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REFERENCE

**DESCRIPTION** TITLE SHEET LEGEND (SOIL & ROCK) SITE PLAN PROFILE BORE LOGS SOIL LABORATORY RESULTS

## STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT** 

# **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY COLUMBUS

PROJECT DESCRIPTION NEW INTERCHANGE AT THE INTERSECTION OF NC 87 AND NC 11

SITE DESCRIPTION BRIDGE NO. 419 ON NC 11 (-Y-) **OVER** NC 87 (-L-)

# 34466 PROIEC

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R–2561CA	1	29

#### **CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOLT TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEICH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (1991) 707-680. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU UN-PLACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOL MOISTURE CONDITIONS. MOICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOL MOISTURE CONDITIONS MAY YARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT, FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPHION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OF FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDENSATIONS FOR ANY THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES: I. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR CUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

S. PAPKE

MID-ATLANTIC DRILLING

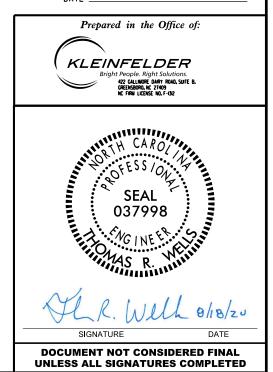
INVESTIGATED BY S. PAPKE

DRAWN BY C. DRISCOLL

CHECKED BY <u>T. WELLS</u>

SUBMITTED BY \_KLEINFELDER, INC.

DATE AUGUST 2020



## NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

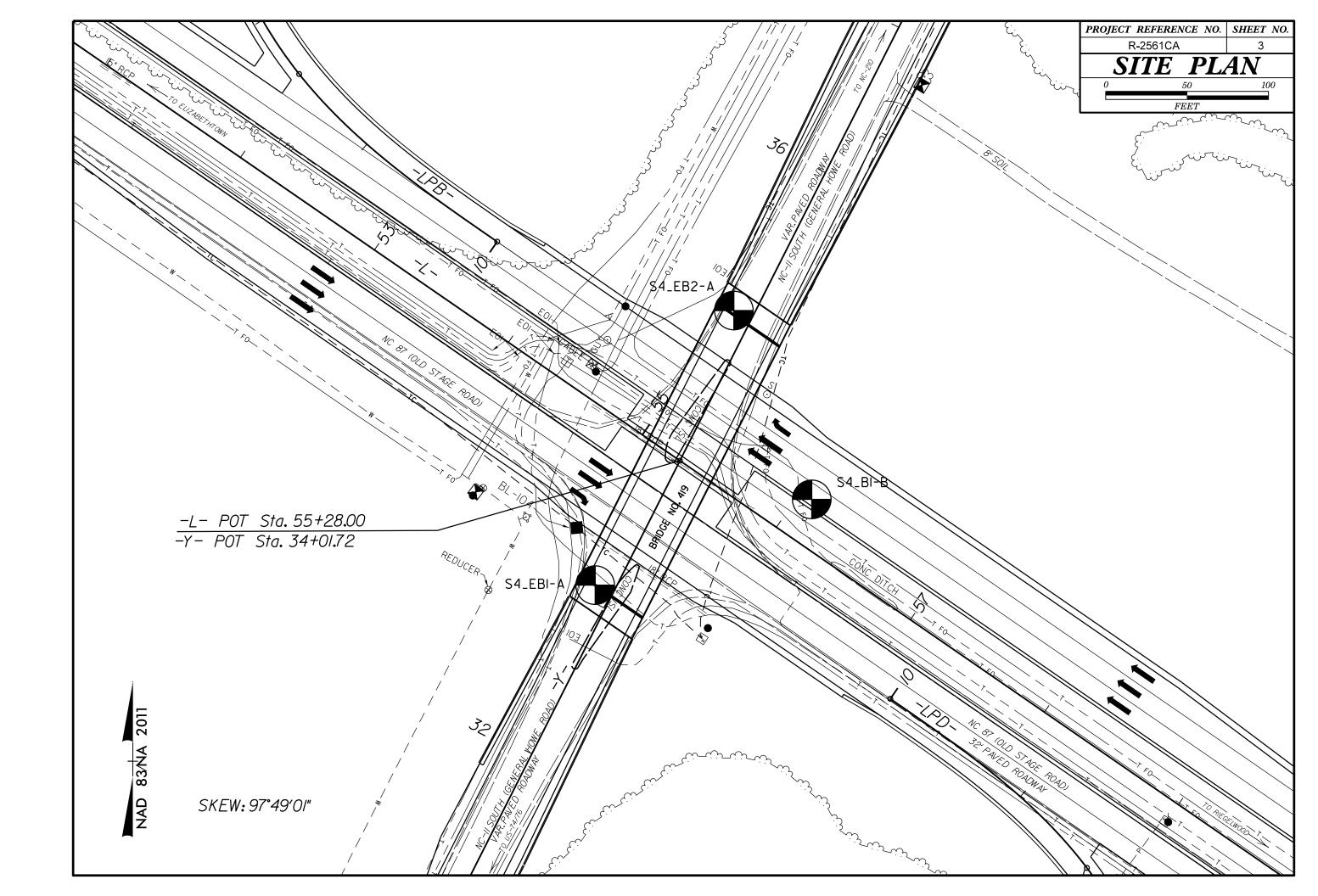
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

			SOIL (	DESCRI	PTION	·				T		G	RADATION			T			ROCK	DESCRIPT	ION
BE PENET ACCORDI IS B CONSISTE	RATED WITH NG TO THE BASED ON TH NCY, COLOR,	UNCONSOLIDA A CONTINUOL STANDARD PEN HE AASHTO SY , TEXTURE, MOIS SIGAL COMPOSI	TED.SEMI-CON IS FLIGHT PON NETRATION TE STEM.BASIC I STURE.AASHTC	NSOLIDATED WER AUGER ST (AASHT DESCRIPTIC D CLASSIFI	D, OR WEA R AND YI O T 206 ONS GENI ICATION,	ATHERED E IELD LESS 6, ASTM DI IERALLY IN AND OTHEF	THAN 100 586). SOIL CLUDE TH R PERTINE	) BLOWS PE . CLASSIFI E FOLLOWI NT FACTOR	ER FOOT CATION NG: RS SUCH	WELL GRADED - INDICAT UNIFORMLY GRADED - IN GAP-GRADED - INDICATE	DICATE	GOOD REPRES ES THAT SOIL IXTURE OF UN	ENTATION OF PARTI PARTICLES ARE AL	LL APPROXI IZES OF TW	MATELY THE SAME SIZE.	ROCK LINE I SPT REFUSA BLOWS IN N REPRESENTE	INDICATE L IS PE ION-COA D BY A	ES THE LEVE INETRATION I STAL PLAIN ZONE OF WE	AIN MATERIAL THA L AT WHICH NON- BY A SPLIT SPOOM	AT WOULD YIE COASTAL PLA N SAMPLER EC TRANSITION	ELD SPT REFUSAL IF TESTI AIN MATERIAL WOULD YIELD OUAL TO OR LESS THAN 0. BETWEEN SOIL AND ROCK
AS	S MINERALO VERY STIFF.G	GICAL COMPOSI GRAY, SILTY CLAY, N	TION, ANGULAI	ERBEDDED	FINE SA	ND LAYERS.	,ETC.FOF <i>HIGHLY PL</i> A	R EXAMPLE, STIC.A-7-6					SOIL GRAINS IS D	ESIGNATED	BY THE TERMS:	WEATHERED	IHLS HF		a		IAL THAT WOULD YIELD SP
	S	OIL LEGE	ND AND				CATION			ANGULAR, SUBAN			ICAL COMPOS			ROCK (WR)			100 BLOWS PER	R FOOT IF TE	ESTED.
GENERAL CLASS.	(	GRANULAR MATER ≤ 35% PASSING ■			CLAY MATE		OR	GANIC MATERI	IALS	MINERAL NAM			Z, FELDSPAR, MICA, 1		N. ETC.		E				EOUS AND METAMORPHIC RC IF TESTED. ROCK TYPE IN
GROUP	A-1	A-3	A-2	_	A-5 A-		A-1, A-2	A-4, A-5		ARE USED IN	I DESCR		IN THEY ARE CONSIL	JERED OF 9	SIGNIFICANCE.	ROCK (CR)		20.20	GNEISS, GABBRO	SE GRAIN MET	TAMORPHIC AND NON-COAST
0	A-1-a A-1-b	A-2-4 A-	2-5 A-2-6 A-2			A-7-5, A-7-6	A-3	A-6, A-7		SI TGI		UMPRESSIBLE	RESSIBILITY	LL < 3	1	NON-CRYSTAL ROCK (NCR)	LLINE				OULD YEILD SPT REFUSAL
SYMBOL				3						MODE	RATELY	COMPRESSIE		LL = 3 LL > 5	- 50	COASTAL PL					CEMENTED INTO ROCK, BUT INCLUDES LIMESTONE, SANDS
	50 MX						Granular	SILT- CLAY	MUCK.				GE OF MATER		-	(CP)			SHELL BEDS, E	TC. ATHERING	
*40 3 *200 1	30 MX 50 MX 15 MX 25 MX	51 MN 10 MX 35 MX 35	MX 35 MX 35	MX 36 MN 3	6 MN 36	MN 36 MN	SOILS	SOILS	PEAT	ORGANIC MATERIAL		GRANULAR SOILS	SILT - CLAY SOILS	OTH	ER MATERIAL	FRESH	BUCK	FRESH, CRYST			HOW SLIGHT STAINING. ROCK
MATERIAL PASSING #40 LL PI	_ 6 MX		MN 40 MX 41 M MX 11 MN 11 M				SOILS LITTL		HIGHLY	TRACE OF ORGANIC MA LITTLE ORGANIC MATT MODERATELY ORGANIC HIGHLY ORGANIC	TER	2 - 3% 3 - 5% 5 - 10% > 10%	3 - 5% 5 - 12% 12 - 20% > 20%	TRACE LITTL SOME HIGHL	E 10 - 20% 20 - 35%	VERY SLIGHT (V SLI.)	HAMME ROCK CRYST	R IF CRYSTA GENERALLY F	LLINE. RESH, JOINTS STAI OKEN SPECIMEN FA	NED.SOME JOI	INTS MAY SHOW THIN CLAY C IGHTLY. ROCK RINGS UNDER H
OF MAJOR	Ø STONE FRAGS. GRAVEL, AND		4 MX Y OR CLAYEY EL AND SAND	8 MX 12 SILTY SOILS		MX NO MX CLAYEY SOILS	AMOUN	its of Anic	organic Soils			ER LEVEL IN	BORE HOLE IMMEDI		ER DRILLING	SLIGHT (SLI.)	ROCK 1 INCH CRYST	GENERALLY F . OPEN JOINT ALS ARE DUL	RESH, JOINTS STAI S MAY CONTAIN CL L AND DISCOLORED	AY. IN GRANII	OLORATION EXTENDS INTO RO TOID ROCKS SOME OCCASIONA E ROCKS RING UNDER HAMMEF
MATERIALS GEN. RATING AS SUBGRADE	SAND	EXCELLENT TO G		_	AIR TO PO		FAIR TO POOR	POOR	UNSUITABLE	▼ ✓ ₽₩ ○ - ∭-	PERC		EVEL AFTER <u>24</u> SATURATED ZONE, OF		ARING STRATA	MODERATE (MOD.)	grani <sup>.</sup> Dull	TOID ROCKS, M	10ST FELDSPARS A	RE DULL AND	ION AND WEATHERING EFFECT DISCOLORED.SOME SHOW CLA SNIFICANT LOSS OF STRENGTH
		PIOF A-7-5 SUBC					• LL - 30									MODERATELY	ALL R	OCK EXCEPT			D. IN GRANITOID ROCKS, ALL P
			ISISTENC		DENSE E OF STA		RAN	E OF UNC		<u> </u>		MISCELLA	ANEOUS SYMBI	DLS		SEVERE (MOD. SEV.)					TION. ROCK SHOWS SEVERE L ROCK GIVES "CLUNK" SOUND
PRIMARY S		COMPACT CONSIS	TENCY	PENETRA	ATION RE (N-VALUE < 4	SISTENCE E)		RESSIVE S (TONS/FT	TRENGTH	L ROADWAY EMBA L WITH SOIL DE SOIL SYMBOL			025 DIP & DIP DIF → OF ROCK STRU SPT SPT DMT TEST BO	UCTURES	SLOPE INDICATOR	SEVERE (SEV.)	ALL R REDUC	OCK EXCEPT ED IN STREN	GTH TO STRONG SO	D OR STAINED IL. IN GRANIT	D. ROCK FABRIC CLEAR AND E TOID ROCKS ALL FELDSPARS A
GRANULA	٩R	LOC MEDIUM	DENSE		4 TO 10 10 TO 3			N/A					- 131 141		/ INSTALLATION CONE PENETROMETER				SUME FRAGMENTS U <u>YIELD SPT N VALU</u>		ICK USUALLY REMAIN.
(NON-CO)	HESIVE)	DEN VERY VERY SO	DENSE SOF T		30 TO 5 > 50 < 2 2 TO 4			< 0.25 0.25 TO		THAN ROADWA	Y EMBA		AUGER BORING	•	SOUNDING ROD	VERY SEVERE (V SEV.)	BUT M REMAII	IASS IS EFFE NING. SAPROL	CTIVELY REDUCED ITE IS AN EXAMPLI	TO SOIL STAT	D. ROCK FABRIC ELEMENTS AF TUS, WITH ONLY FRAGMENTS OU EATHERED TO A DEGREE THAT TESTED, WOULD YIELD SPT N
SILT-CL MATERIA (COHESI)	AY NL	MEDIUM STI VERY	STIFF FF STIFF		4 TO 8 8 TO 15 15 TO 3	3 5		0.5 TO 1 1 TO 2 2 TO 4	.0	INFERRED ROC			MONITORING ₩ △ PIEZOMETER INSTALLATION	Y	- TEST BORING WITH CORE - SPT N-VALUE	COMPLETE	SCATT				NIBLE.OR DISCERNIBLE ONLY SENT AS DIKES OR STRINGERS
		на Т			> 30 AIN S	SIZE		> 4		+	F	RECOMMEN	NDATION SYME						ROCK	HARDNES	SS
U.S. STD. SIE	EVE SIZE		4 10	40	60		270				J UN	ICLASSIFIED E	EXCAVATION - [	[초_권 UNCL	ASSIFIED EXCAVATION -	VERY HARD			HED BY KNIFE OR WS OF THE GEOLOG		BREAKING OF HAND SPECIMEN
OPENING (MN BOULDEF			4.76 2.00 RAVEL	COARSE		FINE	0.053	GILT	CLAY		J UN		ISTE L EXCAVATION - IGRADABLE ROCK	USED	PTABLE,BUT NOT TO BE IN THE TOP 3 FEET OF NKMENT OR BACKFILL	HARD	TO DE	TACH HAND S	PECIMEN.		DIFFICULTY. HARD HAMMER B
(BLDR.) GRAIN MM		75	(GR.) 2.0	SAND (CSE.SD		SAND (F SD.)	0.05	SL.) 0.005	(CL.)	AR - AUGER REFUSAL		MED.	REVIATIONS	VS1	- VANE SHEAR TEST	HARD	EXCAV		D BLOW OF A GEOL		GROOVES TO 0.25 INCHES DE L'HAND SPECIMENS CAN BE D
SIZE IN.		3 SOIL MOIS	TURE -	CORREL		IN OF	TERMS			BT - BORING TERMINATED CL CLAY CPT - CONE PENETRATION		MOD.	- MICACEOUS - MODERATELY NON PLASTIC	$\gamma$	A WEATHERED - UNIT WEIGHT - DRY UNIT WEIGHT	MEDIUM HARD	CAN B		IN SMALL CHIPS		' FIRM PRESSURE OF KNIFE ( INCH MAXIMUM SIZE BY HARD
	MOISTURE		FIELD MO DESCRI		GUI	DE FOR F	IELD MOI	STURE DES	SCRIPTION	CSE COARSE DMT - DILATOMETER TES DPT - DYNAMIC PENETRA		PMT ·	· ORGANIC - PRESSUREMETER T · SAPROLITIC		SAMPLE ABBREVIATIONS BULK	SOFT	FROM	CHIPS TO SE		SIZE BY MODER	PICK. CAN BE EXCAVATED IN RATE BLOWS OF A PICK POIN
		LIMIT	- SATURA (SAT.					WET, USU		e - VOID RATIO F - FINE FOSS FOSSILIFEROUS		SL SLI	SAND, SANDY SILT, SILTY SLIGHTLY	ST	- SPLIT SPOON - SHELBY TUBE - ROCK	VERY SOFT		RE IN THICK			EADILY WITH POINT OF PICK. R PRESSURE. CAN BE SCRATCH
PLASTIC RANGE <			- WET -	(W)		MISOLID; RI TAIN OPTIM		DRYING TO		FRAC FRACTURED, FRAC FRAGS FRAGMENTS	TURES		• TRICONE REFUSAL MOISTURE CONTENT	RT CBF	- RECOMPACTED TRIAXIAL - CALIFORNIA BEARING			TURE SP	ACING		BEDDING
(PI) PL	+ PLASTI	C LIMIT								HI HIGHLY		v - v			RATIO	TERM VERY WID			SPACING		TERM RY THICKLY BEDDED
		M MOISTURE AGE LIMIT	- MOIST	- (M)				TIMUM MO		DRILL UNITS:	ADVA	ENI USEL ANCING TOOLS: CLAY BITS	ON SUBJEC	HAMME	LUI R TYPE: UTOMATIC MANUAL	WIDE MODERATE CLOSE		SE Ø	E THAN 10 FEET 3 TO 10 FEET 1 TO 3 FEET .16 TO 1 FOOT	THI THI	ICKLY BEDDED 1 INLY BEDDED 0.1 RY THINLY BEDDED 0.0
			- DRY -	(D)		DUIRES AD TAIN OPTIM		WATER TO	ו	CME-55			JS FLIGHT AUGER	CORE	SIZE:	VERY CLO	DSE	LESS	THAN 0.16 FEET	THI	ICKLY LAMINATED 0.00 INLY LAMINATED <
			PL	ASTICII	[Y							8" HOLLOW A		-в	🗌 -н					DURATION	
SLIC	PLASTIC		PLAST	<u>ICITY IND</u> Ø-5 6-15	<u>EX (PI)</u>		DF	VERY LOW SLIGHT		CME-550		TUNGCARBI	FINGER BITS DE INSERTS ] W/ ADVANCER	HAND 1		FOR SEDIMEN		UCKS, INDUR	RUBBING W	ITH FINGER F	MATERIAL BY CEMENTING,HE FREES NUMEROUS GRAINS; ER DISINTEGRATES SAMPLE.
	ERATELY P HLY PLASTI			16-25 26 OR MOR	۱E			MEDIUM HIGH		PORTABLE HOIST			STEEL TEETH		OST HOLE DIGGER AND AUGER	MODER	RATELY	INDURATED			TED FROM SAMPLE WITH ST NIT WITH HAMMER.
			I	COLOR						1	X		2- <sup>15</sup> /16" TUNGCARB.		OUNDING ROD	INDUR	RATED			E DIFFICULT TO BREAK WI	TO SEPARATE WITH STEEL
		INCLUDE COLO JCH AS LIGHT,										CORE BIT		v	ANE SHEAR TEST	EXTRE	EMELY I	NDURATED	SHARP HAM		REQUIRED TO BREAK SAMPLE

