA	19+53.0, L1	56ft		<u> </u>			AFTER DRILLING	_
	ш								
DEPTH	SAMPLE TYPI NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG			MATERIAL DESCRIPTION	n
	_ ss	4-4-7-9 (11)	MC = 6%				(SM) bro trace org	wn, dark brown, fine grained quartz SILTY SAND, medium dense, janics, slight organic odor to 2 ft (FILL)	
	SS 2	9-12-7-7 (19)	MC = 9%	SM					
5		10-9-6-6 (15)	MC = 10%			6.0	- trace cl	ay <u>13</u>	3.7
		8-13-14-15 (27)	MC = 9%				light gray	<i>i</i> and white (SP-SM) (POSSIBLE FILL)	
5 <u>10</u>	SS 5	14 (28)	MC = 17%	SM					
	SS 6	15-17-6 (23)	MC = 22%	-		13.0	- coarse	below 12 ft with trace organics	6.7
	- SS 7	5-5-5 (10)	MC = 34% LL = 33 PL = 20 #200 = 21%				(SC) gre sand-siz	enish gray, variably CLAYEY SAND, loose to medium dense, trace ed phosphate particles (NATIVE)	
	- - \/ ss	6-9-11	NO ONY						
20	8	(20)	IVIC = 60%			20.0		O).3

(ameo foste whee	: ≥r eler				BORING NUMBER E PAGE 1	3-10 OF 1
CLIE	NT Caro	llo Engineer	rs. Inc.				PROJECT NAME Lake Manatee Dam Evaluation	
PROJ	JECT NUN	/BER _300	47 <u>2x2.05</u>				PROJECT LOCATION Manatee County	
DATE	STARTE	D 2/19/14	COMI	PLETE	ED _2/*	19/14	GROUND ELEVATION 19.1 ft HOLE SIZE 3 inches	
DRILI			Independent Drill	li <u>ng, Ir</u>	י <u>-</u> ו <u>כ.</u>		GROUND WATER LEVELS:	
DRILI		HOD Star	ndard Penetration /	Mud I	Rotary		AT TIME OF DRILLING	
LOGO	GED BY _	ND	CHEC	KED	BY G	A	AT END OF DRILLING	
NOTE	STA	18+28.4, L1	72ft				AFTER DRILLING	
o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	Elevation
	ss 1	3-5-7-6 (12)	MC = 10%				(SM) brown, dark brown, very dark brown, fine grained quartz SILTY SAND, very loose to medium dense, trace glass fragments (FILL)	
	ss 2	6-11-12-9 (23)	MC = 13%					
5	SS 3	4-4-2-1 (6)	MC = 11%					
		1-0-1-0 (1)	MC = 10%	SM			- roots	
	SS 5	0-1-0-1 (1)	MC = 12% WOH - 6-inches				- small light gray clayey sand clods - 2-inch greenish gray CLAY pocket at 9 ft	
	ss 6	0-0-1 (1)	MC = 27% WOH - 1 ft	-			- variably SILTY fine grained quartz SAND, few plastics and glass below 1	
		1-2-3	MC = 38%			13.0	(SC) greenish gray, variably CLAYEY SAND, loose, trace sand sized phosphate particles (NATIVE)	6.1
<u>15</u> 		(3)		SC				
	- - - // ss	4-4-7	MC = 929/	CL		17.0	(CL) greenish gray, SANDY CLAY, stiff, layers of silty sand (SM), few sand sized phosphate particles	2.1
20	8	(11)	NIC = 82%			20.0		-0.9

			ameo foste whee	er eler				BORING NUMBER B-11 PAGE 1 OF 1
		Carol	lo Enginoo					DPO IECT NAME Lake Manatee Dam Evaluation
				15, IIIC. 172v2 05				
			DER <u>3000</u>	-12X2.03		-2/2	0/14	GPOLIND ELEVATION 17.8 ft HOLE SIZE 3 inches
		GCON		Independent Drill	ing Ir			
5		G MET	HOD Star	dard Penetration /	Mud F	Rotary		
		BY		CHEC	KFD	BY G	۵	
	NOTES	STA 1	17+87 7 1 2	208ft		. <u></u>	•	AFTER DRILLING
	O DEPTH (ft)	SAMPLE IYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION
1		SS 1	4-7-9-13 (16)	MC = 11%			(5 d	SM) dark brown, SILTY fine grained quartz SAND, very loose to medium ense, trace size shell fragments, light organic odor (FILL) 1in clayey sand pocket at 1 ft
		SS 2	8-10-14-17 (24)	MC = 4%	_			
		SS 3	11-11-12- 11 (23)	MC = 11%			-	less silty 6 ft to 10 ft
		SS 4	8-8-7-7 (15)	MC = 5%	_		-	trace cemented sand nodules at 6 to 6.5 ft light gray (SP-SM) pockets below 6.5 ft
		SS 5	5-5-3-4 (8)	MC = 4%	SM			
		SS 6	1-2-2 (4)	MC = 25%	-		-	gray (SP) pockets wet at 11 ft
		SS 7	1-2-2 (4)	MC = 27%	-			
		SS 8	1-1-6 (7)	MC = 25%	-			
	20	SS 9	2-4-5 (9)	MC = 33%			-	dark brown, gray, more silty below 18 ft
		SS 10	2-2-3 (5)	MC = 93%	-		20.5 (1 si	-2.: VIH) greenish gray, SANDY elastic SILT, firm to stiff, trace silt, trace sand ized phosphate particles (NATIVE)
	25	SS 11	4-4-5 (9)	MC = 82% LL = 134 PL = 68 #200 = 61%	мн			
	X	SS 12	4-5-7 (12)	MC = 99%			28.0	-10.2
	×	SS	47-50/2"		SC		(8 <u>29.2</u> c	SC) gray, CLAYEY SAND, very dense, few sand sized phosphate particles, emented zones
		13	I				\ <u>-</u>	light gray, cemented dolomitic silt at 29 ft Bottom of borehole at 29.2 feet.

			amec foster whee	r Ier				BORING NUMBER B-12 PAGE 1 OF 1		
CLIE	NT _			s, Inc.				PROJECT NAME Lake Manatee Dam Evaluation		
DATE	E ST		D $2/20/14$	COMI	PLETE	D 2/	20/14	GROUND ELEVATION 14.9 ft HOLE SIZE 3 inches		
	LINC		NTRACTOR	Independent Drill	ing, In			GROUND WATER LEVELS:		
	LINC		THOD Stan	dard Penetration /	Mud F	Rotary		AT TIME OF DRILLING		
	GED	BY _	JS	CHEC	KED	BY _G	6A	AT END OF DRILLING		
	ES _	STA	17+34.3, L29	96ft				AFTER DRILLING		
O DEPTH (ft)		NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION		
	\mathbb{N}	SS 1	5-6-9-8 (15)	MC = 9%				(SM) dark brown, SILTY fine grained quartz SAND, medium dense to very dense, organic odor (FILL)		
	\mathbb{N}	SS 2	9-15-15-19 (30)	MC = 11%				- cemented sand pockets		
5_5	\mathbb{N}	SS 3	13-21-32- 26 (53)	MC = 8%	SM					
		SS 4	24-25-27- 26 (52)	MC = 9%	_					
		SS 5	11-11-9-8 (20)	MC = 20%						
		SS 6	6-5-4 (9)	MC = 24%	SM		10.5	(SM) gray, greenish gray, brown, SILTY fine grained quartz SAND, loose, trace sand sized phosphate particles (NATIVE)		
15		SS 7	2-5-5 (10)	MC = 31%			13.5	(SC) dark greenish gray, CLAYEY SAND, loose to medium dense, trace silt, trace sand sized phosphate particles		
		SS 8	5-5-7 (12)	MC = 53%	SC		18.0	2.1		
20		SS 9	4-6-7 (13)	MC = 83%	-		18.0	(CH) dark greenish gray, SANDY fat CLAY, stiff to hard, trace silt, trace sand sized phosphate particles		
		SS 10	4-4-6 (10)	MC = 109%	-			- layers and pockets of phosphatic silty sand		
_ 25		SS 11	4-6-6 (12)	MC = 106%	СН					
) 		SS 12	50/2"					- layer of dolomitic SILT at 25.5 ft		
30	-	SS 13	11-16-22 (38)	MC = 40% LL = 55	-		30.0	- less sandy below 28 ft		
VELL				#200 = 91%				Bottom of borehole at 30.0 feet.		
GENERAL BH / TP /										

		amec foste whee	er eler				BORING NUMBER B-13 PAGE 1 OF 1		
CLIE	NT Caro	llo Engineer	rs, Inc.				PROJECT NAME Lake Manatee Dam Evaluation		
PRO	JECT NU	MBER 3004	472x2.05				PROJECT LOCATION Manatee County		
DAT	E STARTE	D 2/20/14	СОМ	PLETE	D _2/;	20/14	GROUND ELEVATION _14.7 ft HOLE SIZE _3 inches		
		NTRACTOR	Independent Drill	ling, Ir	IC.		GROUND WATER LEVELS:		
		FHOD Stan	dard Penetration /	Mud F	Rotary	, 			
			CHEC	CKED	BY _G	jA			
Wed	E3 <u>51A</u>	10+00.4, L4	041	1	1		AFTER DRILLING		
2 - MANAEE COUNTY I DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION		
00472	_ ss	2-3-9-9	MC = 7%			(SM) p dense	ale brown, brown, dark brown, SILTY fine grained quartz SAND, loose to trace organics, slight organic odor (FILL)		
		(12)		-					
		8-8-9-7 (17)	MC = 9%						
REPORTV	SS 3	2-5-3-3 (8)	MC = 8%	_		- local	construction debris (cloth and wire) at 5 ft		
	SS 4	5-8-8-10 (16)	MC = 8%						
0877/GEOT	SS 5	12-14-18- 19 (32)	MC = 11%						
M-EVAL\REPO	SS 6	14-16-18 (34)	MC = 16%	SM		- few s	ilty nodules, slight petroleum odor (11 ft to 15 ft)		
- - - - - - - - - - - - - - - - - - -	- SS 7	7-8-4 (12)	MC = 18%	_					
AROLLO-LK	SS 8	4-3-2 (5)	MC = 20%	-		- some - trace	e shell fragments construction debris (brick fragments) between 16 ft and 17.5 ft		
02472X2 00472X2 00	- SS 9	4-4-6 (10)	MC = 20%			20.5	-5.		
:59 - T:\'	ss ss	4-5-7	MC = 93%	CL		(CL) gi particle	reenish gray, SANDY CLAY, stiff, trace silt, trace sand sized phosphate es (NATIVE)		
15 14		(12)				23.0	-8.		
GDT - 4/29	- SS 11	5-12-13 (25)	MC = 51%			(SC) li dense	ght gray, gray, dark gray, CLAYEY fine grained quartz SAND, medium to very dense, dolomitic, trace silt, some sand sized phosphate particles		
ABS.	1 00	00.50/5"	140 0001	-		- trace	cemented sandy clay layers		
		26-50/5"	WC = 26%						
C-44 GINT S	- SS 13	10-16-14 (30)	MC = 47%	sc		- layer below	s and pockets of dark gray silty sand with sand sized phosphate particles 28 ft		
L / MELL -	- SS - 14	32-26- 50/4"	MC = 25%	-					
L/HBH/J	- - - - - SS 15	15-19-38 (57)	MC = 31%			35.0 - dolor	nitic cemented SANDY CLAY layer -20.		
С Ю							Bottom of borehole at 35.0 feet.		

			ame foste whee	er eler						BC	DRING NUMBER PAGE	B-14 1 OF 1
	CLIEN	NT <u>Carol</u>	lo Enginee	rs, Inc.						ike Manatee Dar	m Evaluation	
	PROJ	ECT NUM	IBER _ 300	472x2.05					PROJECT LOCATION	Manatee Cou	nty	
	DATE	STARTE	D <u>2/20/14</u>	СОМ	IPLETE	ED _2/2	20/14		GROUND ELEVATIO	N <u>17.7 ft</u>	HOLE SIZE _3 inches	
2	DRILL		ITRACTOR	Independent Dri	lling, Ir	nc.			GROUND WATER LE	VELS:		
2	DRILL	ING MET	HOD Star	ndard Penetration	/ Mud I	Rotary			AT TIME OF DF	RILLING		
	LOGO	GED BY	JS	CHE	CKED	BY _G/	A		AT END OF DR	ILLING		
	NOTE	STA	17+54.5, L1	47ft					AFTER DRILLI	NG		
	o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG			МАТ	ERIAL DESCRII	PTION	Elevation
		SS 1	2-2-4-3 (6)	MC = 65%				(SM) dar dense, tra	k brown, SILTY fine g ace organics, slight o	rained quartz SA rganic odor (FILI	AND, very loose to medium L)	
		SS 2	6-7-10-8 (17)	MC = 12%				- 2 inch c	layey sand pocket at	3 ft		
	5	SS 3	5-6-6-5 (12)	MC = 9%				- local ce	mented sand nodules	3		
		SS 4	6-3-3-3 (6)	MC = 11%								
	10	ss 5	1-1-1-2 (2)	MC = 12%				- trace fir	e gravel size cement	ed sand		
	 	SS 6	2-2-3 (5)	MC = 19%	SM							
	15	SS 7	4-4-3 (7)	MC = 21%				- wet belo - light gra	ow 13.5 ft ay sand zones 13.5 ft	to 17.5 ft		
		SS 8	6-8-7 (15)	MC = 22%	-							
	20	SS 9	2-2-2 (4)	MC = 29%	-			- trace de	ecomposing plant root	S		
- 00.4- 01.02		SS 10	5-6-4 (10)	MC = 35%				- large, c	oarse 3 inch decompo	osing wood fragr	nent at 21 ft	
		SS 11	7-5-5 (10)	MC = 55% MC = 22%			24.0	(CL) gree (NATIVE	enish gray, SANDY C)	LAY, stiff, few sa	and sized phosphate particles	-6.3
		SS 12	4-5-5 (10)	MC = 79%	CL							
	 30	SS 13	6-8-40 (48)	MC = 26% MC = 69% LL = 71	СН		29.5 30.0	(CH) ligh	t gray, SILTY fat CLA	Y, hard, dolomiti	ic, few cemented sands, trace	-11.8 e -12.3
				PL = 32 #200 = 65%]		L		Botton	n of borehole at :	30.0 feet.	/

		amec foste whee	: r !ler			BORING NUMBER B-1 PAGE 1 OF
CLIE	NT Card	ollo Engineer	s. Inc.			PROJECT NAME Lake Manatee Dam Evaluation
PRO	JECT NU	MBER <u>300</u> 4	472x2.05			PROJECT LOCATION Manatee County
DATE	E STARTI	ED <u>2/20/14</u>	СОМ	PLETE	ED _2/2	0/14 GROUND ELEVATION 15.8 ft HOLE SIZE 3 inches
	LING CO	NTRACTOR	Independent Drill	ling, Ir	IC.	GROUND WATER LEVELS:
	LING ME	THOD Stan	dard Penetration /	Mud I	Rotary	AT TIME OF DRILLING
	GED BY	JS	CHEC	KED	BY _G	A AT END OF DRILLING
	ES <u>Sta</u>	17+17.0, L2	19ft			AFTER DRILLING
- MANAEE COUNTY D DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0		1000				(SP-SM) dark brown, poorly graded fine grained quartz SAND with SILT, loose
- 1004		4-6-9-9 (15)	MC = 9%			to medium dense, trace organics, slight organic odor (FILL)
	SS 2	9-18-16-17 (34)	MC = 8%	SP-		
	SS 3	7-11-12-10 (23)	MC = 10%	SM		
	SS 4	8-5-4-4 (9)	MC = 12%			- light gray, gray, trace organics below 6 ft
10	SS 5	2-2-2-5 (4)	MC = 38%			(SC) light gray, gray, greenish gray, CLAYEY fine grained quartz SAND, very loose to medium dense, trace cementation, trace sand sized phosphate particles (NATIVE)
JAM-EVAL/RE	SS 6	3-3-3 (6)	MC = 32%	-		
X MANATEE	- SS 7	7-6-7 (13)	MC = 43%	-		
CAROLLO-L	SS 8	7-7-8 (15)	MC = 68%	sc		- greenish gray below 15 ft
2004/2X2	- SS 9	5-7-5 (12)	MC = 80% #200 = 22%	-		
- 00:G1 GL/6Z	SS 10	6-7-10 (17)	MC = 76%	-		
BS.GDT - 4/ - 72 - 52	- SS 11	4-6-6 (12)	MC = 104%			25.0
JSLA						Bottom of borehole at 25.0 feet.
P/WELL - C-44 GINT STD						

			amec foste whee	: Ir Iler			BORING NUMBER B-1 PAGE 1 OF	6 ∶1
	CLIE	NT <u>Car</u>	ollo Engineer	s, Inc.			PROJECT NAME Lake Manatee Dam Evaluation	
	PROJ		JMBER <u>3004</u>	4/2x2.05			PROJECT LOCATION _ Manatee County	
	DATE	START	ED <u>2/20/14</u>		PLETE	D _2/	20/14 GROUND ELEVATION 15.9 ft HOLE SIZE 3 inches	
GPJ	DRILI		DNTRACTOR	Independent Dril	ling, Ir	IC.	GROUND WATER LEVELS:	
NGS.	DRILI	LING ME	ETHOD Star	idard Penetration /	Mud I	Rotary	AT TIME OF DRILLING	
BORI	LOGO	GED BY	JS	CHEC	CKED	BY _G		
AM -	NOTE	S <u>S</u> TA	<u>17+84.8, L2</u>	71ft			AFTER DRILLING	
X2 - MANAEE COUNTY D.	o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ation
JIX\300472		ss 1	5 2-4-5-6 (9)	MC = 7%			(SP-SM) brown, dark brown, poorly graded fine grained quartz SAND with SILT, loose to medium dense, trace white sand (FILL)	
STAPPENE			8-10-13-12 (23)	MC = 10%				
AL REPOF		SS 3	4-7-8-8 (15)	MC = 10%	SP- SM			
DTECHNIC		ss 4	8-9-6-5 (15)	MC = 11%			- dark brown, black 6 ft to 8 ft	
PORT/GE(10	SS 5	5-3-3-3 (6)	MC = 11%	_		- gray, light brown 8 ft to 10.5 ft	5 /
M-EVAL\RE		ss 6		WOH - 1 ft MC = 26%	sc		(SC) gray, greenish gray, CLAYEY fine grained quartz SAND, very loose, trace sand sized phosphate particles (POSSIBLE FILL)	
DAN					1			2.9
K MANATE	15	SS 7	6 6-9-10 (19)	MC = 25% #200 = 2%	-		loose to medium dense, trace organics, possible riverbed sediments (POSSIBLE FILL)	
CAROLLO-L		SS 8	5 10-13-8 (21)	MC = 22%				
\300472X2 (ss 9	9-13-14 (27)	MC = 24%	SP			
3/15 15:00 - T:		SS 10	5 10-4-6 (10)	MC = 26%			- trace decomposing wood fragments	_
S.GDT - 4/26	 	ss 11	6 4-4-6 (10)	MC = 85%	CL		(CL) greenish gray, SANDY CLAY, stiff, trace sand sized phosphate particles (NATIVE)	<u>-1.</u>
STD US LAB			26-50/1"	MC = 35%	sc		 (SC) light gray, greenish gray, CLAYEY fine grained quartz SAND, very dense, trace sand sized phosphate particles - 3-inch cemented silt lense at 26.5 ft 	-9.6
/ELL - C-44 GINT 5	 <u>30</u>	SS 13	5 18-21-24 (45)	MC = 29%	CL		- (CL) greenish gray, light gray, SANDY CLAY, hard, locally cemented, trace sand seams with phosphate particles, clay portions hard and dry	<u>-12.′</u>
. BH / TP / W	 		21-50/4"	MC = 36%			33.0	-17.1
GENERAL	35	- SS 15	8-8-17 (25)		SC		(SC) gray, dark gray, greenish gray, CLAYEY fine grained quartz SAND, medium dense - 3-inch partially cemented clay lense at 34 ft	-19.1

Bottom of borehole at 35.0 feet. APPENDIX B

			ameo foste whee	e er eler				BORING NUMBER B-17 PAGE 1 OF 1
	CLIEN	IT Carol	lo Engineers	s, Inc.				PROJECT NAME Lake Manatee Dam Evaluation
	PROJ		IBER _ 3004	172x2.05				PROJECT LOCATION Manatee County
ГG	DATE	STARTE	D 2/21/14	СОМ	PLETE	D 2/2	21/14	GROUND ELEVATION 30.8 ft HOLE SIZE 3 inches
AM.G	DRILL	ING CON	TRACTOR	Independent Drillir	ng, Inc			GROUND WATER LEVELS:
L ∠L	DRILL	ING MET	HOD Stan	dard Penetration / N	lud Ro	otary		AT TIME OF DRILLING
cour	LOGG	ED BY	JS	CHEC	KED	BY G	۹	AT END OF DRILLING
IAEE	NOTE	S _STA 1	4+75.6, L72	2ft				AFTER DRILLING
INT FILES\300472X2 - MAN	o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION
OGSVALL G		AU 1		MC = 6%			(SM) pa trace or	le brown, brown, SILTY fine grained quartz SAND, loose to medium dense, ganics, slight organic odor (FILL)
30RING L		AU 2		MC = 9%				
EST/ALL F		SS 3	2-3-2-2 (5)	MC = 12%	_			
FIELD TI		SS 4	4-5-5-3 (10)	MC = 15%	_			
TEE\LAB 8	10	SS 5	3-5-7-7 (12)	MC = 19%	_			
2X4 LK MANA		SS 6	3-4-4 (8)	MC = 18%	SM			
TS\30047;	15	SS 7	4-7-10 (17)	MC = 15%	-		- brown	13.5 ft to 15 ft
OJEC			600		-		- light bi	own, dark brown below 15.5 ft
0)/PR			(18)	MC = 16%				
80000								
TECH (3	20	ss 9	5-9-12 (21)	MC = 17%	_			
GEO			0.40.0		-			
-9 - S			8-12-6 (18)	MC = 18%				
3DT - 2/5/20 13:4	 _ 25	SS 11	4-4-5 (9)	MC = 43% LL = 48 PL = 20 #200 = 22%			23.0 (SM) gr particles	7.8 eenish gray, SILTY SAND, loose to dense, trace sand sized phosphate (NATIVE)
ABS.C		ss ss	3-4-3	m = 32% MC = 44%	4			
N US L		/ 12	(7)					
T STL		V ss	5-18-15	MC = 24%	- 5M			sh arov light arov
-44 GIN	30	/ 13	(33)	IVIC - 24%	-		- greeni	sn gray, lignt gray
WELL - C		SS 14	3-3-4 (7)	MC = 32%				
/ TP /		22	4-7-5	MC = 39%			33.5 (SC) are	-2.7 eenish grav, CLAYEY SAND, medium dense, trace sand sized phosphate
L BH.	35	15	(12)	LL = 47	SC		35.0 particles	-4.2
SENER/				#200 = 49%				Bottom of borehole at 35.0 feet.

				amec foste whee	r Iler				BORING NUMBER B- PAGE 1 OF	18 F 1
	CLIEI PROJ	NT Jec'	Caro T NUN	Ilo Engineer	s, Inc. 172x2.05				PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County	
	DATE	ST	ARTE	D 2/21/14	СОМ	PLETE	D _2/2	21/14	GROUND ELEVATION _25.7 ft HOLE SIZE _3 inches	
GPJ	DRIL	LING	g coi	NTRACTOR	Independent Drill	ling, Ir	IC.		GROUND WATER LEVELS:	
NGS.	DRIL		G MET	FHOD Stan	dard Penetration /	Mud F	Rotary			
BORI	LOGO	GED	BY _	JS	CHEC	KED	BY <u>G</u>	iA		
- MM	NOTE	-s _	STA	14+02.4, L1	60ft	1		1	AFTER DRILLING	
42 - MANAEE COUNTY D	o DEPTH (ft)		SAMIPLE ITPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	ration
IX\300472>			AU 1		MC = 10%			(SM) bi trace c	rown, gray, SILTY fine grained quartz SAND, very loose to very dense, ayey nodules (FILL)	
TVAPPEND			AU 2		MC = 10%			· · ·		
AL REPOR	5	\mathbb{N}	SS 3	1-2-3-3 (5)	MC = 12%			- trace	fine gravel	
DTECHNIC		\mathbb{X}	SS 4	7-6-6-6 (12)	MC = 11%					
PORT/GEO	10	X	SS 5	5-5-3-2 (8)	MC = 11%	SM				
DAM-EVAL/RE			SS 6	1-1-1 (2)	MC = 20%					
< MANATEE	15		SS 7	19-33-28 (61)	MC = 16%	-		- loss c and mo	f circulation at 13 ft, encountered toe drain aggregate, abandoned hole oved west 1, drilled down to 13.5 ft and began sampling	
CAROLLO-LI			SS 8	21-25-24 (49)	MC = 21%	-		18.0 wot		77
72X2 (00	100		-		(SC) ar	eenish gray, CLAYEY fine grained quartz SAND, loose to medium	
- T:\30047	20		9	(5)	MC = 46%	_		dense,	trace sand sized phosphate particles (NATIVE)	
/29/15 15:00			SS 10	4-4-5 (9)	MC = 32%	sc				
ABS.GDT - 4	25		SS 11	9-9-9 (18)	MC = 24%					
T STD US L			SS 12	4-4-5 (9)	MC = 24%			28.0		-00
- C-44 GIN	 30		SS 13	4-4-5 (9)	MC = 62% LL = 92	мн		(MH) g particle 30.0	reenish gray, elastic SILT with sand, stiff, trace sand sized phosphate s	<u>-2.3</u> -4.3
NELL					#200 = 72%				Bottom of borehole at 30.0 feet.	
GENERAL BH / TP /										

