#### **CONTENTS**

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REFERENCE

<u>SHEET NO.</u>	<b>DESCRIPTION</b>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5-6	CROSS SECTIONS
7-12	BORE LOGS
13-28	SOIL TEST RESULTS
29	SITE PHOTOGRAPHS

# STATE OF NORTH CAROLINA

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

# **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY ROCKINGHAM

PROJECT DESCRIPTION REPLACE BRIDGE NO. 178 ON SR 1929 (ESTES ROAD) OVER US 29

STATE PROJECT REFERENCE NO. STATE SHEETS NO. 29 N.C BR-0097 1

#### **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, GEOTECHNICL ENGINEERING UNIT AT (1991) 707-6805. 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 SATISTY 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 GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT. 2. 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.

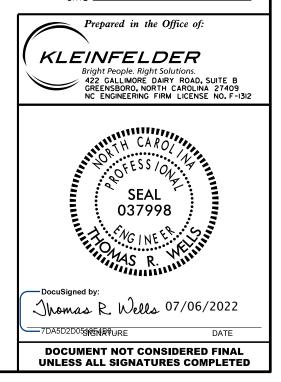
PERSONNEL

#### D. KUBINSKI

TRIGON EXPLORATION

INVESTIGATED BY \_\_\_\_\_. MUBINSKI DRAWN BY <u>T. WELLS</u> CHECKED BY <u>X. BARRETT</u>

SUBMITTED BY \_\_\_\_\_\_KLEINFELDER, INC.



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

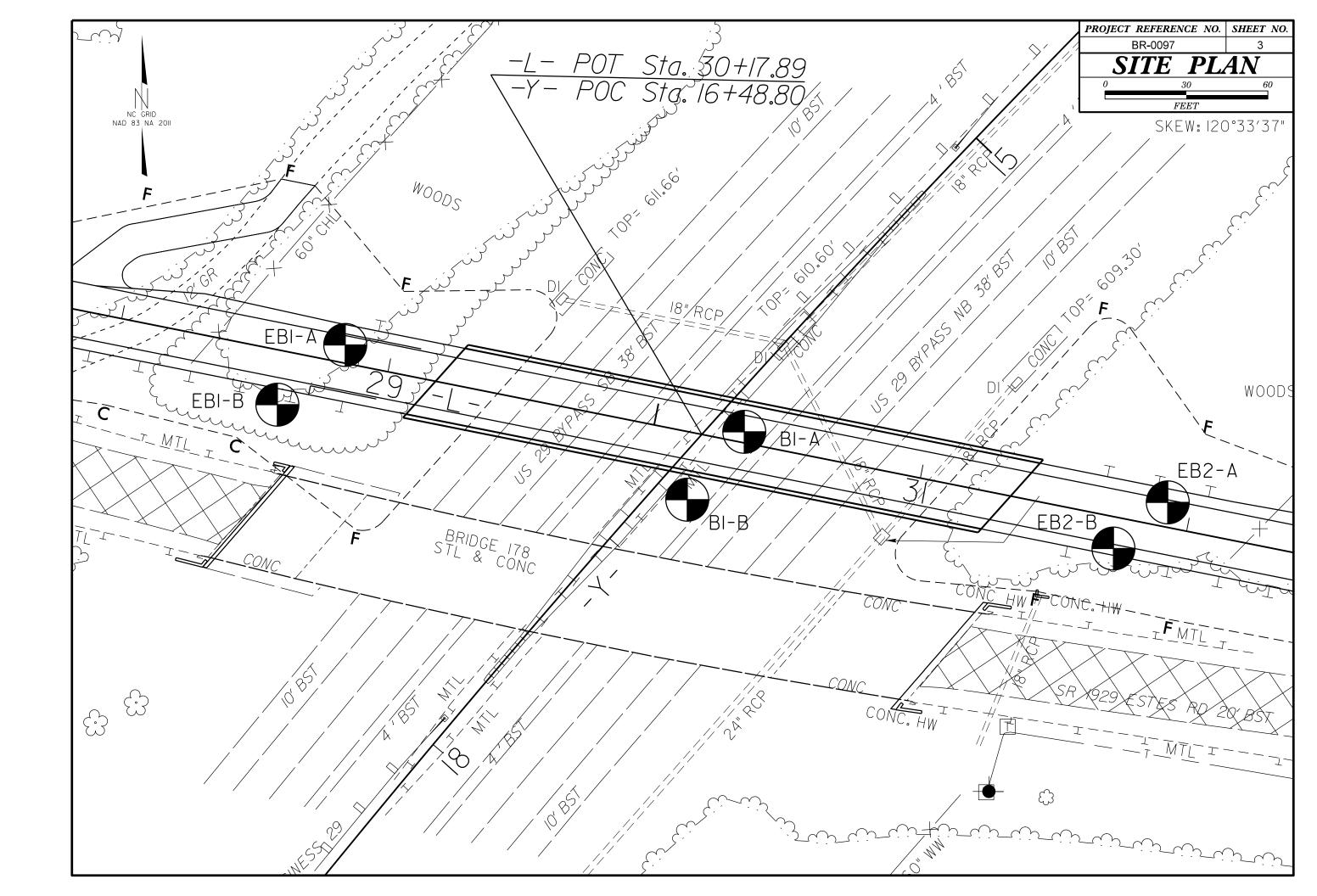
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

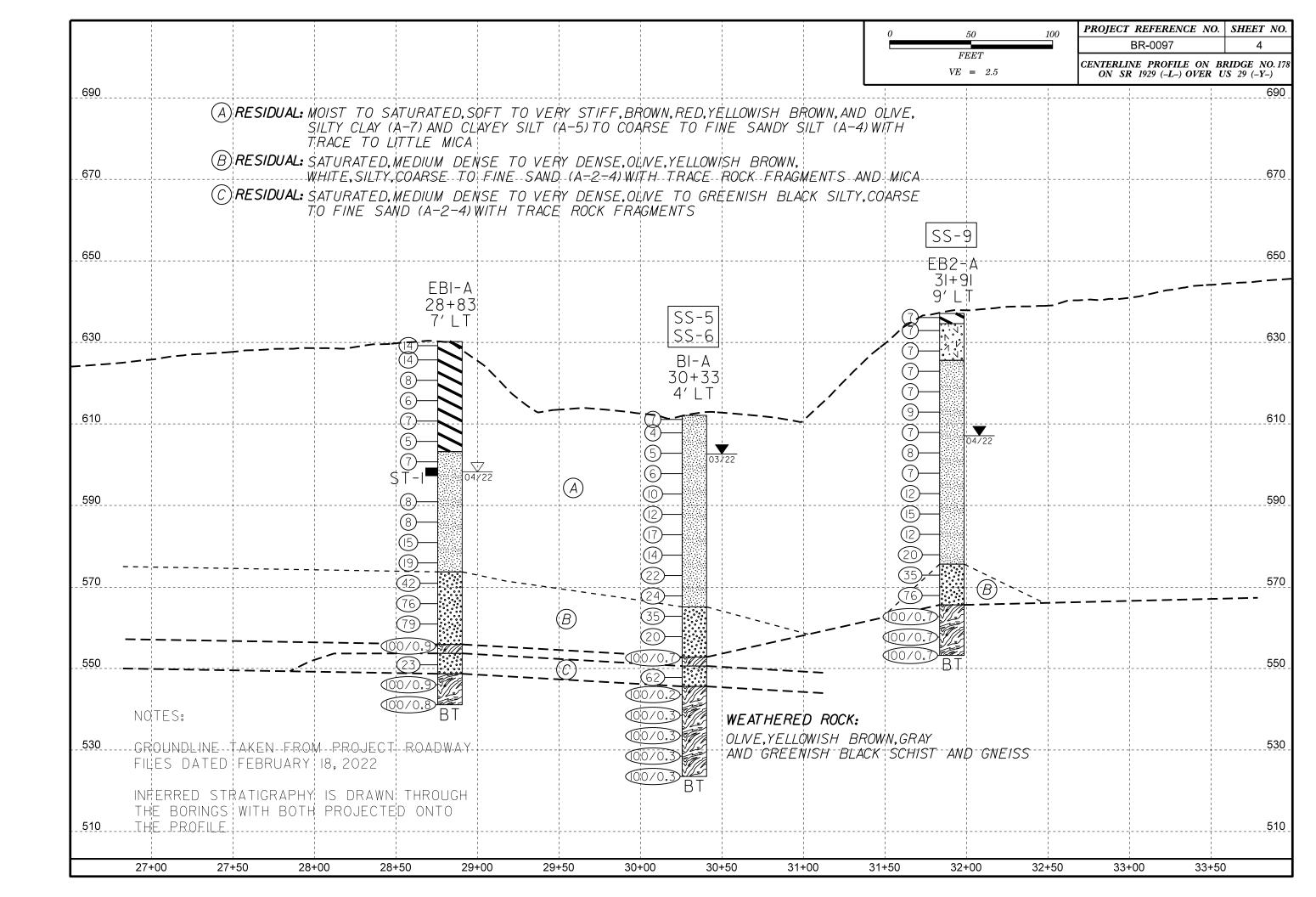
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60	ADUIFER - A WATER BEARING FORMATION OR STRATA.
IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF.GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	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.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS		CRYSTALLINE	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
LLASS. (\$30/PASING 200) (>35/PASSING 200)	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
GROUP         A-1         A-3         A-2         A-4         A-5         A-6         A-7         A-1, A-2         A-4, A-5           CLASS.         A-1-b         A-2-4         A-2-5         A-2-6         A-2-7         A-7, A-1, A-2         A-4, A-5	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL	SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR)     ROCK TYPE INCLUGES PHYLLITE, SLATE, SANDSTONE, ETC.     COASTAL PLAIN     COASTAL PLAIN     COASTAL PLAIN     COASTAL PLAIN	OF SLOPE.
	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK SPT REFUSAL ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, 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.
10 50 MX GRANULAR CLAY MUCK,	PERCENTAGE OF MATERIAL	CP) HILL BEDS, ETC. WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
*40 30 MX 50 MX 51 MN *200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 50 LS SOLLS	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.
MATERIAL	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
PASSING *40 LL 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN LITTLE OR	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 11 MN 11 MN MODERATE HIGHLY	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	OF A CRYSTALLINE NATURE.	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
URUUP INUEX 20 20 20 4 MX 8 MX 12 MX 16 MX NU MX AMUUNTS UP SOILS		SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
USUAL TYPES STUNE FRADS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS	STATIC WATER LEVEL AFTER <u>24</u> HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
GEN. RATING EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	$\frac{\nabla PW}{\partial Q} = PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA$	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30		WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS. ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR PANGE OF STANDARD RANGE OF UNCONFINED	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	(MOD.SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE COMPRETING THESS ON PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT <sup>2</sup> )	WITH SOIL DESCRIPTION OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4		(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
GRANULAR LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30 N/A		IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS
(NON-COHESIVE) DENSE 30 TO 50 VERY DENSE > 50		VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
VERY SOFT < 2 < 0.25	→ INFERRED SOIL BOUNDARY - CORE BORING ● SOUNDING ROD	(V SEV.) REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	OF AN INTERVENING IMPERVIOUS STRATUM.
GENERALLY         SOFT         2 TO 4         0.25 TO 0.5		VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</u>	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
SILT-CLAY         MEDIUM STIFF         4 TO 8         0.5 TO 1.0           MATERIAL         STIFF         8 TO 15         1 TO 2		COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	ROCK QUALITY DESIGNATION (ROD) - 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
(COHESIVE)         VERY STIFF         15 TO 30         2 TO 4           HARD         > 30         > 4	TTTTTT ALLUVIAL SOIL BOUNDARY A PIEZUMETER OF SPT N-VALUE	ALSO AN EXAMPLE.	RUN AND EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION -	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053		HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	BY MODERATE BLOWS.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY $\gamma$ - UNIT WEIGHT	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL
SOIL MOISTURE - CORRELATION OF TERMS	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_{ m d}$ - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
(ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u>	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	DPT - DYNAMIC PENETRATION TEST         SAP         SAPROLITIC         S - BULK           e - VOID RATIO         SD         SAND, SANDY         SS - SPLIT SPOON	PIECES CAN BE BROKEN BY FINGER PRESSURE.	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
(SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE SL SILT, SILTY ST - SHELBY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
PLASTIC SEMICOLID. DECULIDES, DRVING, TO	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
RANGE - WET - (W) SEMISULID REGULARS IN THE TO	FRAGS FRAGMENTS         w - MOISTURE CONTENT         CBR - CALIFORNIA BEARING           HI HIGHLY         V - VERY         RATIO	FRACTURE SPACING BEDDING	BENCH MARK: N/A
	EQUIPMENT USED ON SUBJECT PROJECT	TERM         SPACING         TERM         THICKNESS           VERY WIDE         MORE THAN 10 FEET         VERY THICKLY BEDDED         4 FEET	ELEVATION: N/A FEET
OM _ OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE         3 TO 10 FEET         THICKLY BEDDED         1.5 - 4 FEET           MODERATELY CLOSE         1 TO 3 FEET         THINLY BEDDED         0.16 - 1.5 FEET	
SL SHRINKAGE LIMIT	CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE Ø.16 TO 1 FOOT VERY THINLY BEDDED Ø.03 - Ø.16 FEET	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	X CME-55 G* CONTINUOUS FLIGHT AUGER CORE SIZE:	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	FIAD - FILLED IMMEDIATELY AFTER DRILLING
PLASTICITY	X         CME-55         X         8" HOLLOW AUGERS         -H	INDURATION	THE BORINGS WERE SURVEYED BY SEPIENGINEERING & CONSTRUCTION, INC.USING A SUB CENTIMETER GPS.
PLASTICITY INDEX (PI) DRY STRENGTH	CME-550     HARD FACED FINGER BITS	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NON PLASTIC         0-5         VERY LOW           SLIGHTLY PLASTIC         6-15         SLIGHT	TUNGCARBIDE INSERTS	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MODERATELY PLASTIC 16-25 MEDIUM	VANE SHEAR TEST	COATNO CAN BE SEDADATED EDON CAMPLE WITH STEEL DOODE.	
HIGHLY PLASTIC 26 OR MORE HIGH		MODERATELY INDURATED BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR		INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER;	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X     MUDILE B-57       CORE BIT     VANE SHEAR TEST	DIFFICULI TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REDUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14