#### PROJECT REFERENCE NO.

# R-2561CA

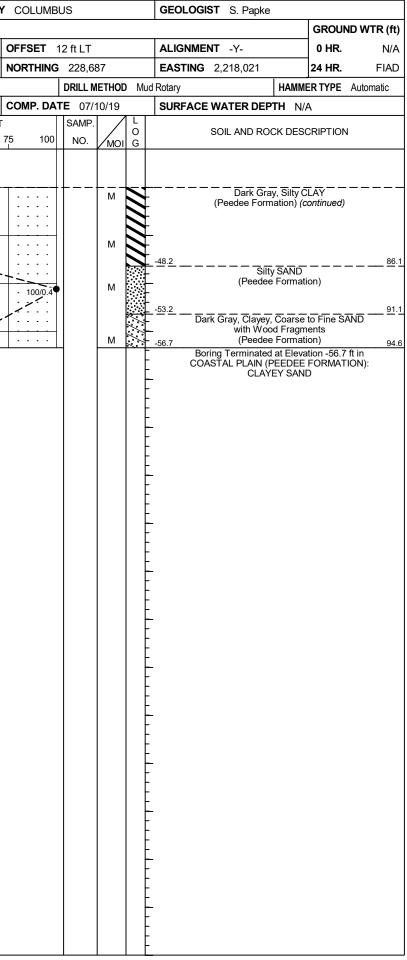
	TERMS AND DEFINITIONS
ED. AN INFERRED ) SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
1 FOOT PER 60 IS OFTEN	AQUIFER - A WATER BEARING FORMATION OR STRATA.
	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
T N VALUES >	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
NCLUDES GRANITE,	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
AL PLAIN IF TESTED. C.	<u>COLLUVIUM</u> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
MAY NOT YIELD STONE, CEMENTED	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
	$\underline{\text{DIKE}}$ - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
RINGS UNDER	$\underline{\text{DIP}}$ - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
COATINGS IF OPEN, HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
DCK UP TO AL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
R BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
S. IN AY. ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
H AS COMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FELDSPARS DULL .OSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
VIDENT BUT	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
ARE KAOLINIZED	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS
RE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
F STRONG ROCK T ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
VALUES < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
IN SMALL AND S. SAPROLITE IS	<u>ROCK QUALITY DESIGNATION (RQD)</u> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
IS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
ILOWS REQUIRED	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
EEP CAN BE DETACHED	$\underline{\text{SLICKENSIDE}}$ - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
DR PICK POINT. BLOWS OF THE	STANDARD PENETRATION TEST (PENETRATION RESISTANCE)(SPI) - NUMBER OF BLOWS (N OR BPF)OF A 140 LB.HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
FRAGMENTS	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
. PIECES 1 INCH HED READILY BY	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	BENCH MARK: BM-2 AT STA. 33+28.44 -Y- 103' LT (228,744 FT.N.,
THICKNESS	2,217,948 FT.E)
4 FEET 1.5 - 4 FEET	ELEVATION: 38.19 FEET
16 - 1.5 FEET 03 - 0.16 FEET	NOTES:
08 - 0.03 FEET	FIAD - FILLED IMMEDIATELY AFTER DRILLING
0.008 FEET	
EAT, PRESSURE, ETC.	
TEEL PROBE:	
PROBE:	
E;	



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			S4_EBI-A	S4_BI-B	S4_EB2-A 34+99			
40			33+IO I2' L T	34+l7 83′ RT	12' L T			Λ
40 — — — –		7						
		COAST AL PLAIN: MOIST TO SATURATED, LOU MEDIUM DENSE.ORANGE.E YELLOW, TAN, WHITE, AND D SILTY COARSE TO FINE TO CLAYEY COARSE TO F (WACCAMAW, FORMATION)	$\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $					
		MEDIUM DENSE, ORANGE, E YELLOW, TAN, WHITE, AND D	ARK GRAY.		( <b>4</b> -07/19			
20		SILTY COARSE TO FINE S TO CLAYEY COARSE TO F	SAND INE SAND ©	6	0—			20
20			@					20
					<b>I</b>			
		MOIST TO SATURATED.SO VERY STIFF.ORANGE. DARK GRAY TO BLACK.SAM CLAY TO SILTY CLAY VEFF FODMATION			6-1			
2		CLAY TO SILTY CLAY (PEEDEE FORMATION)			©- <b>X</b>			
0					@ <b>\</b>			0
			6	<sup>(6</sup> –	6-			
			9 <b>-</b>	6	<b>9</b>			
								_
-20		MOIST TO WET STIEF TO			•••••			-2
		MOIST TO WET.STIFF TO DARK GRAY.SILTY CLAY TO FINE SANDY CLAY (PEEDEE FORMATION)		6	®- <b>2</b>			
		(PEEDEE FORMATION)		23-	20-			
		©	36	40- <b>N</b> BT	( <b>4</b>			
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		Ø	®- <b>1</b>					
					ВТ			
		Ć	49					
-60		i 	FIAD	·	·	(A) ROADWAY EMBANKMENT: MOIST, MEDIUM DENSE, OR	ANGE.BROWN TO GRAY. YEY FINE TO COARSE SAND AND PA	
								AVEMENI
						WET.VERY DENSE.DARK ( TO FINE TO CLAYEY COA	RAY.SILTY COARSE SAND RSE SAND CLAYEY COARSE TO FINE SAND	
						(PEEDEE FORMATION) CCOASTAL PLAIN:		
-80	NOTES:	     					LAILI CUARSE IU FINE SAND	-8
	GROUNDLINE TAKEN FROM PROJECT ROADWAY FILES RECEIVED ON SEPTEMBER 10, 2019					(D) COAST AL PLAIN: MOIST.VERY STIFF.DARK SILTY CLAY (PEEDEE, FOR	GRAY.	
	INFERRED STRATIGRAPHY IS DRAWN THROUGH					SILTY CLAY (PEEDEE, FOR E COASTAL PLAN:	IATION)	
	THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE					E COAST AL PLAN: MOIST.VERY DENSE TO DI SILTY SAND TO CLAYEY CO WITH WOOD FRAGMENTS (	NSE,DARK GRAY, ARSE TO FINE SAND REEDEE EORDATION	
100						WITH WOOD FRAGMENTS (		-10

## GEOTECHNICAL BORING REPORT BORE LOG

WBS	34466	6.4.1			ТІ	<b>P</b> R-2561CA	-	Y COLUME				GEOLOGIST S. Papke			WBS	34466.4	4.1			TI	P R-2561CA	(	COUNTY
			Bridg	e No. 4		NC 11 (-Y-) over NC			-			I '	GROUND	NTR (ft)				Bridg	e No.		NC 11 (-Y-) ov		
	ING NO.		-		_	<b>TATION</b> 33+10	. ,	OFFSET	12 ft LT			ALIGNMENT -Y-	0 HR.	N/A		NG NO.					TATION 33+10		C
COLI	LAR ELI	<b>EV.</b> 37	.9 ft		т	OTAL DEPTH 94.6 1	ft	NORTHING	<b>3</b> 228,6	87		EASTING 2,218,021	24 HR.	FIAD	COLL	AR ELE	<b>V</b> . 37	7.9 ft		тс	OTAL DEPTH	94.6 ft	N
DRILL	RIG/HAN	MER EF	F./DATE	MID5	464 CN	ME-45C 90% 02/21/2019		1	DRILL	NETHOD	) Mu	Rotary HAMN	LIER TYPE Aut	tomatic	DRILL RIG/HAMMER EFF./DATE MID5464 CME-45C 90% 02/21/201			1/2019	•				
DRIL	LER B	. Fowler			ST	TART DATE 07/09/	19	COMP. DA	TE 07/	10/19		SURFACE WATER DEPTH N	/Α		DRIL	LER B.	Fowle	er		ST	TART DATE 0	)7/09/19	c
ELEV	DRIVE ELEV	DEPTH		N COL			PER FOO	Г	SAMP.		L	SOIL AND ROCK DES			ELEV	DRIVE ELEV	DEPTH	·	w col		BI	LOWS PE	ER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25	50	75 100	NO.	моі		ELEV. (ft)		DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25	50	) 75
40		ļ													-40	-40.2	781					Match	Line
	-	<b>†</b>										37.9 GROUND SURF		0.0			10.1	6	7	10	· · • •17 ·		
35	<u>36.6</u>	L	8	7	8					м		36.6 <b>ROADWAY EMBAN</b> 35.1 Asphalt (0.0 - 1.3	Feet)	1.3	-45	+						· · · ·	
		+ <u>2.0</u>	7	6	5	• • 11 • • • • •				м		Orange and Brown, Clayey	Fine to Coars	e	-40	-45.2 -	83.1	8	8	10	· · · • 18		
		+										<b>COASTAL PL/</b> Tan, White, and Dark Gray,		to		‡						***	
30	29.9	8.0		6								Fine SAND (Waccamaw Forn	-		-50	-50.2	88.1	100/0 1				· · ·	
		‡	4	6	6	12 <sup>•</sup> · · · · · · · · · · · · · · · · · · ·		·   · · · ·		M		(Waccamaw Form	lation			‡		100/0.4					
25		+						·   · · · ·							55	+							
25	24.9	13.0	4	4	6					м					-55	-55.2 -	93.1	6	13	36		• • • •	19
		‡				$\left  \left  \begin{array}{c} \cdot \tilde{F} \\ \cdot \cdot \cdot \end{array} \right  \cdot $																	10
20	19.9	18.0		_	-							Orange and Dark Gray, (Waccamaw Forn	Sandy CLAY nation)			1							
		1	WOH	2	2	• • • • • • • • • • • • • • • • • • •				м						ŧ							
		±				.\     . <b>\</b>										ł							
15	14.9 -	23.0	4	6	8					М						+	•						
		t										11.9		26.0		ł							
10	99	28.0				<b>l</b> .					N	Dark Gray, Silty ( Peedee Forma				ł							
		-	5	6	9	•••15 ••••				м	N	(*	,			+							
		Ŧ									N					Ŧ							
5	4.9	33.0	5	7	9					М	N					Ŧ	•						
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0	-0.1	38.0														Ŧ							
		- 30.0	5	6	9	•••15 ••••				м	N					1							
		Ŧ									N					Ŧ							
-5	-5.1 _	43.0	5	6	9											-							
		1		J	Ű	· · <b>/</b> <sup>15</sup>   · · · ·										‡							
-10	-10.1 -	‡														‡							
	-10.1 -	<u>48.0</u>	3	4	5					м						+	•						
5		‡				· ŀ · ·   · · · ·		·   · · · · ·								‡							
-15	-15.1 -	- 53.0	60/0.1			│		60/0.1		м		-15.1		53.0		+							
-20		‡	00/0.1			││ · · · · · · · · · · · ·						-17.1 Silty Coarse SA (Peedee Forma	tion)	55.0		‡							
-20		‡				: : : : : : : : : : :						Dark Gray, Silty ( (Peedee Forma	CLAY tion)			‡							
-20	-20.1 -	<u> </u>	5	8	9	· · • • 17 · · · ·				м						+	•						
		‡				.					$\square$					‡							
-25	-25.1 -	63.0				<b> </b> -					$\square$					+							
		‡	5	1	11	· · · • • 18 · · · · ·				M	$\square$					ŧ							
-30	.	‡				:::; ::::					$\square$					ŧ							
	-30.2 -	- 68.1	6	9	12	$\begin{vmatrix} & \cdot & \cdot & \cdot \\ & \cdot & \cdot & \cdot & \bullet \\ & \cdot & \cdot & \bullet & \bullet & \bullet \\ & \cdot & \cdot & \bullet & \bullet & \bullet & \bullet \\ & & & & & \bullet & \bullet & \bullet &$				м	$\square$					+							
201	.	±										-33.2		71.1		ł							
-35	-35.2 -	- 73.1				· · · · · <b>`</b> \ · · ·					/./.	Dark Gray, Clayey, Coarse (Peedee Forma	to Fine SAND	,		Ŧ							
BOKE DOUBLE -35		1	5	5	31	••••••••••••••••••••••••••••••••••••••				м		,	,			Ŧ							
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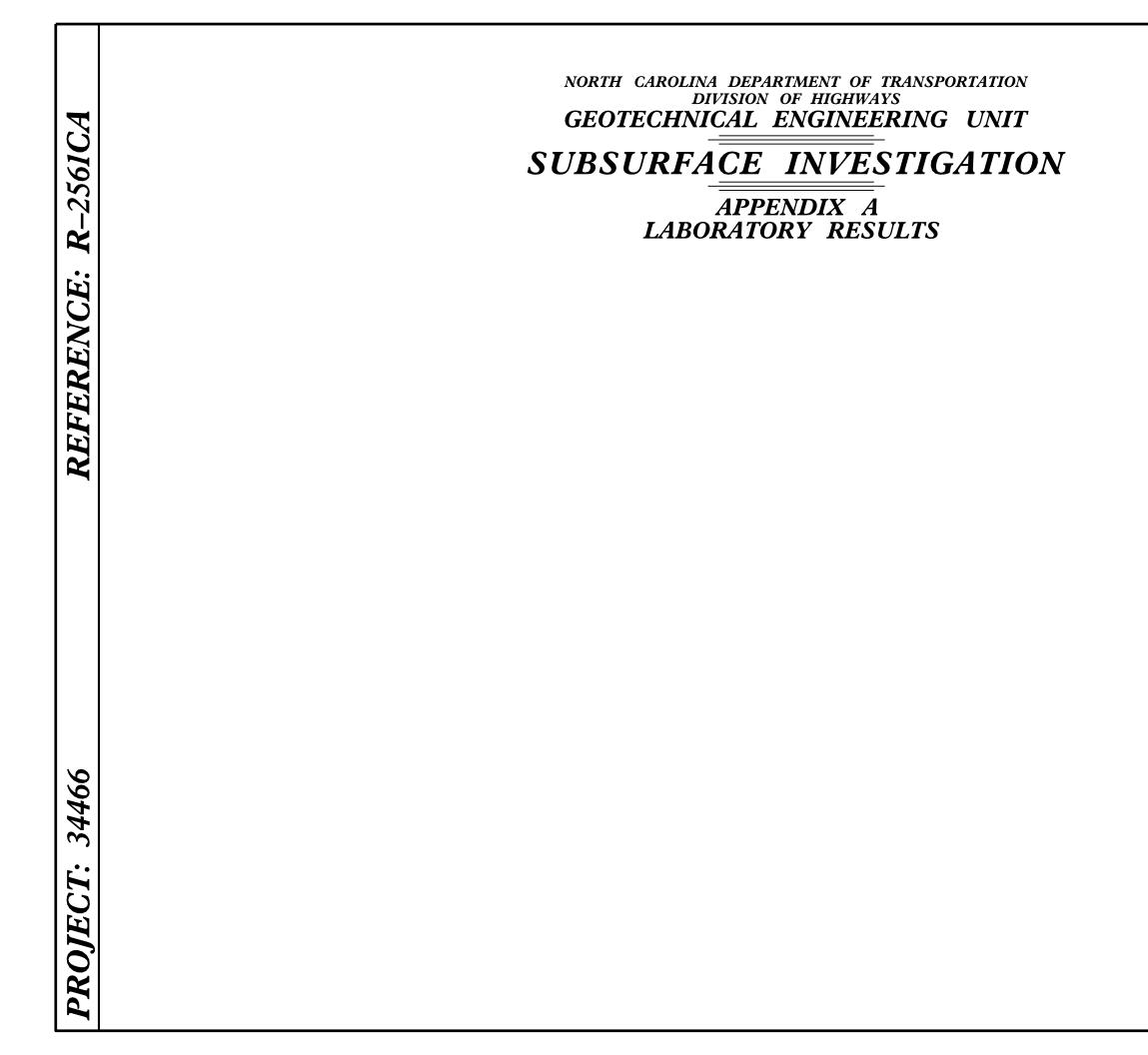
## GEOTECHNICAL BORING REPORT BORE LOG

											)RE		JG							
WBS 3	34466.4	4.1			ТІ	<b>P</b> R-256	1CA		COU	NTY	COLUN	1BU:	S			GEOLOGI	ST S. Papke			
SITE DE	ESCRIF	TION	Bridg	ge No.	419 or	n NC 11 (-	Y-) ov	er NC	87 (-L-	-)									GROUN	ID WTR (ft)
BORING						TATION				·	OFFSET	83	ft RT			ALIGNME	NT -Y-		0 HR.	N/A
COLLA					_				t	_	NORTHIN			9			2,218,154		24 HR.	7.0
				F MID		ME-45C 90%					-				Mu	d Rotary	, -, -	НАММ	LIER TYPE	
DRILLE									0		COMP. D				ivia		WATER DEF			7 atomato
		DEPTH		w col					PER FC				SAMP.		L				A	
	RIVE ELEV (ft)	(ft)	0.5ft	-		0	25		50	7	5 10		NO.	моі	O G		SOIL AND RC	CK DES	CRIPTION	
	(11)						-		1	1					0	ELEV. (ft)				DEPTH (f
40	-+														Ŀ	-				
	Ŧ														F					
35	35.6 +	0.0	2		6				_						_	35.6	GROUN			0
	Ŧ		2	4	0	· • 10								М	-	– <sub>33.1</sub> Br	own and Yellow			ine2
	32.0 ‡	3.6	3	4	6		.   .	· · ·		· · · ·					$\langle \cdot \rangle$		(Waccam	SAND aw Forn	nation)	
30	- ‡		5	-	Ŭ	• • 10			· ·			41		M			range, Clayey, (Waccam	Coarse	to Fine SAN	
	±						.   .	· · ·	· ·	· · ·						_ <u></u>	Prange and Tan	, Silty, F		<u>se</u> <u>6</u>
	27.0	8.6	7	7	9		-   - 6   -	· · ·		::				м			(Waccam	SAND aw Forn	nation)	
25	+								<u> </u>			-				-	,		,	
	22.0 ±	13.6								• •										
20	+		4	5	4	- •9 -	-   -							М	-					
	Ŧ															19.0	Dark Gray to	Black S	Silty CLAY	<u>16</u>
	17.0 ‡	18.6	1	1	2	<i> i</i> ::	.   .	· · ·		· · · ·					N		(Peede	e Forma	tion)	
15	- ‡			'	2				· ·			41		М		-				
	‡						.   .	· · · · · ·	· · ·	· · ·	· · · ·				$\mathbf{N}$					
	12.0	23.6	5	6	9		-   - 5   -	· · ·		· ·				м	N					
10	<u>+</u>								· · ·			-			N	-				
	7.0 ±	28.6				· ·				• •					Y					
5	Ŧ	-0.0	5	5	9	• • • 14								М	V					
	Ŧ															-				
	2.0 ‡	33.6	5	7	9		.   .	· · ·		· · · ·					N					
0	- ‡		5	<i>'</i>	9		6 -							м	$\mathbf{X}$	_				
	. ‡						.   .	· · ·		· · · ·	· · · ·				$\mathbf{N}$					
	-3.0	38.6	5	6	9		-   - 5   -	: : :		: :				м	N					
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	-8.0	43.6					.   .			: :					N					
-10	Ŧ		5	7	9	•	6							М	V					
	Ŧ							·							$\mathbb{A}$		ark Grav Coars	e to Fine	Sandy Cl	AY 46
	13.0	48.6	4	43	40		.   .	· · ·	1	· · ·	· · · ·						ark Gray, Coars (Peede	e Forma	tion)	
-15	- ‡		-	-10	-10							-		М		-				
	‡							· · · · · ·	· · ·	· · · ·	·  · · ·					10.0				50
	18.0	53.6	60/0.1				.   .	· · ·			60/0.	1		М		<u>-18.0</u> -19.4	Silty Co	oarse SA	ND	53
-20	+											-				- \	(Peede Dark Gray, F	e Forma		
_	23.0	58.6					.   .		· ·	: :							(Peede	e Forma	tion)	
-25	Ŧ		6	7	9	• 1	6 -							М		_				
	Ŧ							• • •				]				_				
	28.0 +	63.6	6	11	13		·\  :	· · ·						N.4						
-30	‡			''			<b>0</b> 24							М		-				
	‡						:	· · · ·		· · ·	· · · · ·									
-	33.0	68.6	6	11	29		:   :	- <b>∖</b>		::				М		-34.5				70.
	+							<b>T</b>	-1			╧┨				- Boi	ring Terminate	at Elev	ation -34.5	ft in
	Ŧ														F	COA	ASŤAL PLAIN ( SAN	DY CLA	Y	iun).
	ŧ														F					