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Piezometers Near Spillway (2014)

		f V	amec oster wheeler		WELL	NUMBER Well-1-D PAGE 1 OF 2				
CLIEN	T Caro	llo En	gineers, Inc.		PROJECT NAME Lake Manatee Dam -	Phase 2				
PROJ		IBER	300472x4		PROJECT LOCATION Manatee County					
DATE	STARTE	D 8/	18/14	COMPLETED 10/14/14	GROUND ELEVATION 28.1 ft	HOLE SIZE 10 inches				
DRILL	ING COM	NTRAG	CTOR Terra	a Sonic Drilling Services	LOCATION <u>N1148782.7</u> , E541016.5					
DRILL	ING MET	THOD	Sonic Core	9	GROUND WATER LEVEL AT TIME OF	F DRILLING				
LOGG	ED BY	JR		CHECKED BY DK						
NOTE	s									
o DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATER	IAL DESCRIPTION	WELL DIAGRAM				
 	SC 1	SP- SM		brown, dark brown, poorly graded f - trace clayey nodules from 6 to 8 f	ine grained quartz SAND with SILT					
 	SC 2	SP- SC	15.0	brown, greenish gray, SAND with C cemented	AY, trace to few clayey nodules, slightly					
	SC 3	SC		greenish gray, variably clayey, CLA particles	AYEY SAND, trace silt, trace phosphate					
 35	SC 4	CL	30.0	greenish gray, variably sandy CLA - sand lense at 32 ft - sand lense at 35 ft	Y, few to some silt	-1.9				
 - 40		-		- sand lense at 37 ft - sand lense at 39 ft						
 45	sc	sc	41.0	greenish gray, CLAYEY SAND, fev	v to some silt	-12.9 Bentonite Seal -16.9 Sand Pack				



WELL NUMBER Well-1-D PAGE 2 OF 2

PROJECT NAME _ Lake Manatee Dam - Phase 2

CLIENT Carollo Engineers, Inc. PROJECT NUMBER 300472x4

PROJECT LOCATION Manatee County

(tt) (tt) 45	SAMPLE TYPE	NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
45		5			executed every every nearly and the every device the OAND 10, OUT 1	
 50		5	SP- SM		greenish gray, gray, poorly graded fine grained quartz SAND with SILT, trace cemented silt nodules	
 <u>55</u>	 	SC 6	ML SP SP- SM		51.5 -23.4 52.0 light greenish gray, variably sandy SILT, cemented, dolomitic -23.9 53.0 gray poorly graded fine grained quartz SAND, phosphatic sands -24.9 54.5 greenish gray, gray, poorly graded fine grained quartz SAND with SILT, trace -26.4 gray, poorly graded fine grained quartz SAND, trace silt, trace cemented sand and silt nodules -26.4	Slotted Screen
60		SC	SP- SM ML		58.0 -29.9 greenish gray, gray, fine grained quartz SAND with SILT, trace phosphatic -31.4 59.5 particles, slightly desiccated -31.4 61.0 gray, variably sandy SILT, cemented, dolomitic, trace phosphatic particles, sandy -29.9	Blank
	Ц,	7			61.0 veins	Didilk

	f V	amec oster wheeler		WELL	NUMBER Well-2-D PAGE 1 OF 2					
CLIENT Caro	llo En	gineers, Inc.		PROJECT NAME _Lake Manatee Dam - Pl	nase 2					
PROJECT NUI	PROJECT NUMBER 300472x4 PROJECT LOCATION Manatee County									
DATE STARTE	DATE STARTED 8/19/14 COMPLETED 8/19/14 GROUND ELEVATION 35.79 ft HOLE SIZE 10 inches									
DRILLING CO	NTRAG	CTOR Terra	Sonic Drilling Services	LOCATION N1148894.3, E541146.4						
DRILLING ME	THOD	Sonic Core		GROUND WATER LEVEL AT TIME OF I	DRILLING					
LOGGED BY	LOGGED BY ND CHECKED BY DK HOLE COMPLETION									
NOTES										
O DEPTH (ft) SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL	DESCRIPTION	WELL DIAGRAM					
5 SC 1 10	SP- SM		dark brown, brown, poorly graded fine cemented sand fragments throughout	grained quartz SAND with SILT, trace						
15 SC 2	sc	12.0	gray, greenish gray, CLAYEY SAND 2-inch sand lense		23.8					
20	SP- SM		light brown, brown, poorly graded fine sand nodules	grained quartz SAND with SILT, trace silty	Grout					
25 SC 3	SC	22.0	greenish gray, variably clayey, CLAY throughout, trace phosphate particles	EY SAND, trace silt, small sandy pockets throughout	13.8					
		32.0	greenish gray, sandy SILT, sand lens phosphate particles throughout sandy	es throughout, sandy pockets throughout, zones						
35 SC 4 	SC	37.0	greenish gray, CLAYEY SAND, sandy	y lenses throughout, phosphate particles	-1.2 Sand Pack					
40	ML	40.0	greenish gray, variably sandy SILT, tr sand veins throughout - 2-inch thick sand lense	ace phosphate particles throughout, trace						
	SC	44.0	greenish gray, CLAYEY SAND, few p	hosphate particles throughout	-8.2					
			(Continu	ed Next Page)						

		f	imec oste whee	r ler	WELL	NUMBER Well-2-D PAGE 2 OF 2
	T Caro	llo En	aineer	s Inc	PROJECT NAME ake Manatee Dam - Pl	hase 2
PROJECT NUMBER _300472x4			_3004	72x4	PROJECT LOCATION Manatee County	
(tt) 45	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	WELL DIAGRAM
	5 5 5 5 6	SC SP- SC SP- SM		46.0 50.0 53.5	greenish gray, CLAYEY SAND, few phosphate particles throughout <i>(continued)</i> greenish gray, SAND with CLAY, few phosphate particles throughout, slightly silty, some cemented clayey nodules greenish gray, SAND with SILT, some phosphate particles throughout, some cemented silt fragments throughout	
55	7	SC		55.0	Dettern of borshole at 55 0 feat	-19.2

V	/0		9	*		WELL	NUMBER PZ-3A-D PAGE 1 OF 4		
	T Caral			•					
			172~1						
DATE	STARTE	D 4/18/17	+1 2 14		COMPLETED 4/19/17	GROUND FLEVATION 45 ft	HOLE SIZE 6 inches		
DRILL			Mac	drid End					
DRILL	ING MET	HOD Star	ndard	Penetra	ation / Mud Rotary	GROUND WATER LEVEL AT TIME OF D	RILLING		
LOGG	ED BY	DR	laara		CHECKED BY JB	HOLE COMPLETION 2-inch diameter PVC r	monitoring standpipe		
NOTE	S Locat	ion: Soil-cei	ment ı	upstrea	m slope behind south approach wall		······································		
DEPTH (ft) NUMBER BLOW COUNTS (N VALUE) (ft)						ERIAL DESCRIPTION	WELL DIAGRAM		
					6-inch casing installed to 40	feet below ground surface, sampling started			
					at 110 feet below ground su	urface			
35									
					(Co	ontinued Next Page)			

			4	*	WELL NU	MBER PZ-3A-D PAGE 2 OF 4			
			J.)					
PROJ	ECT NUM	IBER _3004	472x4		PROJECT LOCATION Bradenton, FL				
2 DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM			
- 40 - 40 -					G-inch casing installed to 40 feet below ground surface, sampling started at 110 feet below ground surface (continued)	- grout			

				*	WELL NU	MBER PZ-3A-D PAGE 3 OF 4			
			J.)	DDO JECT NAME J aka Manatoo Dam				
PROJ	ECT NUN	IBER <u>300</u> 4	472x4		PROJECT INAME _Lake Manatee Dam PROJECT LOCATION _Bradenton, FL	PROJECT LOCATION Bradenton, FL			
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM			
70 70 775 775 775 775 775 775 777 777 77					G-inch casing installed to 40 feet below ground surface, sampling started at 110 feet below ground surface (continued)	- fine sand pack			

V	/0	00	5	*	WELL NU	MBER PZ-3A-D PAGE 4 OF 4
	IT <u>Carol</u>	lo IBER 300/	172×4		PROJECT NAME Lake Manatee Dam PROJECT I OCATION Bradenton El	
HLd HLd 105	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
 				110.0	6-inch casing installed to 40 feet below ground surface, sampling started at 110 feet below ground surface <i>(continued)</i>	
 <u>115</u> 	SS 1	14-19-33 (52) 16-29- 50/4"	MH	118.0	dark gray, greenish gray, Sandy Elastic SILT, hard	← sand pack ← sceeen
 	SS 3	20-17-26 (43) 11-17-	SM		gray, greenish gray, SILTY SAND, dense to very dense	← bentonite plug
	4	50/5"		126.4	-81.4 Bottom of borehole at 126.4 feet.	

				*		WELL N	UMBER PZ-3A-M PAGE 1 OF 3	
M	/0	\mathbf{O}	J.	,				
CLIEN	T Carol	lo		, 		PROJECT NAME Lake Manatee Dam		
PROJ		IBER _ 3004	472x4			PROJECT LOCATION Bradenton, FL		
DATE	STARTE	D 4/13/17			COMPLETED 4/17/17	GROUND ELEVATION _45 ft	HOLE SIZE 6 inches	
DRILL	ING CON	ITRACTOR	Mad	lrid Eng	gineering Group			
DRILL	ING MET	HOD Star	ndard	Penetra	ation / Mud Rotary	GROUND WATER LEVEL AT TIME OF DRI	LLING	
LOGG	ED BY _	DR			CHECKED BY JB	HOLE COMPLETION 2-inch diameter PVC me	onitoring standpipe	
NOTE	S Locat	ion: Soil-ce	ement	upstrea	am slope behind south approach wa	И.		
o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATE	ERIAL DESCRIPTION	WELL DIAGRAM	
					6-inch casing installed to 30 at 40 feet below ground sur) feet below ground surface, sampling started face	- grout	
35								

V	* WELL NUMBER PZ-3A-M PAGE 2 OF 3								
CLIEN	CLIENT Carollo PROJECT NAME Lake Manatee Dam								
PROJ		BER _3004	172x4		PROJECT LOCATION Bradenton, FL				
G DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM			
					6-inch casing installed to 30 feet below ground surface, sampling started at 40 feet below ground surface <i>(continued)</i>				
 - 45 	SS 1	2-4-4 (8)	SC		greenish gray, CLAYEY SAND, loose				
 <u>55</u> 	SS 2	10-12-13 (25)	SP- SM		greenish gray, SAND with Silt, medium dense				
- 60 	SS 3 SS 4	4-6-9 (15)	МН		greenish gray, Sandy Elastic SILT, stiff to hard calcareous/dolomitic silt, cemented at 63.5 feet 70.0 -25.0	← fine sand pack ← sand pack			
						•			



				*		WELL	NUMBI	ER PZ-4-SR PAGE 1 OF 2
W	0	\mathbf{O}	J.	,				
CLIENT	Carol	lo				PROJECT NAME Lake Manatee Dam		
PROJE		IBER _ 3004	472x4			PROJECT LOCATION Bradenton, FL		
DATE S	TARTE	D <u>5/11/17</u>			COMPLETED <u>5/11/17</u>	GROUND ELEVATION 48.8 ft	HOLE SIZ	E 4 inches
DRILLIN	NG CON	ITRACTOR	Mad	lrid Eng	gineering Group			
DRILLIN	NG MET	HOD Star	ndard	Penetr	ation / Mud Rotary	GROUND WATER LEVEL AT TIME OF D	RILLING	
LOGGE	DBY	JD			CHECKED BY JB	HOLE COMPLETION backfilled with cuttings	s and benton	ite chips
NOTES				lpsirea				rough hollow stern aug
DEPTH (ft)	AMPLE TYF NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATE	ERIAL DESCRIPTION		WELL DIAGRAM
0	S					Ele	vation	874
	SS 1	2-4-6-10 (10)			gray, light brown, fine-grain shell fragments, very loose	ed quartz SAND, silty lensing, trace rock and to medium dense, dry to moist		
	ss 2	9-7-6-8 (13)						
	ss	5-3-4-4						
- {	ss	3-2-2-2			· •			
- 7	4	(4)	-		- - -			
 10	5	(10)	-					
			-					
 15	SS 6	2-5-6 (11)	-					
			SP		- - - -			grout
	1 00		-					
20	7	(2)						
		111	-					
25	8	(2)						
					· · ·			
		4 5 9	-					
30	× 33 9	(13)						
								⊢ fine sand
	ss	3-4-7	SP-		33.5		15.3	sand pack
35 🗸	V 10	(11)	SC		1			

WELL NUMBER PZ-4-SR

PAGE 2 OF 2

CLIENT Carollo

PROJECT NAME Lake Manatee Dam

PROJECT NUMBER 300472x4

*

PROJECT LOCATION Bradenton, FL

G DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM			
 40 -	SS 11	14-21-25 (46)	SP-		gray, brown, SAND with Clay, fine-grained quartz sand, trace lenses of yellow-orange phosphatic sands, medium dense to dense, moist to wet (Fill/ Possible Fill) <i>(continued)</i>				
 - 45 	SS 12	9-10-9 (19)	SC	48.5	0.3	- screen			
 _ <u>50</u> 	SS 13	8-8-11 (19)	CL- ML	50.0	gray-blue, Silty CLAY with Sand, with light gray lenses of fine-grained clayey sand, very stiff, moist -1.2 gray, light brown, CLAYEY SAND, fine-grained quartz sand, lenses of gray-black phosphatic sands, medium dense to dense, wet				
 - <u>55</u> 	SS 14	4-10-31 (41)	SC						
		10-12-16			44.0				
00		(20)	I	<u>[/////00.0</u>	-11.2 Bottom of borehole at 60.0 feet.	sing the second sector			
V	/0	00	5.	*		WELL	NUMBER PZ-4A-D PAGE 1 OF 5		
-----------------	-----------------------	-----------------------------	----------	----------------	---	---	-------------------------------	--	--
CLIEN	IT Carol	lo				PROJECT NAME Lake Manatee Dam			
PROJ	ECT NUN	IBER _3004	472x4			PROJECT LOCATION Bradenton, FL			
DATE	STARTE	D 4/24/17			COMPLETED <u>4/27/17</u>	GROUND ELEVATION _46 ft	HOLE SIZE _ 6 inches		
DRILL	ING CON	TRACTOR	Mad	lrid Eng	gineering Group				
DRILL	ING MET	HOD _Star	ndard	Penetra	ation / Mud Rotary	GROUND WATER LEVEL AT TIME OF D	RILLING		
LOGG	ED BY	DR			CHECKED BY JB	HOLE COMPLETION 2-inch diameter PVC r	monitoring standpipe		
NOTE	S Locat	on: Soil-cer	ment ı	upstrea	m slope behind north approach wall				
o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATE	ERIAL DESCRIPTION	WELL DIAGRAM		
					6-inch casing installed to 40 at 110 feet below ground su	feet below ground surface, sampling started			
					at 110 feet below ground su	Intace			
35					(Cr	ntinued Next Page)			

			4	*	WELL NU	MBER PZ-4A-D PAGE 2 OF 5
)	DPO JECT NAME Lake Manatee Dam	
PROJ		IBER 3004	472x4		PROJECT LOCATION Bradenton, FL	
DEPTH (ft)	IPLE TYPE IUMBER	BLOW COUNTS I VALUE)	J.S.C.S.	RAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
35	SAN	02		0	Elevation	
					6-inch casing installed to 40 feet below ground surface, sampling started at 110 feet below ground surface (<i>continued</i>)	- grout

				*	WELL NU	MBER PZ-4A-D PAGE 3 OF 5
			J.	•	PPO IECT NAME Lake Manatee Dam	
PROJ		10 1BER _3004	472x4		PROJECT INAME _Lake Manatee Dam PROJECT LOCATION _Bradenton, FL	
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
70 70 70 75 75 75 75 80 80 80 80 80 80 90 90 90 90 91 92 100 100 100 100					G-inch casing installed to 40 feet below ground surface, sampling started at 110 feet below ground surface (continued)	 - fine sand pack - sand pack

WELL NUMBER PZ-4A-D PAGE 4 OF 5 CLIENT Carollo PROJECT NAME Lake Manatee Dam PROJECT NUMBER _300472x4 PROJECT LOCATION Bradenton, FL SAMPLE TYPE NUMBER GRAPHIC LOG BLOW COUNTS (N VALUE) U.S.C.S. DEPTH (ft) MATERIAL DESCRIPTION WELL DIAGRAM Elevation 105 6-inch casing installed to 40 feet below ground surface, sampling started at 110 feet below ground surface *(continued)* 110 110.0 -64.0 dark gray, greenish gray, SILTY SAND, very dense, phosphatic sands, SS 25-23-33 trace dolomitic clay 1 (56) sceeen SM 115 SS 17-20-32 2 (52) -72.0 118.0 greenish gray, CLAYEY SAND, very dense, interlayered phosphatic sand layers, interlayeyred clay seams 120 SS 20-50/3" SC 3 123.0 -77.0 greenish gray, SILTY SAND, very dense, phosphatic sand layering 125 bentonite plug SS 50 SM 4 128.0 -82.0 greenish gray, lack, Sandy CLAY, hard, slightly silty, Abundant phosphatice sands 130 SS 11-18-29 5 (47) CL 135 14-19-30 SS 6 (49) 138.0 -92.0 sand backfill gray, greenish gray, CLAYEY SAND, very dense, silty, calcarious, clay SC lenses 140

(Continued Next Page)

				*	WELL NU	VBER PZ-4A-D PAGE 5 OF 5
M	VO	\mathbf{O}	J.)		
CLIEN PROJ	NT <u>Carol</u>	lo IBER <u>300</u> 4	472x4		PROJECT NAME Lake Manatee Dam PROJECT LOCATION Bradenton, FL	
	Ш					
EPTH (ft)	LE TY MBER	LOW NUNTS /ALUE	s.c.s.	APHIC -0G	MATERIAL DESCRIPTION	WELL DIAGRAM
	SAMF NU	SCB SCB	, <u> </u>	GR	Elevation	
	SS 7	16-50/5"			140.5	
	-					
			CL			
	ss 8	10-13-17				
		(00)		<u>V/////</u>	Bottom of borehole at 146.5 feet.	

V	/0	00	9	*		WELL I	NUMBER PZ-4 PAGE 1	A-M 1 OF 3
	T Carol	lo		,		PROJECT NAME ake Manatee Dam		
PROJ		1 BER 300-	472x4			PROJECT LOCATION Bradenton, FL		
DATE	STARTE	D 4/20/17			COMPLETED 4/21/17	GROUND ELEVATION 46 ft	HOLE SIZE 6 inches	
DRILL	ING CON	ITRACTOR	Mad	Irid End	gineering Group			
DRILL	ING MET	HOD Star	ndard	Penetra	ation / Mud Rotary	GROUND WATER LEVEL AT TIME OF D	RILLING	
LOGG	ED BY	DR			CHECKED BY JB	HOLE COMPLETION 2-inch diameter PVC r	nonitoring standpipe	
NOTE	S _Locat	ion: Soil-ce	ment ı	upstrea	m slope behind north approach wall.			
o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATE	RIAL DESCRIPTION	WELL DIAGR	RAM
					6-inch casing installed to 40 at 65 feet below ground surf	feet below ground surface, sampling started ace	- grout	
35								

			4	*	WELL NUI	MBER PZ-4A-M PAGE 2 OF 3
			J.			
PROJ	IT <u>Carol</u> ECT NUM	o BER 3004	472x4		PROJECT NAME Lake Manatee Dam PROJECT LOCATION Bradenton, FL	
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
35					Elevation 6-inch casing installed to 40 feet below ground surface, sampling started	
	SS 1	6-8-10 (18)	МН		at 65 feet below ground surface <i>(continued)</i>	 fine sand pack sand pack sand pack



		f V	amec oster wheeler		WELL	NUMBER PZ-26-D PAGE 1 OF 2
CLIEN	T Caro	lo En	gineers, Inc.		PROJECT NAME _Lake Manatee Dam - P	hase 2
PROJ	ECT NUM	IBER	300472x4		PROJECT LOCATION Manatee County	
DATE	STARTE	D _8/	13/14	COMPLETED <u>8/13/14</u>	GROUND ELEVATION 20.74 ft	HOLE SIZE 6.625 inches
DRILL	ING CON	ITRAC	CTOR Terra	a Sonic Drilling Services	LOCATION N1148934.1, E540729.4	
DRILL	ING MET	HOD	Sonic Core		GROUND WATER LEVEL AT TIME OF	DRILLING
LOGG	ED BY	SA		CHECKED BY DK	HOLE COMPLETION	
NOTE	s					
o DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIA	L DESCRIPTION	WELL DIAGRAM
 - 5 	SC	SP- SM	1.0	SAMPLES WERE BAGGED AND NO LABOROTORY TESTING, LITHOLO PZ-27 greenish gray, poorly graded fine gra phosphatic sands	OT CLASSIFIED TO CONDUCT OGY WAS AVERAGED FROM PZ-25 AND ined quartz SAND with SILT, trace	19.7
 - 15 20	SC 2	SP	20.0	brown, dark brown, poorly graded fin	e grained quartz SAND, trace silt	<u>6.7</u>
		SP- SC	23.0	brown, poorly graded fine grained qu sized phosphate	artz SAND with CLAY, trace sand to pebble	-2.3
 	SC 3	MH	31.0	light gray, sandy elastic SILT, cemer fine phosphatic sands	nted, common calcareous clayey sand, few	-10.3
	Ы	SM		greenish gray, variably clayey and sil	ty, SILTY SAND, trace phosphatic sands	Grout
-	\square	SP	33.0	dark gray, fine grained quartz SAND.	some fine phosphatic sand. trace silt	-12.3
35	∣ sc	MH	35.0	light gray and gray, variably sandy, S	ANDY SILT, cemented	-14.3
	4			gray, fine grained quartz SAND, few fragments	phosphatic fine sand, minor cemented silt	
	\square	SP		nagmente		
 - 40 		мн	<u>1949-04</u> [38.0	greenish gray, light gray, pale brown, phosphatic sands	, sandy elastic SILT, trace clay, few fine	-11.3
45	l ∖ sc					



		f V	amec oster wheele	iL		WELL	NUN	IBER PZ-26-M PAGE 1 OF 1
CLIEN	NT Caro	llo En	gineers, l	Inc.		PROJECT NAME Lake Manatee Dam - P	hase 2	
PROJ		/ BER	300472	2x4		PROJECT LOCATION Manatee County		
DATE	STARTE	D _8/	13/14		COMPLETED <u>8/13/14</u>	GROUND ELEVATION 20.85 ft	HOLE	SIZE _ 6.625 inches
DRILL		ITRA	CTOR _T	Ferra Sor	nic Drilling Services	LOCATION <u>N1148925.5</u> , E540735.2		
DRILL	LING MET	HOD	Sonic C	Core		GROUND WATER LEVEL AT TIME OF	DRILLIN	G
LOGO	GED BY _	SA			CHECKED BY DK			
NOTE	S							
o DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATERIAL	DESCRIPTION		WELL DIAGRAM
		SP- SM	1.	0 SA LA P2 gr ph	AMPLES WERE BAGGED AND NO ABOROTORY TESTING, LITHOLOO Z-27 reenish gray, poorly graded fine grain hosphatic sands	T CLASSIFIED TO CONDUCT BY WAS AVERAGED FROM PZ-25 AND hed quartz SAND with SILT, trace		⊸ Grout
 20	-	SP	20	4.0 br	rown, dark brown, poorly graded fine	grained quartz SAND, trace silt	<u>6.9</u>	
	-	SP- SC	23	br siz 3.0 lig	own, poorly graded fine grained qua zed phosphate aht gray, sandy elastic SILT, cement	rtz SAND with CLAY, trace sand to pebble ed. common calcareous clavey sand, few	-2.2	
25	- - - -	мн		fin	ne phosphatic sands			 ■Bentonite Seal ■Sand Pack
_ 30 _	1		31	1.0			-10 2	
[]]	SM		gr	reenish gray, variably clayey and silty	y, SILTY SAND, trace phosphatic sands		
	-		33	3.0	ark aray fine arained quartz CAND	some fine phosphatic cand, trace ailt	-12.2	
35	-	MH	34	<u>4.0</u> ua 5.0 lia	and gray, nine grained quartz SAND, so the gray and gray, variably sandy. SA	NDY SILT, cemented	-13.2	
	1			<u>gr</u>	ray, fine grained quartz SAND, few p	hosphatic fine sand, minor cemented silt		
-	4	SP		fra	agments			
 - 40 		мн	38	8.0 gr ph	reenish gray, light gray, pale brown, s nosphatic sands	sandy elastic SILT, trace clay, few fine	-17.2	Slotted Screen
45			45	5.0	D-# ()	rehele at 45 0 feat	-24.2	