#### PROJECT REFERENCE NO.

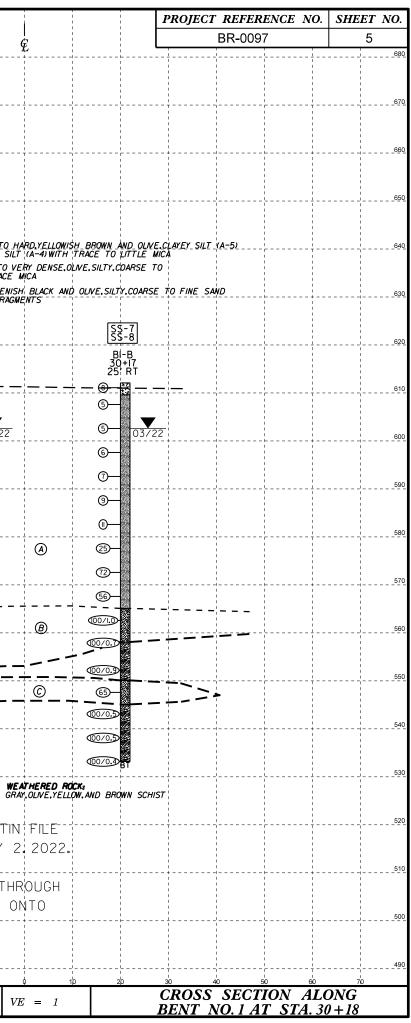
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	TERMS AND DEFINITIONS
ED	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
	AQUIFER - A WATER BEARING FORMATION OR STRATA.
	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR TH
	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY M A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE
	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABO WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABO
TE.	SURFACE.
	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM
	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SL OF SLOPE.
.D 2D	$\frac{\text{CORE RECOVERY (REC.)}}{\text{BY TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE C} 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 ROCKS OR CUTS MASSIVE ROCK.
	$\underline{\text{DIP}}$ - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED HORIZONTAL.
EN. IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPL SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANE
	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIG1NAL POSITION AND DISPARENT MATERIAL.
	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED
L БТН	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TIELD.
	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCU
	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SU ITS LATERAL EXTENT.
	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTION
	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MO





HORIZ. SCALE	0 20	40	VE = 1	CROS	S SECTION NT NO.1 AT	ALONG	HO	PRIZ. SCALE 0 (FEET)	20	40
SKEW:	120°33′37" p 20 10	φ				8 <mark>0 9</mark> 0	_490_490	\$KEW:120°33′37"	-+	
1	ROSS SECTIONS	I I		·			_500_500	THE CROSS SECTIO	1 1	
	ED STRATIGRAF ORINGS WITH BO							NFERRED STRATIGR		
				·			_510_510		-+	
	7_LS_TIN.TIN D		i i					BR0097_LS_TIN.TIN		
I. I.	DLINE TAKEN F	ROM	TIN-FILE	·			520 520	GROUNDLINE TAKEN	- I	
NOTES								NOTES:	1	100/0.3 BT
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									- i - i -	100/0.3
	WE AT HI	ERED ROCK: YELLOWISH B	ROWN.QLIVE GRAY GNE	00/0.DB1 /SS	 		_540_540			100/0.3
				<b>00/0.</b> ₿ -						100/0.2
	*		©_`>				_550_550	······································		
										100/0.7
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		6-	B						<u>+</u> +	
· +		<b></b>					_570_570		-+	@
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· +				· · · · · · · · · · · · · · · · · · ·			_590_590			
			04/22 <b>A</b>							<u> </u>
			$\nabla$				_600_600		-+	©
1 1 1										<u></u>
		······································		@ST-2			_610_610			· · · · · · · · · · · · · · · · · · ·
		6		@						30+33 4' LT
				© _ [			_620_620	EXISTING (	ROUND	<u>_BI-Å_</u>
	EXISTING GROUND			9 <b>U</b>						SS-5 SS-6
		······································		·····	 		_630_630	© RESIDUAL	sATURATED,VL (A-2-4)WITH	ERY DENSE.GI TRACE ROCK
		ĘBI-/ 28+8 7′ L1	3	EBI-B 28+62 20' RT					SATURATED.M FINE SAND	
		·	·				_640_640		NOIST_TO_SAT	
	SIDUAL: SATURATED.MEDIU WHITE.SILTY.COARS									
	SIDUAL: MOIST TO SATURA	TED.SOFT TO VERY STIF OARSE_TO_FINE_SANDY_S	F.BROWN TO YELLOWIS SILT (A+4)WITH TRACE	H BROWN TO OLIVE SILTY			_650_650		-+	
					· · · · · · · · · · · · · · · · · · ·		_660_660		-+	
	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	·			_670_670	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
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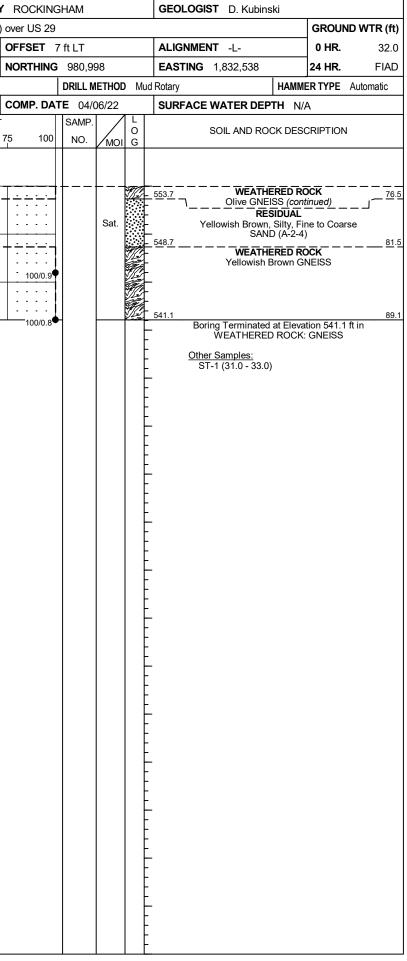


	. SCALE <sup>0</sup> EET)	مب مبر مبر 20	$\frac{40}{VE} =$	1	CROSS SE END BENT N	CTION ALONG 0. 2 AT STA. 31 + 3	
30	SKEW: 120°33'	5.7" 50 40 30	 2/0 1/0				48 60
<del> </del>	THE CROSS	SECTIONS.					- 48     
, L	THE BORINGS	WITH BOTH P	ROJECTED ONTO				49
۔ ا	NFERRED ST	¦ Ratigraphy is	DRAWN THROUG	¦			
1	BROO97_LS_T	IN.TIN DATED	FEBRUARY 2. 20	22			
<sup>10</sup>	GROUNDLINE	i i i	PROJECT	i i	·		5
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50		00/0,DBT	00/0.9	• — •			5
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70		₽ <sup>®</sup>	``````		·		5
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<u>530</u>		0	· · · · · · · · · · · · · · · · · · ·	EXISTING G	ROUND		_!63
			9 <b>-5</b>				
i40		EB2-A 31+91 9' LT	EB2-B 3I+75 12/ RT		· · · · · · · · · · · · · · · · · · ·		6
		SS-9	<u>[55-10]</u>				
50		· · · ·	INSE.OLIVE SILTY.FINE TO CO				6
	_	SANDY SILT (A-4) WI	D.MEDIUM STIFF TO HARD. TY CLAY (A-7) AND CLAYEY S TH TRACE TO LITTLE MICA TO VERY DENSE.OLIVE, SILTY.				
60	(A) RESID	WAL MOIST TO SATURATE	D.MEDIUM STIFF TO HARD.	RED TO REDDISH YE	LLOW TO YELLOWISH BROW	N	66
70							6]
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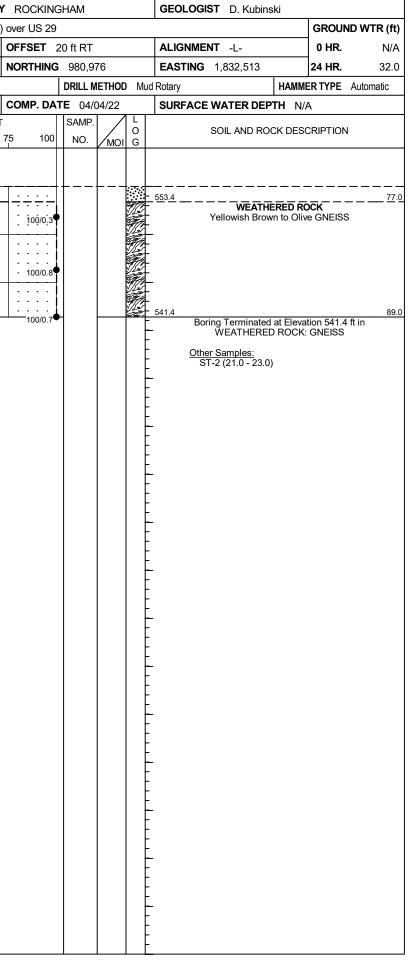
PROJECT REFERENCE NO.	SHEET NO.
BR-0097	6