## GEOTECHNICAL BORING REPORT BORE LOG

STE DESCRIPTION      Exclusion      End (1)      Control (1) <thcontrol (1)<="" th="">      Contro (1)      &lt;</thcontrol>	
DORING 00, 54_TIDA      STATICM 34-99      OPERET 12 II.1      ALCOMENT X-      OIR      NO.        COLLAR ELEV. 38 I II      TOTAL DEPTH 94.7 II.      MORTING 2218,055      24 HR, 6X      COLLAR ELEV. 38 I II.      COLAR ELEV. 38 I II.      COLAR ELEV. 38 I III.	DUNTY CO
COLLAR ELEV. 38.1 ft      TOTAL DEPTH      9.7 ft      NORTHING      22.18,108      24 HR      8.5        COLLAR ELEV. 38.1 ft      TOTAL DEPTH      9.7 ft      DOBLER      Final Model CA:-80:000202000      DOBLER      Final Model CA:-80:000202000      DOBLER      Final Model CA:-80:000202000      DOBLER      Final Model CA:-80:00020000      DOBLER      Final Model CA:-80:00020000000000000000000	(-L-)
DRLL REINAUMEREF.DATE      DRLL REINAUMERT      FAMILY      HAMBER TYPE      Advances        DRLL REINAUMEREF.DATE      0004-000-000-000-000-000-000-000-000-00	OFF
DRULER B forwer      START DATE      DOWP DATE <thdowp date<="" th=""></thdowp>	NOF
DRULER B forwer      START DATE      DOWP DATE <thdowp date<="" th=""></thdowp>	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	CO
(10)    (10)	FOOT
40  31  12  16  0  0  10  12  10  0  0  1  <	75
9.0    12    0    0    0.1    GROUND SUPFACE    0      15    13.2    2.7    16    9    0 <td< td=""><td></td></td<>	
30    12    0	ne
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36    22    4    3    4    20    000000000000000000000000000000000000	
30    293    42    5    7    7    7.4    10    10    10    10    10    10    10    10    10    10    11    12    11    11    11	
30    243    12    5    7    7    14    1    1    14    1<	••••
25    24    132    3    3    4    97	
25    249    132    3    3    4    -7    -1	
25    24.9    132   /   /   /      20    19.9    18.2   /   /   /      15    14.9    22.2   /   /   /      15    14.9    22.2   /   /   /	
20    19.9    18.2    1    1    2	
20    19.9    118.2    1    1    2      15    14.4    23.2    4    6    7      10    9.9    28.2    4    6    9      5    4.9    33.2    5    6    9      1    1.1    38.2    6    8    12      -1    1.3    2.6    8    12       -1    1.4    2.7    8        10    9.9    28.2    4    6    9      -1    1.5    1.5         -1    1.5          -1           -1            -1            -1            -1	
20    10.9    18.2    1    1    2      15    14.9    2.3.2    4    6    7      10    9.9    2.8.2    4    6    9      1    1.1    1.1    1.1    1.1    1.1    1.1      10    9.9    2.8.2    4    6    9    1.1    1.1      10    9.9    2.8.2    6    9    1.1    1.1    1.1    1.1      10    9.9    2.8.2    6    9    1.1    1.1    1.1    1.1      10    9.9    2.8.2    6    9    1.1	
15    14.9    23.2    4    6    7      10    9.9    28.2    -    -    -      5    4.9    33.2    -    -    -      -    -    -    -    -    -      -    -    -    -    -    -      -    -    -    -    -    -      -    -    -    -    -    -      -    -    -    -    -    -      -    -    -    -    -    -      -    -    -    -    -    -    -      -    -    -    -    -    -    -    -      -    -    -    -    -    -    -    -    -      -    -    -    -    -    -    -    -    -    -      -    -    -    -    -    -    -    -    -    -    -    -    -    -    - <td< td=""><td></td></td<>	
15    14.9    23.2	
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5    4.9    332    6    9      0    .0.1    38.2	
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-5    -5.1    43.2    -10	
-10    -10.1    48.2    4    4    5    7    8      -10    -10.1    48.2    4    4    5    7    8      -15    -15.1    53.2    100/0.4    -10.1    -10.1    -13.1    -13.1      W    -13.1    -13.1    -13.1    -13.1    -13.1      -15    -15.1    53.2    100/0.4    -10.0    -10.0      -15    -15.1    -53.2    100/0.4    -10.0    -10.0      -15    -15.1    -53.2    100/0.4    -10.0    -110.0	
-10 -10.1 48.2 4 4 5	
-10 -10.1 48.2 -10 -10.1 48.2 -15 -15.1 53.2 -15 -15.1 53.2 -16 -17 -100/0.4 -17 -100/0.4 -18.1 -1	
100/0.4	
100/0.4	
100/0.4	
-20 -20.1 - 58.2	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$-25$ $-25.1 \pm 63.2$	
-35 $-351$ $-732$	
$+$ 5 6 8 $\cdot$	

UNTY COLUMBUS		GEOLOGIST S. Papke							
L-)			GROUND WTR (ft)						
OFFSET 12 ft	LT	ALIGNMENT -Y-	<b>0 HR.</b> N/A						
NORTHING 22	28,855	EASTING 2,218,106	24 HR. 8.5						
		#	RTYPE Automatic						
COMP. DATE		SURFACE WATER DEPTH N/A	\						
	MP. / L								
75 100 N	IO. MOI G	SOIL AND ROCK DESC							
e II									
		Dark Gray, Silty CL (Peedee Formation) (cc	_AY						
			· · · · · /						
• • •   • • • •		46.6 Boring Terminated at Elevat	84.7 ion -46.6 ft in						
		COASTAL PLAIN (PEEDEE F SILTY CLAY	FORMATION):						
		<u>Other Samples:</u> ST-4 (19.7 - 21.7)							
	<u>E</u>								
	F								
	E								
	F								
	[								





8



#### LABORATORY SUMMARY SHEET FOR SOIL SAMPLES

#### PROJECT NO.: 34466.4.1 (R-2561CA) COUNTY: COLUMBUS NEW INTERCHANGE AT INTERSECTION OF NC 87 AND NC 11

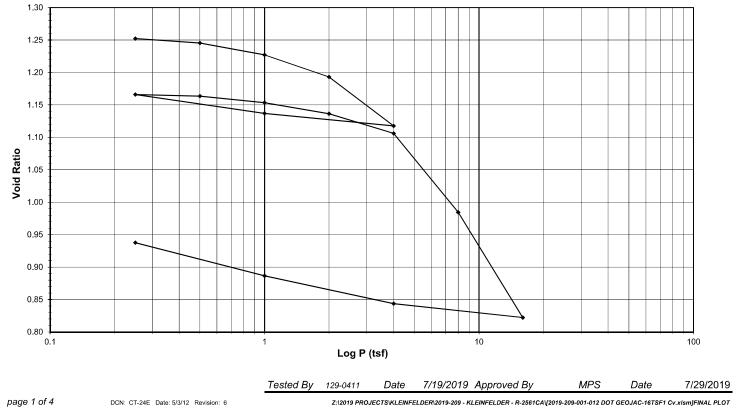
									/	Atterberg Limit	s				Gradatio	n Results			
Sample No.	Boring Number	Alignment	Station	Offset	Sample Depth (ft.)	woisitie	Organic Content (%)	AASHTO Class.	L.L.	P.L.	P.I.	Retained #4 Sieve	Pass #10 Sieve	Pass #40 Sieve	Pass #200 Sieve	Coarse Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)
ST-4	S4_EB2-A	-Y-	34+99	12' LT	19.7 - 21.7	41.5		A-7-6	49	18	31	0.0	100.0	99.8	70.0	0.3	42.7	28.1	28.9



AASHTO T-216

Client	Kleinfelder	Boring No.	S4_EB2-A
Client Reference	R-2561CA	Depth (ft)	19.7-21.7
Project No.	R-2019-209-001	Sample No.	ST-4
Lab ID	R-2019-209-001-012	Visual Description	GRAY LEAN CLAY

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xism]FINAL PLOT DCN: CT-24E Date: 5/3/12 Revision: 6 2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION AASHTO T-216

Client	Kleinfelder
Client Reference	R-2561CA
Project No.	R-2019-209-001
Lab ID	R-2019-209-001-012

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED Consolidometer No. R409

1 Division = 0.0001 (in.)

Sample Properties	Initial	Final					Test Data	Summary			
<i>Water Content</i> Tare Number	TB-05	SS-3		Applied	Final Dial		Corrected	-	Volume	Dry	Void
				Pressure	-	Deflection	-	Sample	(cc)	Density	Ratio
Wt. Tare & WS (g)	370.62	231.69	-	(tsf)	(div)	(div)	(div)	(mm)		(g/cc)	
Wt. Tare & DS (g)	301.70	199.43		0	0	0	0	25 400	00 440	4 00004	4 0000
Wt. Water (g)	68.92	32.26		Seating	0	0	0	25.400	80.440	1.23894	1.26800
Wt. Tare (g)	135.63	100.71		0.25	80.8	10.7	70.1	25.222	79.876	1.24769	1.25210
Wt. DS (g)	166.07	98.72		0.5	130.4	30.0	100.4	25.145	79.633	1.25150	1.24530
Water Content (%)	41.50	32.68		1	228.1	47.1	181.1	24.940	78.983	1.26179	1.22699
				2	405.1	74.4	330.7	24.560	77.780	1.28131	1.1930
Sample Parameters				4	765.1	101.3	663.8	23.714	75.100	1.32703	1.1175
Sample Diameter (in)	2.5	2.5		1	647.9	69.8	578.1	23.932	75.789	1.31497	1.1369
Sample Height (in)	1.0000	0.8544		0.25	484.2	34.5	449.7	24.258	76.822	1.29728	1.1660
Sample Volume (cc)	80.44	68.72		0.5	501.2	40.8	460.4	24.231	76.736	1.29874	1.16364
Wt. Wet Sample + Ring (g)	355.21	346.42		1	560.2	55.4	504.8	24.118	76.379	1.30481	1.1535
Wt. of Ring (g)	214.19	214.19		2	658.1	77.3	580.8	23.925	75.768	1.31534	1.1363
Wt. of Wet Sample (g)	141.02	132.23		4	816.7	102.2	714.5	23.585	74.692	1.33428	1.1060 <sup>-</sup>
Wet Density (pcf)	109.39	120.06		8	1397.1	146.5	1250.6	22.223	70.380	1.41603	0.98442
Wet Density (g/cc)	1.75	1.92		16	2165.6	199.9	1965.8	20.407	64.627	1.54208	0.8222
Water Content (%)	41.50	32.68		4	2010.0	138.4	1871.6	20.646	65.385	1.52421	0.8435
Wt. of Dry Sample (g)	99.66	99.66		1	1769.0	86.8	1682.1	21.127	66.909	1.48950	0.8865
Dry Density (pcf)	77.31	90.49		0.25	1502.1	45.6	1456.5	21.701	68.724	1.45016	0.93772
Dry Density (g/cc)	1.24	1.45									
Void Ratio	1.2681	0.9377									
Saturation (%)	91.96	97.92									
Specific Gravity	2.81	Measured									
			Tested Bv	129-0411	Date	7/19/2019	Input Chec	ked Bv	GEM	Date	7/29/20

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Boring No.	S4_EB2-A
Depth (ft)	19.7-21.7
Sample No.	ST-4
Visual Description	GRAY LEAN CLAY



AASHTO T-216

Client Kleinfelder Client Reference R-2561CA Project No. R-2019-209-001 Lab ID R-2019-209-001-012

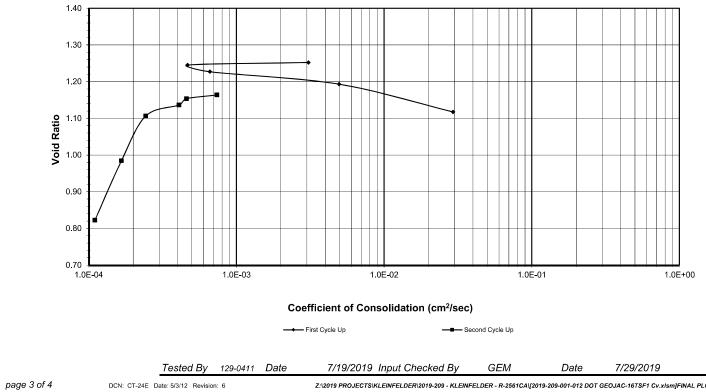
Boring No.

Depth (ft)

Sample No.

S4\_EB2-A 19.7-21.7 ST-4 GRAY LEAN CLAY Visual Description

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xlsm]FINAL PLOT DCN: CT-24E Date: 5/3/12 Revision: 6 2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION AASHTO T-216

Client	Kleinfelder
Client Reference	R-2561CA
Project No.	R-2019-209-001
Lab ID	R-2019-209-001-012

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED

<b>1 Division =</b> 0.0001	(in.)									
Sample Properties	Initial	Final				-	C <sub>v</sub> Test Data Sເ	ummary		
Water Content				Load Increment	Dial Reading	Machine Deflection	Corrected Dial Reading	Sample Height	Time <i>t</i> 50	Cv
Tare Number	TB-05	SS-3			@ t <sub>50</sub>		@ t <sub>50</sub>	@ t <sub>50</sub>		
Wt. Tare & WS (g)	370.62	231.69		(tsf)	(div)	(div)	(div)	(cm)	(min.)	(cm²/sec
Wt. Tare & DS (g)	301.70	199.43								
Wt. Water (g)	68.92	32.26		0 - 0.25	68.7	10.7	58.0	2.525	1.70	0.00308
Wt. Tare (g)	135.63	100.71		0.25 - 0.5	175.6	30.0	145.6	2.503	11.00	0.00047
Wt. DS (g)	166.07	98.72		0.5 - 1.0	369.8	47.1	322.7	2.458	7.50	0.00066
Water Content (%)	41.50	32.68		1.0 - 2.0	400.0	74.4	325.6	2.457	1.00	0.00496
				2.0 - 4.0	404.9	101.3	303.6	2.463	0.17	0.02929
Sample Parameters				4.0 - 1.0	NA	69.8	NA	NA	NA	NA
Sample Diameter (in)	2.5	2.5		1.0 - 0.25	NA	34.5	NA	NA	NA	NA
Sample Height (in)	1.000	0.854		0.25 - 0.5	1126.2	40.8	1085.4	2.264	5.70	0.00074
Sample Volume (cc)	80.44	68.72		0.5 - 1.0	1725.0	55.4	1669.6	2.116	8.00	0.00046
Wt. Wet Sample + Ring (g)	355.21	346.42		1.0 - 2.0	2373.6	77.3	2296.3	1.957	7.70	0.00041
Wt. of Ring (g)	214.19	214.19		2.0 - 4.0	3000.0	102.2	2897.8	1.804	11.00	0.00024
Wt. of Wet Sample (g)	141.02	132.23		4.0 - 8.0	4000.0	146.5	3853.5	1.561	12.00	0.00017
Wet Density (pcf)	109.39	120.06		8.0 - 16.0	5000.0	199.9	4800.1	1.321	13.00	0.00011
Wet Density (g/cc)	1.75	1.92		16.0 - 4.0	NA	138.4	NA	NA	NA	NA
Water Content (%)	41.50	32.68		4.0 - 1.0	NA	86.8	NA	NA	NA	NA
Wt. of Dry Sample (g)	99.66	99.66		1.0 - 0.25	NA	45.6	NA	NA	NA	NA
Dry Density (pcf)	77.31	90.49								
Dry Density (g/cc)	1.24	1.45								
Void Ratio	1.2681	0.9377								
Saturation (%)	91.96	97.92								
Specific Gravity	2.81	Measured								
, , , , ,		Tested By	129-0411	Date	7/19/2019	Input Check	ed Bv	GEM	Date	7/29/2019

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Boring No.	S4_EB2-A
Depth (ft)	19.7-21.7
Sample No.	ST-4
Visual Description	GRAY LEAN CLAY

AASHTO T-216

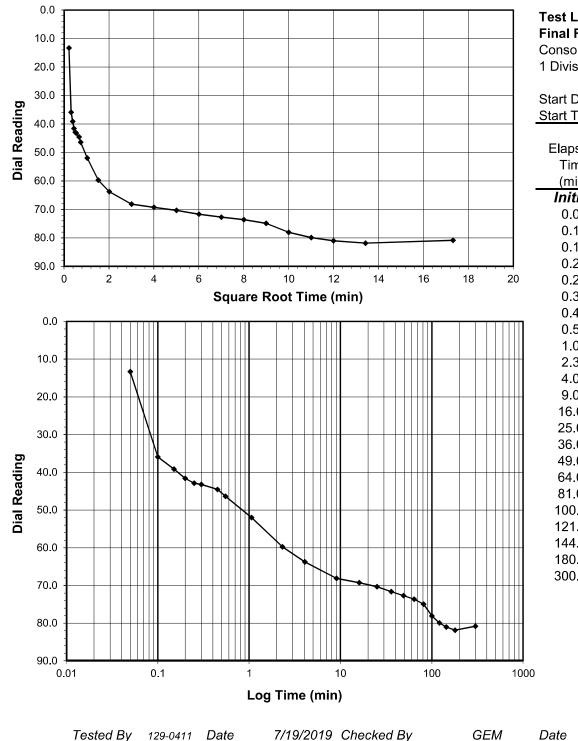


#### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Client Client Project	Kleinfelder R-2561CA	Boring No. Depth (ft)	S4_EB2-A 19.7-21.7	Client Client Project	Kleinfelder R-2561CA
Project No.	R-2019-209-001	Sample No.	ST-4	Project No.	R-2019-209-001
Lab ID	R-2019-209-001-012	Visual Description	GRAY LEAN CLAY	Lab ID	R-2019-209-001-012

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED

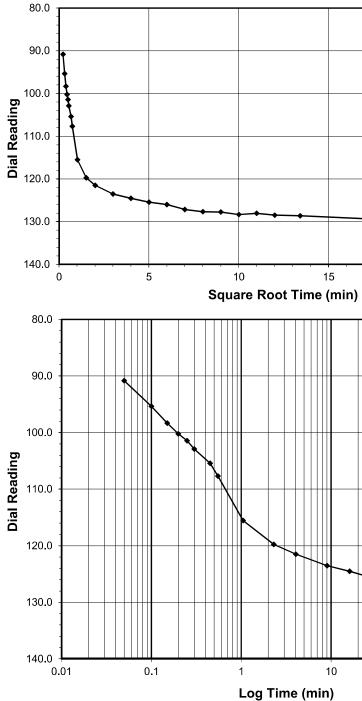


page 1 of 1

Test Load Final Readi	(tsf) ng (div)	0.0-0.25 80.8
Consolidom		R409
1 Division	(in)	0.0001
1 DIVISION	("')	0.0001
Start Date		7/19/2019
Start Time		11:07:25
Elapsed		Dial
Time		Reading
(min)		(div)
Initial		0.0
0.05		13.3
0.10		35.9
0.15		39.1
0.20		41.6
0.25		42.9
0.30		43.2
0.45		44.6
0.55		46.4
1.07		52.0
2.32		59.7
4.07		63.8
9.07		68.1
16.07		69.3
25.07		70.3
36.07		71.7
49.07		72.7
64.07		73.6
81.07		74.9
100.07		78.1
121.07		79.9
144.07		81.0
180.07		81.9
300.08		80.8
0		
0		
Dete	7/00/0040	

7/29/2019

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By 129-0411 Date

DCN: CT-24E Date: 5/3/12 Revision: 3

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DCN: CT-24E Date: 5/3/12 Revision: 3 Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\(2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xism)STEP 1

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S4_EB2-A
19.7-21.7
ST-4
GRAY LEAN CLAY