ļ			a f	imec ostei vhee	r ler		WELI		BER PZ-27-D PAGE 1 OF 2
CLIEN	IT _C	aroll	lo Eng	gineers	s, Inc.		PROJECT NAME Lake Manatee Dam - I	Phase 2	
PROJ		NUM	IBER	3004	72x4		PROJECT LOCATION Manatee County		
DATE	STAF	RTEI	D_8/	11/14	GROUND ELEVATION 16.13 ft	HOLES	SIZE 6.625 inches		
DRILL	ING C	CON	TRAC	TOR	Terra	Sonic Drilling Services	LOCATION N1149156.4 , E540932		
DRILL	ING N	MET	HOD	Sonio	c Core		GROUND WATER LEVEL AT TIME OF	DRILLING	
LOGG	ED B	Y _/	٩S			CHECKED BY DK	HOLE COMPLETION		
NOTE	s								
o DEPTH (ft)	SAMPLE TYPE	NUMBER	U.S.C.S.	GRAPHIC LOG		MATERIAL I	DESCRIPTION		WELL DIAGRAM
	7		SP		1.0	brown, poorly graded fine grained quart	tz SAND, trace silt	15.1	
	2		SP- SC/		2.0	dark gray, brown, poorly graded fine gra clayey nodules	ained quartz SAND with CLAY, trace	14.1	
	\square					dark brown and gray, poorly graded fine	e grained quartz SAND, minor silt		
5	$\supset s$	sc							
	\sum	1	SP						
	\square								
	M								
10	2				10.0			6.1	
	Z		SP-			brown to dark brown, poorly graded fine	e grained quartz SAND, trace silts with		
	\sum		SC		12.0	groopich gray, variably clayer, fine grai	nod quartz CLAVEX SAND fow fing	4.1	
	\square					phosphatic particles, slightly dolomitic,	few phosphate gravel		
15	\bowtie s	sc	SC						
	\sum	2							
			N/I		17.0	palo brown, candy SILT		-0.9	
	\square	ł			18.0	dark greenish gray, SILTY SAND, sligh	t clay content, few phosphatic sands	-1.9	
20	2		SM						
	2				21.0		· · · · · · · · · · · · · · · · · · ·	-4.9	
	\sum	ł	MH		22.0	light gray, sandy elastic SIL I, cemente fine phosphatic sands	d, common calcareous clayey sand, few	-5.9	
	\square		SP		24.0	dark gray, trace silt, poorly graded fine	grained quartz SAND, some fine	-7.9	
25	\supset s	SC		TII		light grav to grav sandy elastic SILT d	olomitic few phosphatic sands		
	\int	3							
	\square		мн						
	М								Crout
30									Giout
	5	-	<u>en</u>		31.0	dark gray, poorly graded fine grained g	uartz SAND, some fine phosphatic sand	-14.9	
	\square	ł	MH		32.0	trace silt	danz SAND, some line prosphatic sand,	-15.9	
	М		SP		34.0	light gray to gray, variably sandy, SANE	DY SILT, cemented, dolomitic		
35	$\supset s$	SC [MH		35 5	uark gray, tine grained quartz SAND, so light gray and gray, variably sandy SAI	ome fine phosphatic sand, trace silt NDY SILT, cemented		
	\mathcal{A}	4	SP		27.0	gray, fine grained quartz SAND, few ph	osphatic fine sand, minor cemented silt	20.0	
	М				31.0	fragments	andy elastic SILT trace clay for fine		
	Н					phosphatic sands	andy clashe oil i, have edy, lew lille		
40	\square								
	\sum		MH						
	\square							Į,	
	М								
45	\supset s	SC						- K	

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WELL NUMBER PZ-27-D

PAGE 2 OF 2

CLIENT Carollo Engineers, Inc.

PROJECT NAME Lake Manatee Dam - Phase 2

PROJECT NUMBER			3004	472x4	PROJECT LOCATION Manatee County	
4 DEPTH 41	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	WELL DIAGRAM
	5	мн			greenish gray, light gray, pale brown, sandy elastic SILT, trace clay, few fine phosphatic sands <i>(continued)</i>	
 55 	SC 6			50.0	-3: gray, pale brown, grayish brown, SILTY SAND	3.9
 60		SM			- cemented silt fragments at 57 ft	■ Bentonite Seal
 				64.0	- cemented sand at 62.5 ft dark gray, gray, greenish gray, sandy elastic SILT, slight cementation	7.9
 	7	-			- clayey nodules at 67ft	
 <u>75</u> 	/// SC 8	МН			- cemented silt, fine phosphatic particles at 72 ft	-Slotted Screen
 - 80		_		80 5	â	
				00.5	Bottom of borehole at 80.5 feet.	

		f V	amec oste whee	r ler		WELL	. NUN	ABER PZ-27-M PAGE 1 OF 1
CLIEN	NT Caro	llo En	gineers	s, Inc.		PROJECT NAME Lake Manatee Dam - I	Phase 2	
PROJ		IBER	3004	72x4		PROJECT LOCATION Manatee County		
DATE	STARTE	D 8/	11/14		COMPLETED 8/11/14	GROUND ELEVATION 15.99 ft	HOL	E SIZE 6.625 inches
DRILL		ITRA	CTOR	Terra	Sonic Drilling Services	LOCATION N1149150.2, E540939.7	_	
DRILL	ING MET	THOD	Soni	c Core		GROUND WATER LEVEL AT TIME OF		IG
LOGG	SED BY	AS			CHECKED BY DK	HOLE COMPLETION		
NOTE	S							
o DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATER	IAL DESCRIPTION		WELL DIAGRAM
		SP		1.0	brown, poorly graded fine grained	quartz SAND, trace silt	15.0	
	-	SP-		2.0	dark gray, brown, poorly graded fir	ne grained quartz SAND with CLAY, trace	14.0	
			1	.	dark brown and gray, poorly grade	d fine grained quartz SAND, minor silt		X X
5	1						K	
		SP					Ŕ	
	-							
							K	
10				10.0			6.0	Grout
	-	SP-			brown to dark brown, poorly grade	d fine grained quartz SAND, trace silts with		X X
	-	30		12.0	greenish gray variably clayey fine	grained quartz CLAYEY SAND few fine	4.0	
	-				phosphatic particles, slightly dolon	nitic, few phosphate gravel		
15	-	SC						X X
	-							
	-	ML		17.0	pale brown, sandy SILT		-1.0	
				10.0	dark greenish gray, SILTY SAND,	slight clay content, few phosphatic sands	-2.0	X X
20	-	SM						
	-			21.0	light gray, sandy elastic SILT, com	ented common calcareous clavey sand few	-5.0	 Bentonite
	1			22.0	fine phosphatic sands		-6.0	Seal
		SP		24.0	dark gray, trace silt, poorly graded	fine grained quartz SAND, some fine	-8.0	Sand Pack
25	-				light gray to gray, sandy elastic SII	LT, dolomitic, few phosphatic sands		
	-							
		мн						
	-						-	
30	-			24.0			45.0	
	-	SP		32.0	dark gray, poorly graded fine grain	ed quartz SAND, some fine phosphatic sand,	-15.0	
]	MH		33.0	trace silt	CANDY SILT competed delemitic	-17.0	■ Slotted
	-	SP		34.0	dark gray, fine grained guartz SAN	ID, some fine phosphatic sand, trace silt	-18.0	Screen
35	-	MH		35.5	light gray and gray, variably sandy	, SANDY SILT, cemented	-19.5	
[_	1	SP		37.0	gray, fine grained quartz SAND, fe fragments	w phosphatic fine sand, minor cemented silt	-21.0	
	-	мн			greenish gray, light gray, pale brow phosphatic sands	vn, sandy elastic SILT, trace clay, few fine		
40				40.5	D-#-	f harabala at 40 5 fact	-24.5	
					Bottom o	I DOTENDIE AT 40.5 TEET.		

CLIENT Carolio Engineers, Inc. PROJECT NAME Lake Manatee Dam - Phase 2 PROJECT NAMER 300472x4 PROJECT NAME NoLE Size 6 incl DATE STARTED 102716 COMPLETED 128/16 GROUND ELEVATION 28 incl Incl Size 6 incl DRILING CONTRACTOR Adamen & Associates, Inc. LOCATION N1149013.77, ES1139.61 LOCATION N1149013.77, ES1139.61 INCL Size 6 incl DRILING CONTRACTOR Adamen & Associates, Inc. LOCATION N1149013.77, ES1139.61 LOCATION N1149013.77, ES1139.61 INCL Size 6 incl NOTES CHECKED BY JS CHECKED BY JS HOLE COMPLETION WELL DL NOTES SM 01 2.0 very pale brown, SILTY SAND, parially cemented, trace Imesit 2.0 AU SM 1 2.0 very pale brown, SILT SAND, fine grained sand, local thin clay lenses, trace fine gravel at 9 to 10 feet 100 100 SPT 7.7.13 SM Incl 2.0 greenish gray, CLAYEY SAND, very fine sand, local thin clay lenses, trace fine gravel 6.0 SPT 3-8-11 SM 1 Incl 3.0 100 feet 10.0 SPT 1-3-14 <td< th=""><th></th><th>amec foster wheel</th><th>r ler</th><th></th><th>WELL</th><th>NUMBER PZ-28-M PAGE 1 OF 2</th></td<>		amec foster wheel	r ler		WELL	NUMBER PZ-28-M PAGE 1 OF 2	
PROJECT NUMBER 300472x4 PROJECT LOCATION Manage County DATE STATED 122/16 COMPLETED 1/22/16 GROUND ELEVATION 28.11 HoLE SIZE 6 intel DRILING CONTRACTOR Adames & Associates, inc. LOCATCON NITA00137, 72.541139.01 GROUND WATER LEVEL AT TIME OF DRILLING DRILING CONTRACTOR Adames & Associates, inc. LOCATCON NITA00137, 72.541139.01 GROUND WATER LEVEL AT TIME OF DRILLING NOTES CHECKED BY JB HOLE COMPLETION WELL DI	CLIENT Carol	lo Engineers	s, Inc.		PROJECT NAME Lake Manatee Dam - Phase 2		
DATE STARTED 1/27/16 COMPLETED 1/28/16 GROUND ELEVATION 28 ft HOLE SIZE 6 incl DRILLING CONTRACTOR Adarmen & Associates, Inc. LOCATION N114901377, E61139.81 CHECKED BY JS GROUND WATER LEVEL AT TIME OF DRILLING INCLES CHECKED BY JS CHECKED BY JB HOLE COMPLETION MATERIAL DESCRIPTION WELL DL 0 YS YS </td <td>PROJECT NUM</td> <td>IBER _ 3004</td> <td>72x4</td> <td></td> <td>PROJECT LOCATION Manatee County</td> <td></td>	PROJECT NUM	IBER _ 3004	72x4		PROJECT LOCATION Manatee County		
BRILLING CONTRACTOR Adarmen & Associates, Inc. LOCATION N114901377, E511139.81 DRILLING METHOD Standard Penetration / Mud Rotary GROUND WATER LEVEL AT TIME OF DRILLING	DATE STARTE	D 1/27/16		COMPLETED 1/28/16	GROUND ELEVATION _28 ft	HOLE SIZE 6 inches	
DRILLING METHOD Standard Penetration / Mud Rotary GROUND WATER LEVEL AT TIME OF DRILLING	DRILLING CON	TRACTOR	Adarmen	& Associates, Inc.	LOCATION <u>N1149013.77</u> , E541139.81		
LOGGED BY JS CHECKED BY JB HOLE COMPLETION NOTES	DRILLING MET	HOD Stand	dard Pene	tration / Mud Rotary	GROUND WATER LEVEL AT TIME OF D	DRILLING	
NOTES Second State	LOGGED BY _	JS		CHECKED BY JB			
The set of th	NOTES						
AU SP 10 Drown, fine grained quartz SAND, frace sit 27.0 AU 20 very pale town, SILT SAND, partially cemented, trace limesit 26.0 SPT 7.7.13 SP 10 brown, fine grained quartz SAND with SILT, trace clayey nodules SPT 6.63 SM 12.0 very pale town, SILT SAND, partially cemented, trace limesit 26.0 SPT 6.5-8 5 (13) trace gravel at 9 to 10 feet 16.0 SPT 6.5-8 13.0 trace fine gravel trace fine gravel 16.0 SPT 1-3-11 SM 12.0 cal sand lenses between 18 to 20 feet 6.0 SPT 1-3-14 SC SC greenish gray, CLAYEY SAND, very fine sand, sand size phosphate 6.0 SPT 1-3-14 SC 32.0 4.0 4.0 SPT 1-3-14 SC 32.0 4.0 SPT 1-3-14 S2.0	 DEPTH (ft) sample TYPE NUMBER 	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATE		WELL DIAGRAM	
AU SPT 7.7-13 SPT 7.7-13 SPT 7.7-13 SPT 7.7-13 SPT 7.7-13 SPT 7.7-13 SPT 7.7-13 SPT 7.7-13 SPT 7.7-13 SPT 3.8-11 SM 4 SM 4 Comparison of the standard st	AU 1	_	SP	1.0 brown, fine grained quartz	SAND, trace slit	27.0	
SC SPT 4-9-14 30 9 (23) 32.0 greenish gray, variably sandy CLAY, 35 10 (7) 	$\begin{array}{c c} & 1 \\ AU \\ 2 \\ 5 \\ 5 \\ - 4 \\ - 4 \\ - 4 \\ - 4 \\ - 4 \\ - 4 \\ - 5 \\ - 4 $	7-7-13 (20) 6-5-8 (13) 3-8-11 (19) 1-3-11 (14) 2-5-6 (11)	SP- SM	2.0 Very pale brown, SILTY SA brown, fine grained quartz trace gravel at 9 to 10 feet 12.0 dark brown, SILT SAND, fit trace fine gravel local sand lenses between 22.0 greenish gray, CLAYEY SA particles, trace silts	AND, partially cemented, trace limeshit SAND with SILT, trace clayey nodules ne grained sand, local thin clay lenses, 18 to 20 feet AND, very fine sand, sand size phosphate		
SPT 3-3-4 35 10 (7)	 	4-9-14 (23)	SC	32.0		4.0	
	SPT 35 10 	3-3-4 (7)		greenish gray, vanabiy sar	OY OLAT,		
40 SPT 2-4-4 CL 40 11 (8) 6-inch sand lense at 43.5 to 44 feet	40 SPT 40 11 45 SPT 12	2-4-4 (8) 3-4-8 (12)	CL	6-inch sand lense at 43.5 t	o 44 feet	Sand Pack	

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(Continued Next Page)



	f V	imec oster whee	- ler		WEL	L NUMBER PZ-28-S PAGE 1 OF 1
CLIENT Carol	lo En	gineers	s, Inc.		PROJECT NAME Lake Manatee Dam -	Phase 2
PROJECT NUM	IBER	PROJECT LOCATION Manatee County				
DATE STARTE	D _1/	28/16		COMPLETED 1/28/16	GROUND ELEVATION 28 ft	HOLE SIZE 6 inches
DRILLING CON	ITRAC	TOR	Adarm	en & Associates, Inc.	LOCATION <u>N1148988.91</u> , E541151.99	
DRILLING MET	HOD	Stand	dard Pe	netration / Mud Rotary	GROUND WATER LEVEL AT TIME OF	F DRILLING
LOGGED BY	JS			CHECKED BY JB		
NOTES						
C DEPTH (ft) SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATERI	AL DESCRIPTION	WELL DIAGRAM
	SP		1.0	brown, fine grained quartz SAND, the	race silt	27.0
	SM		2.0	very pale brown, SILTY SAND, part	tially cemented, trace limesilt	26.0
	SP- SM SM		<u>12.0</u> 22.0 25.0	brown, fine grained quartz SAND w trace gravel at 9 to 10 feet dark brown, SILT SAND, fine graine gravel local sand lenses between 18 to 20 greenish gray, CLAYEY SAND, ver trace silts	ed sand, local thin clay lenses, trace fine feet	Grout Government Government Government Government Government Grout

		ameo foste whee	e eler				WELL	NU	MBER PZ-29-M PAGE 1 OF 2	
CLIEN	T Carol	lo Engineei	rs, Inc				PROJECT NAME Lake Manatee Dam - Pr	nase 2		
PROJE	ECT NUN	IBER _ 300	472x4				PROJECT LOCATION Manatee County			
DATE STARTED 1/25/16						PLETED _1/25/16	GROUND ELEVATION 23 ft	HO	LE SIZE _6 inches	
DRILL	ING CON	ITRACTOR	Ada	rmen	& Asso	ciates, Inc.	LOCATION <u>N1148774.35</u> , E541075.78			
DRILL	ING MET	HOD Star	ndard	Pene	tration /	Mud Rotary	GROUND WATER LEVEL AT TIME OF D	RILLI	NG	
LOGG	ED BY	JS			CHEC	KED BY JB				
NOTES										
o DEPTH (ft)	 SAMPLE TYPE NUMBER 	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG		MATE			WELL DIAGRAM	
	AU 1		SP- SC		20	brown, fine grained quartz nodules, minor rock fragme	SAND with CLAY, trace silt, clayey ents	21.0		
	AU		SM		2.0	gray, SILTY SAND, fine gra	ained quartz, thin lenses of sandy silt	21.0		
	2		Sivi		4.0	harring first successful successful		19.0		
5	SPT 3	10-7-5-6 (12)	SP- SM		6.0	brown, fine grained quartz	SAND with SIL I	17.0		
	SPT	3-3-2-5	SP-			brown, fine grained quartz	SAND with CLAY, 6-inch sand lense at 7 to	17.0		
	4	(5)	SC		8.0	7.5 feet		15.0		
 _ 10 _	SPT 5	7-8-10-10 (18)	SP			brown, fine grained quartz	SAIND, trace siit			
					12.0	grav greenish grav SILTY	SAND fine grained minor clay	11.0		
 _ <u>15</u> 	SPT 6	2-3-6 (9)	SM			gray, greenior gray, or r				
	SPT	3-4-5			17.0	light greenish gray, dark gr fine to coarse phosphatic s	eenish gray, sandy SILT, trace fine sands, ands, minor clay content	6.0	Grout	
 	SPT 8 SPT 9	(9) 3-3-6 (9) 4-9-6 (15)	ML			commons sand lenses from	n 23 to 25 feet			
 - <u>-</u> - <u>-</u> 	SPT 10 SPT	<u> </u>			37.0	cemented silt with interbed driller noted hard drilling at	ed sand lenses between 33 and 35 feet 35.5 feet, no sample recovered in spoon	14.0	Sand Pack	
		3-7-33	SP- SM		39.5	dark gray, fine grained qua throughout	rtz SAND with SILT, phosphatic sands	-14.0		
40	▲ <u>12</u>	(40)	ML		42.0	light gray, sandy SILT, cen	nented	-19.0		
	SPT <u>13</u>	18-22-28 (50)	SP- SM			dark gray, fine grained qua throughout	rtz SAND with SILT, phosphatic sands		◄ Slotted Screen	



	a f v	imec oste vhee	r ler		WELL	NUMBER PZ-29-S PAGE 1 OF 1		
CLIENT Carol	lo Eng	gineers	s, Inc.		PROJECT NAME Lake Manatee Dam - Pl	hase 2		
PROJECT NUM	IBER	3004	72x4		PROJECT LOCATION Manatee County			
DATE STARTED 1/27/16 COMPLETED 1/27/16 GROUND ELEVATION 23 ft HOLE SIZE 6 in								
DRILLING CON		TOR	Adarm	men & Associates. Inc.	LOCATION N1148729.45 . E541063.17			
DRILLING METHOD Standard Penetration / Mud Rotary GROUND WATER I EVELAT TIME OF DRILLING								
LOGGED BY	JS			CHECKED BY JB				
NOTES								
DEPTH (ff) SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG		MATERIA	L DESCRIPTION	WELL DIAGRAM		
	SP- SC			brown, fine grained quartz SAND with rock fragments	n CLAY, trace silt, clayey nodules, minor			
	00		2.0	gray, SILTY SAND, fine grained quar	tz, thin lenses of sandy silt			
	SM		4.0			19.0		
5	SP-			brown, fine grained quartz SAND with	n SILT			
	SP-		6.0	brown, fine grained quartz SAND with	CLAY, 6-inch sand lense at 7 to 7.5 feet	Grout		
	SC		8.0	brown fine grained quartz SAND tra	ce silt	15.0		
10				Slown, fine granica qualiz orano, tra				
	SP							
			12.0	and an anish and OILTY CAND for				
 15 	SM		17.0	gray, greenish gray, Silir t SAND, in	e graned, minor day	Sand Pack		
20	ML			light greenish gray, dark greenish gra coarse phosphatic sands, minor clay	y, sandy SILT, trace fine sands, fine to content	Slotted Screen		
25			25.0	Bottom of bo	prehole at 25.0 feet.	-2.0		

CPT Soundings 2014



























SPT Borings (AFW 2015) Drilled in 2014

		ameo foste whee	er eler			BORING NUMBER B-21 PAGE 1 OF 3			
CLIE	NT Caro	llo Engineers	s, Inc.			PROJECT NAME Lake Manatee Dam Evaluation			
PRO	JECT NUM	IBER <u>3004</u>	72x2.05			PROJECT LOCATION Manatee County			
	E STARTE	ED _2/26/14	СОМ	PLETE	ED _2/2	26/14 GROUND ELEVATION _52.11 ft HOLE SIZE _3 inches			
	LING CO	NTRACTOR	Independent Drillin	ng, Inc.		GROUND WATER LEVELS:			
	LING ME	THOD Stan	dard Penetration / N	/lud Ro	otary	AT TIME OF DRILLING			
b LOG	GED BY	ND	CHEC	CKED	BY G	A AT END OF DRILLING			
	ES STA	17+02.1; Adj	acent to CPT-7			AFTER DRILLING			
DEPTH ODEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION Elevation			
SVALL ני		28-30	MC = 11%			(SP-SM) brown, dark brown, poorly graded fine grained quartz SAND with SILT, dense, local clay, trace cemented sand (FILL)			
	SS 2	23-23-26- 24 (49)	MC = 10% #200 = 8%	SP- SM					
5 N	- ss 3	9-10-12-17 (22)	MC = 17%						
	ss 4	10-7-6-9 (13)	MC = 17% LL = 34 PL = 20 #200 = 31%			 (SC) greenish gray, light gray, variably CLAYEY SAND, very loose to dense, few to some sand sized phosphate particles (FILL) 			
NAIEE/LAB	SS 5	6-8-8-11 (16)	MC = 15%			- local silt layer			
472X4 LK MF	SS 6	6-8-5 (13)	MC = 19%	-					
00201010100 1010101010101010101010101010	- SS 7	4-4-5 (9)	MC = 21% LL = 51 PL = 18 #200 = 36%						
	ss 8	4-5-4 (9)	MC = 21%						
90 H	_	(-)							
20 20 20	- SS 9	4-6-6 (12)	MC = 20%						
1 1 1 1	- SS - 10	3-2-3 (5)	MC = 23% LL = 44 PL = 17 #200 = 33%						
	- SS	3-4-4	MC = 20%	<u>/</u>					
25 25				1					
	SS 12	2-3-3 (6)	MC = 22%						
30	- - - - - - - - - - - - - - - - - - -	5-3-4 (7)	MC = 21% LL = 48 PL = 17						
	SS 14	3-3-3 (6)	$\frac{\#200 = 36\%}{MC = 24\%}$	<u>/</u>					
19- 19- 19- 13- 13-	-	4-5-3 (8)	MC = 22%						


PAGE 2 OF 3

CLIENT Carollo Engineers, Inc.