	0700-	7 4 4												0700-							001111	
	67097		Der								GEOLOGIST D. Kubinski	GROUND WTR (ft)		67097		Doni			P BR-009	97 SR 1929 (E:		
	NG NO.			IAUE DI	-	No. 178 on SR 1929 (Estes Road STATION 28+83	OFFSET				ALIGNMENT -L-	<b>0 HR.</b> 32.0		ING NO.				<u> </u>	ATION 2		5162 K08	
	AR EL					TOTAL DEPTH 89.1 ft	NORTHING		00		EASTING 1,832,538	24 HR. FIAD		LAR ELI				_		<b>TH</b> 89.1 ft	4	
						CME-55 77% 04/23/2021					1		┥┝───						ME-55 77% (			
	LER R					<b>START DATE</b> 04/05/22	COMP. DA					MER TYPE Automatic	┥┝───	LER R						E 04/05/2	<u></u>	c
				ow co		BLOWS PER FOO		SAMP.		1-1	SURFACE WATER DEPTH	I/A				1	w cou	_		BLOWS		
ELEV (ft)	ELEV (ft)	DEPTH (ft)	0.5ft	1	0.5ft	-	7 <u>5</u> 100		1'/	0 I G	SOIL AND ROCK DES	SCRIPTION DEPTH (ft)	ELEV (ft)	DRIVE ELEV (ft)	(ft)		0.5ft		0		50	75
	( )																i t					
635													555				1			Mate	ch Line	
000		ŧ									-			+	<u> </u>			†	· · · ·		<u> </u>	
		ŧ												551.9	78.3	7	13	10				
630	630.2	<u>† 0.0</u>	3	5	9				м		GROUND SUR		550	-	ŧ	,		10		P23 · · · ·	+ • • •	<u>·</u>
		Ŧ									Brown to Red to Yellowis CLAY (A-7) with Tr	sh Brown, Silty ace Mica		546.9	83.3					' <del>  · · · · · ·</del>	+	
625	626.7	+ 3.5 +	4	6	8	$ \begin{vmatrix} 1 & 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 &$			м				545		- 03.3	29	71/0.4					
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620	-	ŧ		4	4				м		-			-	ŧ		40/0.3		_	_		
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2	F70 0	+					· · · · · ·								ŧ		1					
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	571.9	<u> </u>	15	22	20		· · · · · ·				Olive to Yellowish Brown, C Silty, Coarse to Fine SAN Trace Rock Frag	Dlive, and White, ID (A-2-4) with			+							
570	-	‡	15		20	· · · · · • • • • • • • • • • • • • • •			Sat.		Trace Rock Frag	Iments		-	ŧ							
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000		L	I	1	I		100/0.9	<b>7</b>	1	7/1	_				L	1						



SITE DESCRIPTION Replace Bridge No. 178 on SR 1929 (Estes Road) over US 29       GROUND WTR (ft)         BORING NO. EB1-B       STATION 28+62       OFFSET 20 ft RT       ALIGNMENT -L-       0 HR.       N/A         COLLAR ELEV. 630.4 ft       TOTAL DEPTH 89.0 ft       NORTHING 980.976       EASTING 1,832,513       24 HR.       32.0         DRILL RIGHAMMER EFF.DATE       TRIB016 MOBILE B-57 82% 04/23/2021       DRILL METHOD       Mud Rotary       HAMMER TYPE Automatic       DRILL RIGHAMMER EFF.DATE       TRIB016 MOBILE B-57 82% 04/23/2021         DRILLER       R. Toothman       START DATE 04/01/22       COMP. DATE 04/04/22       SURFACE WATER DEPTH N/A       DEPTH (ft)       BLOW COUNT       BLOWS PER FOOT       NO.       MOI G       G       ELEV. (ft)       CLAY (A7-5)       DEPTH (ft)       ELEV       BLOW COUNT       BLOWS PER FOOT       Match Line         630										ONL	200							ı ——									
Demonsky D         ED1-5         STATION         26-62         OPERATION         26-62         Demonstration of the transmission of the transmissin of the transmission of the transmission of the tra														GEOLO	GIST D. Kubinski			-								COUN	
COLLARELLY         DOI: 100:004         TOTAL DEPTH 19:0/h         DOI: 100:004         TOTAL DEPTH 19:0/h         TOTAL DEPTH 10:0/h	SITE	DESCR	IPTION	Rep	lace Br	-			Estes Roa	-								I			-	ace Br	idge No	ა. 178 on S	R 1929 (E	stes Roa	id) o
DBL I. BOULMONATE EFF DAT:         DBL I. FORM - MARCE TYPE - Laborat         DBL I. SOUMMER TYPE - Laborat         DBL III SOUMMER TYPE - Labora         DBL III SOUMMER TYPE - Labora						_				_						0 HR	<b>R.</b> N/A										0
DBLLER & Torthrom         START DATE         Under Start         Start DATE         Under Start         Start DATE         Under Start         Start DATE         Under Start           100         100	COLL	AR ELI	<b>EV.</b> 63	30.4 ft		т	OTAL DEP	<b>TH</b> 89.0	ft	NORTHIN	<b>IG</b> 980,9	976		EASTIN	<b>G</b> 1,832,513	24 HR	<b>R.</b> 32.0	COL	LAR EL	<b>EV.</b> 63	30.4 ft		тс	JTAL DEP	<b>FH</b> 89.0 ft	t	N
Discussion       Description       BLOWS FERFORD       Discussion       State       Discussion       State <thdiscussion< th="">       State       Discuss</thdiscussion<>	DRILL	RIG/HAN	<b>IMER EF</b>	F./DAT	E TRI8	3016 M	OBILE B-57	82% 04/23	/2021		DRILL	METHO	DD Mu	ud Rotary	HAN	MER TYPE	E Automatic	DRILI	l rig/hai	MMER E	FF./DAT	E TRI	8016 MC	OBILE B-57 8	32% 04/23/2	2021	
With With With With With With With With						S	FART DAT	E 04/01/	/22	COMP. D	<b>DATE</b> 04	/04/22		SURFA	CE WATER DEPTH	N/A		DRIL			man		ST	ART DAT	E 04/01/2	22	C
With With With With With With With With	ELEV	DRIVE ELEV	DEPTH	BLC								17			SOIL AND ROCK DE	ESCRIPTIC	ON	ELEV	DRIVE	DEPTH	·		-				
000       00.0.4       0.0.4       0.0.4       0.0.4       0.0.4       0.0.5	(π)	(ft)	(11)	0.5ft	0.5ft	0.5ft	0	25	50	75 10	00 NO.	/мс	) G	ELEV. (ft)				) (ft)	(ft)	(11)	0.5ft	0.5ft	0.5ft	0	25	50	75
0.00       450.4       -0.0																											
00       00	635		+											_				555	+	+		+	<b> </b>		Mato	ch Line	
000       1004       0.0       0.0       0.0       0.00 <th< td=""><td></td><td>-</td><td>ŧ</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td>552 1</td><td>+ 78.3</td><td></td><td></td><td></td><td></td><td>  · · · · i</td><td>4÷÷:</td><td>-:</td></th<>		-	ŧ											-					552 1	+ 78.3					· · · · i	4÷÷:	-:
982.7       3.7       8       4       6       6 </td <td>630</td> <td>630.4</td> <td>÷ 0.0</td> <td></td> <td>- 630.4</td> <td></td> <td></td> <td>0.0</td> <td>550</td> <td></td> <td>+ /0.0 +</td> <td>100/0.:</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td>	630	630.4	÷ 0.0											- 630.4			0.0	550		+ /0.0 +	100/0.:	3					
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595       2       2       2       4       6       -		- 	Ŧ				] : : :							F						Ŧ							
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Self / 2     38 / 2     4     5       Self / 4     3     4     8       Self / 4     48.7     9     10       Self / 4     8     10       Self / 4     8     10       Self / 4     8     11       Self / 4     8     11       Self / 4     8     11       Self / 4     8     10       Self / 4     9     10    <			Ŧ				· ···							<u>593.4</u>					-	Ŧ							
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566.7     63.7     6     9     14     1    <		-	Ŧ				· · · · ·				.			-					-	Ŧ							
566.7     63.7     6     9     14     1    <		581.7 ·	48.7		6	10														Ŧ							
566.7     63.7     6     9     14     1    <	580	-	ŧ		0	10	• • • 16					Sat.		-						Ŧ							
566.7     63.7     69     14     1			‡						 											Ŧ							
566.7     63.7     6     9     14     1    <	575	576.7	+ 53.7 +	4	8	11	<b> </b> -	9				Sat.		F						‡							
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$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		571.7 ·	+ - <u>58.7</u>		10		::::	Ŋ :::	· · · · ·					C	live to Brown, Silty, Coa (A-2-4), Trace	arse to Fine e Mica	SAND			‡							
566.7     63.7     6     9     14         565	570	-	‡	5	10	14	· · · ·	24			· _	Sat.		- 						‡							
$565 \qquad - \qquad 6 \qquad 9 \qquad 14 \qquad \cdots \qquad \bullet 23 \qquad \cdots \qquad \cdots \qquad \cdots \qquad \cdot \qquad \cdot \qquad \cdot \qquad \cdot \qquad \cdot \qquad \cdot \qquad \cdot$		•	‡							· · · · · ·				-						‡							
	565	566.7	+ 63.7 +	6	9	14		23	·   · · · ·			Sat.		È						‡							
562.1     68.3     21     28     32 <t< td=""><td></td><td>-</td><td>‡</td><td></td><td></td><td></td><td></td><td><u> </u></td><td></td><td></td><td></td><td></td><td></td><td><u>⊢</u> ⊦</td><td></td><td></td><td></td><td></td><td>-</td><td>‡</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		-	‡					<u> </u>						<u>⊢</u> ⊦					-	‡							
560     -<		562.1	68.3	01	20	22								F						‡							
557.1     73.3     20     25     22        Sat.	560		‡	21	20	<u>عد</u>			• • • • • • • • • • • • • • • • • • •		·	Sat.		⊢ ⊨						‡							
557.1     73.3     20     25     22       Sat.       555        Sat.			±					· · ·	· / · · ·					-  -						<u>†</u>							
		557.1	73.3	20	25	22			47		:	Sat.		F						ŧ							
	555	_	<u> </u>	1					<u> </u>											1	1	1					