	Test Load(tsf)Final Reading(div)Consolidometer No.1 Division(in)	0.25-0.5 130.4 R409 0.0001
	Start Date Start Time	7/19/2019 20:07:44
20 25	Elapsed Time (min) <b>Initial</b> 0.05 0.10 0.15 0.20 0.25	Dial Reading (div) <b>80.8</b> 90.8 95.4 98.3 100.2 101.5
n)	0.30 0.45	102.9 105.4
	0.55 1.05 2.30 4.05 9.05 16.05 25.05 36.05 49.07 64.07 81.07 100.07 121.07 144.07 180.07 300.07 520.07	107.7 115.5 119.7 121.5 123.5 124.5 125.4 126.0 127.1 127.7 127.8 128.3 128.0 128.5 128.6 129.4 130.4
100 100	00	

7/19/2019	Checked By	GEM	Date	7/29/2019
sion: 3				
7-12010 PPO JECTS			CAV2040 20	0 001 012 DOT GEO IAC 16TSE1 C

AASHTO T-216

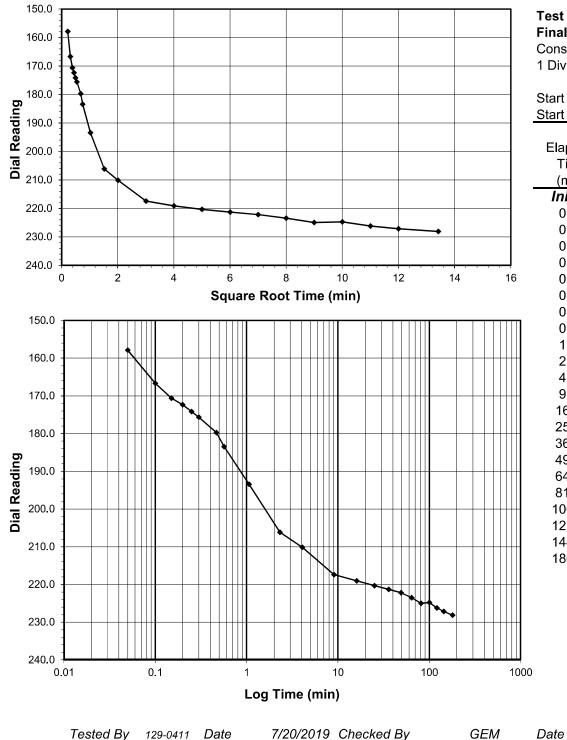


#### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Client Kleinfel		• –			Kleinfelder
Client Project R-2561	CA Dep	oth (ft) 19.7	7-21.7 (	Client Project	R-2561CA
Project No. R-2019	-209-001 Sam	nple No. ST-4	4 F	Project No.	R-2019-209-001
Lab ID R-2019	-209-001-012 Visu	ual Description GRA	AY LEAN CLAY	Lab ID	R-2019-209-001-012

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED

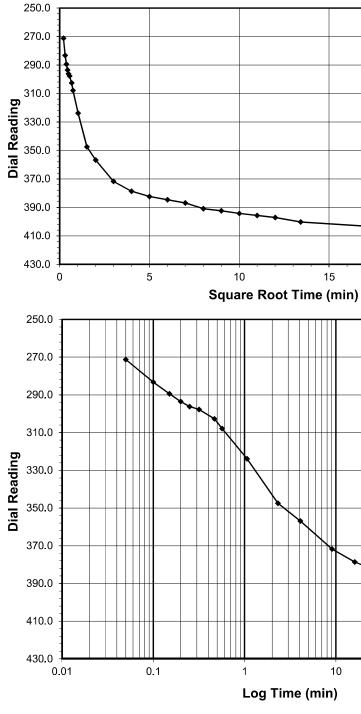


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Test Load(tsf)Final Reading(div)Consolidometer No.11Division(in)Start Data	<b>0.5-1.0</b> <b>228.1</b> <b>R409</b> 0.0001
Start Date	7/20/2019
Start Time	5:08:07
Elapsed	Dial
Time	Reading
(min)	(div)
<i>Initial</i>	<b>130.4</b>
0.05	157.9
0.10	166.7
0.15	170.6
0.20	172.3
0.25	174.1
0.30	175.6
0.47	179.8
0.57	183.5
1.07	193.4
2.32	206.1
4.07	210.1
9.07	217.4
16.07	219.1
25.07	220.3
36.07	221.3
49.07	222.2
64.07	223.5
81.07	225.0
100.07	224.8
121.07	226.2
144.07	227.2
180.07	228.1
0	

7/29/2019

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By 129-0411 Date

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DCN: CT-24E Date: 5/3/12 Revision: 3 Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xlsm]STEP 3

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GEM

Date





Boring No. Depth (ft) Sample No. Visual Description

S4\_EB2-A 19.7-21.7 ST-4 GRAY LEAN CLAY

	<b>Test Load</b> <b>Final Reading</b> Consolidometer 1 Division	<b>(tsf)</b> (div) No. (in)	<b>1.0-2.0</b> <b>405.1</b> <b>R409</b> 0.0001
	Start Date Start Time		7/20/2019 14:08:26
	Elapsed Time (min)		Dial Reading (div)
	Initial 0.05 0.10 0.15 0.20 5 0.25 0.32 0.47 0.57 1.07 2.32 4.07 9.07 16.07 25.07 36.08 49.08 64.08 81.08 100.08 121.08 144.08 180.08 300.08 520.08		228.1 271.3 283.2 289.4 293.5 296.2 297.8 302.7 307.9 323.9 347.5 356.9 371.7 378.7 382.4 384.6 386.9 390.9 392.4 394.2 395.7 397.1 400.2 403.4 405.1
100 1	1000		

7/29/2019

AASHTO T-216

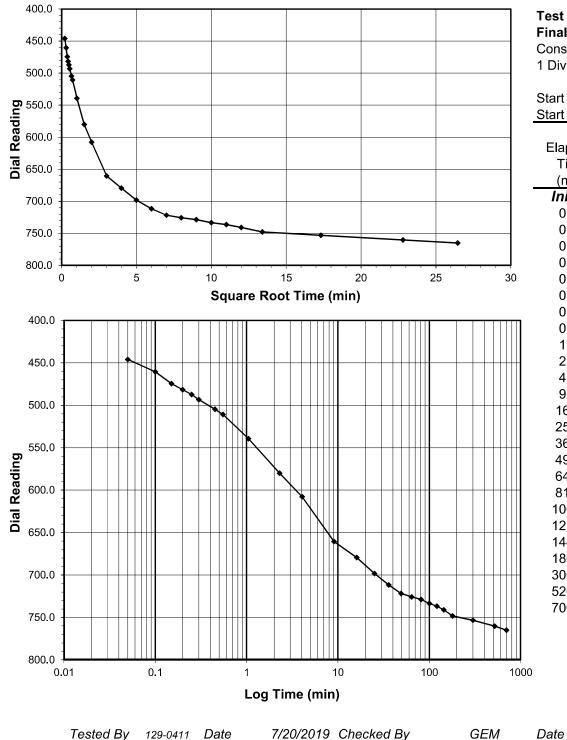


#### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Client	Kleinfelder	Boring No.	S4_EB2-A	Client	Kleinfelder
Client Project	R-2561CA	Depth (ft)	19.7-21.7	Client Project	R-2561CA
Project No.	R-2019-209-001	Sample No.	ST-4	Project No.	R-2019-209-001
Lab ID	R-2019-209-001-012	Visual Description	GRAY LEAN CLAY	Lab ID	R-2019-209-001-012

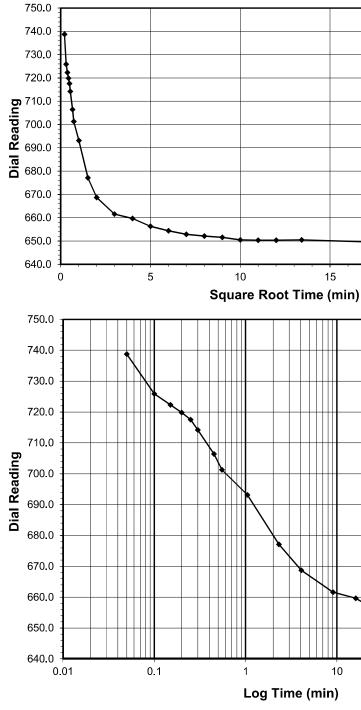
#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



<b>Test Load</b> <b>Final Reading</b> Consolidometer 1 Division	<b>(tsf)</b> (div) No. (in)	<b>2.0-4.0</b> <b>765.1</b> <b>R409</b> 0.0001
Start Date Start Time		7/20/2019 23:08:48
Elapsed Time (min) Initial 0.05 0.10 0.15 0.20 0.25 0.30 0.45 0.55 1.05 2.30 4.05 9.05 16.07 25.07 36.07 49.07 64.07 81.07 100.07 121.07 144.07 180.07 300.07 520.07 700.07		Dial Reading (div) <b>405.1</b> 446.1 460.5 474.5 481.7 487.3 493.3 504.6 510.9 539.4 580.0 607.8 660.5 679.5 698.2 711.6 721.8 725.8 725.8 725.8 725.8 725.8 725.8 725.8 725.8 725.8 725.8 725.8 725.8
)		

7/29/2019

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



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DCN: CT-24E Date: 5/3/12 Revision: 3

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DCN: CT-24E Date: 5/3/12 Revision: 3

Tested By 129-0411 Date

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Boring No. Depth (ft) Sample No. Visual Description

S4\_EB2-A 19.7-21.7 ST-4 GRAY LEAN CLAY

	Test Load(tsf)Final Reading(div)Consolidometer No.1 Division(in)	<b>4.0-1.0</b> 647.9 R409 0.0001
	Start Date Start Time	7/21/2019 11:08:57
	Elapsed Time (min)	Dial Reading (div)
20 25 ) 20 25 )	Initial $0.05$ $0.10$ $0.15$ $0.20$ $0.25$ $0.30$ $0.45$ $0.55$ $1.05$ $2.32$ $4.07$ $9.07$ $16.07$ $25.07$ $36.07$ $49.07$ $64.07$ $81.07$ $100.07$ $121.07$ $144.08$ $180.08$ $300.08$ $420.08$	765.1 $738.7$ $725.9$ $722.3$ $719.9$ $717.5$ $714.1$ $706.4$ $701.3$ $693.1$ $677.1$ $668.7$ $661.6$ $659.6$ $656.3$ $654.4$ $652.2$ $651.6$ $650.5$ $650.4$ $650.5$ $649.6$ $647.9$
100 100	00	

GEM 7/29/2019 7/21/2019 Checked By Date Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xlsm]STEP 6

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AASHTO T-216

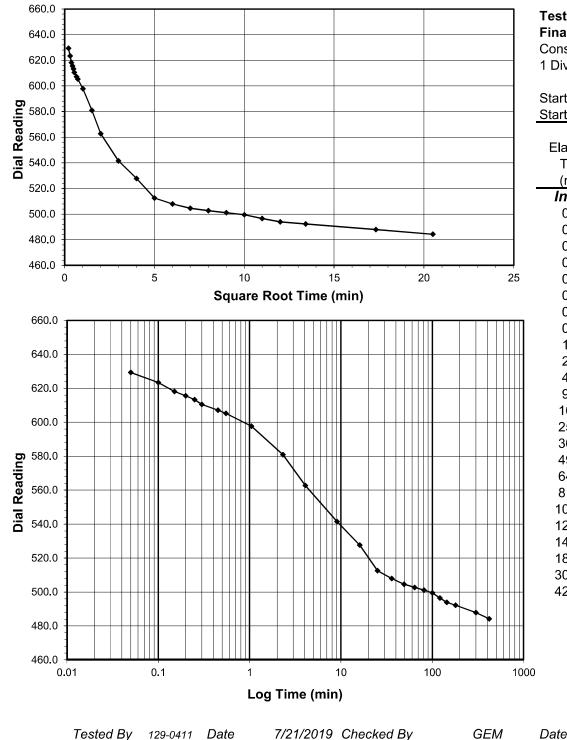


#### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Client	Kleinfelder	Boring No.	S4_EB2-A	Client	Kleinfelder
Client Project	R-2561CA	Depth (ft)	19.7-21.7	Client Project	R-2561CA
Project No.	R-2019-209-001	Sample No.	ST-4	Project No.	R-2019-209-001
Lab ID	R-2019-209-001-012	Visual Description	GRAY LEAN CLAY	Lab ID	R-2019-209-001-012

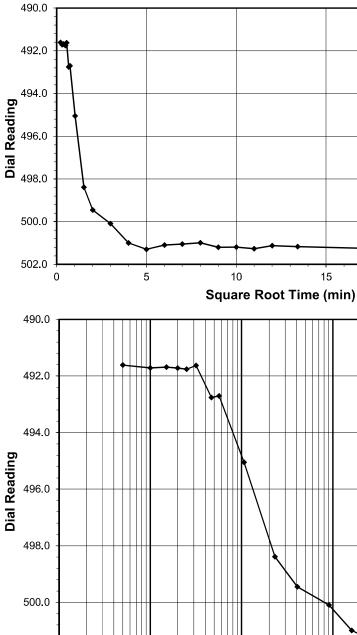
#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



page 1 of 1

Test Load	(tsf)	1.0-0.25
Final Readi	• •	484.2
Consolidom		R409
1 Division	(in)	0.0001
Start Date		7/21/2019
Start Time		18:09:02
Elapsed		Dial
Time		Reading
(min)		(div)
Initial		647.9
0.05		629.3
0.10		623.4
0.15		618.1
0.20		615.6
0.25		613.3
0.30		610.6
0.45		607.1
0.55		605.3
1.05		597.7
2.32		580.9
4.07		562.8
9.07		541.5
16.07		527.7
25.07		512.6
36.07		507.9
49.07		504.6
64.07		502.7
81.07		501.1
100.07		499.5
121.07		496.5
144.07		493.9
180.07		492.2
300.07		487.9
420.00		484.2
00		
Date	7/20/2010	
Dale	7/29/2019	

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



502.0

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0.01

0.1

Tested By 129-0411 Date



1

DCN: CT-24E Date: 5/3/12 Revision: 3

DCN: CT-24E Date: 5/3/12 Revision: 3 Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xlsm]STEP 7

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Boring No. Depth (ft) Sample No. Visual Description

S4\_EB2-A 19.7-21.7 ST-4 GRAY LEAN CLAY

	Test Load(tsf)Final Reading(div)Consolidometer No.1 Division(in)	0.25-0.5 501.2 R409 0.0001
	Start Date Start Time	7/22/2019 1:09:02
20 25 ) 20 25	Elapsed Time (min) Initial 0.05 0.10 0.15 0.20 0.25 0.32 0.47 0.57 1.07 2.32 4.07 9.07 16.07 25.07 36.07 49.07 64.07 81.07 100.07 121.07 144.07 180.07 300.07 420.07	Dial Reading (div) <b>484.2</b> 491.6 491.7 491.7 491.7 491.8 491.6 492.8 492.7 495.0 498.4 499.5 500.1 501.0 501.3 501.1 501.0 501.2 501.2 501.2 501.3 501.1 501.2 501.3 501.2
	00	

GEM 7/29/2019 7/22/2019 Checked By Date Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xlsm]STEP 8

AASHTO T-216

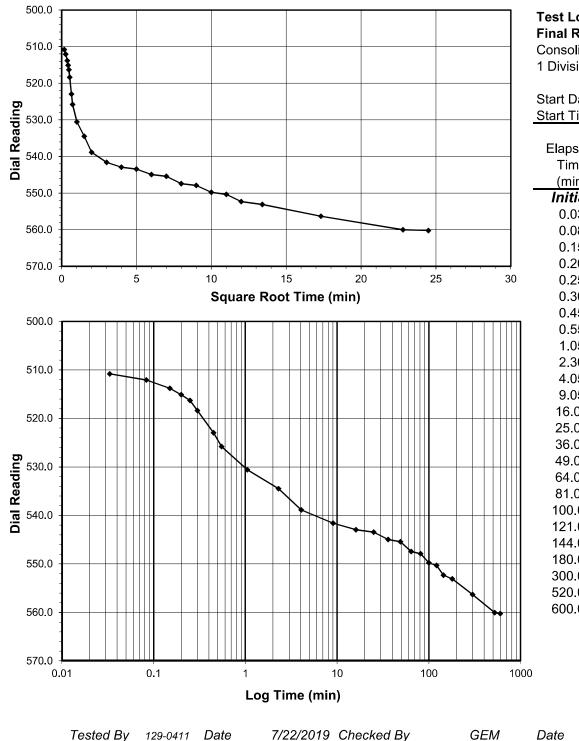


#### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Client	Kleinfelder	Boring No.	S4_EB2-A	Client	Kleinfelder
Client Project	R-2561CA	Depth (ft)	19.7-21.7	Client Project	R-2561CA
Project No.	R-2019-209-001	Sample No.	ST-4	Project No.	R-2019-209-001
Lab ID	R-2019-209-001-012	Visual Description	GRAY LEAN CLAY	Lab ID	R-2019-209-001-012

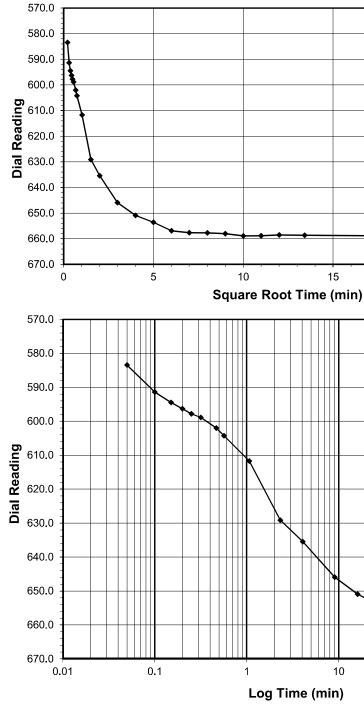
#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load(tsf)Final Reading(div)Consolidometer No.11Division(in)Start DateStart Time	<b>0.5-1.0</b> <b>560.2</b> <b>R409</b> 0.0001 7/22/2019 8:09:06
Elapsed Time (min) <b>Initial</b> 0.03 0.08 0.15 0.20 0.25 0.30 0.45 0.55 1.05 2.30 4.05 9.05 16.05 25.05 36.05 49.05 64.05 81.05 100.05 121.05 144.05 180.05 300.07 520.07 600.07	Dial Reading (div) 501.2 510.8 512.1 513.8 515.1 516.3 518.4 523.0 525.8 530.6 534.5 538.9 541.6 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 542.9 543.4 543.4 543.4 544.9 545.4 547.4 547.9 549.8 550.3 552.3 553.1 556.3 556.3 560.0 560.2
)	

7/29/2019

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By 129-0411 Date

page 1 of 1

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DCN: CT-24E Date: 5/3/12 Revision: 3 Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xism]STEP 10 2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

GEM

Date

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Boring No. Depth (ft) Sample No. Visual Description

S4\_EB2-A 19.7-21.7 ST-4 GRAY LEAN CLAY

		<b>Test Load</b> <b>Final Reading</b> Consolidometer 1 Division	<b>(tsf)</b> (div) No. (in)	<b>1.0-2.0</b> 658.1 R409 0.0001
		Start Date Start Time		7/22/2019 18:09:11
		Elapsed Time (min)		Dial Reading (div)
•		<i>Initial</i> 0.05 0.10 0.15 0.20		<b>560.2</b> 583.5 591.4 594.5 596.3
20 )	) 25	0.25 0.32 0.47		597.8 598.9 602.0
		0.57 1.07 2.32 4.07 9.07		604.3 611.7 629.2 635.4 645.9
		16.07 25.07 36.07 49.07		650.9 653.6 656.9 657.7
		64.08 81.08 100.08 121.08 144.08		657.8 658.0 658.9 658.9 658.5
•		180.08 300.08 520.08		658.6 658.8 658.1
1	00 10	000		