GENERAL

PROJECT NUMBER 300472x2.05

 PROJECT NAME
 Lake Manatee Dam Evaluation

 PROJECT LOCATION
 Manatee County

BH / TP / WE	ELL - C-44	GINT STD US L	-ABS.GDT - 2/	'5/20 13:56 -	Z:\GEOTECH (3	00000)/PR(DJECTS/30	0472X4 LK I	MANATEE\LAB	3 & FIELD TES	STALL BORIN	G LOGS/ALL (GINT FILES	300472X2 - M	ANAEE C	OUNTY DAM.GP.
	70	 	65		60		55		50		45		40		35	DEPTH (ft)
	SS 29	SS 28	SS 27	SS 26	SS 25	SS 24	SS 23	SS 22	SS 21	SS 20	SS 19	SS 18	SS 17	SS 16	SAN	APLE TYPE JUMBER
	50/1"	37-32- 50/3"	5-12-18 (30)	12-12-18 (30)	27-34-30 (64)	10-12-16 (28)	6-8-12 (20)	5-9-10 (19)	4-5-7 (12)	12-18-24 (42)	4-4-6 (10)	1-1-2 (3)	4-4-3 (7)	2-2-2 (4)		BLOW COUNTS VALUE)
	#200 = 61% MC = 44% LL = 39	HC - 22 #200 = 28% MC = 56% LL = 79 PL = 37	PL = 31 #200 = 41% MC = 41% LL = 52 PL = 22	PL = 50 #200 = 90% MC = 50% LL = 51	LL = 38 PL = 22 #200 = 45% MC = 73% LL = 97	PL = 58 #200 = 83% MC = 53%	PL = 21 #200 = 20% MC = 102%	LL = 97 PL = 50 MC = 41% LL = 39	MC = 33% LL = 42 PL = 20 #200 = 25%	MC = 24% $LL = 34$ $PL = 20$ $#200 = 47%$	MC = 34% LL = 51 PL = 26 #200 = 31%	MC = 20% LL = 31 PL = 15	MC = 22%	MC = 22%		TESTS AND REMARKS
	SP- SM		SC	СН	SC		сн	SM CH			SC		-	-		J.S.C.S.
																RAPHIC LOG
	(SP-SM) greenish gray, poorly graded SAND with SILT, very dense, few sand sized phosphate particles	68.0 - 1-inch cemented silt at tip of sample	(SC) greenish gray, light gray, CLAYEY SAND, medium dense to very dense, few to some sand-sized phosphate particles	(CH) greenish gray, light gray, fat CLAY with sand, medium dense to very dense, few to some sand-sized phosphate particles	 (SC) greenish gray, light gray, CLAYEY SAND, medium dense to very dense, few to some sand-sized phosphate particles pockets of clay and sand sandy seams 	56.0 (CH) greenish gray, light gray, fat CLAY with sand, medium dense to very dense, few to some sand-sized phosphate particles - 4-inch sand lense at 54.5 ft	54.0 few to some sand-sized phosphate particles (SC) greenish gray, light gray, CLAYEY SAND, medium dense to very dense, few to some sand-sized obosphate particles	(SM) greenish gray, light gray, variably SILTY SAND, medium dense, few to some sand sized phosphate particles (NATIVE) - 1-inch sand lense at 51 ft and 2-inch sand lense at 52 ft	51.0			- few silt		 (SC) greenish gray, light gray, variably CLAYEY SAND, very loose to dense, few to some sand sized phosphate particles (FILL) (continued) - 1-inch sand lense at 37 ft 		MATERIAL DESCRIPTION
		5.9		<u>8.9</u> 0.9		3.9	<u>1.9</u>	<u>0.1</u> 0.9	1.1						ion	

		ame foste whee	c er eler			BORING NUMBER B PAGE 3	OF 3
CLI	ENT Card	llo Engineers	s, Inc.			PROJECT NAME Lake Manatee Dam Evaluation	
PR	DJECT NUI	MBER <u>3004</u>	472x2.05			PROJECT LOCATION Manatee County	
	(II) SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
70 70)		PL = 33	1	문의가		levation
	- - - - - - - - - - - - - - - - - - -	31-26-12 (38)	#200 = 43% MC = 33% #200 = 27% MC = 21% #200 = 16%	SM		(SM) greenish gray, SILTY SAND, dense, some sand sized phosphate particles, local cemented silt lense throughout (max lense 0.5-inch)	-18.9
	- - - - - - -	50/5"	MC = 24% #200 = 44%	sc		 77.0 (SC) greenish gray, CLAYEY SAND, very dense, some sand sized phosphate particles, local cemented sands 	-24.9
0472X4 LK MANAIEELAD & r	- SS 32					87.0 (MH) greenish gray, variably elastic SILT with sand, very soft to hard, trace sand sized phosphate particles	-34.9
	- SS 33 -	0-0-11 (11)	MC = 68% LL = 105 PL = 56 #200 = 75% WOH - 1 ft	MH		- greenish gray, light gray, more sandy, dolomitic silt, few sand sized phosphate particles, local cemented sands, trace silt, below 92 ft	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SS 34	50/3"	MC = 20% #200 = 56%]		97.0 (SM) greenish gray, SILTY SAND, medium dense, trace clay	-44.9
		8-9-16	MC = 38%	SM			
7997 10) 35	(25)	#200 = 22%		<u> 위험</u>	Bottom of borehole at 100.0 feet.	-47.9
GENERAL BH / IP / WELL - C-44 GINI S IU US							

			ameo foste whee	er eler			BORING NUMBER B-22 PAGE 1 OF 4
		NT Care	ollo Engineer	s Inc			PROJECT NAME Lake Manatee Dam Evaluation
	PROJ		MBER 3004	472x2 05			PROJECT LOCATION Manatee County
	DATE	START	ED 2/26/14	COM	PI FTF	-D 3/	3/14 GROUND ELEVATION 52.88 ft HOLE SIZE 3 inches
_	DRILL			Independent Drill	ling Ir	<u> </u>	GROUND WATER I EVELS:
GP.				dard Penetration /	Mud F	Potany	
NGS							
BOR	LOGG		12,50.2: 4.5		NED		
- MA	NOTE	3 <u>51A</u>	13+50.2, AC		1	1	
2 - MANAEE COUNTY I	o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION Elevatior
X\300472X		ss 1	26-12-13- 18 (25)	MC = 10%			(SP-SM) brown, dark brown, poorly graded SAND with SILT, medium dense to very dense, trace clay nodules at top of sample (FILL)
VAPPENDI		ss 2	17-32-30- 31 (62)	MC = 11%	SP-		- trace cemented sand below 2 ft
AL REPOR	5	SS 3	12-14-18- 21 (32)	MC = 17% #200 = 6%			
DTECHNIC/			14-5-9-15 (14)	MC = 15%			7.0 45 (SC) greenish gray, variably CLAYEY SAND, medium dense to very dense, few to some sand sized phosphate particles (FILL)
EPORT/GEC		SS 5	6-10-16-14 (26)	MC = 15% #200 = 28%			- 1-inch of cemented silt at 9.5 ft
E DAM-EVAL\RE		-					
K MANATEE	15	SS 6	8-6-7 (13)	MC = 18%			
2X2 CAROLLO-LH							
30047	20	SS 7	8-7-5 (12)	MC = 21%			
)0 - T:\					sc		
4/29/15 15:		-					
S.GDT - 4	25	SS 8	8-7-5 (12)	MC = 22% LL = 43 PL = 17			
TD US LAE				#200 = 32%			
4 GINT S1			7 0 12		-		
VELL - C-4	30	9	(21)	MC = 19%			
L BH / TP / W	 						
GENERA.	 35_	SS 10	9-9-11 (20)	MC = 26%			



PAGE 2 OF 4

CLIENT Carollo Engineers, Inc.

PROJECT NAME _Lake Manatee Dam Evaluation

PROJECT NUMBER 300472x2.05 PROJECT LOCATION Manatee County SAMPLE TYPE NUMBER BLOW COUNTS (N VALUE) GRAPHIC LOG DEPTH (ft) GENERAL BH / TP / WELL - C-44 GINT STD US LABS.GDT - 4/29/15 15:00 - T;300472X2 CAROLLO-LK MANATEE DAM-EVALIREPORTIGEOTECHNICAL REPORTAPPENDIX;300472X2 - MANAEE COUNTY DAM - BORINGS.GPJ U.S.C.S. TESTS MATERIAL DESCRIPTION Elevation 35 (SC) greenish gray, variably CLAYEY SAND, medium dense to very dense, few to some sand sized phosphate particles (FILL) (continued) MC = 21% SS 3-7-9 LL = 39 11 (16) 40 PL = 16 #200 = 31% SS 8-10-50/5 MC = 25% - trace silt 12 45 SC - some sand sized phosphate particles, less clayey below 47 ft SS 13 MC = 15% 6-8-10 LL = 43 (18) 50 PL = 25 #200 = 39% SS 8-9-12 MC = 26% 14 (21) 55 - clayey zones below 57 ft MC = 17% SS 5-6-10 59.5 -6.6 - 2-inches of CLAY at tip of sample LL = 154 15 (16) 60 PL = 74 (MH) greenish gray, variably sandy elastic SILT, stiff (NATIVE) #200 = 59% MH 65 **57 O** -14.1 (CL) greenish gray, CLAY with sand, hard CL SS 8-16-20 MC = 52% - sandy clay layer in between 69.5 ft and 7 #200 = 82% 16 (36) 70



PAGE 3 OF 4

CLIENT Carollo Engineers, Inc.

PROJECT NUMBER 300472x2.05

MATERIAL DESCRIPTION Elevation (CL) greenish gray, CLAY with sand, hard (continued) - 1-inch sand lense at 69 ft and 2-inch sand lense at tip of sample (7) -22.1 (SM) greenish gray, SILTY SAND, very dense, cemented sand and silt, few sand sized phosphate particles - hard drilling encountered from 75 ft to 92 ft
(CL) greenish gray, CLAY with sand, hard <i>(continued)</i> - 1-inch sand lense at 69 ft and 2-inch sand lense at tip of sample (7) -22.1 (SM) greenish gray, SILTY SAND, very dense, cemented sand and silt, few sand sized phosphate particles - hard drilling encountered from 75 ft to 92 ft
(SM) greenish gray, SILTY SAND, very dense, cemented sand and silt, few sand sized phosphate particles - hard drilling encountered from 75 ft to 92 ft
- no sample recovered
-40.1 (SC) greenish gray, CLAYEY SAND, very dense, cemented sand and silt, few
-42.1
(CL) greenish gray, slightly SANDY CLAY, hard
-49.1
(SC) greenish gray, CLAYEY SAND, dense
_

CLII PRC		lo Engineer	rs, Inc.				
		10ER _3004	17222 05			PROJECT NAME Lake Manatee Dam Evaluation	
	E TYPE		472X2.05				
DEPTH (#)	SAMPL	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation
			PL = 24 #200 = 41%			(SC) greenish gray, CLAYEY SAND, dense (continued)	
	- SS 24	11-16-18 (34)	MC = 36%	- sc			
- <u>110</u>	-X SS 25	6-8-12 (20)	MC = 38% #200 = 20%			10.0	-57.1

		ameo foste whee	er eler			BORING NUMBER B-23 PAGE 1 OF 3
AVEE COUNTY DAM.GPJ DAT DAT DAM.GPJ DAT DAT DAM.GPJ DAT DAT DAT DAT DAT DAT DAT DAT DAT DAT	ENT <u>Carol</u> JECT NUM E STARTE LING CON LING MET GED BY _ ES <u>STA 1</u>	lo Engineers IBER _3004 ID 3/3/14 ITRACTOR ITRACTOR ITROD _Stan LG 16+20.6; Adj	s, Inc. 172x2.05 Madrid Engineerin dard Penetration / M CHEC acent to CPT-33	PLETE g Grou Iud Ro CKED I	ED <u>3/3</u> up otary BY <u>G</u> A	PROJECT NAME _Lake Manatee Dam Evaluation PROJECT LOCATION _Manatee County /14 GROUND ELEVATION _50.96 ft HOLE SIZE _3 inches GROUND WATER LEVELS: AT TIME OF DRILLING A AT END OF DRILLING AFTER DRILLING
DEPTH DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
General BH / TP / Well - C-44 Gint STD US LABS.GDT - 2/5/20 14:01 - 2/16 OT ECH (300000) PROJECTS/30047224 LK MANATEELLAB & FIELD TESTIALL BORING LOGSWILL C 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0						CPT pushed to 45 ft, mud rotary drilling to 43 ft prior to sampling, refer to CPT-33



BORING NUMBER B-23 PAGE 2 OF 3

CLIENT Carollo Engineers, Inc.

PROJECT NAME Lake Manatee Dam Evaluation

	PROJI		IBER 3004	72x2.05			PROJECT LOCATION Manatee County
NAEE COUNTY DAM.GPJ	G DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION Elevation
OGS/ALL GINT FILES/300472X2 - MA	 40						CPT pushed to 45 ft, mud rotary drilling to 43 ft prior to sampling, refer to CPT-33 (continued)
FIELD TESTALL BORING L	 - 45 	SS 1	11-5-5-8 (10)	MC = 17% #200 = 42%			43.0 8.0 (SC) gray, CLAYEY SAND, loose to medium dense (FILL) - phosphatic clays, few sand-sized phosphate particles
2X4 LK MANATEE\LAB & F	 <u>50</u> 	SS 2	6-9-11-11 (20)	MC = 22% LL = 33 PL = 19 #200 = 42%			- trace sand sized phosphate particles 52.0 -1.0 (MH) dark gray, gray, variably elastic SILT, stiff to very stiff, few sand sized
(300000)/PROJECTS/300472	 <u>55</u>	SS 3	5-5-6-9 (11)	MC = 69% LL = 101 PL = 51 #200 = 92%	MH		phosphate particles (NATIVE)
20 14:01 - Z:\GEOTECH	 60 	SS 4	7-8-10-18 (18)	MC = 58% #200 = 64%	-		- more sandy below 58 ft <u>62.0</u> -11.0 (SM) dark gray, variably SILTY SAND, medium dense, few sand-sized phosphate
STD US LABS.GDT - 2/5/	- – _ <u>65</u> _ – –	SS 5	5-6-9-12 (15)	MC = 50% LL = 68 PL = 32	SM		particles
NERAL BH / TP / WELL - C-44 GINT	 70	SS 6	5-9-8-15 (17)	MC = 71% #200 = 65%	МН		68.0 -17.0 (MH) dark gray, variably sandy elastic SILT, very stiff, few sand-sized phosphate particles
Щ							



PAGE 3 OF 3

PROJECT NAME Lake Manatee Dam Evaluation

CLIENT Carollo Engineers, Inc. PROJECT NUMBER 300472x2.05 PROJECT LOCATION Manatee County GENERAL BH / TP / WELL - C-44 GINT STD US LABS. GDT - 2/5/20 14:01 - Z/GEOTECH (300000)PROJECTS/300472X4 LK MANATEEVAB & FIELD TESTALL BORING LOGSVALL GINT FILES/300472X2 - MANAEE COUNTY DAM. GPJ SAMPLE TYPE NUMBER BLOW COUNTS (N VALUE) GRAPHIC LOG DEPTH (ft) U.S.C.S. TESTS MATERIAL DESCRIPTION Elevation 70 (MH) dark gray, variably sandy elastic SILT, very stiff, few sand-sized phosphate particles (continued) MH 20 -21.0 (SM) gray, SILTY SAND, very dense, heavy cementation, sand to gravel sized phosphate particles SS 7 50/1" 75 SS 8 50/1" SM 80 SS 50/3" 9 85 85.0 -34.0 (SM) gray, SILTY SAND, very dense, cementation, sand to gravel sized phosphate particles - gray, greenish gray, variably silty, trace yellow calcareous sand MC = 49% SS 5-5-12-LL = 91 10 50/3" PL = 45 90 SM SS 50/3" 11 SS 50/3" MC = 27% 12 #200 = 47% 95 -44.0 95.0 (SM) gray, SILTY SAND, medium dense to very dense, heavy cementation, sand to gravel sized phosphate particles SS 6-6-9-15 MC = 36% 13 #200 = 22% (15) 22-30-30-SM SS 31 MC = 26% 100 14 (60) SS 8-11-11-20 MC = 29% 15 (22) -52.0 103.0 Bottom of borehole at 103.0 feet.

			amec foster whee	r ler			BORING NUMBER PAGE	B-24 1 OF 3
	CLIEN PROJI	T <u>Caro</u>	lo Engineers	s, Inc. 72x2.05			PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County	
		STARTE	D 3/3/14	COM		-D 3/3		
_				Madrid Engineeri	ina Gr	- <u></u>	GROUND WATER I EVELS:	
GPJ			HOD Stan	dard Penetration /	Mudi	Potan/		
INGS								
BOR	NOTE		AD 14+71 1· Adi	CREC	JNED	DI <u>0</u>		
MANAEE COUNTY DAM	DEPTH (ft)	SAMPLE TYPE	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
GENERAL BH / TP / WELL - C-44 GINT STD US LABS.GDT - 4/29/15 15:00 - T:300472X2 CAROLLO-LK MANATEE DAM-EVAL/REPORT/GEOTECHNICAL REPORT/APPENDIX:300472X2 - M		AU					CPT pushed to 45 ft, mud rotary drilling to 43 ft prior to sampling, refer to CPT-34	Elevation



PAGE 2 OF 3

CLIENT <u>Carollo Engineers, Inc.</u> PROJECT NUMBER 300472x2.05

AM - BORINGS.GPJ	ні (1) 35	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation
	-						CPT pushed to 45 ft, mud rotary drilling to 43 ft prior to sampling, refer to CPT-34 (continued)	
EE COU	_							
- MANA	-	1						
0472X2	40							
NDIX/30	_							
TAPPE	_	ss 🛛	2-2-2-3	MC = 24%			(SC) greenish gray, CLAYEY SAND, very loose to loose, trace silt, sand sized phosphate particles (FILL)	8.0 d
REPOF	45	/ 1	(4)	#200 = 37%				
HNICAL	-							
SEOTEC	_	ss.	3-4-5-10		SC			
	50	2	(9)	MC = 26%				
EVAL\R	-						52.0	-1.1
E DAM-	-			MC = 40%			(CL) dark gray, greenish gray, variably sandy CLAY, stiff to hard (NATIVE)	
	55	SS 3	5-5-7-8 (12)	LL = 47 PL = 23				
- TO-LKI	-							
2 CARO	-							
00472X:	60		5-3-7-10 (10)	MC = 50%				
00 - T:\3	- 00	<u> </u>			CL		- few sand sized phosphate particles	
9/15 15:	_							
SDT - 4/2	-	ss 5	6-6-8-16 (14)	MC = 69%				
LABS.G	65		(,					
STD US	-							
44 GINT	_	ss	6-19-11-28	MC = 42%				
	70	/\ 6	(30)					
/ TP / W								
RAL BH								
GENE								

		amed foste whee	er eler			BORING NUMBER B- PAGE 3 O	24 F 3
CLIE	NT <u>Caro</u>	llo Engineer	rs, Inc.			PROJECT NAME Lake Manatee Dam Evaluation	
PROJ		/BER _3004	472x2.05			PROJECT LOCATION Manatee County	
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
	0,					(CL) dark gray, greenish gray, variably sandy CLAY, stiff to hard (NATIVE)	ation
	-			CL	72.0	(continued)	-21.1
						(SM) gray, SILTY SAND, very dense, heavily cemented	
	SS 7		MC = 23%	-1			
	SS 8		MC = 27%	-1			
80	-			SM			
	-					- gray, dark gray, some sand sized phosphate particles below 82 ft	
	ss	18-12-32-	MC = 33% #200 = 13%				
85		30/1	#200 - 1370	_			
	-						
AM-E	-				87.0	(MH) dark greenish gray, greenish gray, light gray, variably sandy elastic SILT,	-36.1
	SS 10	7-6-8-13 (14)	MC = 69% LL = 132 PL = 71 #200 = 64%	мн		stiff to hard, cemented	
	SS SS	8-45-50/1"	MC = 62%	-	02.0		11 1
	<u> </u>		MC = 61%	_	92.0	(SC) light gray, CLAYEY SAND, dense, cemented	-41.1
		42-25-20	PL = 31	SC			
95	12	(45)	#200 = 48%				
	X ss	27-50/2"	MC = 36%		96.0	(CL) light gray, variably SANDY CLAY, hard, cemented	-45.1
1 - 1	13		#200 = 67%				
		50/4"	MC = 29%		98.8		-47.9
89.60	14					Bottom of borehole at 98.8 feet.	
/ WEL							
KAL B							
CENE							
						APPENDIX B	

			ame foste whee	c er eler			BORING NUMBER B-25 PAGE 1 OF 3
	CLIEN PROJI DATE DRILL DRILL LOGG	T <u>Carol</u> ECT NUN STARTE ING CON ING MET ED BY _ S <u>STA</u>	Ilo Enginee //BER _ 300 ED _3/3/14 //TRACTOR //HOD _ Star LG 17+42.6; Ad	rs, Inc. 472x2.05 COM Madrid Engineer Indard Penetration / CHEC djacent to CPT-14	PLETE ing Gru Mud F	ED <u>3/3</u> oup Rotary BY <u>G</u>	PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County ground Elevation 53.04 ft HOLE SIZE 3 inches GROUND WATER LEVELS: AT TIME OF DRILLING A AT END OF DRILLING AFTER DRILLING
2 - MANAEE COUNTY DA	DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION Elevation
	-	SS 1	50/4"		sc		(SC) brown, CLAYEY SAND, very dense, possible cementation (FILL)
3EOTECHNICAL REPC	5	ss	2-1-1-1				5.0 48.0 (SP) dark brown, poorly graded fine SAND, very loose, organic staining (FILL)
E DAM-EVAL/REPORT/C	 	2	(2)				
CAROLLO-LK MANATE	_ 15 _ _						
/15 15:00 - 1:\300472X2 1 1 1 1 1 1	20	SS 3	1-0-1-0 (1)	MC = 18% #200 = 4%	- SP		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	_ 						
IP / WELL - C-44 GINI &	30	SS 4	0-0-0-0 (0)	WOH - 2 ft	-		
GENERAL BH /	35	SS 5	0-0-0-0 (0)	WOH - 2 ft			- no sample recovered



PAGE 2 OF 3

CLIENT Carollo Engineers, Inc.

PROJECT NUMBER 300472x2.05

M - BORINGS.GPJ	(ft) (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	tion
INTY DA							(SP) dark brown, poorly graded fine SAND, very loose, organic staining (FILL) <i>(continued)</i>	
AEE COL					SP			
(2 - MAN	40	SS 6	0-0-0-0 (0)	WOH - 2 ft			39.0 (SC) light greenish gray, bluish gray, CLAYEY SAND, very loose to loose, sand	14.0
300472							sized prosphale particles (FILL)	
PENDIX					_			
ORTAP		ss 7	2-2-3-3 (5)	MC = 20% #200 = 30%				
CAL REF								
TECHNI					- SC			
RT/GEO			1-2-3-8 (5)	MC = 20% #200 = 33%	30			
AL/REPC								
DAM-EV								
NATEE		SS 9	0-0-0-0 (0)	WOH - 2 ft				
O-LK MA	<u>55</u>				_			
CAROLL							57.0 (SP) light brown, poorly graded fine to medium grained SAND, very dense,	-4.0
0472X2 (SS	26-39-38- 19				sand sized phosphate particles (NATIVE)	
0 - T:\30	_ 60 _		(77)		58			
9/15 15:0							62.0 (SC) gray, greenish gray, CLAYEY SAND, dense, sand sized phosphate	-9.0
DT - 4/2(ss	8-11-25-22	MC = 27%	_		particles, pockets/seams/vertical features of fine sand	
LABS.G	65		(30)					
STD US					50			
44 GINT	 	SS	8-11-25-22	MC = 33%				
ELL - C	70	12	(30)					
/ TP / W								
ERAL BH								
BENE								



			amed foste whee	er eler			BORING NUMBER B-27 PAGE 1 OF 3
VI - BURINGS.GFJ	CLIEN PROJI DATE DRILL DRILL LOGG NOTE	IT <u>Carol</u> ECT NUM STARTE ING CON ING MET ED BY _ S <u>STA</u>	lo Engineer 1BER _300 D _3/4/14_ ITRACTOR ITRACTOR ITRACTOR AB 12+52.0; Ac	rs, Inc. 472x2.05 Madrid Engineer adard Penetration / CHEC	PLETE ing Gr Mud F CKED	ED <u>3/4/1</u> oup Rotary BY <u>GA</u>	PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County 4 GROUND ELEVATION 54.25 ft HOLE SIZE 3 inches GROUND WATER LEVELS: AT TIME OF DRILLING AT END OF DRILLING AFTER DRILLING
2 - MANAEE COUNTY DAM	DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
		SS 1 SS 2 SS 3 SS 4 SS 5	6-10-8-8 (18) 3-2-3-2 (5) 3-4-1-2 (5) 0-5-6-7 (11) 0-5-6-7 (11)	MC = 15% MC = 22% MC = 26% MC = 21% MC = 22%	SC		(SC) gray, light greenish gray, CLAYEY SAND, loose to medium dense, some sand sized phosphate particles (FILL)



PAGE 2 OF 3

CLIENT Carollo Engineers, Inc.