									.00														
WBS	67097	7.1.1			1	<b>IP</b> BR-0097	COUNT	Y ROCKIN	GHAM			GEOLOGIST D. Kubinski		WBS	<b>S</b> 67097	.1.1			TIP	BR-0097		COUNTY	'
SITE	DESCR	RIPTION	Repl	ace Br	idge I	No. 178 on SR 1929 (E	stes Road	d) over US 29	)				GROUND WTR (ft)	SITE	E DESCR	IPTION	Repla	ace Bri	dge No	. 178 on SF	R 1929 (Es	tes Road)	0\
BORI	NG NO.	. B1-A			5	STATION 30+33		OFFSET	4 ft LT			ALIGNMENT -L-	0 HR. 9.5	BOR	ring no.	B1-A			ST	ATION 30	+33		0
COLI	AR EL	<b>EV.</b> 61	2.1 ft		1	OTAL DEPTH 88.6 f		NORTHING	<b>G</b> 980,9	66		EASTING 1,832,685	<b>24 HR.</b> 9.5	COL	LAR EL	<b>EV.</b> 61	12.1 ft		то	TAL DEPT	H 88.6 ft		N
DRILL	RIG/HAM	MMER EF	F./DAT	E TRI	0055 (	CME-55 77% 04/23/2021			DRILL N	IETHOD	Mud	Rotary HAMM	ER TYPE Automatic	DRIL	l Rig/Hai	IMER EF	F./DATE	e trio	055 CM	1E-55 77% 04	4/23/2021		
DRIL	LER R	R. Toothr	man		S	START DATE 03/22/2	2	COMP. DA	<b>TE</b> 03/2	24/22		SURFACE WATER DEPTH N/	Ά	DRI	LER R				ST	ART DATE	03/22/22	2	С
ELEV	DRIVE ELEV		BLC	w co	UNT	BLOWS	PER FOO	т	SAMP.	$\mathbf{\nabla}$	LO	SOIL AND ROCK DES	CRIPTION	ELEV	/ DRIVE ELEV	DEPTH	BLO	W COL	JNT		BLOWS F		
(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 2	5 5	0	75 I
615		ļ												535		L		$\lfloor - \rfloor$	↓		Match	Line	_
		±										612.1 GROUND SURF			533.8	78.3	100/0.3			· · · · ·	· · · ·	· · · ·	
	612.1	0.0	4	4	3					M		RESIDUAL				ŧ							
610	608.8	- 3.3									88-	Yellowish Brown and Olive, Sandy SILT (A-4) with Trac	Coarse to Fine e to Little Mica	530	528.8	- 83.3							+
	000.0	1	2	2	2					М					020.0		100/0.3					· · · ·	
605		ł												525		Ł							
	603.8	8.3	1	2	3						F				523.8	88.3	100/0.3						
		Ŧ				$\begin{bmatrix} \bullet_{5}, \cdots, \bullet_{r} \\ \bullet_{r}, \cdots, \bullet_{r} \end{bmatrix}$					E I					Ŧ		1					
600	598.8	- - - 13.3							-		F.				-	Ŧ							
	- 590.0	<u>+ 13.3</u> +	2	2	4	$- \left  \begin{array}{c} \mathbf{J} \cdot \cdot \cdot \cdot \\ \mathbf{\phi}_{6} \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \end{array} \right  \cdot $			SS-5	w	F.					Ŧ							
595		ŧ														ŧ							
000	593.8	18.3													-	ŧ							
		‡	4	4	6			· · · · · ·		Sat.						ŧ							
590	-	‡						·   · · · ·			₩Ł.				-	ŧ							
	588.8	<u>- 23.3</u> -	2	5	7	$- \left  \begin{array}{c} \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \\ \cdot \cdot \\ \bullet \\ 12 \end{array} \right  \left  \begin{array}{c} \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \\ \cdot \cdot \\ \cdot \cdot \end{array} \right $	· · · ·	· · · · · ·		Sat.						‡							
505		ŧ														ŧ							
585	- 583.8	+ 28.3													-	ŧ							
		1	4	7	10	┃ · · • • 17 · · · · ·	· · · ·		SS-6	Sat.						ł							
580		ł														Ł							
	578.8	33.3	3	6	8					Sat.	F					Ŧ							
		Ŧ								Jai.	F					Ŧ							
575	573.8	- - <u>38.3</u>				····	+				₿₽.				-	Ŧ							
	5/3.0	<u>+ 30.3</u> +	6	9	13	$- \begin{vmatrix} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \bullet \end{vmatrix}_{22} \cdot \cdot \cdot \cdot$				Sat.	ja kalendar har har har har har har har har har h					Ŧ							
570		Ŧ														ŧ							
0.0	568.8	43.3	5	10	14										-	ŧ							
		‡	5	10	14	24 · · · ·		· · · · · ·		Sat.						ŧ							
565		<b>‡</b> .				<u>\</u>						565.1 Olive, Silty, Coarse to Fine	<u>SAND (A-2-4)</u> <u>47.0</u>		-	‡							
565	563.8	<u>+ 48.3</u> +	10	14	21	$- \begin{vmatrix} \cdot \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \end{vmatrix} \cdot \begin{vmatrix} \cdot \cdot \\ \cdot$	· · · ·	· · · · · ·		Sat.		with Trace Mic	ca			‡							
560		‡					· · · ·									‡							
<u>560</u> 555	558.8	- 53.3				_   <del>  /</del>			1						-	‡							
		‡	6	8	12		· · · ·			Sat.						‡							
555	-	‡					· · ·				L				-	t							
	553.8	- 58.3	23	52	48/0.2	_     2     <u>.</u> .	· · ·	·   · · · · ·				552.8	59.3			ŧ							
		t						100/0.7	<b>T</b>		11	WEATHERED R	OCK			ŧ							
550	- 548.8	- 63.3					! <del>-</del>									Ŧ							
	J <del>4</del> 0.0	<u> </u>	33	36	26	]	• • 62			Sat.	F	Greenish Black and Olive Coarse SAND (A-2-4) wit	, Silty, Fine to h Trace Rock			Í							
545		Ŧ					: <u>.</u>	<u> </u>			ian -	545.6 Fragments	<u>66.5</u>			Ŧ							
	543.8	68.3	100/0.2					100/0.0	1			WEATHERED R Gray and Olive Yellow	V SCHIST		-	Ŧ							
		ŧ	00/0.2						Ţ							ŧ							
540	-	<b>‡</b> .					· · ·		Į						-	‡							
540	538.8	+ 73.3 +	100/0.3	3			· · · ·		<b> </b>							‡							
535		‡														‡							
535		1	I	L	I	11	I			I	SH TA			L	-1	L	I						

ROCKING	HAM		GEOLOGIST D. Kubins	ski		
over US 29					GROUN	ID WTR (ft)
OFFSET 4	ft LT		ALIGNMENT -L-		0 HR.	9.5
NORTHING	980,966		<b>EASTING</b> 1,832,685		24 HR.	9.5
	DRILL MET	HOD Mud	d Rotary	HAMME	R TYPE	Automatic
COMP. DAT	E 03/24/	/22	SURFACE WATER DEP	TH N/A	1	
75 100	SAMP. NO.	MOI G	SOIL AND RO	CK DESC	RIPTION	
COMP. DAT	E 03/24/ SAMP.	/22	SURFACE WATER DEP	TH N/A CK DESC ERED RC ow SCHI	RIPTION	nued)
			-			

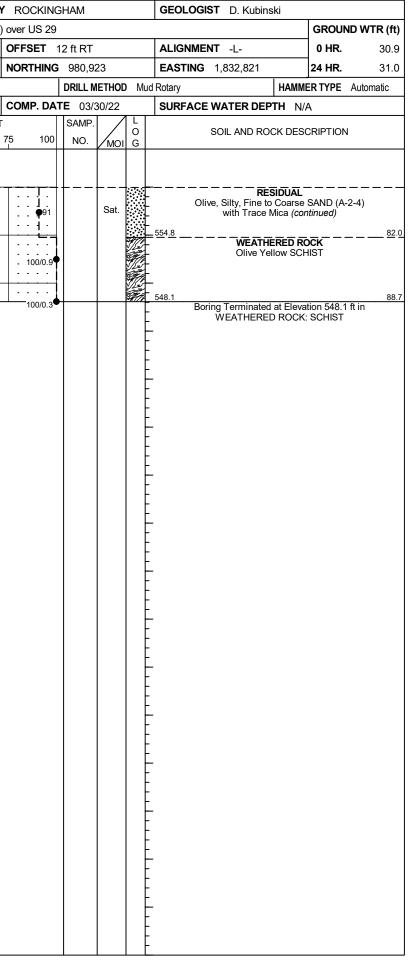
WPP	67097	711			<b>-</b>	IP BR-0097							GEOLOGIST D. Kubinski		WIDO	<b>6</b> 7097.1	1			те	• BR-0097	COUNT	v
			Pon	lace Pr		lo. 178 on SR 1			ROCKING					GROUND WTR (ft)				Renl	ace Rri		. 178 on SR 19		
	NG NO.			ace Di	-	<b>TATION</b> 30+2	-		OFFSET				ALIGNMENT -L-	<b>0 HR.</b> 14.0		ING NO.		repla			<b>ATION</b> 30+17		
	AR ELI					OTAL DEPTH			NORTHING				EASTING 1,832,664	<b>24 HR.</b> 9.5		LAR ELEV		2 1 ft		_			
						ME-55 77% 04/2			NORTHING			n uc	l	ER TYPE Automatic							1E-55 77% 04/23/2		
	LER R								COMP. DA							LER R.1					<b>ART DATE</b> 03		С
				ow co			BLOWS PE			SAMP.		1-1		7	ELEV				W COL	_		OWS PER FOO	
elev (ft)	DRIVE ELEV (ft)	(ft)	0.5ft	0.5ft		4			75 100		17	O I G	SOIL AND ROCK DESC	CRIPTION DEPTH (ft)	ELEV (ft)		(ft)		0.5ft		0 25	50	75
	()						I									(1)				-	<u> </u>	I	
615															535							Match Line	
010		ŧ										-			000	533.6 -	78.5			+			.
-	612.1	0.0	3	3	5								612.1 GROUND SURF/ RESIDUAL	ACE 0.0		T T		100/0.4			·		
610		ŧ		ľ	Ű						M		Yellowish Brown, Clayey SIL	T (A-5), Trace2.5		‡							
-	608.6 ·	+ <u>3.5</u>	2	2	3			· · · · ·			м		Yellowish Brown to Olive, O			‡							
605	-	ŧ											Sandy SILT (A-4), Tra	ace Mica		‡							
005		+ - 8.5														+							
		‡	2	2	3	•5 <sup></sup>		· · · · ·				-				‡							
600		‡														1 1							
-	598.6	+ 13.5	2	3	3			· · · · ·			м					1 1							
505	-	ŧ						· · · · ·								1 1							
595		- - 18.5														+							
		10.0	3	3	4			· · · ·		SS-7	w												
590		ŧ										Ŀ											
-	588.6	23.5	2	4	5	: : : :   :										1 1							
		Ŧ				• • • • • • • • • • • • • • • • • • •					W	E				l I							
585	-															-							
	583.6	<u>+ 28.5</u> T	3	4	7						Sat.	F				I Ŧ							
580		Ŧ										F				I Ŧ							
	578.6	33.5		10	15							F				1 7							
		Ŧ	'	10	15		5				Sat.	F				1							
575	-	Ŧ														‡							
-	573.6	+ <u>38.5</u> +	17	34	38				72	SS-8	Sat.	F				1 7							
570	•	ŧ						/.			1					‡							
010		43.5						. /				F				‡							
		ŧ	12	22	34			656			Sat.					‡							
565	-	ŧ											0live, Silty, Coarse to Fine	SAND (A-2-4) 47.0		‡							
-	563.6	+ 48.5 +	24	44	56			· · · · ·			Sat.		Trace Mica	o,		‡							
<u>565</u> 560 555		ŧ						· · · · ·	_ 100/1.0 <sup>4</sup>			-				‡							
500		- 53.5										-	- 558.1	54.0		‡							
,		‡	13	87/0.2				· · · · ·	100/0.7				WEATHERED RO	DCK		‡							
555	-	‡											Olive and Greenish Blac			‡							
1	553.6	- 58.5	37	28	72/0.4			· · · · ·								1 1							
		ŧ							100/0.9							1 1							
550		- 63 5						<u> </u>					. <u>550.1</u>	<u> </u>		+							
		1 03.5	32	24	41	1		• • <b>•</b> 65			Sat.		Olive, Silty, Fine to Coarse	SAND (A-2-4)		1 <u>†</u>							
545	-	£						· ·   ·				-	545.1	<u>67</u> .0									
-	543.6	68.5	100/0.	a l									WEATHERED RO			Ī							
		£		1					100/0.5							Ŧ							
540	-	<u>-</u>																					
540	538.6	<u>T /3.5</u>	100/0.	5		.	••••		100/0.5			Ø				‡							
535		Ŧ														‡							
	_	<u> </u>	•							ι I	-	11 M C	-			·							