7/29/2019

page 1 of 1 DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xlsm]STEP 9

AASHTO T-216

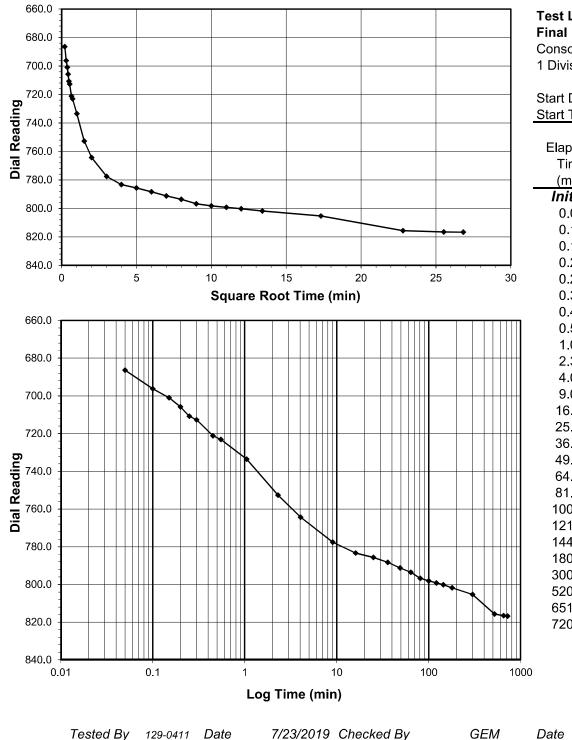


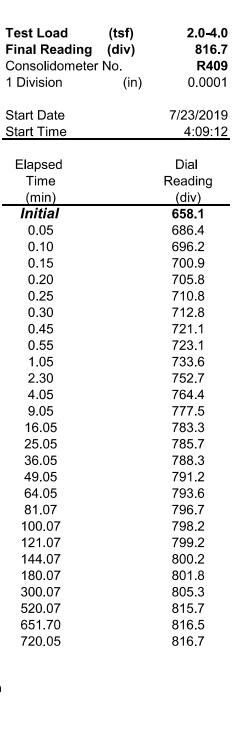
#### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Client	Kleinfelder	Boring No.	S4_EB2-A	Client	Kleinfelder
Client Project	R-2561CA	Depth (ft)	19.7-21.7	Client Project	R-2561CA
Project No.	R-2019-209-001	Sample No.	ST-4	Project No.	R-2019-209-001
Lab ID	R-2019-209-001-012	Visual Description	GRAY LEAN CLAY	Lab ID	R-2019-209-001-012

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



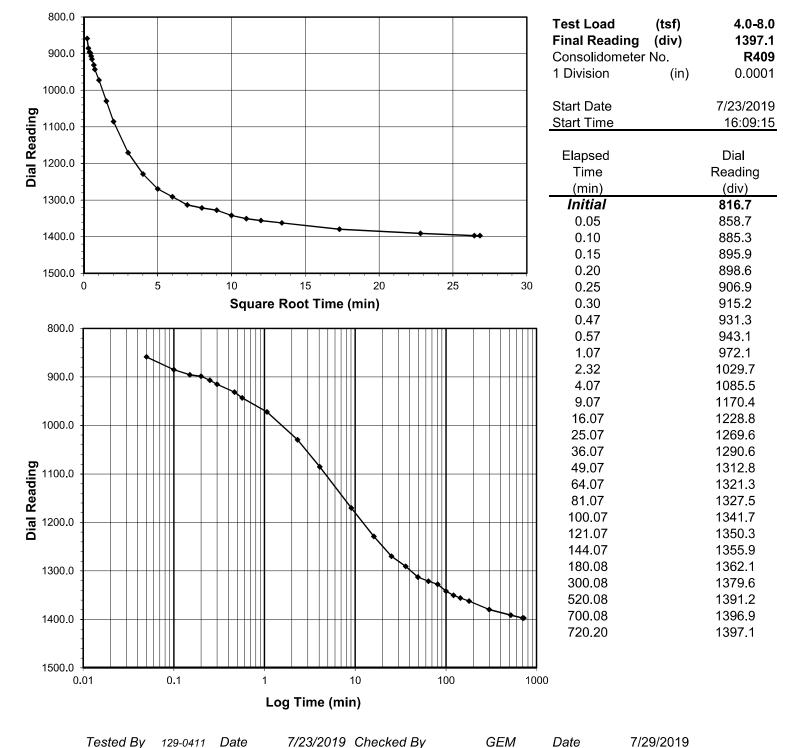


7/29/2019

page 1 of 1

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED

DCN: CT-24E Date: 5/3/12 Revision: 3



Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xlsm]STEP 11

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Boring No. Depth (ft) Sample No. Visual Description

S4\_EB2-A 19.7-21.7 ST-4 GRAY LEAN CLAY

page 1 of 1

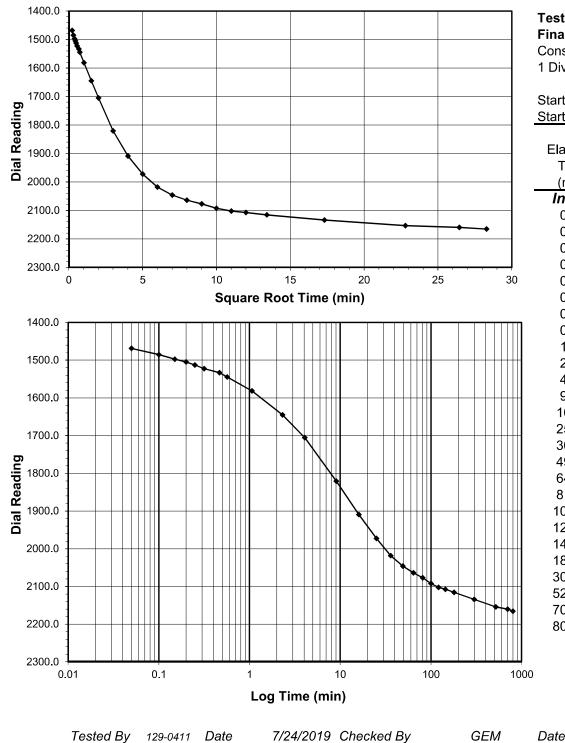
AASHTO T-216



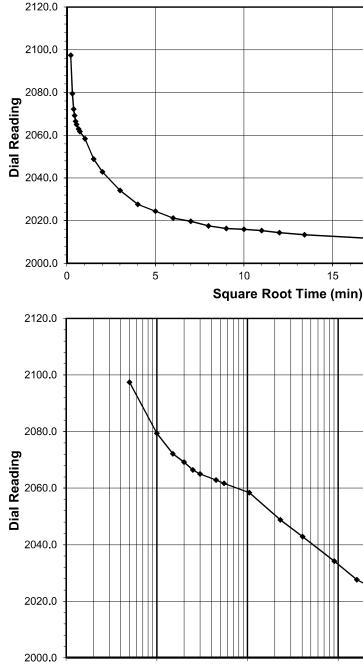
## **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED				Sample Conditions:	UNDISTURBED, INUNDATED
Lab ID	R-2019-209-001-012	Visual Description	GRAY LEAN CLAY	Lab ID	R-2019-209-001-012
Project No.	R-2019-209-001	Sample No.	ST-4	Project No.	R-2019-209-001
Client Project	R-2561CA	Depth (ft)	19.7-21.7	Client Project	R-2561CA
Client	Kleinfelder	Boring No.	S4_EB2-A	Client	Kleinfelder



<b>Test Load</b> <b>Final Readi</b> Consolidome 1 Division	• • •	8.0-16.0 2165.6 R409 0.0001
Start Date Start Time		7/24/2019 4:09:27
Elapsed Time (min) <i>Initial</i> 0.05 0.10 0.15 0.20 0.25 0.32 0.47 0.57 1.07 2.32 4.07 9.07 16.07 25.07 36.07 49.07 64.07 81.07 100.07 121.07 144.07 180.07 300.07		Dial Reading (div) <b>1397.1</b> 1468.7 1485.4 1497.7 1504.9 1512.9 1522.8 1533.4 1544.6 1581.6 1644.8 1705.7 1820.7 1909.3 1972.6 2018.4 2046.1 2063.8 2076.9 2092.4 2102.3 2107.4 2115.6 2134.2
520.08 700.08 800.23		2154.0 2160.1 2165.6
00		
Date	7/29/2019	



0.01

page 1 of 1

0.1

Tested By 129-0411 Date

1

DCN: CT-24E Date: 5/3/12 Revision: 3

10

Log Time (min)

7/24/2019 Ch

page 1 of 1

Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xism]STEP 13

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Boring No.	
Depth (ft)	
Sample No.	
Visual Description	

ED AND DOUBLE DRAINED

	Test Load(tsf)Final Reading(div)Consolidometer No.1 Division(in)	<b>16.0-4.0</b> <b>2010.0</b> <b>R409</b> 0.0001
	Start Date Start Time	7/24/2019 17:29:41
	Elapsed Time (min)	Dial Reading (div)
	Initial $0.05$ $0.10$ $0.15$ $0.20$ $0.25$ $0.30$ $0.45$ $0.55$ $1.05$ $2.30$ $4.05$ $9.05$ $16.05$ $25.05$ $36.07$ $49.07$ $64.07$ $81.07$ $100.07$ $121.07$ $144.07$ $180.07$ $300.07$ $420.12$	2165.6 2097.4 2079.4 2072.2 2069.2 2066.5 2065.0 2062.9 2061.7 2058.4 2042.9 2034.2 2027.7 2024.4 2021.1 2019.7 2017.5 2016.3 2015.9 2015.3 2014.3 2013.4 2011.6 2010.0
100 100	0	

S4\_EB2-A 19.7-21.7

GRAY LEAN CLAY

ST-4

necked By	GEM	Date	7/29/2019

AASHTO T-216

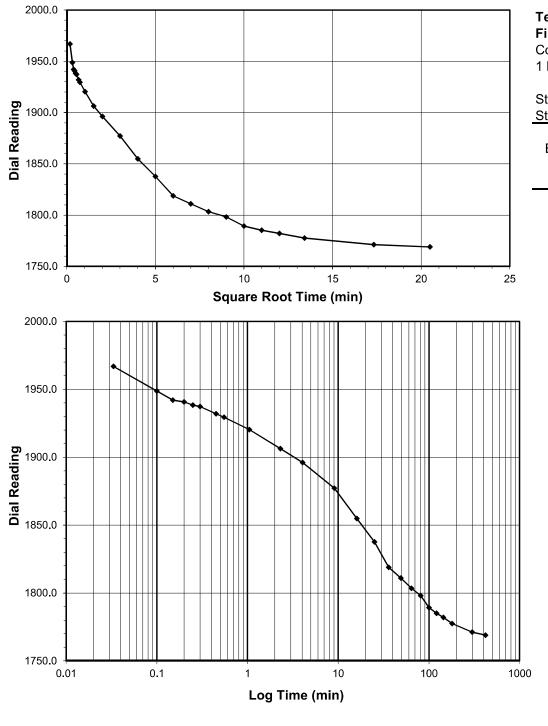


#### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

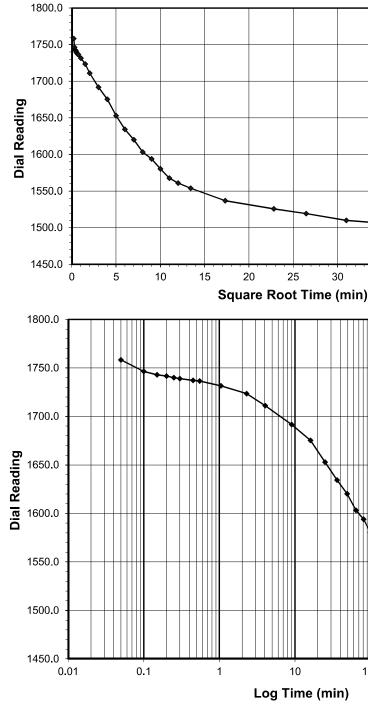
Client	Kleinfelder	Boring No.	S4_EB2-A	Client	Kleinfelder
Client Project	R-2561CA	Depth (ft)	19.7-21.7	Client Project	R-2561CA
Project No.	R-2019-209-001	Sample No.	ST-4	Project No.	R-2019-209-001
Lab ID	R-2019-209-001-012	Visual Description	GRAY LEAN CLAY	Lab ID	R-2019-209-001-012

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



<b>Test Load</b> <b>Final Readi</b> Consolidom 1 Division	• • •	<b>4.0-1.0</b> <b>1769.0</b> <b>R409</b> 0.0001
Start Date Start Time		7/25/2019 0:29:48
Elapsed Time (min) <b>Initial</b> 0.03 0.10 0.15 0.20 0.25 0.30 0.45 0.55 1.05 2.30 4.05 9.05 16.05 25.05 36.05 49.05 64.05 81.05 100.05 121.05 144.05 180.05 300.07 420.05		Dial Reading (div) <b>2010.0</b> 1966.8 1948.7 1942.0 1940.7 1938.4 1937.3 1932.0 1929.5 1920.3 1906.3 1896.1 1877.2 1854.8 1837.7 1818.8 1837.7 1818.8 1837.7 1818.8 1837.7 1818.8 1837.7 1818.8 1837.7 187.2 1798.0 1789.3 1785.1 1782.1 1777.5 1771.1 1769.0
00		
Date	7/29/2019	

#### Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By 129-0411 Date

DCN: CT-24E Date: 5/3/12 Revision: 3

page 1 of 1 DCN: CT-24E Date: 5/3/12 Revision: 3 Z:\2019 PROJECTS\KLEINFELDER\2019-209 - KLEINFELDER - R-2561CA\[2019-209-001-012 DOT GEOJAC-16TSF1 Cv.xism]STEP 15

7/25/2019 Checked By

Tested By

129-0411 Date

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GEM

Date

7/29/2019

7/25/2019 Checked By



Boring No. Depth (ft) Sample No. Visual Description

S4\_EB2-A 19.7-21.7 ST-4 GRAY LEAN CLAY

		sf)1.0-0.25liv)1502.1b.R409(in)0.0001
	Start Date Start Time	7/25/2019 7:29:52
	Elapsed Time (min) Initial	Dial Reading (div) <b>1769.0</b>
35 40 45 n)	0.05 0.10 0.15 0.20 50 0.25 0.30 0.45 0.55 1.05 2.30 4.05 9.05 16.05 25.05 36.07 49.07 64.07 81.07 100.07 121.07	1758.2 1746.3 1742.9 1741.6 1740.0 1739.0 1737.1 1736.5 1731.6 1723.4 1711.1 1691.6 1675.3 1652.8 1634.4 1620.2 1603.2 1593.9 1580.3 1567.8
100 1000	144.07 180.07 300.07 520.07 700.07 960.07 1440.07 1598.22 10000 1598.23 1838.23	1561.0 1554.0 1536.9 1525.8 1519.4 1510.0 1503.3 1501.7 1501.7 1502.1

#### CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS AASHTO T-297

Client: Client Refere Project No.: Lab ID:		Kleinfelder R-2561CA R-2019-209-001 R-2019-209-001-0	12	Boring No.:S4_IDepth (ft):19.7Sample No.:ST-4					
Visual Descr	ription:	Gray Clay (UNDIS	TURBED)						
Stage No.		3		INITIAL SAM		ENSIONS (in)			
Test No.		1		Length 1:	6.252	Diameter 1:	2.871		
•				Length 2:	6.237	Diameter 2:	2.857		
PRESSURE	ES (psi)			Length 3:	6.277	Diameter 3:	2.843		
				Length 4:	6.253	Diameter 4:	2.835		
Cell Pressure	re (psi)	55.0	,	Avg. Length:	6.255	Avg. Diam.:	2.852		
Back Pressu	ure (psi)	50.0							
Eff. Conf. Pr	ressure (psi)	5.0		VOLUME CI	HANGE				
Pore Pressu	ire			Initial Burette	Reading	(ml)	24.0		
Response (%	%)	100		Final Burette	Reading	(ml)	15.4		
				Final Change	e (ml)		8.6		
MAXIMUM	OBLIQUITY F	POINTS							
				Initial Dial Re	ading (mi	)	092		
P =		8.83		Dial Reading			092		
Q =		7.36		Dial Reading			119		
	LOAD		DEFORMAT			PORE PRESSU	DE		
	(LB)		UEFORIMAT (IN)			PORE PRESSU (PSI)			
	8.1		0.000			50.0			
	10.7		0.001			50.3			
	11.0		0.003			50.6			
	25.5		0.008			50.9			
	34.1		0.015			51.6			
	39.6		0.021			52.0			
	46.6 52.3		0.030			52.5			
	52.3 59.6		0.039 0.052			52.9 53.2			
	71.3		0.073			53.5			
	87.6		0.104			53.7			
	103.5		0.141			53.5			
	111.5		0.179			53.1			
	115.9		0.222			52.6			
	118.1		0.253			52.2			
	120.0 120.2		0.297 0.355			51.7 51.2			
	120.2		0.418			50.9			
	121.4		0.464			50.8			
	123.1		0.526			50.7			
	122.7		0.573			50.6			
	124.0		0.619			50.6			
	124.7		0.665 0.696			50.5 50.5			
	105 2					00.0			
	125.3 125.7								
	125.7		0.727			50.4			
	125.7 126.8 128.1 129.5		0.727 0.759 0.790 0.836			50.4 50.4 50.3 50.3			
	125.7 126.8 128.1 129.5 130.9		0.727 0.759 0.790 0.836 0.883			50.4 50.4 50.3 50.3 50.2			
	125.7 126.8 128.1 129.5 130.9 131.4		0.727 0.759 0.836 0.883 0.929			50.4 50.3 50.3 50.2 50.1			
Tested By:	125.7 126.8 128.1 129.5 130.9	Date: 8/7/1	0.727 0.759 0.790 0.836 0.883 0.929 0.976	Input Checke		50.4 50.4 50.3 50.3 50.2	Date:	8/13/19	

#### AASHTO T-297 Kleinfelder Client Reference: R-2561CA Project No.: R-2019-209-001 R-2019-209-001-012 Gray Clay (UNDISTURBED) Visual Description: Effective Confining Pressure (psi) 5.0 INITIAL DIMENSIONS Initial Sample Length (in) 6.25 Initial Sample Diameter (in) 2.85 Initial Sample Area (in<sup>2</sup>) 6.39 Initial Sample Volume (in<sup>3</sup>) 39.94 \_\_\_\_ Strain Deviation $\Delta U$ $\sigma_1$ $\sigma_3$ Stress 0.29 0.40 5.12 4.7 0.59 0.46 4.88 4.4 2.74 0.89 6.86 4.1 4.09 1.58 7.52 3.4 7.92 4.95 2.03 3.0 2.52 2.5 6.05 8.55 2.2 6.93 2.85 9.09 9.92 8.06 3.15 1.9 9.87 3.48 11.39 1.5 12.34 3.67 13.68 1.3 1.5 14.72 3.54 16.20 3.14 17.74 1.9 15.87 16.42 2.57 18.86 2.4 16.67 2.16 19.52 2.9 16.83 1.67 20.17 3.3

page 4 of 11

Client:

Lab ID:

(%)