PROJECT NUMBER _300472x2.05

GENERAL

PROJECT NAME Lake Manatee Dam Evaluation

FRUJ		IDER 3004	1/2X2.05				
HLL 35	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	vation
				-		(SC) gray, light greenish gray, CLAYEY SAND, loose to medium dense, some sand sized phosphate particles (FILL) <i>(continued)</i>	
40	SS 6	2-3-3-2 (6)	MC = 20%				
		3355					
45	7	(8)	MC = 20%	_			
	SS 8	3-3-5-6 (8)	MC = 39% LL = 46 PL = 24 #200 = 12%	sc		47.0 (SC) greenish gray, poorly graded CLAYEY SAND, loose, trace sand sized phosphate particles (NATIVE)	7.3
55 55	SS 9	4-5-14-13 (19)				52.0 (CL) greenish gray, SANDY CLAY, very stiff, trace sand sized phosphate particles - trace sand sized phosphate particles	2.3
60	SS 10	6-7-11-15 (18)	MC = 45% MC = 27%	-		- fine sand pockets - 3-inch sand lense at 59 ft 61.0	-6.8
	M ss	4-10-12-15		sc		(SC) dark greenish gray, CLAYEY SAND, medium dense	-9.8
65		(22)	MC = 32% MC = 47%	CL		(CL) greenish gray, variably sandy CLAY, stiff	
70	12	0-4-0-9 (10)	MC = 98%				



			ame foste whee	c er eler			BORING NUMBER B PAGE 1	-28 OF 3
A - BORINGS.GPJ	CLIEN PROJI DATE DRILL DRILL LOGG NOTE	IT <u>Carol</u> ECT NUM STARTE ING COM ING MET ED BY _ S _ STA	Ilo Enginee //BER _ 300 ID _ 3/4/14 //TRACTOR //HOD _ Star AB 11+49.1; Ad	rs, Inc. 472x2.05 COM Madrid Engineer Indard Penetration / CHEC djacent to CPT-5	PLETE ing Gr Mud F CKED	ED <u>3/4</u> oup Rotary BY _G/	PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County 4/14 GROUND ELEVATION 54.32 ft HOLE SIZE 3 inches GROUND WATER LEVELS: AT TIME OF DRILLING A AT END OF DRILLING AFTER DRILLING	
2 - MANAEE COUNTY DAI	o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	evation
STD US LABS.GDT - 4/29/15 15:00 - 1::300472X2 CAROLLO-LK MANATEE DAM-EVAL/REPORT/GEOTECHNICAL REPORT APPENUIX:300472X		SS 1	8-14-18-17 (32) 0-1-3-2 (4)	MC = 17%	SM		(SM) brown, dark brown, SILTY SAND, very loose to dense (FILL) - no sample recovered 25.0 (SC) greenish gray, gray, variably CLAYEY SAND, very loose to medium dense, some sand sized phosphate particles (FILL)	29.3
- BH / TP / WELL - C-44 GIN	 _ <u>30</u> 	SS 3	0-0-1-1 (1)	MC = 35% WOH - 1 ft	- sc			
GENERAL	 <u>35</u>		0-0-0-0 (0)	MC = 31% WOH - 2 ft				



APPENDIX B

PAGE 2 OF 3

CLIENT Carollo Engineers, Inc.

PROJECT NUMBER 300472x2.05

MI - BUKINGS.GPJ 30 (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation
	SS 5	1-2-2-3 (4)	MC = 30%			(SC) greenish gray, gray, variably CLAYEY SAND, very loose to medium dense, some sand sized phosphate particles (FILL) <i>(continued)</i>	
	SS 6	2-2-2-3 (4)	MC = 26%	-		- some drier portions (34 to 5)	
		2-3-7-5 (10)	PP = 2 tsf MC = 22%	sc			
		3-3-10-15 (13)	PP = 2.25 tsf MC = 22%	-			
50 50		(10)				51.0	3.3
	- - - - - -	7-9-10-12 (19)	PP = 2.75 tsf MC = 25%	-		(SP-SC) greenish gray, gray, poorly graded fine grained quartz SAND with CLAY, medium dense, some sand sized phosphate particles, trace coarse phosphate particles (NATIVE)	
00 15:00 1 5:000		8-7-9-12 (16)	PP = 2 tsf MC = 40% MC = 33% #200 = 9%	SP- SC		- sand lenses throughout sample	
65	- SS 11	3-5-7-11 (12)	PP = 2.0 tsf MC = 57%	-			
70	SS 12	6-39-50/1"	PP = 1.5 tsf MC = 23%	SC		 - 1-inch cemented clay lense at 69 ft (SC) light greenish gray, pale gray, variably CLAYEY fine to medium grained SAND, very dense, some sand sized phosphate particles 	
GENERA							



CLIENT PROJEC DATE S DRILLIN DRILLIN	Caroll CT NUM TARTEL NG CON NG METI D BY L STA 1	D Engineer BER 3004 0 3/4/14 IRACTOR HOD Stan G 8+43.2; Ad	s, Inc. 172x2.05 COM Madrid Engineer dard Penetration / CHE	PLETE	D _3/4	/14	PROJECT NAME Lake Manatee Dam Evaluation	
PROJEC DATE S DRILLIN DRILLIN	CT NUM TARTEL NG CON NG METI D BY L STA 1	BER <u>3004</u> <u>3/4/14</u> IRACTOR HOD <u>Stan</u> G 8+43.2; Ad	A72x2.05 COM Madrid Engineer dard Penetration / CHE	PLETE	D _3/4	/14	PRO IECT I OCATION Manatee County	
DATE S	ITARTEL NG CON NG METI D BY _L STA 1	0 _3/4/14 TRACTOR IOD _Stan .G 8+43.2; Ad	COM Madrid Engineer dard Penetration	PLETE	D <u>3/4</u>	/14		
	NG CON NG METI D BY <u></u> STA 1 U U U U	IRACTOR IOD <u>Stan</u> .G 8+43.2; Ad	Madrid Engineer	ing Gro		/ 1 -	GROUND ELEVATION _54.26 ft HOLE SIZE _3 inches	
	NG METI	HOD <u>Stan</u> .G 8+43.2; Ad	dard Penetration /		oup		GROUND WATER LEVELS:	
	BY L	.G 8+43.2; Ad	CHE	' Mud F	Rotary		AT TIME OF DRILLING	
LOGGE	STA 1	8+43.2; Ad		CKED I	BY G/	4	AT END OF DRILLING	
	ТҮРЕ ER		jacent to CPT-11				AFTER DRILLING	
DEPTH (ft)	SAMPLE NUMB	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	Elevation
	≤ ss (50/4"	MC = 18%			0.5 6-inc	hes of dam crest roadway (asphalt with base course)	53.8
		2-2-2-2 (4)	MC = 17%	_ SM		(SM) H	orown, dark brown, variably SILTY SAND, loose (FILL)	39.3
	SS 3	0-0-2-2 (2) 0-2-4-9 (6)	MC = 22% WOH - 1 ft MC = 18%	SC		(SC) l dense	ght gray, gray, greenish gray, CLAYEY SAND, very loose to medium , some sand sized phosphate particles (FILL)	
5 35					V//A			



PAGE 2 OF 3

CLIENT Carollo Engineers, Inc.

PROJECT NUMBER 300472x2.05

M - BORINGS.GPJ DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
472X2 - MANAEE COUNTY DA	SS 5	5-6-9-10 (15)	MC = 19%	_		(SC) light gray, gray, greenish gray, CLAYEY SAND, very loose to medium dense, some sand sized phosphate particles (FILL) <i>(continued)</i>
ICAL REPORTVAPPENDIX/300	SS 6	10-7-9-10 (16)	MC = 28%	SC		
EVAL/REPORT/GEOTECHN	SS 7	8-7-8-10 (15)	MC = 31%	-		47.0 7.3 (SC) gray, dark gray, variably CLAYEY SAND, loose to medium dense, some fine to coarse phosphate particles (NATIVE)
ROLLO-LK MANATEE DAM	SS 8	2-4-5-8 (9)	MC = 26%	SC		- pockets of fine to medium sand
29/15 15:00 - T:\300472X2 CA	SS 9	16-12-12- 23 (24)	MC = 32% #200 = 18% MC = 67% LL = 104 PL = 46 #200 = 80%			59.0 -4.7 (MH) light gray, greenish gray, elastic SILT with sand, very stiff, some sand sized phosphate particles
NT STD US LABS.GDT - 4/	SS 10	4-9-20-20 (29)	MC = 45%			67.0 -12.7 (SC) gray, dark gray, greenish gray, variably CLAYEY SAND, medium dense, some sand sized phosobate particles
ENERAL BH / TP / WELL - C-44 G	SS 11	6-11-13-18 (24)	MC = 35%	SC		

			amed foste whee	er eler			BORING NUMBER B-2 PAGE 3 OI	29 F 3
		T <u>Caro</u>		rs, Inc.			PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County	
Ľ	ROJI			472x2.05				
	02 DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	vation
	-				sc		(SC) gray, dark gray, greenish gray, variably CLAYEY SAND, medium dense, some sand sized phosphate particles <i>(continued)</i> 72.0	-17.7
		SS 12	50/2"		SM		(SM) gray, dark gray, SILTY SAND, very dense, some fine to medium phosphate particles, heavily cemented layers	
	 80 	SS 13	30-44- 50/4"	MC = 20% #200 = 13%	-		83.0 (CL) greenish gray, dark gray, variably sandy CLAY, very stiff to hard, heavily	-28.7
	85	SS 14 SS 15	24 (26) 5-4-50/5"	MC = 45% MC = 56%	CL		cemented layers	
	90 _	SS 16	50/3"	MC = 30%			- light gray, yellowish gray, drier matrix 92.5	-38.2
	95	SS 17	31-17-32- 50/3"	MC = 32%	SM		(SM) gray, SILTY SAND, medium dense to very dense, trace fine phosphate particles, heavily cemented layers	
	_	SS 18	10-9-16-13 (25)	MC = 34%	_		97.8	-43.5
		SS 19	50/3"	MC = 25%		<u>1919</u>	Bottom of borehole at 97.8 feet.	

			amed foste whee	er eler			BORING NUMBER	B-30 1 OF 3
M - BORINGS.GPJ	CLIENT PROJE DATE S DRILLI DRILLI LOGGE NOTES	T <u>Carol</u> CT NUM STARTE NG CON NG MET ED BY S	lo Engineer 1BER _300- D _3/4/14 1TRACTOR 1TRACTOR 1HOD _Star LG 19+41.8; Ac	rs, Inc. 472x2.05 Madrid Engineeri adard Penetration / CHEC	PLETE ng Gr Mud F XKED I	ED <u>3/5</u> oup Rotary BY G.	PROJECT NAME Lake Manatee Dam Evaluation PROJECT LOCATION Manatee County 6/14 GROUND ELEVATION 54.21 ft HOLE SIZE 3 inches GROUND WATER LEVELS: AT TIME OF DRILLING AT END OF DRILLING A AT END OF DRILLING AFTER DRILLING	
2 - MANAEE COUNIY DA	DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation
		SS 1	36-14-12- 11 (26) 2-2-5-10 (7)	MC = 13% MC = 17%	SM		(SM) brown, dark brown, SILTY SAND, loose to medium dense, trace fine gravel, slight organic odor (FILL)	39.2
GENERAL BH / 1P / WELL - C-44 GIN STD US LABS.GUI - 4/29/19 19:00 - 1:4004/2X2 CAROLEU-EN N		SS 3 SS 4 SS 5	1-4-4-6 (8) 3-2-3-5 (5) 6-7-10-11 (17)	MC = 20% MC = 26% MC = 20%	SC		(SC) gray, light gray, CLAYEY SAND, loose to medium dense, pockets of brown silty clay, some fine phosphate particles (FILL)	



PAGE 2 OF 3

CLIENT Carollo Engineers, Inc.

PROJECT NUMBER 300472x2.05

 PROJECT NAME
 Lake Manatee Dam Evaluation

 PROJECT LOCATION
 Manatee County

M - BORINGS.GPJ 5. DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
	ss 6	4-6-7-6 (13)	MC = 23%			(SC) gray, light gray, CLAYEY SAND, loose to medium dense, pockets of brown silty clay, some fine phosphate particles (FILL) <i>(continued)</i>
40 	SS 7	3-4-4-7 (8)	MC = 24%	sc		
	SS 8	2-4-4-6 (8)	MC = 35%	_		47.0 (SC) gray, greenish gray, variably CLAYEY SAND, loose to very dense, sand sized phosphate particles, layers and pockets of clay and sand (NATIVE)
	SS 9	4-4-6-8 (10)	MC = 29%	_		
00472X2 CAROLLO-LK M	SS 10	6-17-17-22 (34)	MC = 54%	sc		
(GDI - 4/29/15 15:00 - 1 ::X	SS 11	7-32-32- 50/5"	MC = 16% MC = 67%	_		- some cemented layers below 63 ft
	SS 12	4-9-21-18 (30)				
	<u>v </u>	<u> </u>		_1	<u> </u>	1

		amec foster whee	r ler				BORING NUMBER B PAGE 3	8-30 OF 3
CLIER	T Caro	llo Engineers	s, Inc.			PROJECT	NAME Lake Manatee Dam Evaluation	
PROJ		IBER _3004	72x2.05			PROJECT	LOCATION Manatee County	
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG		MATERIAL DESCRIPTION	levation
70 	SS 13	6-36-50/5"	MC = 26% MC = 27% #200 = 16%	SC		(SC) gray, greenish sized phosphate pa <i>(continued)</i>	gray, variably CLAYEY SAND, loose to very dense, sand rticles, layers and pockets of clay and sand (NATIVE)	
	SS 14	31-50/5"		SM		7.0 (SM) gray, greenish - layer of sandy clay	gray, SILTY SAND, very dense, some cementation	-22.8
	SS 15	11-9-12-19 (21)	MC = 29% MC = 61%	_		t.0 (CL) greenish gray,	yellowish gray, variably sandy CLAY, hard	-29.8
90	SS 16 SS 17	8-7-9- 50/3" 50/5"	MC = 71% MC = 27%	- CL		- cemented layers b	elow 93 ft	
	SS 18 SS 19	16-22- 50/4"	MC = 29% MC = 25%	sc		2.0 (SC) gray to dark gr phosphate particles	ay, variably CLAYEY SAND, very dense, trace fine , heavily cemented	37.8
	SS 20	10-50/5"	MC = 34% LL = 44 PL = 24 #200 = 46%	<u>]</u>		3.4	Bottom of borehole at 98.4 feet.	-44.2

			ameo foste whee	c er eler					BOF	RING NUMBER B- PAGE 1 C	- 34 DF 3
M - BORINGS.GPJ	CLIENT _ Carollo Engineers, Inc. PROJECT NUMBER _ 300472x2.05 DATE STARTED _ 3/5/14 COMPLETED _ 3/5/14 DRILLING CONTRACTOR _ Madrid Engineering Group DRILLING METHOD _ Standard Penetration / Mud Rotary LOGGED BY _ LG CHECKED BY _ GA NOTES _ STA 20+41.3; Adjacent to CPT-13						5/14 A	 PROJECT NAME <u>Lake Manatee Dam Evaluation</u> PROJECT LOCATION <u>Manatee County</u> GROUND ELEVATION <u>54.2 ft</u> HOLE SIZE <u>3 inches</u> GROUND WATER LEVELS: AT TIME OF DRILLING AT END OF DRILLING AFTER DRILLING 			
2 - MANAEE COUNTY DA	DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG		МАТЕ	ERIAL DESCRIPTI	ION Elev	vation
0 US LABS.GDT - 4/29/15 15:00 - 1:\300472X2 CAROLLO-LK MANATEE DAM-EVAL\REPORT\GEOTECHNICAL REPORT NAPPENDIX\300472X2		SS 1 SS 2	24-25-17- 10 (42) 4-10-21-25 (31) 3-4-4-3 (8)	MC = 7%	SM		(SM) bro (SM) gra (SC) gra (FILL)	wn, SILTY SAND, Ioos	se to dense (FILL)	nd sized phosphate particles	29.2
BH / IP / WELL - C-44 GINI SIL	 <u>30</u> -	SS 4	1-3-4-3 (7)	MC = 24%	- SC						
GENERAL	35 .	SS 5	3-4-3-4 (7)	MC = 29%			- thin lay	er of dark brown top so	bil		



PAGE 2 OF 3

CLIENT Carollo Engineers, Inc.

PROJECT NUMBER 300472x2.05

				1	1	
HLUCEDEDATING	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION Elevation
						(SC) gray, brown, CLAYEY SAND, loose, few sand sized phosphate particles
						(FILL) (continued)
5 H						- gray, greenish gray
	/ ss	2-2-3-3		-		
≦ ∖ 40	6	(5)	MC = 27%			
				SC		
	/ ss	3-2-4-5				
45	7	(6)	MC = 21%			
						47 0 7 2
						(SM) gray, dark gray, SILTY SAND, loose, few sand sized phosphate particles
	/ ss	3-5-5-6		-		(NATIVE)
5 50	8	(10)	MC = 31%			
				SM		
	/ ss	6-4-5-6		-		54.0 0.2
55	9	(9)	MC = 23% MC = 30%			(SC) gray, CLAYEY SAND, dense, few sand sized phosphate particles
2			LL = 32 PL = 19	1		
			#200 = 21%			
				00		
	∕∕ ss	9-15-25-50	MC = 210/	SC		
60	10	(40)	WC - 21%			
						62.0 -7.8
231						(SM) gray, SILTY SAND, medium dense to very dense, few sand sized
		33-38-	MC = 21%			phosphale particles, neavily contented 20165
65		50/5				
				SM		
5 1	V ss	7-11-19-28	MC = 32%			
70	12	(30)				
3						



BORING NUMBER B-34 PAGE 3 OF 3

CLIENT Carollo Engineers, Inc. PROJECT NUMBER 300472x2.05

F					-			
	07 DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	Elevation
	-	V ss	14-10-19-		SM		(SM) gray, SILTY SAND, medium dense to very dense, few sand sized phosphate particles, heavily cemented zones <i>(continued)</i>	10.8
	 		50/3"	MC = 31% MC = 33%	CL		(CL) greenish gray, light gray, variably sand CLAY, hard, heavily cemented	- 19.6
	- 80 -	_ 14_					82.0 (SM) dark gray, greenish gray, SILTY SAND, medium dense, few sand sized	27.8
	85 _	SS 15	10-9-11-21 (20)	MC = 30%	SM		phosphate particles	
	90	SS 16 SS 17	5-4-8-13 (12) 50/5"				(CL) greenish gray, variably sandy CLAY, stiff to hard, heavily cemented	32.8
	95	SS 18	14-28-34- 50/1" 21-11-	MC = 29%	CL		- gray, few sand sized phosphate particles, below 92 ft	
	-	> 19 > SS 20	50/4"	MC = 47% MC = 20% #200 = 56%	_			
	100 _ -	SS 21	4-6-12-25 (18)	MC = 38% LL = 48 PL = 28			102.0	-47.8
				#200 = 54%	/		Bottom of borehole at 102.0 feet.	
Ľ								

April / May 2017 Borings

				^				PAGE 1 OF 1
M	/0	\mathbf{O}	J.)				
	T Caro	lo				PROJECT NAME Lake Manatee Da	am	
ROJ	ECT NUN	IBER _ 300	472x4			PROJECT LOCATION Bradenton, F	=L	
DATE	STARTE	D 5/3/17		co	MPLETED <u>5/4/17</u>	GROUND ELEVATION 28.5 ft	HOLE	SIZE 4 inches
RILL	ING COM	ITRACTOR	Mad	rid Enginee	ering Group	LOCATION		
RILL	ING MET	HOD Star	ndard	Penetration	/ Mud Rotary	GROUND WATER LEVEL AT TIM	E OF DRILLING	i <u></u>
.OGG	ED BY _	CS		СН	ECKED BY JB	HOLE COMPLETION backfilled with	cuttings and ber	ntonite chips
IOTE	S _Locat	ion: Adjace	nt to fi	ne screen o	chamber behind south downs	stream training wall. Piezometer installed a	adjacent to SPT	location, installed throug
0 (ff)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	Mł	ATERIAL DESCRIPTION	Elevation	WELL DIAGRAM
_	V ss	8-9-11-11			gray, light brown, brown rocks/gravel, medium de	, fine-grained quartz SAND, silty, trace ense to loose, dry to moist		
_	\square	(20)	-				l l l l l l l l l l l l l l l l l l l	
-		7-6-6-6	SP					
		(1-)	-					
5	$\begin{vmatrix} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	2-2-2-3 (4)						
-		2240		6.0	gray, brown, dark brown	n, SILTY SAND, fine-grained sands, very lo	22.5 00se,	
-		(3)			dry to moist			
-	ss	2-1-2-2	1					
- 10	5	(3)						
- - 15 -	SS 6	1-1-1 (2)	SM				11.5	- grout
_					dark brown, light brown, silts. trace cemented silt	fine to medium grained quartz SAND, tra nodules. loose. moist	ce	
_	√ ss	1-2-2	-		,	, ,		
20	7	(4)	-					
-			SP					
25		7-5-2 (7)						
20	~ \ ~	(.)	1	26 0			25	
-	∕ ss	6-9-10			brown, gray, CLAYEY S	AND, trace cemented silt nodules, loose t	2.5 to	← fine sand pack
-	/\ 9	(19)	-		meaium aense, moist			sand pack
-	\ ee	244	-					
30	10	(8)	sc					sceeen
	∖∕ ss	4-4-5	-					
	× 11	(9)		33.0			-4.5	
					Bott	om of borehole at 33.0 feet.		