ROCKING	HAM			GEOLOGIST D. Kubinsk	i		
over US 29				•		GROUN	ID WTR (ft)
OFFSET 2	5 ft RT			ALIGNMENT -L-		0 HR.	14.0
NORTHING	980,94	11		EASTING 1,832,664		24 HR.	9.5
			H.S	1			Automatic
COMP. DAT				SURFACE WATER DEPT			
	SAMP.		L				
75 100	NO.	моі	0 G	SOIL AND ROC	K DESC	RIPTION	
<b>]</b>				533.2			78.9
100/0.4				Boring Terminated a WEATHERED	t Elevat	ion 533.2 SCHIST	ft in
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14/20	0700					<b>D D D A A</b>	.7									14/8	0 0700-							00111	
	67097		- ·			P BR-009				ROCKIN				GEOLOGIST D. Kubinski			<b>S</b> 67097.		<u> </u>			BR-009		COUNT	
			•	ace Br	<u> </u>			(Estes	í	over US 29					GROUND WTR (ft)				-	ace Bri	-		SR 1929 (E	stes Road	1) C
	NG NO.					TATION 3		0.0		OFFSET		40			<b>0 HR.</b> 30.0		RING NO.					ATION 3			+
	AR ELE									NORTHING					<b>24 HR.</b> 30.0		LAR ELE						TH 83.9 ft		N
				E TRI		OBILE B-57									RTYPE Automatic					<u>= TRI8</u>			82% 04/23/2		
										COMP. DA			: ИТТ		Ą		LLER R.						E 03/30/2		
ELEV (ft)	DRIVE	DEPTH (ft)	BLC	W CO	0.5ft	0	BLOV	NS PER 50		75 100	SAMP.	1.7	0	SOIL AND ROCK DESC		ELEV (ft)		DEPTH (ft)		0.5ft		0	BLOWS	PER FOO 50	75 75
()	(ft)	()	0.51	0.51	0.51	0	25	50		100	NO.	Гмо	DI G	ELEV. (ft)	DEPTH (ft)	()	(ft)	()	0.51	0.51	0.51			1	
																							•••		
640		+												-		560	558.9			┝╼┥	ı——+		Mato	h Line	-7
	637.1	F 0.0												GROUND SURFA	ACE 0.0			10.2	30	60	40/0.2				.
635	-	Ŧ	2	3	4	•7						м		RESIDUAL 634.6 Red, Silty CLAY (A	A-7)	555	ļ								
	633.9 -	3.2	2	3	4		1							Red to Reddish Brown, Clay	/ev SILT (A-5)			83.2	38	62/0.2					
	-	ŧ			-	•7 · · •1 · · ·		-	· · · · · ·			M	N V N N	with Trace Mica	а					02/0.2					
630	-	‡											N V V	- 			1 4								
	628.9 -	<u>    8.2   </u>	2	3	4	 ∳7 · ·	· ·   · ·		· · · · · ·			м	л V N	-			‡								
005	-	+				•[••••			· · ·				х <i>У</i> Х Х	- 625.6	11.5		1 1								
625	623.9	13.2												Brown to Olive Yellow, Co Sandy SILT (A-4) with Trace	arse to Fine		+								
	-	ł	2	3	4	•7 • •	· ·	· ·   ·	· · ·			м					1 1								
620	-	ł												-			+								
	618.9 -	18.2	2	2	5	· <u>i</u> ···						м													
	-	Ŧ				•7 • •		.									7								
615	613.9	23.2												F F-			+								
	613.9 -	<u>+ 23.2</u> +	3	5	4	· [· · · • ●9 · ·	· ·   · ·		· · · · · ·	· · · · ·		м		<b>-</b>			‡								
640	-	‡				: [: : :			· · ·								1 1								
610	608.9 -	28.2												<b>4</b>			1 +	•							
	-	t	1	3	4	<b>•</b> 7 • •			· · ·	· · · ·	SS-9						1 1								
605	-	+				. <mark> </mark>								_			+								
	603.9	33.2	1	3	5	.]						Sat.		P			I I	•							
	-	ŧ			Ů	- <b>6</b> 8 - <b>1</b>		-	· · · · · ·			J Sal.													
600		‡						-						-			1 4								
	598.9 -	<u>- 38.2</u> -	2	3	4		· ·   · ·	· ·   ·	· · · · · ·			Sat.		-			‡								
	-	ŧ															1								
595	593.9	43.2															4	•							
	-	+	3	4	8	• •12		.				Sat.		-			+								
590	-	f															7								
- 5	588.9	48.2	3	6	9	· · ŀ ·						Cot					7	•							
	-	Ŧ	Ĭ	ľ				.	· · ·			Sat.					‡								
585		‡					· ·	.									4								
	583.9 -	<u> </u>	WOH	4	8	· ·/· ·	· ·   · ·		· · ·	· · · · ·		Sat.		₽ ₽			‡								
	-	‡						:: :	:::								1				i				
580	578.9	58.2				$\left  \frac{1}{1} \right $	+			+ • • • • •				<b>k</b> -			+								
		+	4	9	11	🎽	20	.				Sat.					7								
575	-	Ŧ					۲, II	.							<u>61.5</u>		7								
010	573.9 -	63.2	6	13	22		×.				11			Olive, Silty, Coarse to Fine S with Trace Mica	5AND (A-2-4) a		+								
	-	‡		13			• •3	5 .   .	· · · ·			Sat.		F F			‡								
570	-	‡					· ·		· · ·	· · · ·				} 			‡								
	568.9 -	68.2	25	31	45		· ·	: :   :		• • • •		Sat.		- -			1								
	-	t					· ·								71.5		1								
565	563.9	73.2					+		· · ·				1		<u>ск                                    </u>		-								
		- / 0.2	31	55	45/0.2			.		100/0.7	<b> </b>			- Olive to Greenish Black			7								
560	-	Ŧ												F F			‡								
500		L	I	I						1		1	100	L		L					L				

DRILL METHOD       Mud Rotary       HAMMER TYPE       Automatic         COMP. DATE       04/01/22       SURFACE WATER DEPTH       N/A         75       100       NO.       Image: Complex of the second se	ROCKING	HAM			GEOLOGIST D. Kubinsk	i		
NORTHING         980,940         EASTING         1,832,841         24 HR.         30.0           DRILL METHOD         Mud Rotary         HAMMER TYPE         Automatic           COMP. DATE         04/01/22         SURFACE WATER DEPTH         N/A           75         100         NO.         MOI         G           NO.         MOI         G         SOIL AND ROCK DESCRIPTION           VEATHERED ROCK         Olive to Greenish Black SCHIST (continued)         SOIL of the second seco	over US 29						GROUN	ID WTR (ft)
DRILL METHOD       Mud Rotary       HAMMER TYPE       Automatic         COMP. DATE       04/01/22       SURFACE WATER DEPTH       N/A         75       100       NO.       MOI       G       SOIL AND ROCK DESCRIPTION         75       100       NO.       MOI       G       WEATHERED ROCK         0       00/0.7       01/2       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION         0       0.00/0.7       6       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION         0.00/0.7       00/0.7       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION         0.00/0.7       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION         0.00/0.7       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION         00/0.7       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION         00/0.7       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION         100/0.7       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION       SOIL AND ROCK DESCRIPTION	OFFSET 9	ft LT			ALIGNMENT -L-		0 HR.	30.0
COMP. DATE       04/01/22       SURFACE WATER DEPTH       N/A         75       100       NO.       L       O       SOIL AND ROCK DESCRIPTION         75       100       NO.       MOI       G       WEATHERED ROCK         WEATHERED ROCK         100/0.7       01/00       6       WEATHERED ROCK         100/0.7       01/00       553.2       83.9         100/0.7       Expring Terminated at Elevation 553.2 ft in       83.9	NORTHING	980,94	10		EASTING 1,832,841		24 HR.	30.0
75     100     NO.     L O G     SOIL AND ROCK DESCRIPTION                      100/0.7		DRILL M	ETHOD	Mud	Rotary	HAMME	RTYPE	Automatic
75     100     NO.     MOI     G       SOIL AND ROCK DESCRIPTION       WEATHERED ROCK       Olive to Greenish Black SCHIST       (continued)          100/0.7          100/0.7 </th <th>COMP. DAT</th> <th><b>E</b> 04/0</th> <th>)1/22</th> <th></th> <th>SURFACE WATER DEPT</th> <th>H N/A</th> <th>۱</th> <th></th>	COMP. DAT	<b>E</b> 04/0	)1/22		SURFACE WATER DEPT	H N/A	۱	
WEATHERED ROCK Olive to Greenish Black SCHIST (continued) 553.2 Boring Terminated at Elevation 553.2 ft in	75 100		моі	0	SOIL AND ROC	K DESC	RIPTION	
Olive to Greenish Black SCHIST (continued)  100/0.7  100/0.7  100/0.7  Boring Terminated at Elevation 553.2 ft in								
100/0.7 Boring Terminated at Elevation 553.2 ft in	100/0.7				Olive to Greenis	sh Black		
					553.2			83.9
	100/0.7				Boring Terminated a	t Elevat ROCK:	ion 553.2 SCHIST	ft in