0.02

0.06

0.13 0.24

0.33

0.48

0.63

0.83

1.17

1.67

2.27

2.87

3.57

4.07

4.77

5.70

6.71

7.45

8.45

9.20

9.94

10.68

11.18

11.68

12.18

12.68

13.43

14.18

14.92

15.67

16.70

16.70

16.56

16.63

16.44

16.48

16.45

16.45

16.40

16.47

16.55

16.61

16.64

16.57

16.52

1.22

0.89

0.75

0.64

0.57

0.56

0.50 0.46

0.42

0.37

0.33

0.26

0.21

0.12

0.04

20.48

20.82

20.82

21.00

20.88

20.93

20.95

21.00

20.99

21.11

21.23

21.36

21.44

21.46

21.48

#### CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

	Boring No.: Depth (ft): Sample No	.:	S4_EB2-A 19.7-21.7 ST-4	
D)				
	Stage No. Test No		3 1	
	VOLUME CHANGE			
	Volume After Consolida Length After Consolida Area After Consolidatic	tion (in)		39.42 6.23 6.330
$\overline{\sigma_3}$	Effective Principle Stress Ratio	Ā	P	Q
$\begin{array}{c} 4.7\\ 4.4\\ 3.0\\ 2.5\\ 2.2\\ 1.5\\ 1.5\\ 1.5\\ 2.4\\ 2.9\\ 3.8\\ 4.3\\ 4.4\\ 4.5\\ 4.6\\ 4.6\\ 4.6\\ 4.8\\ 4.9\\ \end{array}$	1.085 1.105 1.666 2.192 2.664 3.430 4.213 5.346 7.469 10.241 11.006 9.496 7.727 6.841 6.034 5.412 5.050 4.888 4.811 4.699 4.706 4.648 4.614 4.571 4.549 4.538 4.493 4.468 4.386	0.73 1.29 0.32 0.39 0.41 0.42 0.41 0.39 0.35 0.30 0.24 0.20 0.16 0.13 0.10 0.07 0.05 0.05 0.04 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.03 0.02 0.02 0.02 0.01 0.01	4.92 4.65 5.49 5.47 5.45 5.52 5.62 5.89 6.46 7.51 8.83 9.80 10.65 11.19 11.76 12.13 12.47 12.54 12.68 12.69 12.73 12.77 12.79 12.87 12.96 13.06 13.12 13.18	0.20 0.23 1.37 2.04 2.48 3.03 3.47 4.03 4.93 6.17 7.36 7.94 8.21 8.33 8.41 8.35 8.35 8.35 8.28 8.22 8.23 8.23 8.28 8.30 8.23 8.28 8.30 8.23 8.28 8.30 8.23 8.28 8.30 8.28 8.32 8.28 8.22 8.22 8.22 8.22 8.22 8.22 8.22 8.23 8.23 8.28 8.32 8.28 8.30 8.28 8.30 8.28 8.30 8.28 8.32

## CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297

Client: Client Reference: Project No.: Lab ID:	Kleinfelder R-2561CA R-2019-209-001 R-2019-209-001-012	Dep	ing No.: oth (ft): nple No.:	S4_EB2-A 19.7-21.7 ST-4	Client: Client Re Project N Lab ID:		Kleinfelder R-2561CA R-2019-209 R-2019-209			Boring No. Depth (ft): Sample No		S4_EB2-A 19.7-21.7 ST-4	
Visual Description:	Gray Clay (UNDISTURBED)				Visual De	scription:	Gray Clay (	UNDISTUR	BED)				
Stage No.	2	INITIAL SAMP	LE DIMENSIONS (in)		Effective	Confining Pr	essure (psi)	10.0		Stage No.		2	
Test No.	2	•	5.936 Diameter 1:	2.866		-				Test No		2	
PRESSURES (psi)		Length 3: 5	5.995      Diameter 2:        5.964      Diameter 3:        6.001      Diameter 4:	2.853 2.843 2.820	INITIAL [	DIMENSION	S			VOLUME CHANGE			
Cell Pressure (psi) Back Pressure (psi)	60.0 50.0	0	5.974 Avg. Diam.:	2.846		nple Length nple Diamet	• •	5.97 2.85		Volume After Consolic Length After Consolida	. ,		36.5 5.9
Eff. Conf. Pressure (psi)	10.0	VOLUME CHA				nple Area (ir		6.36		Area After Consolidati	on (in²)		6.20
Pore Pressure Response (%)	100	Initial Burette R Final Burette R Final Change (r	eading (ml)	24.0 7.9 16.1	Initial Sar	nple Volume	e (in³)	37.99					
MAXIMUM OBLIQUITY	POINTS				Strain	Deviation	ΔU	$\overline{\sigma}_1$	$\overline{\sigma}_3$	Effective Principle	A	Р	Q
P = Q =	11.32 9.31		ding (mil) fter Saturation (mil) er Consolidation (mil)	189 211 266	(%)	Stress				Stress Ratio			
LOAD	DEFORM		PORE PRESS										
(LB)	(IN)		(PSI)										
10.2	0.00		50.0		0.02	0.02	0.10	10.05	0.0	1 004	0.12	10.20	0.46
16.0 23.1	0.00 0.00		50.1 Run 50.5		0.03 0.11	0.93 2.07	0.12 0.48	10.85 11.63	9.9 9.6	1.094 1.217	0.13 0.23	10.39 10.59	0.46 1.04
31.9	0.00	9	Run 51.1		0.15	3.49	1.13	12.41	8.9	1.392	0.32	10.66	1.75
45.4	0.01		Run 52.3 Run 53.2		0.25 0.35	5.66 7.19	2.26	13.44	7.8 6.8	1.727	0.40	10.61 10.42	2.83 3.59
55.0 66.6	0.02 0.02		Run 53.2 Run 54.4		0.50	9.04	3.22 4.36	14.01 14.71	6.6 5.7	2.054 2.592	0.45 0.48	10.42	3.59 4.52
77.7	0.03		Run 55.2		0.65	10.81	5.23	15.62	4.8	3.246	0.48	10.21	5.40
89.8	0.04	9	Run 56.0		0.84	12.72	6.04	16.72	4.0	4.181	0.48	10.36	6.36
106.9	0.07		Run 57.0		1.20	15.40	7.02	18.42	3.0	6.091	0.46	10.72	7.70
120.5 128.5	0.10 0.13		Run 57.8 Run 58.0		1.71 2.32	17.47 18.63	7.78 8.03	19.73 20.64	2.3 2.0	8.724 10.268	0.45 0.43	10.99 11.32	8.73 9.31
136.5	0.13		ailure 57.8		2.93	19.76	7.80	22.00	2.2	9.825	0.43	12.12	9.88
145.1	0.21		57.5		3.64	20.96	7.46	23.54	2.6	9.117	0.36	13.06	10.48
149.4	0.24		57.0		4.16	21.51	7.01	24.54	3.0	8.095	0.33	13.78	10.75
148.3	0.28		56.5		4.86	21.18	6.53	24.69	3.5	7.038	0.31	14.10	10.59
144.6 140.0	0.34 0.40		55.9 55.6		5.83 6.86	20.40 19.49	5.90 5.57	24.54 23.96	4.1 4.5	5.927 5.364	0.29 0.29	14.34 14.21	10.20 9.75
145.2	0.40		55.5		7.61	20.10	5.45	23.90	4.6	5.383	0.29	14.64	10.05
147.8	0.50		55.2		8.63	20.26	5.21	25.09	4.8	5.192	0.26	14.96	10.13
149.2	0.55	4	55.0		9.39	20.30	5.03	25.31	5.0	5.049	0.25	15.16	10.15
147.9	0.59	9	54.9		10.15	19.94	4.85	25.13	5.2	4.844	0.24	15.16	9.97
146.2	0.64		54.7		10.92	19.53	4.65	24.92	5.4	4.624	0.24	15.15	9.76
146.9	0.67		54.5		11.43	19.51	4.49	25.06	5.5	4.515	0.23	15.30	9.75
148.6 153.4	0.70 0.73		54.3 54.2		11.93 12.44	19.64 20.20	4.35 4.18	25.34 26.07	5.7 5.9	4.450 4.446	0.22 0.21	15.52 15.96	9.82 10.10
153.4	0.76		54.2 54.1		12.44	20.20 19.89	4.18	25.87	5.9 6.0	4.321	0.21	15.90	9.94
153.2	0.80		53.9		13.73	19.89	3.91	26.01	6.1	4.246	0.20	16.07	9.94 9.94
152.1	0.85		53.8		14.48	19.56	3.83	25.77	6.2	4.147	0.20	15.99	9.78
152.1	0.88	4	53.8		14.98	19.44	3.77	25.71	6.3	4.101	0.19	15.99	9.72
154.5	0.91		53.7		15.50	19.65	3.74	25.95	6.3	4.119	0.19	16.12	9.82
ested By: 129-07-041	l Date: 8/7/19	Input Checked	By: GEM	Date: 8/13/19									

## WITH PORE PRESSURE READINGS AASHTO T-297

Boring No.:	S4_EB2-A
Depth (ft):	19.7-21.7
Sample No.:	ST-4

#### CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297

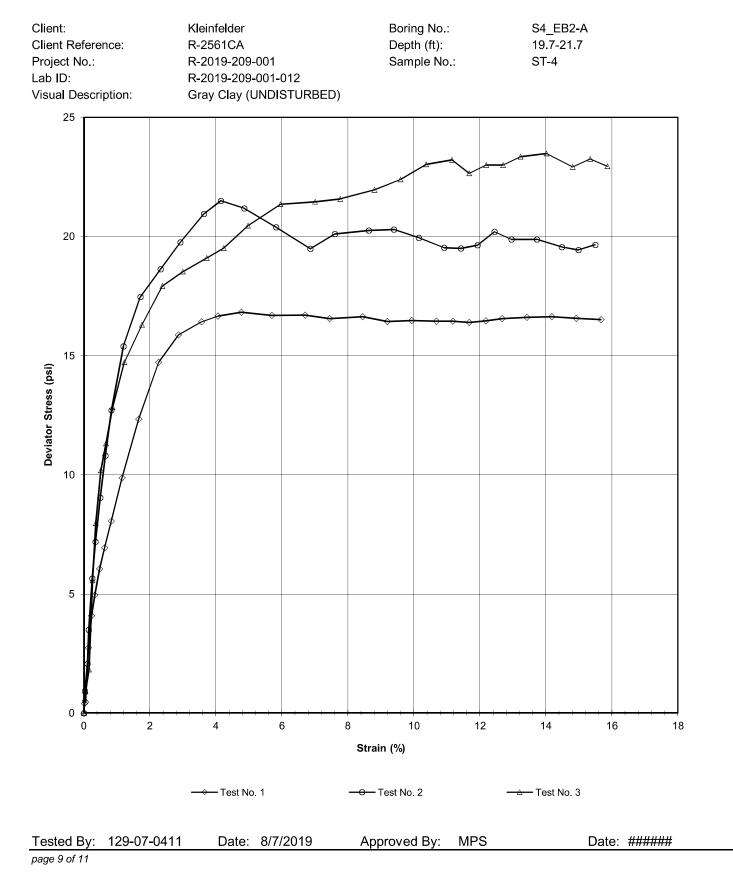
e:	Kleinfelder R-2561CA R-2019-209-001 5 ″ ″		C	epth (ft):						ference: o.:	R-2561CA R-2019-209		
HVFUL	SWLRQ	*UD\ &O	D\ 81',6	785%(	•				Visual De	scription:	Gray Clay (	UNDISTUR	RBED)
	1						<del>.</del>		Effective	Confining Pre	ssure (psi)	20.0	
psi)			Length 2: Length 3:	6.291 6.243	Diameter 2: Diameter 3:	2.843 2.858				DIMENSIONS			
osi) (psi)	70.0 50.0	į	-	6.251 6.260	Diameter 4: <i>Avg. Diam.:</i>						-	6.26 2.84	
sure (psi)	20.0						_		Initial Sar	nple Area (in <sup>2</sup>	<sup>2</sup> )	6.36	
	100		Final Burette	Reading		6.9	)		Initial Sar	nple Volume	(in³)	39.78	
LIQUITY P	POINTS			()					Strain	Deviation	$\Delta U$	$\overline{\sigma}_1$	$\overline{\sigma_3}$
	17.62 10.73		Dial Reading	After Sat	turation (mil)	320	)		(%)	Stress			
LOAD			TION				=						
							-						
									0.03	0.61	0 11	20 54	19.9
									0.05		-0.24	21.18	20.3
20.6		0.009			50.0				0.15	1.83	0.02	21.85	20.0
41.0		0.016			52.0				0.26	5.57	2.02	23.59	18.0
													16.6
													14.8
													13.5 12.1
													10.4
													9.0
													8.0
114.8		0.179			62.4				3.00	18.53	12.45	26.11	7.6
118.8									3.72	19.10	12.90	26.23	7.1
													6.9
													7.0
													6.9
													6.9 7.1
													7.2
													7.3
													7.5
153.2		0.665			62.4				11.16	23.22	12.45	30.81	7.5 7.6
150.6		0.696			62.3				11.68	22.66	12.37	30.32	7.7
153.5									12.19				7.7
													7.8
													7.7
													8.0 8.0
													8.0 8.0
													8.0 8.1
	Date: 8/7/2		Input Chook	ad By:		Data	8/13/2010		10.00	22.00	11.00	01.00	0.1
9-07-0411		019	Input Checke	ed By:	GEM	Date:	8/13/2019			,			
	LOAD IVFUL si) psi) ure (psi) Ure (psi) LQUITYF LQUITYF 10.6 13.9 15.5 20.6 41.0 54.2 66.5 72.7 81.3 91.9 101.1 110.8 14.8 128.0 134.5 136.5 138.2 142.0 134.5 138.2 142.0 145.8 153.5 154.3 157.4 159.6 157.4 159.4 0-07-0411	e: R-2561CA R-2019-209-001 5 ″ ″ HVFULSWLRQ 1 3 <b>bsi)</b> si) 70.0 psi) 50.0 ure (psi) 20.0 100 <b>IQUITY POINTS</b> 17.62 10.73 <b>LOAD</b> (LB) 10.6 13.9 15.5 20.6 41.0 54.2 66.5 72.7 81.3 91.9 101.1 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 114.8 115.5 20.6 41.0 54.2 66.5 72.7 81.3 91.9 101.1 110.8 114.8 114.8 114.8 114.8 115.5 20.6 41.0 54.2 66.5 72.7 81.3 91.9 101.1 110.8 114.8 128.0 134.5 138.2 142.0 145.8 150.8 153.2 150.6 153.5 154.3 157.4 159.6 157.4 159.6 157.4 159.6 157.4 160.5 159.4 0 0 17.62 17.62 17.62 10.73 100 100 100 100 100 100 100 10	e: R-2561CA R-2019-209-001 5 <i>" "</i> HVFULSWLRQ, $*UD \setminus \&C$ 1 3 <b>bsi</b> <b>si</b> ) 70.0 psi) 50.0 ure (psi) 20.0 <b>100</b> <b>IQUITY POINTS</b> <b>17.62</b> 10.73 <b>LOAD DEFORMAT</b> <b>(LB)</b> (IN) 10.6 0.000 13.9 0.002 15.5 0.003 20.6 0.009 41.0 0.016 54.2 0.021 166.5 0.030 72.7 0.040 81.3 0.052 91.9 0.074 101.1 0.105 110.8 0.142 114.8 0.179 118.8 0.222 121.8 0.253 128.0 0.297 134.5 0.356 138.2 0.418 138.2 0.464 142.0 0.525 145.8 0.572 150.6 0.696 153.5 0.727 154.3 0.757 157.4 0.789 159.4 0.946	e: R-2561CA C C C C C C C C C C C C C C C C C C	e: R-2561CA Depth (ft): R-2019-209-001 Sample No 5 " " HVFULSWLRQ, *UD\&OD\ &1',6785% ( 10 1 3 psi) 50.0 ure (psi) 20.0 Ure (psi) 20.0 100 Final Burette Reading 100 Final Burette Reading 100 Final Burette Reading Final Change (ml) 100 Final Burette Reading (ml) 101 Reading After Cans 102 DEFORMATION (LB) (IN) 10.6 0.000 13.9 0.002 15.5 0.003 20.6 0.000 13.9 0.002 15.5 0.003 20.6 0.000 13.9 0.002 15.5 0.003 20.6 0.000 13.9 0.074 10.1 0.0016 54.2 0.021 66.5 0.030 72.7 0.040 81.3 0.052 91.9 0.074 10.1 0.0105 110.8 0.142 114.8 0.179 118.8 0.222 121.8 0.222 121.8 0.222 121.8 0.222 124.8 0.222 124.8 0.222 124.8 0.222 125.5 0.036 136.5 0.418 138.2 0.464 142.0 0.525 138.5 0.418 138.2 0.464 142.0 0.525 145.8 0.572 150.8 0.619 153.2 0.665 150.6 0.696 153.5 0.418 138.2 0.464 142.0 0.525 145.8 0.572 154.3 0.757 157.4 0.789 159.4 0.9946 POT-0411 Date: 8/7/2019 Input Checked By:	e: R-2561CA Depth (ft): R-2019-209-001 5 ~ ~ ~ HVFULSWLRQ, *UD\&OD\ 81',6785% (* INITIAL SAMPLE DIMENSIONS (in Length 1: 6,253 Diameter 1: Length 2: 6,291 Diameter 2: Length 3: 6,243 Diameter 3: Length 4: 6,251 Diameter 4: si) 70.0 Avg. Length 4: 6,251 Diameter 4: si) 70.0 Avg. Length 4: 6,251 Diameter 4: si) 70.0 Avg. Length 4: 6,251 Diameter 4: nitial Burette Reading (ml) Final Burette Reading (ml) Final Burette Reading (ml) Final Change (ml) 100 Final Burette Reading (ml) 100 Final Burette Reading (ml) 100 DEFORMATION PORE PRESS (LB) (IN) (PSI) 10.6 0.0000 50.0 10.6 0.0000 50.0 10.6 0.0000 50.0 13.9 0.002 50.1 15.5 0.003 49.7 20.6 0.009 50.0 41.0 0.016 52.0 54.2 0.021 53.4 65.5 0.030 55.2 72.7 0.040 56.5 81.3 0.052 57.9 91.9 0.074 59.6 81.3 0.052 67.9 91.9 0.074 59.6 81.3 0.052 62.0 11.8 0.227 62.3 13.8 0.253 63.1 138.2 0.448 63.1 138.2 0.448 63.1 138.2 0.448 63.1 138.4 0.277 62.2 153.4 0.757 62.2 153.5 0.727 62.3 154.3 0.757 62.2 155.4 0.945 62.0 159.4 0.946	e: R-2561CA R-2019-209-001 5 	a:    R-2561CA R-2019-209-001 5    Depth (ft):    19.7-21.7 Sample No.:    ST-4      5      Sample No.:    ST-4      4VFULSWLRQ    *UD\&OD\ &1', 67.85 % ('      1    1    1.267.85 % ('	e: R-2561CA Depth (ft): $19^{7}-21.7$ Sample No.: ST-4 Sample No.: ST-4 NF FULSWLRQ, 'UD: & OD: 81', 6785% (' INITIAL SAMPLE DIMENSIONS (in) Length 1: 6.283 Diameter 1: 2.843 Length 2: 6.241 Diameter 3: 2.858 Length 3: 6.243 Diameter 4: 2.866 Xug, Length 3: 6.243 Diameter 4: 2.866 Nure (psi) 20.0 VOLUME CHANGE Initial Burette Reading (ml) 96.0 Final Change (ml) 6.9 Final Change (ml) 6.9 Final Change (ml) 89.1 JOUITY POINTS In Reading Attar Consolidation (ml) 225 Dial Reading Attar Consolidation (ml) 225 17.62 Dial Reading Attar Consolidation (ml) 320 Dial Reading Attar Consolidation (ml) 522 UCMO DEFORMATION PORE PRESSURE (LB) (N) (PS) 10.02 50.0 UI (PS) 0.000 50.1 13.9 0.0000 50.1 13.9 0.000 50.1 13.9 0.000 50.1 13.9 0.000	R-2561CA      Depth (11):      19.7-21.7      Cleant Re Project N1        5      -      Sample No.:      ST-4      Project N1        1      INITAL SAMPLE DIMENSIONS (in)      Lab ID:      Visual De        1      INITAL SAMPLE DIMENSIONS (in)      2.812      Effective        1      Length 2:      6.231      Diameter 3:      2.843        1      Length 2:      6.243      Diameter 3:      2.845        1      Length 4:      6.261      Diameter 4:      2.846        100      Final Burette Reading (m1)      96.0      Initial Sar        100      Final Burette Reading (m1)      89.1      Strain        100      Final Change (mil)      225      (%)        10.752      Dial Reading After Consolication (mil)      320      (%)        10.762      Dial Reading After Consolication (mil)      320      (%)        10.66      0.000      50.1      0.03        10.73      DEFORMATION      PORE PRESURE      0.28        (LB)      (N)      (PS)      0.03        10.5      0.030      55.2 <td>E:      R-2681CA R-2019-209-001 5      Depth [ft]: Sample No.:      19.7-21.7 ST-4      Clent Reference: ST-4      Clent Reference: Lab ID:        1      1      NITIAL SAMPLE DIMENSIONS (in) Length 1:      5.7.4      Visual Description:        1      1      Length 1:      6.25 Dimentor 1:      2.812      Initial Sample Confining Pre- tree (psi)      Initial Sample Confining Pre- tree (psi)</td> <td>s:      R-2361CA R-2019.209.001 5      Deapth (10): Sample No.:      10.7-21.7 ST 4      Chen Reference: Project No.:      R-2319.208 R-2019.208 Lab ID:        1      INITIAL SAMPLE DIMENSIONS (in) Largin 1:      0.2811      Classical Distribution:      Gray Classical Distribution:        1      INITIAL SAMPLE DIMENSIONS (in) Largin 1:      0.2812      Diamater 1:      2.812        1      Largin 2:      0.291      Diamater 1:      2.812      Initial Sample Length (in)      Effective Confining Prosume (psi)        101      Arg. Length:      6.250      Diamater 2:      2.943      Initial Sample Length (in)        100      Final Change (ml)      0.60      Initial Sample Length (in)      Initial Sample Length (in)      Initial Sample Area (in')        100      Final Change (ml)      0.25      Dia Reacting (ml)      25      Old Reacting After Saturation (ml)      26        10.73      Dial Reacting After Saturation (ml)      26      0.05      Saturation      30.02      0.05      Saturation        13.9      0.021      Saturation      6.51      0.038      Saturation      30.02      Saturation        14.001      0.025      Saturation</td> <td>E:      R-2691CA R-2019-209-001 5      Deptif(II): Sample No.:      19.7-21.7 ST4      Client Reference: Project No::      R-26919-209-001 R-2019-209-001 Las JD::      R-26919-209-001 R-2019-209-001-012        VFULS WLRQ      ''UD: &amp; OD::      8 0 D::      8 1, 6 7, 8 5, 0 (''      Visual Description:      Graph 22-001        isi)          2.812      Visual Description:      Graph 22-001        isi)          2.812      Visual Description:      Graph 22-00        isi)          2.812      Visual Description:      Graph 22-00        isi)          2.843      Visual Description:      Graph 22-00        isia)          2.843      Visual Description:      6.226        isia)                 isia)             </td>	E:      R-2681CA R-2019-209-001 5      Depth [ft]: Sample No.:      19.7-21.7 ST-4      Clent Reference: ST-4      Clent Reference: Lab ID:        1      1      NITIAL SAMPLE DIMENSIONS (in) Length 1:      5.7.4      Visual Description:        1      1      Length 1:      6.25 Dimentor 1:      2.812      Initial Sample Confining Pre- tree (psi)      Initial Sample Confining Pre- tree (psi)	s:      R-2361CA R-2019.209.001 5      Deapth (10): Sample No.:      10.7-21.7 ST 4      Chen Reference: Project No.:      R-2319.208 R-2019.208 Lab ID:        1      INITIAL SAMPLE DIMENSIONS (in) Largin 1:      0.2811      Classical Distribution:      Gray Classical Distribution:        1      INITIAL SAMPLE DIMENSIONS (in) Largin 1:      0.2812      Diamater 1:      2.812        1      Largin 2:      0.291      Diamater 1:      2.812      Initial Sample Length (in)      Effective Confining Prosume (psi)        101      Arg. Length:      6.250      Diamater 2:      2.943      Initial Sample Length (in)        100      Final Change (ml)      0.60      Initial Sample Length (in)      Initial Sample Length (in)      Initial Sample Area (in')        100      Final Change (ml)      0.25      Dia Reacting (ml)      25      Old Reacting After Saturation (ml)      26        10.73      Dial Reacting After Saturation (ml)      26      0.05      Saturation      30.02      0.05      Saturation        13.9      0.021      Saturation      6.51      0.038      Saturation      30.02      Saturation        14.001      0.025      Saturation	E:      R-2691CA R-2019-209-001 5      Deptif(II): Sample No.:      19.7-21.7 ST4      Client Reference: Project No::      R-26919-209-001 R-2019-209-001 Las JD::      R-26919-209-001 R-2019-209-001-012        VFULS WLRQ      ''UD: & OD::      8 0 D::      8 1, 6 7, 8 5, 0 (''      Visual Description:      Graph 22-001        isi)          2.812      Visual Description:      Graph 22-001        isi)          2.812      Visual Description:      Graph 22-00        isi)          2.812      Visual Description:      Graph 22-00        isi)          2.843      Visual Description:      Graph 22-00        isia)          2.843      Visual Description:      6.226        isia)                 isia)