	_			*		WEL	L NUMBER SPT-2 PAGE 1 OF 1			
M	/0	\mathbf{O}	5							
CLIEN	IT Carol	lo				PROJECT NAME Lake Manatee Dam				
PROJ		IBER _3004	472x4			PROJECT LOCATION Bradenton, FL				
DATE	STARTE	D 5/4/17			COMPLETED 5/4/17	GROUND ELEVATION 25.28 ft	HOLE SIZE 4 inches			
DRILL	ING CON	TRACTOR	Mad	rid Engi	neering Group					
DRILL	ING MET	HOD Star	ndard I	Penetrat	tion / Mud Rotary	GROUND WATER LEVEL AT TIME OF DR	RILLING			
LOGGED BY CS CHECKED BY JB HOLE COMPLETION backfilled with cuttings and bentonite chips										
NOTES Location: Behind south downstream training wall. Piezometer installed adjacent to SPT location, installed through hollow stem auger										
o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MAT	ERIAL DESCRIPTION	WELL DIAGRAM			
	ss	2-5-11-10	SM		brown, SILT SAND, fine g	rained quartz, medium dense, dry				
		(10)		2	2.0 brown, fine-grained quartz	SAND, trace silts, loose to medium dense,	23.3			
	2	(12)	SP		dry to moist					
5	ss 3	5-7-7-8 (14)								
	ss	6-5-5-4 (10)								
	ss	3-2-3-2		8	brown, gray, SILTY SAND	, fine to medium grained quartz, very loose to	17.3			
10	5 (5) loose, moist				loose, moist					
									grout	
15	SS 6	2-3-4 (7)	SM							
20	ss 7	1-0-0-1 (0)		2	20.5					
	SS 7A	0-0-0-0 (0)	SP		brown, gray, SAND, trace	silt, very loose, moist				
	ss	2-7-9-9			gray, greenish gray, CLAY medium dense, moist	EY SAND, fine grained quartz sand, loose to	^{∠.8} fine sand pack			
25							sand pack			
	SS 9	2-5-5 (10)	SC							
	ss	5-3-5								
30	/ \ 10	(8)		/////3	30.0 Botton	n of borehole at 30.0 feet.	-4.7			

			*				UMBER SPT-3 PAGE 1 OF 1		
WC	\mathbf{O}	J.							
CLIENT Card	ollo				PROJECT NAME Lake Manatee Da	am			
PROJECT NU	MBER _3004	472x4			PROJECT LOCATION Bradenton, I	FL			
DATE START	D 5/4/17			COMPLETED 5/4/17	GROUND ELEVATION 13.69 ft	HOLE	SIZE 4 inches		
DRILLING CO	NTRACTOR	Mad	rid Eng	gineering Group					
DRILLING ME	THOD Star	ndard	Penetr	ation / Mud Rotary	GROUND WATER LEVEL AT TIM	IE OF DRILLING	3		
	<u>CS</u>	·\//			HOLE COMPLETION backfilled with	cuttings and be	ntonite chips		
Location: Near SW corner or downstream apron slab. Piezometer installed adjacent to SPT location, installed through hollow stem auger									
O DEPTH (ft) SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATE	RIAL DESCRIPTION	Elevation	WELL DIAGRAM		
∬ ss	3-5-6-6			light brown, fine-grained qua	artz SAND, trace silt, medium dense, o	dry			
	(11)	SP		, ,		K			
	10-14-10-								
	(24)	SM		4.0 dark brown Sll TY SAND f	ine quartz sand medium dense dry	9.7			
5 3	16-10-5-3 (15)			gray, greenish gray, CLAYEY SAND, fine grained sand, trace			grout		
	3-4-5-5 (9)			phosphatic sands, loose to r	nedium dense, dry to moist				
	3-7-11-10								
		SC				X	ine sand		
6	(5)					· . • . •	pack		
SS 15 7	3-4-5 (9)					sceeen			
	3-4-5 (9)			47.5		2.0	<u>. (* * *), * (*)</u>		
	(0)	1		Bottom	of borehole at 17.5 feet.	-3.0			

* WELL NUMBER SPT-4 PAGE 1 OF 1									
WO	00	J.							
CLIENT Carolle	0				PROJECT NAME Lake Manatee Dam				
PROJECT NUM	BER _3004	472x4			PROJECT LOCATION Bradenton, FL				
DATE STARTED) <u>5/1/17</u>			COMPLETED 5/1/17	GROUND ELEVATION 28.02 ft	HOLE SIZE 4 inches			
DRILLING CON	TRACTOR	Mad	rid Eng	ineering Group					
DRILLING MET	HOD _Star	ndard	Penetra	ation / Mud Rotary	GROUND WATER LEVEL AT TIME C	of Drilling			
LOGGED BY DR CHECKED BY JB HOLE COMPLETION backfilled with cuttings and bentonite chips									
NOTES Location: Behind downstream training wall. Piezometer installed adjacent to SPT location, installed through hollow stem auger									
o DEPTH (ft) SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MAT	ERIAL DESCRIPTION	WELL DIAGRAM			
ss	5-6-5-4			brown, dark brown, fine-gra dense, dry to moist	ained quartz SAND, very loose to medium				
- 1	(11)	-		,,,,					
ss	3-3-3-5								
	2 (6) SS 3-3-2-3 3 (5)								
5 \times SS 3									
	(-)								
-	2-4-4-4 (8)								
	2122								
	(3)					grout			
		SP							
	1-1-2								
15 6	(3)								
/ ss	3-2-4								
20 7	(6)								
	500			light brown below 20 feet		← fine sand pack			
$- \frac{33}{8}$	(18)			Ign Slown Solow 20 1661					
				silty lenses below 23.5 feet		🔫 sand pack			
SS	1-0-0 (0)			25.0					
20 0	(0)			gray, greenish gray, SILTY	AND, fine-grained sands, trace phosphatic	c sceeen			
ss 🗍	3-3-3			sands, loose, moist					
10	(6)	_ sм							
	200	-							
30 11 35	3-2-3 (5)			30.0		-2.0			
				gray, greenish gray, CLAY	EY SAND				
	3-3-7	SC							
	(10)		1///	32.5 Bottom	n of borehole at 32.5 feet.	-4.5			

			*		WEL	L NUMBER SPT-5				
WOOD.										
CLIENT Carolle					PROJECT NAME ake Manatee Dam					
PROJECT NUM	BER 3004	472x4			PROJECT LOCATION Bradenton, FL					
DATE STARTED) 5/3/17			COMPLETED 5/3/17	GROUND ELEVATION 24.08 ft	HOLE SIZE 4 inches				
DRILLING CON	TRACTOR	Mad	rid En	gineering Group						
DRILLING METH	HOD Star	ndard I	Penetr	ation / Mud Rotary	GROUND WATER LEVEL AT TIME OF D	RILLING				
	LOGGED BY ND CHECKED BY JB HOLE COMPLETION backfilled with cuttings and bentonite chips									
NOTES Location: Behind downstream training wall. Piezometer installed adjacent to SPT location, installed through hollow stem auger										
o DEPTH (ft) SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATE	ERIAL DESCRIPTION Ele	WELL DIAGRAM				
SS 1	4-4-4-3 (8)	SP		gray, light brown, fine-grain nodules, dry, loose 2.0	ed quartz SAND, silty, cemented silty	22.1				
5 SS 3	3-2-2-2 (4) 2-2-3-2 (5)	SM		brown, dark brown, SILTY S about 5.5ft, moist, loose	SAND, 2-inch brown clayey sand lense at	18 1				
SS 4	2-2-2-3 (4)	sc		gray, light gray, CLAYEY S	AND, orangish brown mottling, moist, loose	16.1				
SS 5 	2-2-2-2 (4)	SP- SM		gray, dark gray fine to medi content increased with dept 12.0	um graiined quartz SNAD with SILT, silt h, moist, loose	12.1				
SS - 15 6	1-1-3 (4)			dark brown, SILTY SAND, throughout, moist, loose to	cemented reddish brown silt nodules very loose					
		SM			gray, greenish gray below 1	8.5 feet				
20 SS 7	1-0-0-0 (0)			20.5		⊢ fine sand 3.6pack				
SS 	1-0-1-2 (1)			greenish gray, CLAYEY SA mosit to wet, very loose to l	ND, trace phosphatic sands throughout, oose	sand pack				
SS 25 9	4-4-4 (8)	SC				sceeen				
SS 10	2-3-4 (7)			27.5		-3.4				
				Bottom	of borehole at 27.5 feet.					
			~	*		WE	ELL NUI	MBER SPT-6 PAGE 1 OF 1		
-----------------	-----------------------	-----------------------------	----------	----------------	--	---	----------------	---------------------------		
M	/0	\mathbf{O}	J.							
CLIEN	T Carol	0				PROJECT NAME Lake Manatee Dam				
PROJ	ECT NUM	BER _3004	472x4			PROJECT LOCATION Bradenton, FL				
DATE	STARTE	D 5/5/17			COMPLETED _ 5/5/17	GROUND ELEVATION 9.07 ft	HOLE S	ZE 4 inches		
DRILL	ING CON	TRACTOR	Mad	rid Enç	gineering Group					
		HOD <u>Star</u>	idard I	Penetra		GROUND WATER LEVEL AT TIME OF				
NOTE	S Locati	on: Near N'	W cor	ner of	downstream apron slab. Piezometer	installed adjacent to SPT location installed	d through holk	ow stem auger		
o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATE	ERIAL DESCRIPTION	Elevation	WELL DIAGRAM		
	ss 1	1-2-3-3 (5)	SP		brown, fine-grained quartz	SAND, trace silts, loose, dry				
	ss 2	2-3-4-3 (7)			4.0		5.1	grout		
5	ss 3	2-4-3-3 (7)			brown, gray, SILT SAND, fi loose, to medium dense, dr	ne-grained sands, trace clayey nodules, y to moist		⊷ fine sand		
	ss 4	6-4-5-6 (9)	SM					pack		
 _ <u>10</u>	SS 5	5-7-9-7 (16)			9.0 gray, greenish gray, CLAYE medium dense, moist	Y SAND, fine-grained sands, loose to	0.1	sceeen		
	SS 6	4-5-5-6 (10)	SC							
				////	Bottom	of borehole at 12.0 feet.	-2.9			

V	/0	00	5.	*		WELL NUMBER SPT-7 PAGE 1 OF 2				
CLIEN	IT Caroll	0			PROJECT NAM	ME _Lake Manatee Dam				
PROJ	ECT NUM	BER _ 3004	472x4		PROJECT LOC	PROJECT LOCATION Bradenton, FL				
DATE	STARTE	5 /9/17			COMPLETED 5/9/17 GROUND ELE	EVATION 50.98 ft HOLE SIZE 4 inches				
DRILL	ING CON	TRACTOR	Mad	Irid Eng	ineering Group LOCATION					
DRILL	ING MET	HOD Star	ndard	Penetr	ation / Mud Rotary GROUND W	WATER LEVEL AT TIME OF DRILLING				
LOGG	ED BY _	CS			CHECKED BY JB HOLE COMPL	LETION backfilled with cuttings and bentonite chips				
NOTE	S Locati	on: Along d	lam ce	enterlin	e in north approach slab. Piezometer installed adjace	cent to SPT location, installed through hollow stem auger				
o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIP	IPTION WELL DIAGRAM				
				4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	concrete bridge deck and grout	48.0				
 5	SS 1	2-4-6-5 (10)	SM		dark brown, brown, light brown, gray, SILTY quartz, trace clayeys nodules	Y SAND, loose, fine-grained				
	2 2 SS SS	2-4-4-4 (8) 1-1-2-2			7.0 light brown, greenish gray, gray, SANDY CL trace phosphatic sands throughout	44.0 CLAY, very soft to very stiff,				
 _ 10	3 SS 4	(3) 1-1-3-2 (4)								
	SS 5	0-1-4-2 (5)								
 _ 15	SS 6	0-1-2-2 (3)								
 _ 20	SS 7	0-1-1 (2)								
			CL			grout				
 _ 25 _		1-1-2 (3)								
 30	SS 9	2-3-2 (5)								
 35	SS 10	1-3-4 (7)								

(Continued Next Page)



V	/0	00	5	*		WEL	L NUMBER	SPT-8 E 1 OF 2
CLIEN	T Caroll	0			PROJECT NAME La	ke Manatee Dam		
PROJI	ECT NUM	BER _ 3004	472x4		PROJECT LOCATION	Bradenton, FL		
DATE	STARTE	5 /9/17			COMPLETED 5/9/17 GROUND ELEVATION	N 51.01 ft	HOLE SIZE 4 inche	es
DRILL	ING CON	TRACTOR	Mad	rid Eng	ineering Group LOCATION			
DRILL	ING MET	HOD Star	ndard	Penetr	ation / Mud Rotary GROUND WATER	LEVEL AT TIME OF D	RILLING	
LOGG	ED BY _	CS			CHECKED BY JB HOLE COMPLETION	backfilled with cutting	s and bentonite chips	
NOTE	S Locati	on: Along d	lam ce	enterlin	e in north approach slab. Piezometer installed adjacent to S	PT location, installed t	through hollow stem au	ger
o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	Ele	WELL DIA	GRAM
				2 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4	concrete bridge deck and grout			
	ss 1	1-1-1-1 (2)			3.0 brown, gray, light brown, SILTY SAND, very loose, clayey nodules	fine-grained quartz,	48.0	
	SS 2	1-0-0-1 (0)	SM		7.0		44.0	
	SS 3	1-0-2-3 (2)			light brown, gray, greenish gray, SANDY CLAY, so quartz, trace phosphatic sands	ft to stiff, fine-grained		
 	ss 4 ss	1-3-4-4 (7) 0-0-3-2						
	5 SS 6	(3) 1-2-2-4						
 		(+)						
	√ ss	1-2-3						
 	7	(5)	CL					
		101					grou	ut
25	8	1-2-1 (3)						
 30	SS 9	1-2-5 (7)						
 35	SS 10	5-5-6 (11)			(Continued New Down)			



SPT Boring AFW Boring Locations 2017

					*				BORIN	g nume	BER SPT-9
V	/(00	5							FAGE I OF 2
CLIEN	IT Car	rollo			,				PROJECT NAME Lake Manatee Dam		
PROJ		JME	BER _ 3004	172x4					PROJECT LOCATION Bradenton, FL		
DATE	START	ED	0_10/20/17	7		_	COMPLETE	D 10/23/17	GROUND ELEVATION 38 ft	HOLE SIZE	4 inches
DRILL	ING CO	ONT	TRACTOR	Mad	lrid E	ng	gineering Grou	ıp	LOCATION		
DRILL	ING M	ETH	HOD Stan	dard I	Pene	tra	ation / Mud Ro	otary	GROUND WATER LEVEL AT TIME OF D	RILLING	
LOGG	ED BY	_ <u>C</u>	S			_	CHECKED B	Y AC			
NOTE	S Loc	atic	on: North o	r ogee	e sect		n behind norti	n training wall near 201	7 depression. SP1 adjacent to training wall		
DEPTH (ft)	SAMPLE TYPE NUMBER		BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	P C C			MATERIAL DESCRIPTION		Floretin
0		_				1	brow	n fine grain quartz SA	ND with Silt loose dry		Elevation
	M GE	3					bioli				
		2					moist	below 2 feet deep			
	2			SP-							
5	\bigvee se	6	3-3-4-5	SM							
	3		(7)								
		3	3-3-2-5 (5)				8.0				30.0
	V ss	6	4-4-3-4	SM			brow	n, SILTY SAND, loose	, fine grain quartz, moist		
_ 10		_	(7)				10.0 brow	n light brown fine grai	n quartz SAND with Silt, medium dense		28.0
		6	5-8-10-8 (18)	SP- SM			10.0	n, igni brown, into gra			
			4-3-4-4				brow	n, SILTY SAND, loose	, fine grain quartz		26.0
	7		(7)								
15	\bigvee se	3	2-2-6-4	SM							
	8		(8)	OW							
	X ss	3	3-4-6-5								
		_	(10)				18.0 brow	n. light brown, fine grai	n quartz SAND with Silt. very loose		20.0
		5	3-2-2-2 (4)	еD				.,			
_ 20	SS SS	;	2-2-2-3	SM-							
	11		(4)				22.0				16.0
	V ss	şŢ	3-2-3-2				brow	n, light brown, SILTY S	SAND, loose to very loose, fine grain quartz		
		2	(5)	SM			dark	or matarial from 21' 26			
_ 25		5	1-0-0-1 (0)				uark				
	/ \		. ,			4	26.0 CON	CRETE FOOTER			12.0
					N 4 4	0 7 7					
						4 7 0					
30						× 7.					
						× 0 0 ×					
						P. O.N.					
						440					
35					4 4 4	d V V					
- 33					N 4	<u>a:1</u>			(Continued Next Page)		

BORING NUMBER SPT-9

PAGE 2 OF 2

CLIENT Carollo

PROJECT NUMBER 300472x4

voor

*

PROJECT NAME Lake Manatee Dam

PROJECT LOCATION Bradenton, FL

DEPTH (ft)	AMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
35	<i>м</i>			P 6 4		Elevation
						10
	ss 14	4-4-4-4 (8)			gray, CLAYEY SAND, loose to medium dense, fine grain quartz, with phosphatic sand and phosphatic sand nodules	1.0
40	SS 15	2-3-4-4 (7)				
	SS 16	3-4-5-5 (9)	sc			
_ 45	SS 17	3-3-5-6 (8)				
	SS 18	5-5-7-8 (12)			47.0	-9.0
					Bottom of borehole at 47.0 feet.	

					*				SPT-10
			0					PAG	E 1 OF 2
)				
	IT _	Carol		470 4					
PROJ	ECT		IBER <u>3004</u>	472x4		COM		PROJECT LOCATION Bradenton, FL	
	517			Mad	rid En	cowi			es
			HOD Star	 dard	Penetr	ration / I	l <u>ig Group</u> Mud Rotany	GROUND WATER LEVEL AT TIME OF DRILLING	
LOGO	ED	BY	CS			CHEC	KED BY AC		
NOTE	s_	Locati	on: Behind	north	trainin	g wall n	ear 2017 depression. SPT ad	djacent to training wall depression	
	ц	J							
Ŧ		ШШ	UE) UE)	s.	₽,				
(#)	ᇤ	JMB		S.C	LOG			MATERIAL DESCRIPTION	
	MAR	Z	Ξŏz		G				
0		,			<u>ি</u> বাবা		light brown brown fine gra	in quartz SAND with Silt medium dense to loose, dry	Elevation
	sm.	GB 1					nghi biown, biown, nne gra		
		CP					moist beneath 2 feet		
- 1	Ü	2		SP-					
5	M	SS	4-6-5-4	SM					
	М	3	(11)						
L _	М	SS	3-2-4-4						
	$\left(\right)$	4	(6)			8.0	dark brown Silty SAND los	no fino avoir quarta moist	22.0
	X	SS 5	3-4-2-3 (6)	SM			dark brown Silly SAND, loc	sse, line grain quartz, moist	
_ 10	$\left\{ \right\}$					10.0	light brown, brown, fine to r	medium grain guartz SAND with Silt, loose to very loose	20.0
	X	6	2-2-3-5 (5)				0 / /		
	M	SS	3-3-4-3	SP-					
	M	7	(7)	SM					
15	М	SS	1-1-1-1						
Ļ _	\square	8	(2)			16.0			14.0
	X	SS a	0-1-2-2				brown, dark brown, Silty SA	AND, very loose, fine grain quartz	
	$\left\{ \right\}$	5	(0)						
	XI	SS 10	1-1-2-1 (3)						
	\mathbb{N}	22	1_1_2_3	SM			dark brown with shell fragm	nents and angular pea-size gravel found below 20 feet	
	M	11	(3)						
	M	SS	1-1-2-50						
	М	12	(3)			24.0			6.0
25	NA						Concrete footer		
	IX.	SS							
	/				4 4 4 4 4 4				
	$\left\{ \right\}$	00	7405			28.0	gray Clayey SAND, loose.	fine grain quartz, with angular pea-size gravel and phosphatic sand	2.0
		55 13	7-4-6-5 (10)				,		
	[]	SS	2-2-3-5						
[-	M	14	(5)	sc					
É I	M	SS	2-2-4-6						
<u> </u>	[]	15	(6)	-					
35	М	SS	2-2-3-5						

(Continued Next Page)

				*	BORING NUMBER S	PT-10						
V	/0		5		PAG	E 2 OF 2						
CLIEN	NT Carol	lo)	PROJECT NAME Lake Manatee Dam							
PROJ		IBER _ 300	472x4		PROJECT LOCATION Bradenton, FL							
DEPTH (ft)	92 DEPTH SAMPLE TYPE NUMBER NUMBER (T) VALUE) U.S.C.S. LOG LOG		GRAPHIC LOG	MATERIAL DESCRIPTION								
35	\$					Elevation						
		(5)	_		gray Clayey SAND, loose, fine grain quartz, with angular pea-size gravel and phosphatic sand (continued)							
		3-3-4-5	SC		dark gray material with less angular gravel found below 36 feet							
		(7)			38.0 Bottom of borehole at 38.0 feet	-8.0						

Barge Work Borings AFW 2017

		ameo foste whee	er Preier			BORING NUMBER BH- PAGE 1 C	01 DF 2
	NT <u>Carol</u> JECT NUM STARTEL LING CON LING MET GED BY <u></u>	lo IBER _3004 D _8/9/17 ITRACTOR HOD _Star CS of clear wate	472x4 COMF AmDrill, Inc. ndard Penetration / I cHEC	PLETE Mud R	D 8/9 otary 3Y M	PROJECT NAME _Lake Manatee Dam - Barge Work PROJECT LOCATION _Bradenton, FL 3/9/17 GROUND ELEVATION 37 ft	
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	vation
	-					⁻ average water elevation 37 feet	
	-						
	-						
	-						
	SS 1	0-4-4 (8)	6" WOH (19.0' - 19.5')			19.0 (SP-SM) brown to dark brown fine grained quartz SAND, loose to medium dense, slightly silty	18.0
2150-5 - 56:01 DZ	SS 2	4-7-8 (15)		SP- SM			40.0
	SS 3	9-6-4 (10)		SP		(SP) gray fine grained quartz SAND, loose	10.0
MELL - 0-44 GINI	SS 4	4-4-5 (9)	MC = 34% #200 = 33%			32.0 (SC) light greenish gray to greenish gray fine grained quartz CLAYEY SAND, loose to medium dense, with variably calyey and fine to coarse phosphatic pebbles	5.0
	- SS 5	4-3-5 (8)	MC = 30% #200 = 35%	SC			

(Continued Next Page)



		ameo foste whee	c er eler			BORING NUMBER BH-02 PAGE 1 OF 2
	ENT <u>Carol</u> DJECT NUM TE STARTE LLING CON LLING MET GGED BY <u></u> TES <u>19 ft c</u>	IBER <u>300</u> BER <u>300</u> D <u>8/10/17</u> ITRACTOR ITRACTOR ITRACTOR ITRACTOR ITRACTOR ITRACTOR ITRACTOR ITRACTOR	472x4 COMF AmDrill, Inc. March Penetration / N CHEC er	PLETE Mud R	ED 8/1 totary BY M	PROJECT NAME Lake Manatee Dam - Barge Work PROJECT LOCATION Bradenton, FL 10/17 GROUND ELEVATION 37 ft HOLE SIZE 4 inches GROUND WATER LEVELS:
	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
ALL GINI FILES/3004/2X4 - IVA	-					average water elevation 37 feet
	-					
		0-0-0	18" WOH (19.0' -		विस्तः	19.0 18 (SM) dark brown fine grained guartz SILTY SAND, verv loose. with variably silty
	- SS 2	(0) 14-10-6 (16)	20.5')	SM		22.0 15 (SP) brown to dark brown fine grained quartz SAND, loose to medium dense
	- - - - - - - -	4-4-4 (8)		SP		32.0 5 (SC) light greenish gray fine grained quartz CLAYEY SAND, loose, with variably
		4-4-6 (10) 3-4-5 (9)		SC		clayey and fine phosphate pebbles



			ameo foste whee	er eler					BORING NUMBER BH- PAGE 1 C	- 03 DF 2
CL	IEN	T Carol	lo					ROJECT NAME Lake Mana	tee Dam - Barge Work	
PF	ROJE		IBER _ 3004	472x4				ROJECT LOCATION Brade	nton, FL	
DA	ATE :	STARTE	D 8/10/17	COM	PLETE	D 8/1	0/17	GROUND ELEVATION 37 ft	HOLE SIZE 4 inches	
DF	RILLI	NG CON	ITRACTOR	AmDrill, Inc.				BROUND WATER LEVELS:		
וָלָ סיין DF	RILLI	NG MET	HOD Star	ndard Penetration / I	Mud R	otary		$\overline{\mathbf{a}}$ at time of drilling	0.00 ft / Elev 37.00 ft	
ž LC	OGG	ED BY	CS	CHEC	KED I	BY M	;	AT END OF DRILLING		
รู่ NC	DTES	3 _24 ft c	of clear wate	er				AFTER DRILLING		
	(#) 0	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	V	MATERIAL D	ESCRIPTION	vation
	5						average v	vater elevation 37 feet		
	5 - - - - - - - - - - - - - - - - - - -						24.0			13.0
701 7	25	√ ss	0-0-1	12" WOH (24.0' -			24.0 (SP-SM)	ight brown, tan, fine grained q	uartz SAND, very loose, slightly silty	13.0
	- - - - - - - - - - - - - - - - - - -	/ 1 SS 2	(1) 1-1-1 (2)	25.0')	SP- SM		20.0			
- IN	-						32.0 (SP) light	brown fine arained quartz SAN	ND. very loose, with coarse phosphate	5.0
4	-						pebbles	Siewin nine granneu quartz OAI	te, vory loose, with coarse phosphate	
	₁₅ -	$\begin{pmatrix} SS \\ 3 \end{pmatrix}$	4-1-0 (1)	6" WOH (34.5' - 35 0')	SP					
× ·	,									
	-						37.0			0.0
]						(SC) light	greenish gray fine grained qua	artz CLAYEY SAND, medium dense,	
	4	√ ss	6-7-8	MC = 39%	SC		vanabiy C	ayey, with the phosphate ped	טוכס	
8 4	0	∕∖ 4	(15)	#200 = 40%						