WRS	67097	711			т	P BR-009	17		TY ROCKIN				GEOLOGIST D. Kubinski			WRS	67097	1 1			ти	<b>P</b> BR-0097	I	COUNTY	,
			Ren	lace Br					d) over US 2				GEOEOGIGT D. Rubiliski	GROUND WTR (f					Renla	ace Bri		b. 178 on SR			
	NG NO.			IACE DI		<b>FATION</b> 3							ALIGNMENT -L-	<b>0 HR.</b> 30.	·    -		NG NO.		-		-	<b>ATION</b> 31+			-
	AR ELI					OTAL DEP		ft	NORTHIN				EASTING 1,832,821	<b>24 HR.</b> 31.			AR ELE								<u> </u>
						OBILE B-57								ERTYPE Automatic	_							DBILE B-57 829			_
	LER R				-				COMP. D				SURFACE WATER DEPTH N//				LER R.								C
ELEV	DRIVE			ow co				S PER FOO		SAMP.		1-1					DRIVE			W COI			BLOWS PE		
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft		0	25	50	75 100	NO.	мо	O I G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION DEPTH		(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft		0 25			75
								1	l																-
640																560							Match	Line	
	-	Ŧ											-				558.4	78.4				· · · ·			Τ
	636.8	0.0	2	4	5	<b>I</b> .					M		636.8 GROUND SURFA	ACE (	0.0		-	-	12	35	56				
635	-	Ŧ		·	Ŭ								Red to Orange, Silty Cl	LAY (A-7)		555	_	-							+
	633.4	<u>† 3.4</u>	2	3	4	· · · · ·					м						553.4	83.4	29	71/0.4					
630	-	Ŧ											630.8 	$\overline{IIT}$ (A-5) with $\overline{IIT}$	.0_	550	-	-							
	628.4	8.4				1						N V V	- Trace Mica				548.4	88.4	100/0 0						
	-	Ŧ	2	3	3	<b>•</b> 6					M	N N V V					-	-	100/0.3						
625	_	Ŧ					+ • • •		· · · · ·			N (	624.8Reddish Yellow to Yellowi	ish Brown to 12	.0		-	-							
	623.4	<u>T 13.4</u>	2	2	3					SS-10	м		- Olive, Coarse to Fine Sandy - Trace to Little M	SILT (A-4) with			-	-							
620	-	Ŧ				1					1			lica			-	-							
	618.4	18.4							· · · · ·				- ·				-	-							
	-	Ŧ		3	3	<b>•</b> 6					M		-				-	-							
615	-	Ŧ					+ • • •						-				-	-							
	613.4	<u>† 23.4</u> †	3	4	3				· · · · ·		м						-	-							
610	-	Ŧ											-				-	-							
	608.4	28.4				$  \cdot \cdot \cdot \cdot  $							- ·				-	-							
	-	Ŧ	1	3	3	<b>6</b>			· · · · · ·				• •				-	-							
605	-	Ŧ				- <del>1</del>		· · · · ·					-				-	-							
	603.4	<u>† 33.4</u>	2	3	5						Sat.		•				-	-							
600	-	ŧ											-				-	-							
	- 598.4	38.4				· · · ·				1			-				-	-							
		Ŧ	1	3	5						Sat.		• •				-	-							
595	-	ŧ				<u> </u>							-				-	-							
	593.4	<u>† 43.4</u> †	2	5	7	· · · · ·					Sat.		•				-	-							
590	-	Ŧ				· · · · ·							• •				-	-							
6/1	588.4	48.4		_	-					1			-				-	-							
585	-	ŧ	4	5	8	<b>•</b> 13					Sat.		-				-	-							
	-	Ŧ				- + +	+						-				-	-							
z	583.4	<u>+ 53.4</u>	6	7	12	:::\.	· · ·   · · ·	·   · · · ·	· · · · · ·		Sat.						-	-							
580	-	ŧ				•											-	-							
		58.4								11			-				-	-							
		‡	6	9	13		22	·   · · · ·	· · · · · ·		Sat.						-	-							
575	-	‡					$\begin{pmatrix} \cdots \end{pmatrix}$						-				-	-							
	573.4	63.4	10	16	20			· · · · ·	· · · · · · · ·		Sat.		- -				-	-							
570	-	‡					●36						- -				-	-							
		+ 684					· · ·			11			- ·				-	-							
		+	15	26	60	· · · ·		· · · · ·	86		Sat.						-	-							
BORE DOUBLE	-	‡					· · ·	·   · · ·	 	41			-				-	-							
	563.4	73.4	22	78/0.4				 	·   · i				562.9	73	.9		-	-							
1000 560	-	ŧ		3,0.4				:	100/0.9	1			WEATHERED RC 560.3 Olive SCHIST	<b>DCK</b> 76	5		-	-							
Sec. 260		L	I	I		LL						477		/	· <u> </u>										_



### LABORATORY SUMMARY SHEET FOR SOIL SAMPLES

## WBS NO. (TIP NO.): 67097.1.1 (BR-0097) PROJECT ID: 39271 COUNTY: ROCKINGHAM

# DESCRIPTION: REPLACE BRIDGE NO. 178 ON SR 1929 (ESTES ROAD) OVER US 29

										Atterberg Limits Gradation Results									
Sample No.	Boring Number	Alignment	Station	Offset	Sample Depth (ft.)	Natural Moisture Content (%)	AASHTO Class.	N-Value (blows/ ft.)	L.L.	P.L.	P.I.	Retained #4 Sieve	Pass #10 Sieve	Pass #40 Sieve	Pass #200 Sieve	Coarse Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)
SS-5	B1-A	-L-	30+33	4' LT	13.3 - 14.8		A-4	6	NP	NP	NP	0.0	99.0	97.4	62.7	4.9	62.3	18.4	14.3
SS-6	B1-A	-L-	30+33	4' LT	28.3 - 29.8		A-4	17	NP	NP	NP	1.0	96.0	89.1	55.0	17.3	38.6	31.8	12.4
SS-7	B1-B	-L-	30+17	25' RT	18.5 - 20.0		A-4	7	NP	NP	NP	1.0	98.0	96.1	64.5	7.2	42.4	38.2	12.1
SS-8	B1-B	-L-	30+17	25' RT	38.5 - 40.0		A-4	72	NP	NP	NP	3.0	89.0	82.8	42.7	22.4	48.0	19.6	10.0
SS-9	EB2-A	-L-	31+91	9' LT	28.2 - 29.7		A-4	7	NP	NP	NP	0.0	98.0	96.3	50.0	9.6	67.5	8.6	14.2
SS-10	EB2-B	-L-	31+75	12' RT	13.4 - 14.9		A-4	5	NP	NP	NP	1.0	97.0	96.3	72.6	6.0	33.9	42.0	18.2
ST-1	EB1-A	-L-	28+83	7' LT	31.0 - 33.0	53.8	A-4		NP	NP	NP	0.0	99.9	97.0	49.0	7.9	52.0	23.3	16.8
ST-2	EB1-B	-L-	28+62	20' RT	21.0 - 23.0	50.5	A-7-5		64	46	18	0.2	99.8	97.0	70.5	5.4	31.7	39.5	23.4



Sigmatriax.xls

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

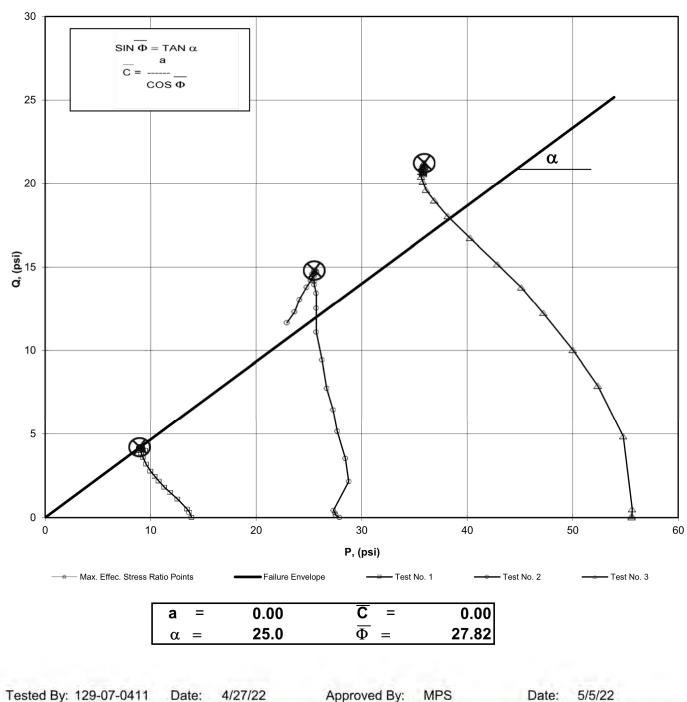
Client:
Client Reference:
Project No.:
Lab ID:

page 1 of 10 DCN: CT-S28 DATE: 4/12/13 REVISION: 3

Kleinfelder BR-0097 R-2022-091-002 R-2022-091-002-001 Boring No.: Depth (ft): Sample No.:

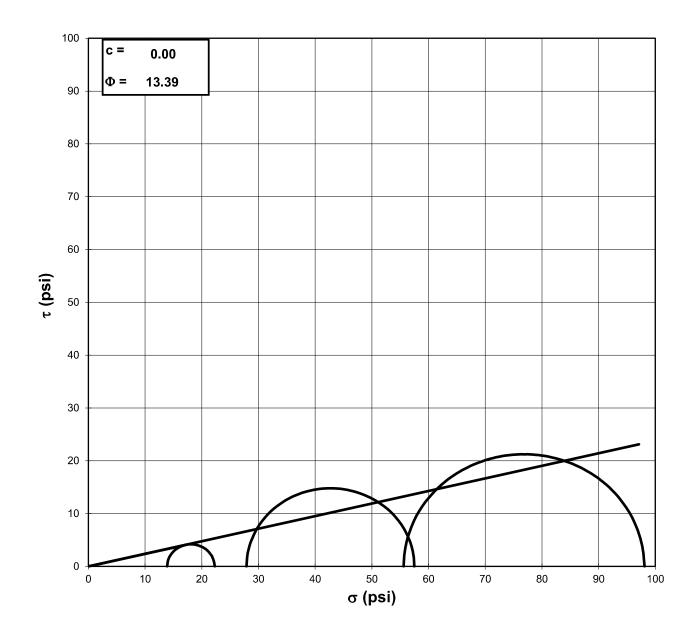
EB1-B 21.0-23.0 ST-1

### **Consolidated Undrained Triaxial Test with Pore Pressure**



AASHTO T-297

Client:	Kleinfelder
Client Reference:	BR-0097
Project No.:	R-2022-091-002
Lab ID:	R-2022-091-002-001
Visual Description:	Orange Clayey Silt (UNDIS
	0, , , , , ,