## WITH PORE PRESSURE READINGS AASHTO T-297

Boring No.:	S4_EB2-A		
Depth (ft):	19.7-21.7		
Sample No.:	ST-4		

ED)					
_	Stage No. Test No		1 3		
	VOLUME CHANGE				
	Length After Consolida	Volume After Consolidation (in <sup>3</sup> ) Length After Consolidation (in) Area After Consolidation (in <sup>2</sup> )			
$\overline{\sigma_3}$	Effective Principle Stress Ratio	A	P	Q	
19.9 20.3 20.0 18.0 16.6 14.8 13.5 12.1 10.4 9.0 8.0 7.6 7.1	1.031 1.045 1.092 1.309 1.480 1.690 1.841 2.064 2.410 2.806 3.234 3.444 3.679	0.18 -0.26 0.01 0.36 0.43 0.52 0.58 0.62 0.65 0.68 0.67 0.67 0.68	20.23 20.73 20.93 20.80 20.60 19.88 19.12 18.48 17.81 17.18 16.99 16.85 16.68	0.31 0.45 0.92 2.79 3.98 5.10 5.66 6.42 7.36 8.15 8.96 9.27 9.55	
6.9 7.0 6.9 6.9 7.1 7.2 7.3 7.5 7.6 7.7 7.7 7.8 7.7 8.0 8.0 8.0 8.1	3.834 3.930 4.077 4.114 4.027 4.055 4.075 4.054 4.059 3.956 3.971 3.937 4.019 3.954 3.861 3.920 3.838	0.67 0.64 0.61 0.60 0.59 0.57 0.54 0.54 0.53 0.53 0.53 0.53 0.53 0.53 0.53 0.53 0.52 0.52	16.65 17.21 17.62 17.62 17.92 18.17 18.48 19.05 19.20 18.99 19.24 19.33 19.41 19.69 19.47 19.59 19.56	9.76 10.23 10.68 10.73 10.79 10.98 11.20 11.51 11.61 11.33 11.50 11.50 11.50 11.68 11.74 11.46 11.63 11.47	

#### CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS AASHTO T-297



## WITH PORE PRESSURE READINGS AASHTO T-297

INDISTURBED)			
IPLE CONDITION S	UMMARY		
S4_EB2-A	S4_EB2-A	S4_EB2-A	
19.7-21.7	19.7-21.7	19.7-21.7	
ST-4	ST-4	ST-4	
T1	T2	Т3	
0.0005	0.0005	0.0005	
50.0	50.0	50.0	
1	1	1	
41.5	44.1	46.5	
112.0	112.5	113.5	
79.2	78.1	77.5	
42.5	41.3	32.5	
1.113	1.142	1.158	
1.086	1.063	0.765	
	S4_EB2-A 19.7-21.7 ST-4 T1 0.0005 50.0 1 41.5 112.0 79.2 42.5 1.113	$\begin{array}{cccc} - & - & - & - \\ 19.7-21.7 & 19.7-21.7 \\ ST-4 & ST-4 \\ \hline T1 & T2 \\ 0.0005 & 0.0005 \\ 50.0 & 50.0 \\ 1 & 1 \\ \\ 41.5 & 44.1 \\ 112.0 & 112.5 \\ 79.2 & 78.1 \\ 42.5 & 41.3 \\ 1.113 & 1.142 \\ \end{array}$	



Tested By: 129-07-0411	Date:	8/7/19
page 10 of 11	DCN: CT-S28 DA	TE: 4/12/13 REVISION: 3

Sheet 23

Specific Gravity (Measured)	2.68
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#### MOHR TOTAL STRENGTH ENVELOPE AASHTO T-297

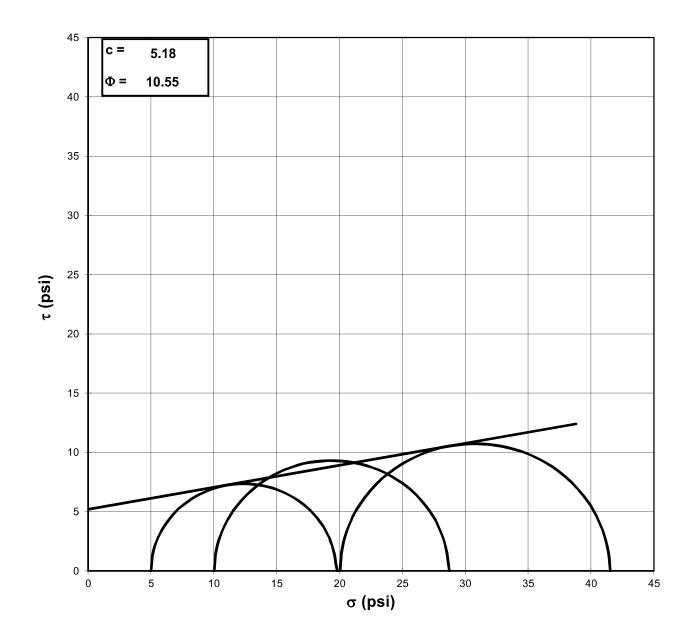
CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS AASHTO T-297

Kleinfelder R-2561CA R-2019-209-001 R-2019-209-001-012

Boring No.: Depth (ft): Sample No.: S4\_EB2-A 19.7-21.7 ST-4

#### Client: Client Reference: Project No.: Lab ID: Visual Description:

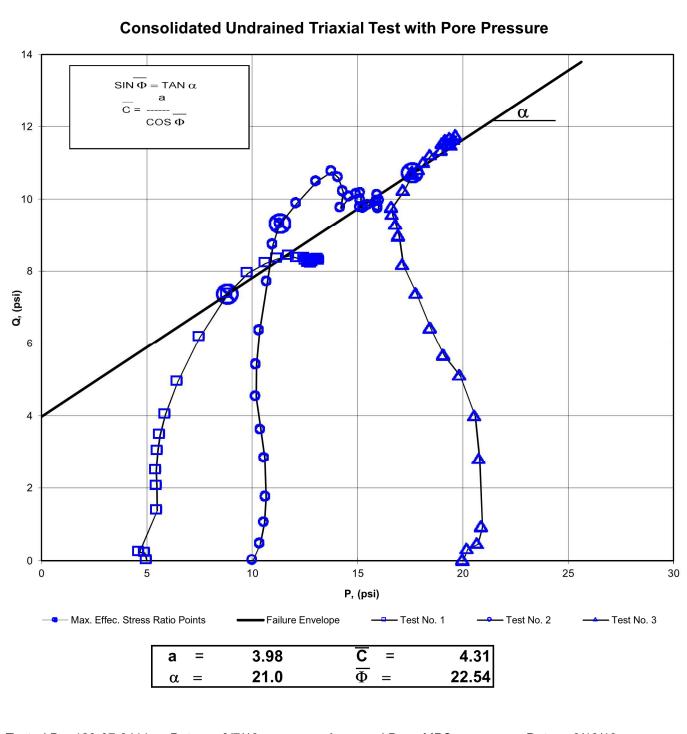
Kleinfelder R-2561CA R-2019-209-001 R-2019-209-001-012 Gray Clay (UNDISTURBED)



Failure Based on Maximum Effective Principal Stress Ratio

8/7/19 Approved By: MPS *Tested By:* 129-07-0411 Date: page 2 of 11 DCN: CT-S28 DATE: 4/12/13 REVISION: 3

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Tested By: 129-07-0411 Date: 8/7/19 Approved By: MPS Date: 8/13/19 page 1 of 11 DCN: CT-S28 DATE: 4/12/13 REVISION: 3 Sigmatriax.xls

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Boring No.: Depth (ft): Sample No.: S4\_EB2-A 19.7-21.7 ST-4

NOTE: GRAPH NOT TO SCALE

Date: 8/13/19

#### CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS AASHTO T-297



S4\_EB2-A

19.7-21.7

ST-4

		١		PRESSU SHTO T-	<b>RE READINGS</b> 297			
Client: Client Refe Project No Lab ID:		Kleinfelder R-2561CA R-2019-209 R-2019-209			Boring No.: Depth (ft): Sample No		S4_EB2-A 19.7-21.7 ST-4	
Visual Des	scription:	Gray Clay (l	JNDISTURB	ED)				
Effective (	Confining Pre	essure (psi)	5.0		Stage No. Test No		3	
INITIAL D	IMENSIONS				VOLUME CHANGE			
Initial Sam Initial Sam	aple Length (i aple Diameter aple Area (in <sup>2</sup> aple Volume (	r (in) )	6.25 2.85 6.39 39.94		Volume After Consolida Length After Consolida Area After Consolidatic	tion (in)		39.42 6.23 6.330
Strain (%)	Deviation Stress	ΔU	$\overline{\sigma}_1$	$\overline{\sigma}_3$	Effective Principle Stress Ratio	Ā	P	Q
0.02 0.06 0.13 0.24 0.33 0.48 0.63 0.83 1.17 1.67 2.27 2.87 3.57 4.07 4.77 5.70 6.71 7.45 8.45 9.20 9.94 10.68 11.18	0.40 0.46 2.74 4.09 4.95 6.05 6.93 8.06 9.87 12.34 14.72 15.87 16.42 16.67 16.83 16.70 16.70 16.56 16.63 16.44 16.48 16.45	0.29 0.59 0.89 1.58 2.03 2.52 2.85 3.15 3.48 3.67 3.54 3.14 2.57 2.16 1.67 1.22 0.89 0.75 0.64 0.57 0.56 0.50	5.12 4.88 6.86 7.52 7.92 8.55 9.09 9.92 11.39 13.68 16.20 17.74 18.86 19.52 20.17 20.48 20.82 20.82 20.82 21.00 20.88 20.93 20.95 21.00	$\begin{array}{c} 4.7\\ 4.4\\ 3.0\\ 2.29\\ 1.5\\ 1.59\\ 4.3\\ 4.4\\ 4.4\\ 4.4\\ 4.5\\ 4.6\end{array}$	1.085 1.105 1.666 2.192 2.664 3.430 4.213 5.346 7.469 10.241 11.006 9.496 7.727 6.841 6.034 5.412 5.050 4.888 4.811 4.699 4.706 4.648 4.614	0.73 1.29 0.32 0.39 0.41 0.42 0.41 0.39 0.35 0.30 0.24 0.20 0.16 0.13 0.10 0.07 0.05 0.05 0.04 0.03 0.03 0.03	$\begin{array}{c} 4.92\\ 4.65\\ 5.49\\ 5.47\\ 5.45\\ 5.52\\ 5.62\\ 5.89\\ 6.46\\ 7.51\\ 8.83\\ 9.80\\ 10.65\\ 11.19\\ 11.76\\ 12.13\\ 12.47\\ 12.54\\ 12.68\\ 12.68\\ 12.69\\ 12.73\\ 12.77\end{array}$	0.20 0.23 1.37 2.04 2.48 3.03 3.47 4.03 4.93 6.17 7.36 7.94 8.21 8.33 8.41 8.35 8.35 8.32 8.22 8.22 8.22 8.22

Lab ID:	R-2019-209-001-012			Campie In	0
Visual Description:	Gray Clay (UNDISTU	IRBED)			
Stage No.	3		INITIAL SAM		IENSIONS (ii
Test No.	1		Length 1:	6.252	Diameter 1
F			Length 2:	6.237	Diameter 2
PRESSURES (psi)			Length 3:	6.277	Diameter 3
			Length 4:	6.253	Diameter 4
Cell Pressure (psi)	55.0	A	vg. Length:	6.255	Avg. Diam
Back Pressure (psi)	50.0				
Eff. Conf. Pressure (psi)	5.0		<b>VOLUME C</b>	HANGE	
Pore Pressure			Initial Burette	e Reading	(ml)
Response (%)	100		Final Burette	Reading	(ml)
			Final Chang	e (ml)	
MAXIMUM OBLIQUITY F	POINTS				
			Initial Dial Re	eadina (mi	D
<u>P</u> =	8.83		Dial Reading		
Q =	7.36		Dial Reading	After Conso	olidation (mil)
LOAD	C	EFORMATI	ON		PORE PRES
(LB)		(IN)			(PSI)
8.1		0.000			50.0
10.7		0.001			50.3
11.0		0.003			50.6
25.5 34.1		0.008 0.015			50.9 51.6
39.6		0.015			51.6
46.6		0.030			52.5
52.3		0.039			52.9
59.6		0.052			53.2
71.3		0.073			53.5
87.6		0.104			53.7
103.5		0.141			53.5
111.5 115.9		0.179 0.222			53.1 52.6
118.1		0.253			52.0
120.0		0.297			51.7
120.2		0.355			51.2
121.4		0.418			50.9

Kleinfelder

R-2561CA

R-2019-209-001

NITIAL SAMPLE DIMENSIONS (in)						
ength 1:	6.252	Diameter 1:	2.871			
ength 2:	6.237	Diameter 2:	2.857			
ength 3:	6.277	Diameter 3:	2.843			
_ength 4:	6.253	Diameter 4:	2.835			
g. Length:	6.255	Avg. Diam.:	2.852			
<b>/OLUME CI</b>	HANGE					
nitial Burette Reading (ml) 24.0						
Final Burette Reading (ml) 15.						
Final Change (ml)			8.6			
nitial Dial Reading (mil) 092						
	• •	uration (mil)	092			
Dial Reading A		( )	119			
•	5					

Boring No.:

Depth (ft):

Sample No.:

LOAD	DEFORMATION	PORE PRESSURE
(LB)	(IN)	(PSI)
8.1	0.000	50.0
10.7	0.001	50.3
11.0	0.003	50.6
25.5	0.008	50.9
34.1	0.015	51.6
39.6	0.021	52.0
46.6	0.030	52.5
52.3	0.039	52.9
59.6	0.052	53.2
71.3	0.073	53.5
87.6	0.104	53.7
103.5	0.141	53.5
111.5	0.179	53.1
115.9	0.222	52.6
118.1	0.253	52.2
120.0	0.297	51.7
120.2	0.355	51.2
121.4	0.418	50.9
121.4	0.464	50.8
123.1	0.526	50.7
122.7	0.573	50.6
124.0	0.619	50.6
124.7	0.665	50.5
125.3	0.696	50.5
125.7	0.727	50.4
126.8	0.759	50.4
128.1	0.790	50.3
129.5	0.836	50.3
130.9	0.883	50.2
131.4	0.929	50.1
132.1	0.976	50.0
Tested By: 129-07-0411	Date: 8/7/19 I	

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Client:

**Client Reference:** 

Project No.:

DCN: CT-S28 DATE: 4/12/13 REVISION: 3

Sigmatriax.xls

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Boring No.:	S4 EB2-A
Depth (ft):	19 7 21 7
Sample No.:	ST-4
•	

### CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297



Client: Client Reference: Project No.: Lab ID:	Kleinfelder R-2561CA R-2019-209-001 R-2019-209-001-012		Boring No Depth (ft): Sample N		S4_EB2-/ 19.7-21.7 ST-4		Clier Clier Proj Lab
Visual Description:	Gray Clay (UNDISTURBE	D)					Visu
Stage No.	2	INITIAL SA		MENSIONS (in)			Effe
Test No.	2	Length 1:	5.936	Diameter 1:	2.866		
	<u>_</u>	Length 2:	5.995	Diameter 2:	2.853		
PRESSURES (psi)		Length 3:	5.964	Diameter 3:	2.843		INIT
		Length 4:	6.001	Diameter 4:	2.820		
Cell Pressure (psi)	60.0	Avg. Length:	5.974	Avg. Diam.:	2.846		Initia
Back Pressure (psi)	50.0						Initia
Eff. Conf. Pressure (psi)	10.0	VOLUME (	HANGE				Initia
Pore Pressure		Initial Bure	te Reading	g (ml)	24.0		Initia
Response (%)	100	Final Buret		(ml)	7.9		
		Final Chan	ge (ml)		16.1		
MAXIMUM OBLIQUITY	POINTS						St
		Initial Dial I	Reading (m	nil)	189		(
P =	11.32	Dial Readir	ng After Sa	turation (mil)	211		
Q =	9.31	Dial Reading	After Cons	olidation (mil)	266		
LOAD	DEFO	RMATION		PORE PRESSU	JRE		
(LB)		(IN)		(PSI)			
10.2		.000		50.0			
16.0		.002		50.1			0
23.1		.006		50.5			0
31.9 45.4		.009 .015		51.1 52.3			0
45.4 55.0		.021		53.2			0 0
66.6		.029		54.4			0
77.7		.038		55.2			Ō
89.8		.049		56.0			0
106.9		.071		57.0			1
120.5 128.5		.101 .137		57.8 58.0			2
136.5		.173		57.8			2
145.1		.215		57.5			-3
149.4	0	.245		57.0			4
148.3		.287		56.5			4
144.6 140.0		.344 .404		55.9 55.6			5 6
145.2		.449		55.5			7
147.8		.509		55.2			8
149.2	0	.554		55.0			9
147.9		.599		54.9			1(
146.2		.644		54.7			1(
146.9 148.6		.674 .704		54.5 54.3			1 <sup>.</sup> 1.
153.4		.734		54.2			12
151.9		.764		54.1			12
153.2	0	.809		53.9			13
152.1		.854		53.8			14
152.1 154.5		.884 .914		53.8 53.7			14 15
			kod Pyr		Deter	9/12/10	13
Tested By: 129-07-041 <sup>2</sup>	1 Date: 8/7/19	Input Chec	Neu Dy:	GEM	Date:	8/13/19	page

WITH PORE PRESSURE READINGS AASHTO T-297

Client: Client Ref Project No Lab ID:		Kleinfelder R-2561CA R-2019-209 R-2019-209			Boring No.: Depth (ft): Sample No.:		S4_EB2-A 19.7-21.7 ST-4	
Visual De	scription:	Gray Clay (	UNDISTURB	ED)				
Effective	Confining Pro	essure (psi)	10.0		Stage No. Test No		2	
INITIAL D		6			VOLUME CHANGE			
Initial Sample Diameter (in)2.8Initial Sample Area (in²)6.3		5.97 2.85 6.36 37.99		Volume After Consolidation (in <sup>3</sup> ) Length After Consolidation (in) Area After Consolidation (in <sup>2</sup> )		36.59 5.90 6.205		
Strain (%)	Deviation Stress	ΔU	$\overline{\sigma}_{l}$	$\overline{\sigma}_3$	Effective Principle Stress Ratio	Ā	P	Q
0.03 0.11 0.15 0.25 0.35 0.65 0.84 1.20 1.71 2.32 2.93 3.64 4.16 4.86 5.83 6.86 7.61 8.63 9.39 10.15 10.92 11.43 11.93 12.44 12.95 13.73 14.48 14.98 15.50	0.93 2.07 3.49 5.66 7.19 9.04 10.81 12.72 15.40 17.47 18.63 19.76 20.96 21.51 21.18 20.40 19.49 20.10 20.26 20.30 19.94 19.53 19.51 19.64 20.20 19.89 19.89 19.56 19.44 19.65	0.12 0.48 1.13 2.26 3.22 4.36 5.23 6.04 7.02 7.78 8.03 7.46 7.01 6.53 5.90 5.57 5.45 5.21 5.03 4.85 4.65 4.49 4.35 4.65 4.49 4.35 4.65 3.91 3.83 3.77 3.74	$\begin{array}{c} 10.85\\ 11.63\\ 12.41\\ 13.44\\ 14.01\\ 14.71\\ 15.62\\ 16.72\\ 18.42\\ 19.73\\ 20.64\\ 22.00\\ 23.54\\ 24.00\\ 23.54\\ 24.69\\ 24.54\\ 23.96\\ 24.54\\ 23.96\\ 24.69\\ 25.09\\ 25.31\\ 25.13\\ 24.92\\ 25.06\\ 25.34\\ 26.07\\ 25.87\\ 26.01\\ 25.77\\ 25.71\\ 25.95\end{array}$	$\begin{array}{c} 9.9\\ 9.6\\ 9.8\\ 7.8\\ 6.7\\ 4.0\\ 0.3\\ 2.2\\ 2.6\\ 0.5\\ 1.5\\ 6.8\\ 0.2\\ 4.5\\ 5.5\\ 5.7\\ 9.0\\ 1.2\\ 3.3\\ 4.5\\ 5.5\\ 5.5\\ 5.9\\ 0.1\\ 2.3\\ 3.5\\ 5.5\\ 5.9\\ 0.1\\ 2.3\\ 3.5\\ 5.5\\ 5.9\\ 0.1\\ 2.3\\ 3.5\\ 5.5\\ 5.5\\ 5.9\\ 0.1\\ 2.3\\ 3.5\\ 5.5\\ 5.5\\ 5.5\\ 5.5\\ 5.5\\ 5.5\\ 5$	1.094 1.217 1.392 1.727 2.054 2.592 3.246 4.181 6.091 8.724 10.268 9.825 9.117 8.095 7.038 5.927 5.364 5.383 5.192 5.049 4.844 4.624 4.515 4.450 4.446 4.321 4.246 4.147 4.101 4.119	0.13 0.23 0.32 0.40 0.45 0.48 0.48 0.48 0.48 0.43 0.39 0.36 0.33 0.31 0.29 0.29 0.29 0.29 0.22 0.24 0.24 0.22 0.21 0.20 0.20 0.20 0.19 0.19	$\begin{array}{c} 10.39\\ 10.59\\ 10.66\\ 10.61\\ 10.42\\ 10.20\\ 10.21\\ 10.36\\ 10.72\\ 10.99\\ 11.32\\ 12.12\\ 13.06\\ 13.78\\ 14.10\\ 14.34\\ 14.21\\ 14.64\\ 14.96\\ 15.16\\ 15.16\\ 15.16\\ 15.16\\ 15.52\\ 15.90\\ 15.93\\ 16.07\\ 15.99\\ 15.99\\ 16.12\\ \end{array}$	0.46 1.04 1.75 2.83 3.59 4.52 5.40 6.36 7.70 8.73 9.31 9.88 10.48 10.75 10.59 10.20 9.75 10.05 10.13 10.15 9.97 9.76 9.75 9.82 10.10 9.94 9.94 9.72 9.82

page 5 of 11 DCN: CT-S28 DATE: 4/12/13 REVISION: 3 2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net



#### CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297



Client: Client Reference: Project No.: Lab ID:	Kleinfelder R-2561CA R-2019-209-001 R-2019-209-001-012	Boring No.: Depth (ft): Sample No.:	S4_EB2-A 19.7-21.7 ST-4	Client: Client Referer Project No.: Lab ID:	ice:
Visual Description:	Gray Clay (UNDISTURBED)			Visual Descrip	otion:
Stage No.	1	INITIAL SAMPLE DIMENSIONS (in)		Effective Conf	fining Pr
Test No.	3	Length 1: 6.253 Diameter 1:	2.812		
		Length 2: 6.291 Diameter 2:	2.843		
PRESSURES (psi)		Length 3: 6.243 Diameter 3:	2.858	INITIAL DIME	<u>INSIONS</u>
	70.0	Length 4: 6.251 Diameter 4:	2.866		
Cell Pressure (psi)	70.0	Avg. Length: 6.260 Avg. Diam.:	2.845	Initial Sample	-
Back Pressure (psi)	50.0			Initial Sample	
Eff. Conf. Pressure (psi)	20.0	VOLUME CHANGE		Initial Sample	•
Pore Pressure		Initial Burette Reading (ml)	96.0	Initial Sample	Volume
Response (%)	100	Final Burette Reading (ml)	6.9		
		Final Change (ml)	89.1		
MAXIMUM OBLIQUITY	POINTS			Strain De	eviation
_		Initial Dial Reading (mil)	225	(%) 5	Stress
P =	17.62	Dial Reading After Saturation (mil)	320		
Q =	10.73	Dial Reading After Consolidation (mil)	522		
LOAD	DEFORMA	TION PORE PRESS	URE		
(LB)	(IN)	(PSI)			
10.6	0.000				
13.9	0.002				0.61
15.5	0.003				0.91
20.6	0.009			0.15	1.83
41.0 54.2	0.016 0.02			0.26 0.36	5.57 7.97
66.5	0.02				10.20
72.7	0.040				11.32
81.3	0.052				12.84
91.9	0.074				14.73
101.1	0.105				16.30
110.8	0.142				17.93
114.8 118.8	0.179 0.222				18.53 19.10
121.8	0.253				19.10
128.0	0.297				20.45
134.5	0.356				21.35
136.5	0.418				21.46
138.2	0.464				21.58
142.0	0.525				21.96
145.8 150.8	0.572 0.619				22.40 23.03
150.8	0.665				23.03
150.6	0.696				22.66
153.5	0.727	62.3		12.19	23.00
154.3	0.757	62.2		12.70	23.00
157.4	0.789				23.35
159.6	0.836				23.48
157.4 160.5	0.883				22.92
100 5	0.915	62.0			23.25
159.4	0.946			15.86	22.95

WITH PORE PRESSURE READINGS AASHTO T-297

Client: Client Ref Project No Lab ID:		Kleinfelder R-2561CA R-2019-209 R-2019-209		Boring No.: Depth (ft): Sample No.:			S4_EB2-A 19.7-21.7 ST-4	
Visual Description: Gray Clay (UNDISTURB								
Effective Confining Pressure (psi) 20.0				Stage No. Test No		1 3		
INITIAL D		S			VOLUME CHANGE			
Initial Sample Length (in) Initial Sample Diameter (in) Initial Sample Area (in <sup>2</sup> ) Initial Sample Volume (in <sup>3</sup> )		6.26 2.84 6.36 39.78		Volume After Consolidation (in <sup>3</sup> ) Length After Consolidation (in) Area After Consolidation (in <sup>2</sup> )			32.54 5.96 5.457	
Strain (%)	Deviation Stress	ΔU	$\overline{\sigma}_{l}$	$\overline{\sigma}_3$	Effective Principle Stress Ratio	A	P	Q
0.03 0.05 0.15 0.26 0.36 0.51 0.67 0.88 1.24 1.76 2.38 3.00 3.72 4.24 4.97 5.96 7.01 7.77 8.81 9.60 10.37 11.16 11.68 12.19 12.70 13.24 14.02 14.82 15.35 15.86	0.61 0.91 1.83 5.57 7.97 10.20 11.32 12.84 14.73 16.30 17.93 18.53 19.10 19.52 20.45 21.35 21.46 21.58 21.96 22.40 23.03 23.22 22.66 23.00 23.00 23.35 23.48 22.92 23.25 22.95	0.11 -0.24 0.02 2.02 3.42 5.25 6.57 7.97 9.59 11.01 12.01 12.45 12.90 13.15 13.06 13.09 13.14 12.91 12.85 12.75 12.50 12.45 12.37 12.30 12.21 12.30 12.02 12.02 12.07 11.95	20.54 21.18 21.85 23.59 24.58 24.98 24.98 24.78 25.18 25.95 26.11 26.23 26.40 27.43 28.35 28.71 29.15 29.68 30.57 30.81 30.32 30.74 30.83 31.09 31.43 30.93 31.22 31.03	$\begin{array}{c} 19.9\\ 20.3\\ 20.0\\ 18.0\\ 16.6\\ 14.8\\ 13.5\\ 12.1\\ 10.4\\ 9.0\\ 7.6\\ 7.1\\ 6.9\\ 7.0\\ 6.9\\ 7.1\\ 7.2\\ 7.3\\ 7.5\\ 7.6\\ 7.7\\ 7.8\\ 7.7\\ 8.0\\ 8.0\\ 8.1\\ \end{array}$	1.031 1.045 1.092 1.309 1.480 1.690 1.841 2.064 2.410 2.806 3.234 3.444 3.679 3.834 3.930 4.077 4.114 4.027 4.055 4.075 4.055 4.055 4.055 4.055 4.055 4.059 3.936 3.937 4.019 3.954 3.920 3.838	0.18 - $0.26$ 0.01 0.36 0.43 0.52 0.65 0.62 0.65 0.67 0.68 0.67 0.64 0.61 0.61 0.61 0.60 0.59 0.57 0.54 0.53 0.53 0.53 0.53 0.52 0.52	20.23 20.73 20.93 20.60 19.88 19.12 18.48 17.18 16.99 16.85 16.65 17.21 17.62 17.62 17.62 17.92 18.17 18.48 19.05 19.20 18.99 19.24 19.33 19.41 19.69 19.47 19.59 19.56	0.31 0.45 0.92 2.79 3.98 5.10 5.66 6.42 7.36 8.15 8.96 9.27 9.55 9.76 10.23 10.68 10.73 10.79 10.98 11.20 11.51 11.61 11.50 11.50 11.68 11.74 11.63 11.47

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Sheet 27

CONSOLIDATED UNDRAINED TRIAXIAL TEST



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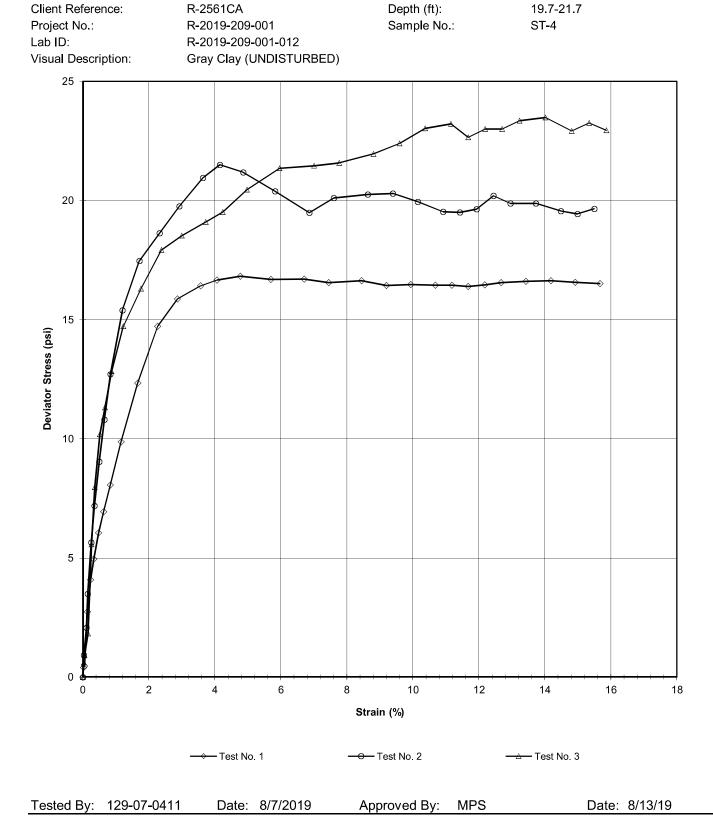
#### CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS AASHTO T-297

Boring No.:

Kleinfelder



S4\_EB2-A



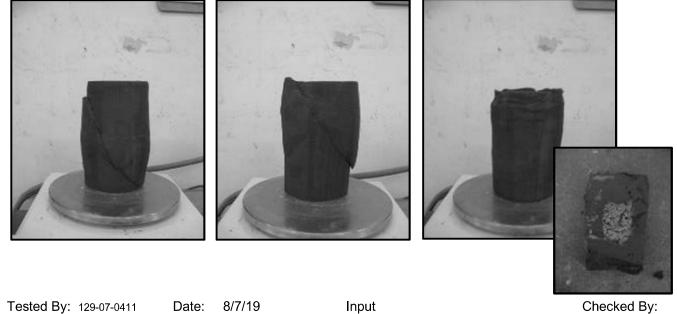
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#### CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS AASHTO T-297

Client: Client Reference: Project No.: Lab ID:	Kleinfelder R-2561CA R-2019-209-001 R-2019-209-001-012	:	Specific Gravity (Measured)	2.68	
Visual Description:	Gray Clay (UNDISTU	JRBED)			
	SAMPLE C	ONDITION	ISUMMARY		
Boring No.: Depth (ft): Sample No.:		S4_EB2-A 19.7-21.7 ST-4	S4_EB2-A 19.7-21.7 ST-4	S4_EB2-A 19.7-21.7 ST-4	
Test No. Deformation Rate (in Back Pressure (psi) Consolidation Time (		T1 0.0005 50.0 1	T2 0.0005 50.0 1	T3 0.0005 50.0 1	
Moisture Content (%) Total Unit Weight (pcf) Dry Unit Weight (pcf) Moisture Content (%) Initial State Void Rati Void Ratio at Shear,	(FINAL) o,e	41.5 112.0 79.2 42.5 1.113 1.086	44.1 112.5 78.1 41.3 1.142 1.063	46.5 113.5 77.5 32.5 1.158 0.765	



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GEM

### CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297



	MOISTURE CONTENT	г	
	T1	Т2	Т3
Tare Number	TB-05	SS-7	860
Weight of Tare & Wet Sample (g)	370.62	383.61	396.60
Weight of Tare & Dry Sample (g)	301.70	307.68	313.65
Weight of Tare (g)	135.63	135.41	135.19
Moisture Content (%) (INITIAL)	41.50	44.08	46.48
Tare Number	TB-05	TB-02	TB-01
Weight of Tare & Wet Sample (g)	369.95	422.04	511.81
Weight of Tare & Dry Sample (g)	309.95	338.01	419.6
Weight of Tare (g)	135.64	134.54	135.55
weight of Tare (g)	155.04	134.54	155.55
Moisture Content (%) (FINAL)	42.50	41.30	32.46
	42.00	11.00	02.10
	UNIT WEIGHT		
Weight of Tube & Wet Sample (g)	1174.49	1122.28	1185.77
Weight of Tube (g)	0	0	0
Weight of Wet Sample (g)	1174.49	1122.28	1185.77
Length 1 (in)	6.252	5.936	6.253
Length 2 (in)	6.237	5.995	6.291
Length 3 (in)	6.277	5.964	6.243
Length 4 (in)	6.253	6.001	6.251
Diameter 1 (in)	2.871	2.866	2.812
Diameter 2 (in)	2.857	2.853	2.843
Diameter 3 (in)	2.843	2.843	2.858
Diameter 4 (in)	2.835	2.82	2.866
Average Length (in)	6.255	5.974	6.260
Average Area (in)	6.386	6.359	6.356
Sample Volume (cm <sup>3</sup> )	654.56	622.55	651.96
Unit Wet Weight (g/cm <sup>3</sup> )	1.79	1.80	1.82
Unit Wet Weight (pcf)	112.02	112.54	113.55
Unit Dry Weight (pcf)	79.17	78.11	77.52
Unit Dry Weight (g/cm <sup>3</sup> )	1.27	1.25	1.24
Initial Burette Reading	24	24	96
Final Burette Reading	15.4	7.9	6.9
Initial Dial Reading	092	189	225
Dial Reading After Saturation	092	211	320
Dial Reading After Consolidation	119	266	522
Volume Change during Consolidation	8.6	16.1	89.1
Volume Change during Saturation	0.00	6.88	29.68
Volume at Shear (cm <sup>3</sup> ) *The		599.57	533.17
Volume of Solids (cm <sup>3</sup> ) measurer		290.64	302.05
Volume of Voids (cm <sup>3</sup> ) are a		308.93	231.12
Volume of Water (cm <sup>3</sup> ) at	352.75	321.68	262.79
Void Ratio, e shea		1.063	0.765
	1.000	1.005	0.705

Sheet 29