BORING NUMBER BH-03

CLIENT Carollo

PROJECT NAME Lake Manatee Dam - Barge Work



		amec foste whee	: r Iler			BORING NUMBER BH-04 PAGE 1 OF 2
	NT <u>Carol</u> JECT NUM E STARTE LING CON LING MET GED BY <u></u> ES <u>5 ft of</u>	lo IBER _3004 D _8/11/17 ITRACTOR 'HOD _Stan CS clear water	72x4 COMI AmDrill, Inc. dard Penetration / I CHEC	PLETE Mud R :KED I	:D 8/1 totary BY M	PROJECT NAME _Lake Manatee Dam - Barge Work PROJECT LOCATION _Bradenton, FL 1/17 GROUND ELEVATION _37 ft HOLE SIZE _4 inches GROUND WATER LEVELS: ✓ AT TIME OF DRILLING _0.00 ft / Elev 37.00 ft C AT END OF DRILLING AFTER DRILLING
DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
FILES\30U4/2X4 - IMA	-					average water elevation 37 feet
	- SS 1	3-5-7 (12)				(SP-SM) dark brown fine grained quartz SAND, medium dense, with slightly silty
	- SS 2	5-9-12 (21)				
	SS 3	8-12-17 (29)		SP- SM		
	SS 4	8-14-21 (35)				22.0 15
	SS 5	4-9-21 (30)		SM		(SM) dark brown fine grained quartz SILTY SAND, dense, with fine phosphate pebbles
	SS 6	2-2-11 (13)	MC = 31% #200 = 44%	-		(SC) light greenish gray fine grained quartz CLAYEY SAND, medium dense to loose, with coarse phosphate pebbles
	SS 7	3-3-3 (6)		SC		
	- - SS 8	3-3-4 (7)				



			ameo foste whee	er eler			BORING NUMBER BH-05 PAGE 1 OF 2
(GE WORK.GPJ	CLIEN PROJI DATE DRILL DRILL LOGG NOTE	IT <u>Carol</u> ECT NUM STARTEL ING CON ING MET GED BY <u></u>	lo IBER <u>3004</u> D <u>8/14/17</u> ITRACTOR ITRACTOR CS clear water	472x4 COMI AmDrill, Inc. CHEC	PLETE Mud R :KED I	D 8/1 totary BY M	PROJECT NAME _ Lake Manatee Dam - Barge Work PROJECT LOCATION _ Bradenton, FL 14/17 GROUND ELEVATION _ 37 ft HOLE SIZE _ 4 inches GROUND WATER LEVELS:
NAEE COUNTY DAM - BAF	o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
E/ALL GINT FILES/3004/2X4 - MF	5						average water elevation 37 feet
		SS 1 SS 2	3-6-10 (16) 9-14-22 (36)		SP- SM		8.5 (SP-SM) dark brown fine grained quartz SAND with silt, medium dense to dense
USERS/ABHIJEET.CHORDIA	20	SS 3	5-11-15 (26)		sc		17.0 20 (SC) light gray and brown fine grained quartz CLAYEY SAND, medium dense 22.0 15 (SM) dark brown fine grained quartz SILTY SAND, very dense, variably silty
2/25/20 10:54 - C:	25	SS 4	8-25-50 (75)	50 blows/ 6"	SM		27.0
C-44 GINI STD US LABS.GUI -		SS 5	5-3-6 (9)		SC		U (SC) light greenish gray fine grained quartz CLAYEY SAND, loose to medium dense, variably clayey
GENERAL BH / IP / WELL-(<u>35</u> 	SS 6 SS 7	3-3-4 (7) 3-4-4 (8)	MC = 29% #200 = 26%			



			ame foste whee	c er eler			BORING NUMBER BH-06 PAGE 1 OF 4
RGE WORK.GPJ	CLIEN PROJI DATE DRILL DRILL LOGG NOTE	IT <u>Carol</u> ECT NUM STARTEI ING CON ING MET ED BY <u></u> S 23.5 ft	lo IBER _300 D _8/15/17 ITRACTOR ITRACTOR ITROD _Star CS t of clear w	472x4 <u>COMF</u> <u>AmDrill, Inc.</u> ndard Penetration / I CHEC ater	PLETE Mud R	ED <u>8/1</u> Rotary BY <u>M</u>	PROJECT NAME _ Lake Manatee Dam - Barge Work PROJECT LOCATION _Bradenton, FL 15/17 GROUND ELEVATION _37 ft HOLE SIZE _4 inches GROUND WATER LEVELS: AT TIME OF DRILLING 1C AT END OF DRILLING AFTER DRILLING
NAEE COUNTY DAM - BAF	o DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION Elevatio
T FILES/300472X4 - MA	5						average water elevation 37 feet
T T T T T T T T T	 						
USERSVABHIJEET.CHOR	20						
BS.GDT - 2/25/20 10:54 - C:		SS 1	0-0-0-0 (0)	30" WOH (23.5' - 25.5')	-		23.5 13 Residual of Jet Grout Material
.L - C-44 GINT STD US LA	30		3-2-1 (3) 3-3-3				30.0 7 (SC) light greenish gray fine grained quartz CLAYEY SAND, loose, with variably calyey and fine phosphatic pebbles
GENERAL BH / TP / WEL	<u>35</u> - - 40		(6) 3-3-4 (7)	MC = 27% #200 = 24%	SC		







		amed foste whee	c er eler			BORING NUMBER BH-C PAGE 1 OF)7 ⁼ 4
CLIEN PROJ DATE DRILL DRILL LOGG NOTE	IT <u>Carol</u> ECT NUM STARTEL ING CON ING MET GED BY <u></u> S 23.5 f	lo IBER _3004 D _8/16/17 ITRACTOR ITRACTOR ITROD _Star CS t of clear wa	472x4 COMF AmDrill, Inc. Adard Penetration / I CHEC ater	PLETE Mud R	ED <u>8/1</u> Rotary BY _M	PROJECT NAME _Lake Manatee Dam - Barge Work PROJECT LOCATION _Bradenton, FL /17/17 GROUND ELEVATION _37 ft HOLE SIZE _4 inches GROUND WATER LEVELS: AT TIME OF DRILLING MC AT END OF DRILLING AFTER DRILLING	
	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION Eleva	ation
						average water elevation 37 feet	
– – – – – – – – – – –							
	-						
	SS 1	1-0-0 (0)	12" WOH (24.0' - 25.0')	-		23.5 Residual of Jet Grout Material 27.0 (ML) greenish gray SANDY SILT, firm	<u>13.5</u> 10.0
	SS 2	1-3-5 (8)		ML		(,)	
	SS 3	3-3-3 (6)				37.0 (SC) light greenish gray CLAYEY SAND, loose, with variably clayey and fine	0.0
40	SS 4	8-4-4 (8)		SC		phosphate pebbles	



BORING NUMBER BH-07

CLIENT Carollo

PROJECT NAME Lake Manatee Dam - Barge Work

PROJ	PROJECT NUMBER _300472x4					PROJECT LOCATION Bradenton, FL	
DEPTH 6 (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	TESTS AND REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	ion
						(SC) light greenish gray CLAYEY SAND, loose, with variably clayey and fine phosphate pebbles (continued)	
45 45 	SS 5		Full Recovery	SC		shelby tube pushed	
50	SS 6	8-8-17 (25)		CL		CL) light greenish gray SANDY CLAY, very stiff, with fine to coarse phosphatic pebbles	0.0
	SS 7	18-15-20 (35)	MC = 67% LL = 55 PL = 20 #200 = 71%	СН		(CH) light greenish gray Fat CLAY with Sand, hard, with fine to coarse phosphatic pebbles	20.0
	SS 8	50/2"	50 blows/ 2"	SC		(SC) light greenish gray fine grained quartz CLAYEY SAND, with variably clayey and fine phosphate pebbles, dolomitic silt layering	<u>.0.0</u> 25.0
 	SS 9	16-50/5"	50 blows/ 5"	SP- SM		(SP-SM) light greenish gray fine grained quartz SAND, very dense, with slightly silty and fine phosphate pebbles	30.0
 	SS 10		50 blows/ 5"	SM		(SM) light greenish gray fine grained quartz SILTY SAND, very dense, with variably clayey and fine phosphate pebbles, cemented fragments	
75	SS 11	50/3"	50 blows/ 3"			77.04	40.0
80	SS 12	29-50/2"	50 blows/ 2"	SM		(SM) greenish gray SILTY SAND, very dense, with fine phosphate pebbles	
5						(Continued Next Page)	





CPT Soundings 2017
































Kiewit Borings 2018

¥,	REE WEEK	Kiew	Kiewit it Engineering Group Inc	TEST BC RECO	RINC RD	3				BOR	ING N	0: k	(-1
PRO	OJECT	NAME	Lake Manatee Dam Rehab.	PROJECT NUMBER 18-238-	550.09.01		DATE	E_05 S	Sep 18	3 to 06 S	ep 18		
LAT	TITUDE	E _27.4	9312 deg	LONGITUDE -82.35467 deg			ELE\	/ATION	N <u>+3</u>	9.2 feet			
COI	NTRAC		Amdrill	DRILLING METHOD Mud Rot	ary		LOG	GED B	Y SJ	L			
DRI	LL RIC	3 TYPE	Barge-mounted CME 55	HAMMER TYPE Auto			HAM	MER E	FFICII	ENCY 8	8.5%		
(ft)	NO	<u>ں</u>			гүре ER	ERΥ	/ IE)			▲ S	SPT N VA	LUE 4	▲ 40
EPTH	EVATI (ft)	RAPH LOG	MATERIAL DE	SCRIPTION		ECOVE (in)	BLOW SOUNT VALL	PP (tsf)	PV (psf)	PL ⊢ 20	. MC	LL 	- 30
		0			SAN	RE	υĘ			FINE 20	ES CONT	ENT (60 8	%) 🗆 30
			Barge		_								
		-	water										
	35											· · · · · · · · · · · · · · · · · · ·	
5													
										-		-	
 -	30	-										· · · ·	
		1 1 1 1 1 1	SILTY SAND, (SM), fine sand	with some organics and shells,			0.4.0	-					
15	- 25		banded gray with some brown,	wet, very loose		8	(3)	-					
			*POORLY GRADED SA	ND with SILT, (SP-SM);									
	20		Graphic log could not be	e changed.	SPT	15	7-11-13	-		MC=16.	24% 🔺 #	200=8	8.49%
20 20							(24)						
												· · · · · · · · · · · · · · · · · · ·	
			light brown, moist to wet, medi	u with trace fine (1/4") gravel, um dense									
25	15		POORLY-GRADED SAND, (SI), fine sand with some silt, n dense	SPT 3	15	9-9-11 (20)				A	· 	
	 10						3-3-5				10 05 0	· ·	
30			CLAYEY SAND, (SC), gray, m No recovery	oist, loose	4 ST	20	(8)				/ı∪=25.49	/o	
			-		5								
25	- 5		Becoming gray-blue		SPT 6	22	4-4-4 (8)	1				-	
	1	V-1-1-1-				I		1		· · · · ·			

*Note: After Wood's review of field and laboratory test data.



		IECT	NAM		50 00 01			. 05 0	Son 10	8 to 06 Sep 18		
		TUDE	27.4	Land widthated Dath Nethal. FROJECT NUMBER 16-236-5 19312 deg LONGITUDE -82.35467 dea	00.08.01		ELEV	ATIO	TION _+39.2 feet			
	G DEPTH (ft)	ELEVATION (ff)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □ 20 40 60 %0		
	-			CLAYEY SAND, (SC), gray, moist, loose (continued)	ST 7	23		4.0		MC=43.1%; #200=34.6%; LL=54.9; PL=23.5; PI=31.4		
JRINGS/LAKE MANALE	40			SANDY CLAY, (CL), gray-blue, moist, firm		24	4-4-5 (9)					
	45	-5		not be changed. Becoming blue/gray/green clay with gray 1/4" thick medium sand lenses and more silty, 1/4 inch medium sand lenses, very stiff	SPT 9	24	4-7-9 (16)			MC=64.7%; #200=41.6%; LL=71.0, PL=33.2; PI=37.8		
	50	- 10		SILTY SAND, (SM), fine sand with ~1.5" thick gray-green silty clay layers, gray with black grains, moist, medium dense CLAY, (CL), with silt, low plasticity, bluish to greenish gray, moist, firm to stiff	SPT 10	24	11-50					
USERS\SAMUEL.LASLEY\O	 55 	- 15		SAND, (SP), fine to medium sand, white with black grains, wet, medium dense ~2" thick layer of white hard clay/calcite/limestone in gravel-sized particles at 54.8'	SPT 11	22	8-16-12 (28)			MC=37.8%		
	- - 60_ -	 20 		*SILTY SAND with GRAVEL (SM); Graphic log could not be changed.	SPT 12	9	50/5"			>>/		
LOG - GINT SILJ US LAB.	65 - -	- <u>25</u>		GRAVELLY SAND, (SP-GP), coarse sand to fine gravel (3/8" to 1/4"), subangular to angular, gray, wet, very dense	SPT 13	19	23-28- 50/3"			MC=23.0%; #200=18.4% >>/ #4=82.1%		
	- - 70_ -	-30		SAND (SP), medium with trace 1/4" to 1/8" subangular particles, white and black grains, wet, very dense	SPT 14	_2_	50/4"			>>		

|--|--|

			Mit Engineering Group Inc	50 00 01		DATE	. 05	Son 19	to 06 9	20n 19		
LAT	TITUDE	E 27.4	49312 deg LONGITUDE -82.35467 deg	50.09.01		ELEV	<u></u> /ATIOI	N +39).2 feet)	
DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ 10 ₽ 20	SPT N 20 L 40 ES C(N VALU 30 MC 60 DNTEN	IE ▲ 40 LL 80 IT (%) □
 75			SAND (SP), medium with trace 1/4" to 1/8" subangular particles, white and black grains, wet, very dense <i>(continued)</i>	SPT 15	0	50/0"			20	40	60	80
 80	 40 		Fine to medium sand with some clay, 1/2" cemented particles, black grains in white matrix, moist to wet, very dense	SPT 16	1	50/0"						>>/
 _ 85			SILTY CLAY, (CL-ML), with some fine sand, light gray, moist, very stiff	SPT 17	26	7-8-13 (21)	2.5 1.5 0.5					
 _ 90			CLAYEY SAND, (SC), fine sand with silt, gray with some black grains, moist, medium dense	SPT 18	25	7-6-6 (12)	2.0			•		
 <u>95</u>	 55		Bottom of borehole at 95.0 feet.	SPT 19	24	6-7-6 (13)	2.0			<u> </u>		

*		Kiev	Kiewit vit Engineering Group Inc	TEST B REC	oring ord	i				BORI	NG N	10: K-2)
PR	OJECI		Lake Manatee Dam Rehab.	PROJECT NUMBER 18-23	8-550.09.01		DATE	E <u>10 S</u>	Sep 18	3 to 11 Se	p 18		-
LA	ritudi	E <u>27.</u> 4	19294 deg	LONGITUDE82.35445 de	g		ELE\	ATION	N _+39	0.0 feet			
col	NTRAG	CTOR	Amdrill	DRILLING METHOD Mud F	Rotary		_ LOG	GED B	Y_SJ	L			
DRI	LL RIG	G TYPE	Barge-mounted CME 55	HAMMER TYPE Auto			HAM	MER E	FFICIE	ENCY 88	3.5%		
ft)	N	O			A PE	34	s îii			▲ S 10	PT N V/ 20	ALUE ▲ 30 40	
PTH (I	EVATIO	RAPHIC	MATERIAL DI	ESCRIPTION	PLE TY	COVEF (in)	BLOW OUNTS VALUE	PP (tsf)	PV (psf)	PL 20	40 MC		
B		ß			SAM	RE	Ξŏz				S CONT	ENT (%)	
0			Barge							20	40 (<u>60 80</u>	
			Water										
_	-	-	Waler										
5	35												
_	Į .												
-	+ -	-										÷	
-	 30												
10													
_	+ -	-											
-	+ -	-											
-	25												•••
15													
	+ -	리이는	SILTY SAND, (SM), fine sand	with trace organics, dark brow	/n, V SPT	10	4-4-4	-		MC=17.3	34%		
-	<u> </u>		wet to moist, loose		1	10	(8)	_		••••••			
-	20												
20	+ -												
· -	+ -									· · · · · · · · · · · · · · · · · · ·		÷	
	ļ -												
	15		~23 ft to 28 feet: wood fibers in	n drill mud	SPT	0	1-1-1			A			
25	+ -						(2)						
-	t :												
	+ -		CLAYEY SAND, (SC), fine sai gray-green clay, moist, loose	nd, black sand grains and light				1.0 to		MC=31.3 LL=37.2	8%; #200 ; PL=19	0=26.1%; .9 PI=17.3	3
20	10				SPT 3	20	3-3-4 (7)					· · · · · · · · · · · · · · · · · · ·	
30	<u>+</u> -						(.)						
	[]									· · · · · · · · · · · · · · · · · · ·			
	+							40					
35	5				SPT 4	24	5-5-6 (11)	2.0 to					
50	1	V. 1.1.1.						1 2.0					

\$	E	Kiev	Kiewit TEST BO RECO	rin(RD	3				BORING	NO: K-2
PR LA		NAME 27.4	E Lake Manatee Dam Rehab. PROJECT NUMBER 18-238-5 49294 deg LONGITUDE -82.35445 deg	50.09.01		DATE	<u>10 S</u> ATION	Sep 18	3 to 11 Sep 18 9.0 feet	
25 DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N 10 20 PL N 20 40 □ FINES CO 20 40	VALUE ▲ <u>30</u> 40 MC LL 60 80 WNTENT (%) □ 60 80
			SILTY CLAY, (CL-ML), with sand, borderline CL-ML/SC/CL, gray-green clay with black sand grains, moist, stiff *CLAYEY SAND (SC); Graphic log could not be changed.	SPT 5	20	4-6-6 (12)	1.5 to 3.5		MC=24.6%;#/ LL=34.8; PL=2	200=38.4%; 21.4; PI=13.4
			CLAYEY SAND, (SC), with trace 1/4" rounded gravel, with layering of more and less clay, black sand grains with gray-green clay, moist, loose	SPT 6	24	4-5-5 (10)	1.5 to 2.5			
			LEAN CLAY, (CL), gray-green, moist, stiff to very stiff *CLAYEY SAND (SC); Graphic log could not be changed.	SPT 7	23	5-7-7 (14)	2.0		MC=39.1%, # LL=57.2 PL=2	200=25.3%; 4.7 PI=32.5
			SAND, (SP), medium to fine, black and white grains, moist to wet, medium dense to very dense *SILTY SAND (SM); Graphic log could not be changed.	SPT 8 ST 9	21 0	5-7-10 (17)	2.0		MC=24.6%; # LL=34.8; PL=2	200=38.4%; 21.4; PI=13.4
- 78-09-18 07:45 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1			Hard driving and rig chatter begin. Thin layer of hard clay/calcite/limestone, white, very hard, broken angular pieces from 1/4" to 5/8"	SPT 10	0.5	50/0"				×
	 		SILTY SAND, (SM), fine sand, dark gray with white and black grains, moist to wet, very dense, with 1/4" thick silty clay layer (gray-green), continued hard driving and rig chatter	SPT 11	1.5	50/4"				>
			SAND, (SP), medium sand, white and black grains, wet, medium dense to very dense, with cemented particles up to 1/4", continued hard driving and rig chatter	SPT 12 SPT 13	12 17	13-9-9 (18) 13-34- 50/3"			· · · · · · · · · · · · · · · · · · ·	>

\$	E	Kiew	Kiewit it Engineering Group Inc	TEST BO RECO	rin(RD	3				BORI	NG N	10: K-2	2
PR	OJECT	NAME	Lake Manatee Dam Rehab.	PROJECT NUMBER 18-238-5	50.09.01		DATI	E <u>10</u>	Sep 18	3 to 11 Se	p 18		_
LA	TITUDE	27.4	9294 deg	LONGITUDE -82.35445 deg			ELE\	VATIO	N <u>+39</u>	9.0 feet			_
DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DE	ESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SI 10 PL 20 □ FINES 20	PT N V/ 20 MC 40 S CON1 40	ALUE ▲ <u>30 40</u> LL 60 80 ENT (%) 60 80)
TA.GF													
			Cemented pieces up to 3/4"	hole at 73 5 feet	SPT	0.5	50/0"	1		ļ <u>,</u>			
KIEWIT STANDARD GEOTECH LOG - GINT STD US LAB.GDT - 28-09-18 07:45 - C:USERSISAMUEL LASLEYIODIVARIOUSWORKLAKE MANATEE DAM REHABIBORINGSLAKE MANAI											ΡΔ		E 3

Kiewit Engineering Group Inc	E		
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BORING NO: K-3

PROJECT NAME Lake Manatee Dam Rehab. PROJECT NUMBER 18-238-550.09.01 DATE 31 Aug 18 to 04 Sep 18

ELEVATION +38.9 feet

LATITUDE 27.49318 deg CONTRACTOR Amdrill

DRILL RIG TYPE Barge-mounted CME 55

DRILLING METHOD Mud Rotary

LONGITUDE _-82.35403 deg

HAMMER TYPE Auto

LOGGED BY SJL

HAMMER EFFICIENCY 88.5%

DECT DATA.GPJ	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL 40 60 80 □ FINES CONTENT (%) □ 20 40 60 80
PRO		-	Barge						
IATEE	+ -	-	Water						
	+	-							
SILAK	35	-							······
DNINC	+ -	-							
HAB/B(+ -	-							
N N N N									
	30	-							
TANK 10		-							
AKE N	+ -	-							
	+ -	-							
		-							
		-							
T	[]								
	<u> </u>								
RS/S/	20		SAND, (SP), fine to medium sand with trace to some silt, dark gray to brown, wet, medium dense, trace to some silt	SPT	15	3-8-13			
20	+ -		*POORLY GRADED SAND with SILT (SP-	1	15	(21)			•
7:45 - (+ -		SM); Graphic log could not be changed.						
9-18 0	+ -	$\left \right\rangle$							
- 28-0	15								
			Fine sand, light gray	SPT 2	13	4-4-7 (11)			
] _								
			·						
- GINT	+ -								
	10		Fine to coarse sand, brown, very loose to fine aray sand at 30'	SPT	12	12-1-1			MC=8.6%; #200=6.6%
<u>5 30</u>	+ -			3		(2)			
	+ -								
	1								
	5					8-9-12			
≦ <u>35</u>			CLAYEY SAND, (SC), gray to light gray, moist, medium dense	4	22	(21)			

*Note: After Wood's review of field and laboratory test data.

Ś		Kiewi	t Engineering Group Inc	TEST BO RECO	rin(RD	3				BORING	NO: K-3
PRO	OJECT		Lake Manatee Dam Rehab.	PROJECT NUMBER 18-238-5	50.09.01			E <u>31</u> /	Aug 18	8 to 04 Sep 18	
	ITUDE	27.49	J318 deg	LONGITUDE -82.35403 deg					N <u>+38</u>	B.9 feet	
G DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL D	ESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N V 10 20 PL MC 20 40 □ FINES CON 20 40	ALUE ▲ <u>30 40</u> C LL 60 80 TENT (%) □ 60 80
			CLAYEY SAND, (SC), gray to	light gray, moist, medium dense							
			*SANDY CLAY (CL) be changed.	Graphic log could not							
 40					SPT 5	24	4-4-5 (9)	-		MC=34.19%; LL=49; PL=10	#200=51.8%; ; PI=39
45			Trace black, fine, subangular	3/8" gravel	SPT 6	25	4-6-8 (14)				
			/	very dense							
- 50	-10		SAND, (SP), medium sand, lig Aret, medium dense 3 inch clay layer at 49 feet	ht gray with some black grains,	SPT 7	24	5-5-7 (12)	_		A	
			changed.	Dhic log is not							
 55	15				SPT 8	18	6-13-15 (28)	_		MC=29.3%; #20	00=18.1%
								-			
			SANDY CLAY, (CL), with som	e cemented sand, gray with							
60			Diack sand grains, moist, hard) some cemented sand below	SPT 9	9	50/3"			MC=27.5%; #20	00=26.0% >>
			58 feet; Graphic lo	g could not be changed.							
	25		No recovery, bard driving		SPT	0	50/0"	-			>>
65			the receivery, nard uniting								
	$\left \right $										
	-30		SAND, (SP), medium to coars gravel, gray and black grains, *CLAYEY SAND (SC): Gr	e sand, trace fine subangular wet, very dense	SPT 11	10	33-50	_		MC=15.7%; #20	00=16.8%
				aprile log could not be changed.							
	1 1	N.									