Failure Based on Maximum Effective Principal Stress Ratio

Approved By: MPS *Tested By:* 129-07-0411 Date: 4/27/22 page 2 of 10 DCN: CT-S28 DATE: 4/12/13 REVISION: 3

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# MOHR TOTAL STRENGTH ENVELOPE

Boring No.:	
Depth (ft):	
Sample No.:	

EB1-B 21.0-23.0 ST-1

STURBED)

NOTE: GRAPH NOT TO SCALE

Date: 5/5/22

AASHTO T-297



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

Client: Client Reference: Project No.:	Kleinfelder BR-0097 R-2022-091-002	C	Boring No.: Depth (ft): Bample No.:		EB1-B 21.0-23.0 ST-1		
Lab ID:	R-2022-091-002-00		·		-		
Visual Description:	Orange Clayey Silt	(UNDISTURBEI	))				
Stage No.	0		NITIAL SAM	PLE DIM	IENSIONS (in)		
Test No.	1	L	ength 1:	5.962	Diameter 1:	2.833	5
		L	ength 2:	5.971	Diameter 2:	2.836	5
PRESSURES (psi)			ength 3:	5.994	Diameter 3:	2.846	
			ength 4:	5.999	Diameter 4:	2.848	
Cell Pressure (psi)	63.89	Avg	g. Length:	5.982	Avg. Diam.:	2.841	
Back Pressure (psi)	50.0						
Eff. Conf. Pressure (psi)	13.9	V	<b>OLUME CH</b>	ANGE			
Pore Pressure		Ir	nitial Burette	Reading	(ml)	46.7	,
Response (%)	99	F	inal Burette	Reading	(ml)	26.7	,
		F	inal Change	(ml)		20.0	)
MAXIMUM OBLIQUITY	POINTS						
_			nitial Dial Rea			308	
P =	8.97		Dial Reading		• •	308	
Q =	4.18	D	ial Reading A	fter Conse	olidation (mil)	389	)
LOAD		DEFORMATIO	N		PORE PRESS	URE	
(LB)		(IN)			(PSI)		
6.3		0.000			50.0		_
10.0		0.001			50.5		
12.6		0.003			50.9		
20.0		0.009			52.4		
24.9		0.014			53.5		
28.8 33.4		0.020 0.030			54.4 55.3		
37.0		0.030			56.0		
41.0		0.051			56.7		
46.4		0.072			57.5		
51.7		0.103			58.2		
55.4		0.140			58.6		
57.5		0.175			58.9		
58.9		0.217			59.1		
59.6		0.246			59.1		
60.4 61.6		0.289 0.346			59.1 59.1		
62.4		0.346			59.1		
63.0		0.451			59.1		
63.8		0.512			59.0		
64.4		0.558			59.0		
64.6		0.603			59.0		
65.1		0.649			58.9		
65.3		0.678			58.9		
65.3 65.2		0.708			58.9		
65.2 65.3		0.738 0.768			58.9 58.8		
65.4		0.813			58.8		
65.1		0.858			58.7		
64.9		0.888			58.4		
64.4		0.918			58.3		
Tested By: 129-07-041	1 Date: 4/27/2	۰ I»	nput Checkee		GEM	Date	: 5/5/22

Client: Client Refe Project No Lab ID:		Kleinfelder BR-0097 R-2022-091 R-2022-091			Boring No.: Depth (ft): Sample No.:	EB1-B 21.0-23.0 ST-1		
Visual Des	scription:	Orange Clay	yey Silt (UND	ISTURE	BED)			
Effective C	Confining Pr	essure (psi)	13.9		Stage No. Test No		0 1	
INITIAL D		S			VOLUME CHANGE			
Initial Sam Initial Sam	ple Length ple Diamet ple Area (ir ple Volume	er (in) 1 <sup>2</sup> )	5.98 2.84 6.34 37.91		Volume After Consoli Length After Consolic Area After Consolida	dation (in)		36.69 5.90 6.218
Strain (%)	Deviator Stress PSI	ΔU	$\overline{\sigma}_1$	$\overline{\sigma}_3$	Effective Principal Stress Ratio	Ā	P	Q
0.03 0.06 0.15 0.24 0.34 0.50 0.66 0.87 1.22 1.74 2.37 2.97 3.68 4.18 4.89 5.87 6.89 7.65 8.68 9.45 10.22 10.99 11.50 12.00 12.51 13.02 13.78 14.55 15.06 15.57	0.60 1.02 2.20 3.00 3.61 4.34 4.91 5.53 6.37 7.18 7.72 7.99 8.15 8.22 8.28 8.37 8.40 8.43 8.44 8.43 8.44 8.43 8.42 8.39 8.35 8.30 8.26 8.19 8.08 8.01 7.89	0.50 0.94 2.44 3.54 4.38 5.28 5.96 6.66 7.50 8.21 8.64 8.93 9.06 9.11 9.08 9.01 9.08 9.01 8.98 8.96 8.92 8.91 8.88 8.85 8.82 8.78 8.66 8.40 8.31	$\begin{array}{c} 13.99\\ 13.97\\ 13.65\\ 13.34\\ 13.13\\ 12.95\\ 12.84\\ 12.76\\ 12.77\\ 12.86\\ 12.97\\ 12.95\\ 12.98\\ 13.01\\ 13.10\\ 13.15\\ 13.22\\ 13.26\\ 13.32\\ 13.36\\ 13.39\\ 13.38\\ 13.37\\ 13.33\\ 13.33\\ 13.31\\ 13.32\\ 13.49\\ 13.47\end{array}$	$\begin{array}{c} 13.4\\ 13.0\\ 11.5\\ 10.3\\ 9.5\\ 8.6\\ 7.2\\ 6.4\\ 5.7\\ 5.0\\ 4.8\\ 4.8\\ 4.8\\ 4.9\\ 4.9\\ 5.0\\ 5.0\\ 5.0\\ 5.1\\ 1.2\\ 5.5\\ 5.6\end{array}$	1.045 1.079 1.192 1.289 1.380 1.504 1.619 1.764 1.997 2.263 2.470 2.610 2.686 2.720 2.720 2.720 2.720 2.746 2.746 2.746 2.746 2.746 2.746 2.746 2.708 2.692 2.684 2.692 2.684 2.665 2.648 2.628 2.603 2.545 2.460 2.414	0.84 0.93 1.12 1.19 1.22 1.23 1.23 1.22 1.19 1.15 1.13 1.13 1.12 1.12 1.11 1.09 1.09 1.09 1.09 1.09 1.07 1.07 1.07 1.07 1.07 1.07 1.07 1.07 1.07 1.07 1.07 1.08 1.06	13.69 13.46 12.55 11.85 11.32 10.78 10.39 10.00 9.58 9.27 9.11 8.96 8.91 8.98 8.96 8.97 9.01 9.04 9.15 9.18 9.19 9.20 9.21 9.27 9.49 9.52	0.30 0.51 1.10 1.50 1.81 2.17 2.45 2.76 3.19 3.59 3.86 3.99 4.07 4.11 4.14 4.20 4.21 4.22 4.23 4.21 4.22 4.23 4.21 4.22 4.21 4.22 4.21 4.22 4.21 4.20 3.94

page 3 of 10 DCN: CT-S28 DATE: 4/12/13 REVISION: 3 Sigmatriax.xls 2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net



AASHTO T-297



CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS -297

			WITH PORE	NTO T-	
Client: Client Ref Project No Lab ID:		Kleinfelder BR-0097 R-2022-09 <sup>7</sup> R-2022-09 <sup>7</sup>			Bo Do Sa
Visual Des	scription:	Orange Cla	ayey Silt (UNI	DISTURE	BED
Effective (	Confining Pre	essure (psi)	27.9		Si Te
INITIAL D	IMENSIONS	5			V
Initial Sam Initial Sam	nple Length ( nple Diamete nple Area (in <sup>2</sup> nple Volume	r (in) ²)	6.20 2.85 6.38 39.52		Vo Le Ar
Strain (%)	Deviator Stress PSI	ΔU	$\overline{\sigma}_1$	$\overline{\sigma_3}$	Ei Si
0.02 0.05 0.15 0.24 0.34 0.64 0.86 1.21 1.73 2.34 2.97 3.69 4.19 4.92 5.91 6.93 7.71 8.73 9.51 10.28 11.05 11.57 12.08 12.59 13.11 13.89 14.66	0.30 0.56 0.86 4.30 7.06 10.30 12.90 15.47 18.85 22.17 26.86 27.89 28.32 28.63 29.10 29.60 29.21 29.30 29.42 29.51 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.35 28.94 29.31	0.50 0.70 1.00 1.27 2.96 5.35 7.04 8.94 11.07 13.28 14.72 15.62 16.33 16.55 16.94 17.01 17.17 17.04 17.17 17.06 16.91 16.96 16.92 16.88 16.92 16.85 16.54 16.54 16.62	27.69 27.75 30.92 31.99 32.84 33.75 34.42 35.67 36.79 38.24 39.13 39.44 39.66 39.59 39.98 40.31 40.31 39.93 40.31 39.93 40.31 39.93 40.31 39.93 40.31 39.93 40.31 39.93 40.31 39.93 40.44 40.42 39.96 39.37 38.58 37.15 35.95 34.58	27.4 27.2 26.9 26.6 24.9 22.5 20.8 19.0 16.8 14.6 13.2 12.3 11.6 11.3 11.0 10.9 10.7 10.9 10.7 10.9 10.7 10.8 11.0 10.9 11.1 11.0 11.0 11.0 11.3 11.3	

page 6 of 10

Client:	Kleinfelder	Boring No.:	EB1-B
Client Reference:	BR-0097	Depth (ft):	21.0-23.0
Project No.: Lab ID:	R-2022-091-002 R-2022-091-002-001	Sample No.:	ST-1

#### Visual Description: Orange Clayey Silt (UNDISTURBED)

Stage No.	0	INITIAL SAM		IENSIONS (in)	
Test No.	2	Length 1:	6.228	Diameter 1:	2.851
F		Length 2:	6.143	Diameter 2:	2.857
PRESSURES (psi)		Length 3:	6.228	Diameter 3:	2.853
		Length 4:	6.195	Diameter 4:	2.836
Cell Pressure (psi)	77.89	Avg. Length	6.199	Avg. Diam.:	2.849
Back Pressure (psi)	50.0				
Eff. Conf. Pressure (psi)	27.9	VOLUME CH	IANGE		
Pore Pressure		Initial Burette	Reading	(ml)	46.0
Response (%)	97	Final Burette	Reading	(ml)	15.6
		Final Change	e (ml)		30.4
MAXIMUM OBLIQUITY P	OINTS				
		Initial Dial Re	eading (m	il)	365
<u>P</u> =	25.52	Dial Reading	After Sa	turation (mil)	375
Q =	14.80	Dial Reading A	After Conso	olidation (mil)	528