*Note: After Wood's review of field and laboratory test data.

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AME Lake Manatee Dam Rehab. PROJECT NUMBER 18-238- 27.49318 deg LONGITUDE -82.35403 deg 00 MATERIAL DESCRIPTION	550.09.01		ΠΔΤΕ			
27.49318 deg LONGITUDE82.35403 deg 0 MATERIAL DESCRIPTION				31/	Aug 18	to 04 Sep 18
MATERIAL DESCRIPTION			ELE\	ATIO	- +38	.9 feet
	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □ 20 40 60 80
SAND, (SP), medium to coarse sand, trace fine subangular						
No gravel, medium dense	SPT 12	16	7-9-13 (22)	-		A
Very dense. No recovery	SPT 13	0	50/2"			>>
	SPT	0	50/4"			>>
End of spoon came off in hole. No recovery. Hole terminated.	14					

Kiewit Engineering Group Inc

DRILL RIG TYPE Barge-mounted CME 55

TEST BORING RECORD

BORING NO: K-4

PROJECT NAME	Lake Manatee Dam Rehab.	PROJECT NUMBER	18-238-550.09.01

DATE 11 Sep 18 to 12 Sep 18

ELEVATION +39.0 feet

LATITUDE _27.4936 deg _____ CONTRACTOR _Amdrill
 LONGITUDE
 -82.35388 deg

 DRILLING METHOD
 Mud Rotary

HAMMER TYPE Auto

LOGGED BY SJL

HAMMER EFFICIENCY 88.5%

ECT DATA.GPJ	o DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □ 20 40 60 80
COX-				Barge						
				Water						
MANA										
AKE		35								
NGS/L	5									
BORI										
HAB										
AM RE										
EE D		30								
ANAI	10		-							
KE KE										
RK A										
OMS										
VRIOU		25	-							
	15									
SLEY										
I-LAX			-							
AMUE			in terta in	CAND (CD) measure to fine conducity come site how measure week to						
RS/S		20		moist, medium dense	SPT 1	18	4-6-6 (12)			A
:\USE	20									MC=2.44%
45 - C										
18 07:										
-60-8										
- 10		15		With clay, light brown to light gray (with tings of green)	SPT	17	9-7-7			
AB.G	25			with clay, light blown to light gray (with thige of green)	2		(14)			
ISD										
l S I										
U 9 -										
DO-		10		Medium sand with little to no fines, light brown, wet, loose	SPT	8	5-5-3			A MC-22/20/
	30				3		(٥)			⁰ , 22, 22– کانا
GEC										
DARL			////	CLAYEY SAND, (SC), gray-green, moist, loose						
STAN								0.75		
		5				24	3-6-10	15		
z١	35		WWW				(10)			

Klewit Engineering Group Inc

BORING NO: K-4

			WIT Engineering Group Inc	50 00 01			: 11 0	Son 10	8 to 12 Sep 18
	TITUDE	E_27.	4936 deg LONGITUDE -82.35388 deg	50.08.01		ELEV		1 _+39	9.0 feet
DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION SANDY LEAN CLAY(CL); Graphic log could not be changed.	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □
35 19-19-19-19-19-19-19-19-19-19-19-19-19-1			STLTY CLAY, (CL-ML), with sand, gray-green, moist to dry, very stiff (continued)	ST 5	13		4.5		20 40 60 80 MC=30.9%; #200=53.4%; LL=46.0; PL=23.7; PI=22.3
			SANDY CLAY, (CL), with silt, clayey sand in layers, gray-green, moist, stiff				1 5 to		
40				SPT 6	25	4-5-5 (10)	2.0		
			*CLAYEY SAND (SC) with silt, gray-green, moist, loose; Graphic log could not be changed.	51	12		4.5+		MC=20.7%; #200=35.6%; LL=48.3; PL=26.8; PI=21.5
	-5		Some coarse sand/fine gravel with black, rounded particles up to 1/4"	SPT 8 ST	25	4-5-5 (10)	1.0 to 2.0		.
			*CLAYEY SAND (SC), medium dense; Graphic log could not be changed. SILTY CLAY, (CL-ML), with fine sand lenses and trace	9					
	- <u>-10</u> 		rounded fine gravel/coarse sand (up to 1/4"), gray-green, moist, very stiff	SPT 10 ST 11	24 8.5	5-10-11 (21)	1.5 to 2.5		MC=39.5% #200=38.6%; LL=40.1; PE=26.1; PI=14.8 MC=29.9%;#200=18.3%
	-15		SAND, (SP), fine to medium sand, alternating with 2" thick layers of CLAYEY SAND (SC), black and white sand grains with gray-green clay, moist, medium dense	SPT 12	21	9-11-15 (26)			
	-20		LEAN CLAY, (CL), gray-green, moist, stiff to very stiff, with one ~1" layer of fine sand			7-13-15	2.5		
60	 		SAND, (SP), medium to fine sand with clay, black and white grains, moist, medium dense, hard driving	13	22	(28)			
65	-25		Medium to coarse sand, some cementation, dense to very dense	SPT 14 SPT	18	9-23-15 (38) 9-11-34-			A
	+ - + - + -		At 66 feet: ~2 inch layer of strongly cemented fine-grained material, gray	15	15	50/3"			>>/
9 JANNAKN 0	-30		More black sand particles, some cementation	SPT 16	11	26-50			
	+ -								·····

*Note: After Wood's review of field and laboratory test data.

Kiewit Engineering Group Inc	
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TEST BORING

Kiewit Engineering	g Group Inc RECC	JRD					
PROJECT NAME Lake Manat	tee Dam Rehab. PROJECT NUMBER _18-238	-550.09.01		DATI	E <u>11</u>	Sep 18	3 to 12 Sep 18
LATITUDE 27.4936 deg	LONGITUDE82.35388 deg			ELE\		N _+39	9.0 feet
DEPTH (ft) ELEVATION (ft) GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □ 20 40 60 80
Strongly co	emented fine-grained particles, white	SPT	0.25	50/2"]		
NOTES: Piezometer installed	at 67.5 feet sand nack from 73.5 feet.	17 ed from 59 f] feet to	the mudlir	ne		

	E	Kiew	Kiewit	TEST BO RECO	rino RD	3				BORI	NG NO): K-5
PF	ROJEC		Lake Manatee Dam Rehab.	PROJECT NUMBER 18-238-5	50.09.01		DATE	E_04 \$	Sep 18	3 to 05 Se	p 18	
<i>L</i> /	ATITUD	E _27.4	19371 deg	LONGITUDE82.3542 deg			ELE\	ATIO	N <u>+38</u>	8.9 feet		
C	ONTRA		Amdrill	DRILLING METHOD Mud Rota	ary		LOG	GED B	Y_SJ	L		
DF	RILL RIG	G TYPE	Barge-mounted CME 55	HAMMER TYPE Auto			HAM	MER E	FFICI	ENCY 88	1.5%	
					1	1		1	1	1		
ECT DATA.GPJ	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DE	SCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ S 10 PL 20 □ FINE: 20	PT N VALU 20 30 MC 40 60 S CONTEN 40 60	UE ▲ 40 LL 80 NT (%) □ 80
ROJ			Barge									
а – Ш		1	Water		-							
DRINGS\LAKE MANAT	 _ <u>35</u>	-										
HAB/BC										· · · · · · · · · · · · · · · · · · ·		
		-										
AKE MANAT	<u>)</u>	-										
WORK/I										- - - - - -		
	25		SAND, (SP), fine to medium sa gravel and shells, gray to brow	and with trac <mark>e fine subrounded</mark> n, wet, loose	SPT	10	3-3-4					
	5				1	12	(7)	-				
] -		SANDY CLAY, (CL), white, mo	ist, firm to stiff	-							
ERS/S	20		SAND (SP) fine to medium sa	and with some silt dark brown	SPT	17	15-13-17					
8 07:45 - C:\US			with light banding, wet, mediun	n dense			(30)	-				
1-09-1		7777		d grav to grav blue moist firm	-							
	15		to stiff		SPT	10	6-7-9	0.5 to		 	K I I I I I I I I I I I I I I I I I I I	
	<u>-</u>				▲ <u> </u>		(10)	1.0				
GINTS			SAND, (SP), fine to coarse, wh dense.	ite to off-white, wet, medium	1							
=01ECH LOG	<u> 10</u> 0				SPT 4	13	12-3-20 (23)	-			•	
TANDARD GE			CLAYEY SAND, (SC), fine san dense	d, gray-blue, moist, medium	-							
35 STEWIT S	5				SPT 5	24	4-4-5 (9)	1.0 to 2.0				



	PRO	JECT	NAM	E Lake Manatee Dam Rehab PROJECT NUMBER 18-238-5	50 09 01		DATE	04 9	Sep 18	3 to 05 Sep 18
	LAT	TUDE	27.	49371 deg LONGITUDE -82.3542 deg	00.00.01		ELEV	 /ATIOI	N +38	3.9 feet
	DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □
	<u>35</u> 			CLAYEY SAND, (SC), fine sand, gray-blue, moist, medium dense <i>(continued)</i>	SPT	18	5-5-5			20 40 60 80
TAB/BORINGS/LAKE MAN	<u>40</u> 	 5		SILTY CLAY, (CL-ML), low plasticity, gray, moist, firm to stiff	o SPT	00	(10)			
LAKE MANA IEE UAM REF	<u>45</u> 	 - 10		SAND, (SP), fine to medium sand with some silt, gray with some black grains, moist, loose Fine sand with clay and silt	7	20	(10)			
	<u>50</u>	 - 15		At 49': little to no fines Becoming dense with 2" layers of gray clay	SPT 8 SPT 9	14 22	6-10-12 (22) 9-15-24 (39)			
- 28-09-18 07:45 - C:\USEKS\SAMU		 		LEAN CLAY, (CL), with silt and trace sand and ~1.5 inch layers of fine sand, gray, moist, stiff SAND, (SP), fine to medium sand, gray, wet, very dense	SPT 10 ST 11	24	6-6-7 (13)	1.0		
	- - - 65 - -	 -25 		Fine to coarse sand with some silt	SPT 12	2.5	50/1"			>>1
	- - 70 - -	- 30 		Medium sand, 1" to 2" layer of hard clay/calcite/limestone	SPT 13	7	50/5"			>>

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						DAT	- 04	0 10	1 to 05 Con 10
	TITUDE	NAW E 27.	9371 deg LONGITUDE -82.3542 deg	550.09.01		ELEV	<u>. 04</u> /ATIO	<u>Sep 18</u> N +38	3.9 feet
DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □
 	 -35 		SAND, (SP), fine to medium sand, gray, wet, very dense <i>(continued)</i> Fine sand, some clay, trace fine (1/8") subrounded gravel/coarse sand, light gray to white, moist to wet	SPT 14	2	50/1"			>>,
 	 40 		LEAN CLAY, (CL), trace to some silt, gray-blue, moist, very stiff	SPT 15	24	9-9-10 (19)	2.0 to 2.5		
<u>85</u> 	 		SILTY SAND, (SM), fine sand, some clay, gray, moist, very dense	SPT 16	18	7-9-50/5"			>>/
 90 	<u>-50</u> 		Medium dense, trace to some clay in ~3" layers CLAYEY SAND, (SC), fine sand, some silt, gray, moist, very	SPT 17	23	9-9-11 (20)			•
	-55		dense	SPT	12	26-50/3"			>>,
	1	× / / /	Bottom of borehole at 94.5 feet.	<u> </u>			1		

Kiewit Engineering Group In

BORING NO: K-6

 PROJECT NAME
 Lake Manatee Dam Rehab.
 PROJECT NUMBER
 18-238-550.09.01

 LATITUDE
 27.49087 deg
 LONGITUDE
 -82.35441 deg

DATE 06 Sep 18 to 07 Sep 18

ELEVATION +38.8 feet

LATITUDE 27.49087 deg
CONTRACTOR Amdrill

DRILL RIG TYPE Barge-mounted CME 55

 DRILLING METHOD
 Mud Rotary

 HAMMER TYPE
 Auto

LOGGED BY SJL

HAMMER EFFICIENCY 88.5%

	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □ 20 40 60 80
			Barge						
			Water						
	L -								
AKE	35								
5	1 -								
	1 -		SAND, (SP), fine sand with silt and organics, brown, wet, very	SPT	2	WOH			
HAB	1.		louse						
х Т	1 -								
Ë UA	_ 30			SPT	24	WOH			
	1 -								
] .								
] .								
] _								
	_ 25			SDT		455			
15]		Medium sand, trace organics and little to no silt, red-brown, wet loose	3	14	(10)			
]								
TASI									
ACION	_20					WOH-			
20			Coarse sand, trace subrounded to rounded gravel, 1" layer of clavey sand, wet, very loose	4	5	WOH-1 (1)			▶
			*SANDY FAT CLAY (CH), very soft; Graphic log						
2 0 2 1		K	could not be changed.						
		X	SANDY CLAY, (CL), with gravel, moist to wet, gray						
27	15			SPT		1-1-1			MC=33.1%; #200=55.5%;
25			-CLAYEY SAND, (SC), gray, wet, very loose SILTY CLAY (CL-ML) with trace sand gray moist very soft	5	18	(2)			LL=53; PL=23; PI=30
			SILTY SAND, (SM), fine sand with clay, gray, moist, medium dense						
50-	_ 10			SPT		5-9-10			·····
				6	24	(19)			▲
			*SANDY FAT CLAY (CH); Graphic log could not be changed.						
		X	CLAY, (CL), with 1/2" thick fine sand layers, gray-green, moist,	-					
	5		stiff				4.0.		
35			2" layer of white, angular gravel-sized particles	SPT 7	22	10-5-4 (9)	1.0 to 1.5		A



	000	1507	Kiev	vit Engineering Group Inc	-0.00.04		D 4 7 -			2 to 07 Con 40				
	PROJECT NAME Lake Manatee Dam Renab. PROJECT NUMBER 18-238-550.09.01 LATITUDE 27.49087 deg LONGITUDE -82.35441 deg								DATE Ub Sep 18 to 07 Sep 18 ELEVATION +38.8 feet					
┝		1000							∎ <u>+30</u>					
	S DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL ↓ ↓ ↓ 20 40 60 80 □ FINES CONTENT (%) □ 20 40 60 80				
5 Z				CLAY, (CL), with 1/2" thick fine sand layers, gray-green, moist,										
	 40	 		*SANDY FAT CLAY (CH); Graphic log could not be changed. SANDY CLAY (CL), with 1/8" thick gray fine sand lenses, gray-green clay, moist, stiff	SPT 8	20	4-5-10 (15)	1.0		MC=85.4%; #200=56.8%; LL=123.9; PL=36.5 ; PI=87.4				
		 		*CLAYEY SAND (SC), loose; Graphic log could not be changed.				0.25						
	45 -	 		SANDY CLAY, (CL), dark gray-green turning light gray/white with black sand grains, moist, very soft to firm	SPT 9	26	2-3-3 (6)	0.25		MC=61.5%; #200=29.2%; LL=78.4; PL=23.9; PI=54.5				
	50	10		SAND, (SP), with two 2" layers of white strongly-cemented fine-grained material broken into angular 1/2" gravel, black and white sand grains, wet, very dense	SPT 10	10	50/4"			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	*SANDY FAT CLAY (CH); Graphic log could not be changed.										
EL.LASLEY/C	55	-15		of lean clay without sand and clayey sand	SPT	23	4-5-5 (10)			·····				
								_						
1 - 28-09- 10 01 40	60	<u>-20</u> 			SPT 12	25	5-5-7 (12)	1.5 to 2.0		MC=98.9%; #200=87.6%; LL=98.3; PL=36.5 ; PI=61.8				
CAB.C				SAND, (SP), fine, black and white grains, wet, medium dense	1									
	<u>65</u>	25		2" clayey sand layer	SPT 13	16	10-16-10 (26)			A				
	70 -	 <u>-30 _</u> 		Becoming SAND, (SP), with clay, very dense, rig chatter/hard driving begins	SPT 14	14	9-50/4"	-		>>				

dE -	Kiewit Engineering Group Inc

PRO	PROJECT NAME Lake Manatee Dam Rehab. PROJECT NUMBER 18-238-550.09.01 DATE 06 Sep 18 to 07 Sep 18												
LAT	LATITUDE _27.49087 deg LONGITUDE82.35441 deg ELEVATION _+38.8 feet												
DEPTH (ft)	ELEVATION (ff)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ S 10 PL 20 □ FINE 20	PT N 20 M 40 S COI 40	VALU 30 C 60 NTEN 60	Ξ ▲ 40 LL H 80 Γ (%) □ 80	
 75	 		SAND, (SP), fine, black and white grains, wet, medium dense <i>(continued)</i> Medium to fine sand, trace to no clay, ~1" cemented zone, hard driving continues	SPT 15	13	11-50/5"	-					>>	
 	<u>-40</u> 			SPT 16	0	50/0"						>>	
 85	 45		SILTY CLAY, (CL-ML), trace sand, light gray-blue, moist to dry, stiff to hard	SPT 17	9	50/3"	<u>1.5</u> 3.5					>>	

Bottom of borehole at 85.0 feet.

ş	E	Kiewi	liewit	TEST BO RECO	RINO RD	3				BORI	NG NG	D: K	[-7
PR	OJECT	NAME	Lake Manatee Dam Rehab.	PROJECT NUMBER 18-238-5	50.09.01		DATE	07 8	Sep 1	8 to 10 Se	p 18		
LA	TITUDE	27.4	9112 deg	LONGITUDE82.35442 deg			ELEV		1 +3	9.0 feet			
co	NTRAC		Amdrill	DRILLING METHOD Mud Rota	ary		LOG	GED B	Y _SJ	IL			
DR	ILL RIG	TYPE	Barge-mounted CME 55	HAMMER TYPE Auto			HAM	MER E	FFICI	ENCY 88	8.5%		
										1			
a.gpj EPTH (ft)	EVATION (ft)	RAPHIC LOG	MATERIAL DE	SCRIPTION	PLE TYPE UMBER	COVERY (in)	BLOW OUNTS VALUE)	PP (tsf)	PV (psf)	▲ S 10 PL 20	PT N VAI <u>20 3</u> <u>MC</u> 40 6	LUE 4 0 4 LL 0 8	▶ <u>+0</u> 30
DE	E	Ū			SAM	RE	υŽ				S CONTE	ENT (S	%) 🗆
0 EC			Barge							20	40 6	08	\$ 0
ш Д –	+ -	_	Water		_								
NATE	+ -												
Ш Ш	+ -												:
LAK	35												:
00 N∭ 5	+ -												:
NBOR	+ -												
EHAE	+ -												
AM R	⊥ ↓												
	30												
TAN 10													
Э Ц			SILTY SAND, (SM), fine to me	dium sand with organics, dark	SPT	7	WOH						
KILAI	T												
NON	T 1												
	25												
84 15	- 20				SPT 2	17	WOH		4	†			
	+ -										••••		:
ASLE	+ $+$:
	+ $+$										· · · · · · · · · · · · · · · · · · ·		
SAMI	+ +												
ERS/	20		CLAYEY SAND, (SC), dark gra	av sand with white/grav clav.	SPT	17	4-3-3						
9 <u>20</u> 20	+ $+$		wet, loose				(0)						: :
	+ $+$: : · · · · · · ·
18 07	+ +												
8-09-	+ $+$												
01-2	15				SPT	22	2-3-3	1.0 to		MC=34.9	9%; #200	=33.6	%;
0 g 25	+ -				4	22	(6)	2.0		LL=55.9	PL=22.2	:; PI=3	33.7
US L			stiff	ight gray-green, moist, firm to									:
210 L			·										:
			CLAYEY SAND, (SC), fine sar stiff to very stiff	d, gray-green-blue, dry to wet,									:
- go	10				ерт		17-12 10	10					
					5	20	(22)	1.0		MC=26.2	8%		
E C L													
2D GE	† 1												· · · · · · · · · · · · · · · · · · ·
NDAF	† †												:
- STA	+ -		*SILTY SAND (SM); Gra changed.	phic log could not be									:
35			Faries between sandy clay and	l clayey sand. Some 1/8" thick	SPT 6	24	5-5-9 (14)	1.0 to 2.0		MC=43.7	75%; #20	0=35.	8%

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	* P		Kiew		TES R	T BOI	ring RD	6				BORING	g no:	K-7
P	ROJ	IECT	NAME	Lake Manatee Dam Rehab.	PROJECT NUMBER	18-238-55	0.09.01		DATE	<u>07 S</u>	Sep 18	3 to 10 Sep 1	8	
Ľ	ATIT	TUDE	27.4	9112 deg	_ LONGITUDE82.35	442 deg			ELEV	ATION	+39	9.0 feet		
		ELEVALION (ft)	GRAPHIC LOG	MATERIAL D *SILTY SAND (SM); (changed.	ESCRIPTION Graphic log could not be	;	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT 10 20 PL 20 40 □ FINES C 20 40	N VALUE 30 MC 60 CONTENT 0 60	E ▲ 40 LL H 80 - (%) □ 80
	+			fine sand lenses CLAYEY SAND, (SC), fine sa stiff to very stiff <i>(continued)</i>	nd, gray-green-blue, dr	y to wet,								
	+	_		CLAY, (CL), gray-green, mois lenses every 1.5 to 3 inches	st, stiff, 1/4" thick fine sa	nd								
	0	-		*CLAYEY SAND (SC); (Graphic log could not be		SPT 7	20	4-3-6 (9)	0.75		MC=83.55%	••••••••••••••••••••••••••••••••••••••	
	+			changed.										
	-5	-5		SAND, (SP), medium sand, b	lack and white grains, n	noist,	SPT 8	22	9-11-50/4"	0.5 1.5		MC=61.5%; LL=78.4; PL	#200=29 =23.9; Pl	0.2%; =54.5 ^{>} ▲
	+++++++++++++++++++++++++++++++++++++++			very dense			ODT							
	50	-10_		2-inch thick layer of white har feet CLAYEY SAND, (SC), fine to sand grains with grav-green c	d clay/calcite/limestone medium sand, black an	at 49.5 d white		16	10-50/5"			MC=23.31%)	>>▲
	+ + 55_	-15					SPT 10	23	5-5-5 (10)	1.5		<u> </u>		
	+			LEAN CLAY, (CL), gray-gree	n, moist, stiff									
Ct: 10 01 -60-07		<u>-20</u>		With 1/4" to 1" thick fine sand	llenses		SPT 11	26	5-5-5 (10)	0.75 to 1.0		A		
	+++++++++++++++++++++++++++++++++++++++			SILTY SAND, (SM), fine sand dense	I, black and white grains	s, wet,								
	5 	-25					SPT 12	20	7-15-18 (33)				•	
	+	-30		CLAYEY SAND, (SC), fine sa clay, moist, dense	nd, black sand grains w	/ith white	SPT		11-13-22					
	<u>'0</u>			SAND, (SP), fine to medium s very dense 3" thick silty sand layer at 70	sand, black and gray gra	ains, wet,	13	20	(35)			MC=67.28%		`

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			wit Engineering Group Inc	FF0 00 01		DATE	- 07	Con 10	9 to 10 Con 19	
	JJECI	NAW	E Lake Manatee Dam Renab. PROJECT NUMBER 18-238 49112 deg LONGITUDE -82 35442 deg	550.09.01	ELEVATION +39.0 feet					
DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY (in)	BLOW COUNTS (N VALUE)	PP (tsf)	PV (psf)	▲ SPT N VALUE ▲ 10 20 30 40 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □	
	 -35 		SAND, (SP), fine to medium sand, black and gray grains, wet very dense <i>(continued)</i>	SPT 14		50/1"	7		20 40 60 80	
80	-40 -40 		LEAN CLAY, (CL), white, moist, hard, trace fine	SPT 15	1.5	50/1"			>>	
85	-43 50		 1/2" thick layer of fine rounded gravel at 83.5 feet, clay becomes silty and sandy, light gray, with 1/4" thick sand seams, stiff to hard At 89.5 feet: Very soft clay with some fine (5/8" to 1/8") subrounded to subangular gravel, little silt or sand 	SPT 16 SPT 17	17	7-50/5" 4-4-5 (9)	2.0		>>> •	
	1		Bottom of borehole at 90.0 feet.							