LOAD	DEFORMAT	ION	PORE PRESSU	RE	
(LB)	(IN)		(PSI)		
12.2	0.000		50.0		
14.1	0.001		50.5		
15.7	0.003		50.7		
17.6	0.009		51.0		
39.0	0.014		51.3		
56.2	0.020		53.0		
76.5	0.029		55.4		
92.8	0.038		57.0		
109.1	0.052		58.9		
130.7	0.073		61.1		
152.3	0.104		63.3		
171.6	0.142		64.7		
184.1	0.179		65.6		
192.0	0.222		66.3		
195.8	0.253		66.5		
199.2	0.297		66.9		
204.3	0.357		67.0		
209.7	0.418		67.2		
210.4	0.465		67.0		
211.0	0.527		67.2		
213.2	0.574		67.1		
215.8	0.621		66.9		
218.2	0.667		67.0		
218.3	0.698		66.8		
216.6	0.729		66.9		
213.9	0.760		66.9		
209.6	0.791		66.9		
200.5	0.838		66.8		
191.2	0.885		66.5		
182.9	0.917		66.6		
175.9	0.948		66.5		
Tested By: 129-07-0411	Date: 4/27/22	Input Checked By:	GEM	Date:	5/5/22
	N: CT-S28 DATE: 4/12/13 REVISION: 3	. ,			

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Boring No.:	EB1-B
Depth (ft):	21.0-23.0
Sample No.:	ST-1

#### BED)

Stage No. Test No		0 2	
VOLUME CHANGE			
Volume After Consolida Length After Consolida Area After Consolidatio	ition (in)		37.48 6.04 6.209
Effective Principal Stress Ratio	Ā	P	Q
1.011 1.021 1.032 1.162 1.283 1.457 1.619 1.816 2.121 2.517 2.903 3.189 3.413 3.497 3.614 3.676 3.762 3.714 3.724 3.704 3.679 3.701 3.650 3.628 3.586 3.518 3.364 3.168 3.069 2.955	1.72 1.28 1.20 0.30 0.43 0.54 0.60 0.61 0.60 0.61 0.63 0.67 0.69 0.74 0.77	27.54 27.47 27.32 28.77 28.46 27.69 27.30 26.69 26.24 25.70 25.71 25.70 25.50 25.50 25.50 25.50 25.52 25.43 25.52 25.43 25.52 25.43 25.52 25.43 25.52 25.48 25.58 25.69 25.68 25.75 25.48 25.48 22.92 22.48	0.15 0.28 0.43 2.15 3.53 5.15 6.45 7.73 9.43 11.09 12.53 13.43 13.94 14.16 14.32 14.55 14.80 14.73 14.61 14.65 14.71 14.65 14.71 14.67 14.67 14.47 14.67 14.47 14.20 13.81 13.05 12.30 11.65 11.11



#### AASHTO T-297

Client: Client Reference: Project No.: Lab ID:	Kleinfelder BR-0097 R-2022-091 R-2022-091		Boring No.: Depth (ft): Sample No.:		EB1-B 21.0-23.0 ST-1		
Visual Description:	Orange Clay	yey Silt (UNDISTUF	STURBED)				
Stage No.	0		INITIAL SAM		IENSIONS (in)		
Test No.	3		Length 1:	6.113	Diameter 1:	2.811	
			Length 2:	6.133	Diameter 2:	2.840	
PRESSURES (psi)			Length 3:	6.132	Diameter 3:	2.835	
			Length 4:	6.164	Diameter 4:	2.827	
Cell Pressure (psi)	105.6		Avg. Length:	6.136	Avg. Diam.:	2.828	
Back Pressure (psi)	50.0						
Eff. Conf. Pressure (psi)	55.6						
Pore Pressure			Initial Burette			92.8	
Response (%)	97		Final Burette		(ml)	21.7	
			Final Chang	e (ml)		71.1	
MAXIMUM OBLIQUITY	POINTS						
			Initial Dial Re	eading (m	nil)	240	
<u>P</u> =	35.93		Dial Reading	g After Sa	turation (mil)	248	
Q =	21.22		Dial Reading	After Cons	olidation (mil)	534	
LOAD		DEFORMA			PORE PRESSL	JRE	
(LB)		(IN)			(PSI)		
18.4		0.000	1		50.0		
19.6		0.001			50.1		
24.2		0.002			50.4		
75.0		0.008			55.6		
110.6 135.6		0.014 0.020			61.1 65.6		
161.7		0.020			70.6		
180.1		0.039			74.2		
196.7		0.051			77.9		
215.8		0.072			82.0		
232.3		0.102			85.4		
245.0		0.140			87.7		
254.1 261.8		0.177 0.220			89.1 89.9		
266.9		0.251			90.4		
272.6		0.294			90.6		
278.9		0.353			90.9		
284.3		0.414			90.9		
287.0		0.460			90.9		
288.7 290.2		0.522 0.568			90.8 90.7		
290.2		0.614			90.7		
293.5		0.660			90.5		
294.3		0.691			90.6		
295.7		0.722			90.6		
296.6		0.753			90.5		
297.5 299.3		0.783 0.830			90.5 90.4		
299.3 301.4		0.830			90.4 90.4		
302.0		0.908			90.3		
302.7		0.938			90.3		
Tested By: 129-07-041	1 Date:	4/27/22	Input Checke	ed By:	GEM	Date:	
nade 7 of 10	BOUL 07 000 BUT	E: 4/12/13 DEV/ISION: 3					

page 7 of 10

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

## WITH PORE PRESSURE READINGS AASHTO T-297

Client: Client Refe Project No Lab ID:		Kleinfelder BR-0097 R-2022-091 R-2022-091			Boring No.: Depth (ft): Sample No.:	EB1-B 21.0-23.0 ST-1		
Visual Des	scription:	Orange Cla	yey Silt (UNI	DISTURE	BED)			
Effective C	Confining Pro	essure (psi)	55.6		Stage No. Test No		0 3	
INITIAL D	MENSIONS	3			VOLUME CHANGE			
Initial Sam Initial Sam	ple Length ( ple Diamete ple Area (in ple Volume	er (in) <sup>2</sup> )	6.14 2.83 6.28 38.55		Volume After Consoli Length After Consolic Area After Consolidat	lation (in)		34.06 5.84 5.830
Strain (%)	Deviator Stress PSI	ΔU	$\overline{\sigma}_1$	$\overline{\sigma}_3$	Effective Principal Stress Ratio	Ā	P	Q
0.02 0.04 0.14 0.24 0.34 0.51 0.66 0.87 1.23 1.75 2.40 3.03 3.76 4.29 5.03 6.04 7.09 7.88 8.93 9.73 10.51 11.31 11.83 12.35 12.89 13.41 14.21 15.00 15.54 16.06	0.20 0.99 9.69 15.77 20.03 24.45 27.54 30.32 33.43 36.04 37.93 39.20 40.17 40.78 41.40 41.98 42.37 42.44 42.23 42.08 42.00 41.84 41.72 41.69 41.56 41.45 41.34 41.26 41.09 40.93	0.09 0.45 5.64 11.10 15.58 20.60 24.22 27.88 32.02 35.45 37.69 39.08 39.08 40.35 40.63 40.85 40.90 40.89 40.73 40.67 40.52 40.60 40.59 40.53 40.47 40.45 40.38 40.28	55.71 56.14 59.65 60.27 60.05 59.45 58.92 58.04 57.01 56.19 55.84 55.72 55.90 56.03 56.37 57.07 56.93 56.73 56.73 56.73 56.92 56.92 56.63 56.73 56.73 56.73 56.73 56.63 56.63 56.49 56.47 56.36 56.26	$\begin{array}{c} 55.5\\ 55.2\\ 50.0\\ 44.5\\ 40.0\\ 35.0\\ 31.4\\ 27.7\\ 23.6\\ 20.2\\ 17.9\\ 16.5\\ 15.7\\ 15.2\\ 15.0\\ 14.7\\ 14.8\\ 14.9\\ 15.1\\ 15.0\\ 15.1\\ 15.2\\ 15.3\\ 15.3\end{array}$	1.004 1.018 1.194 1.354 1.501 1.699 1.878 2.094 2.418 2.788 3.117 3.373 3.555 3.675 3.675 3.846 3.884 3.884 3.886 3.845 3.845 3.829 3.814 3.775 3.781 3.778 3.778 3.778 3.778 3.778 3.778 3.778 3.778 3.778 3.778 3.778 3.778 3.778 3.778 3.778 3.778 3.779 3.771 3.729 3.711 3.689 3.672	0.48 0.47 0.60 0.73 0.80 0.87 0.91 0.95 0.99 1.01 1.02 1.01 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.01 1.01 1.01 1.01 1.01	55.61 55.65 54.80 52.39 50.03 47.22 45.15 42.88 40.29 36.12 35.81 35.64 35.64 35.64 35.64 35.64 35.64 35.64 35.93 35.93 35.96 35.92 35.93 35.92 35.85 35.85 35.85 35.85 35.85 35.82 35.79	0.10 0.49 4.84 7.88 10.01 12.23 13.77 15.16 16.71 18.02 18.96 19.60 20.09 20.39 20.70 20.99 21.19 21.22 21.11 21.04 21.00 20.92 20.86 20.85 20.73 20.63 20.54 20.47

page 8 of 10

5/5/22

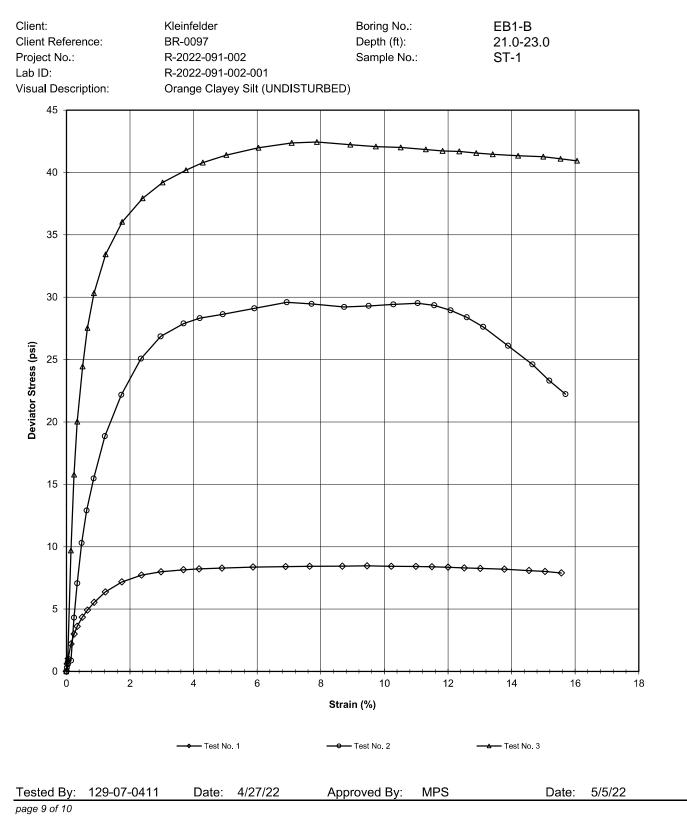


# CONSOLIDATED UNDRAINED TRIAXIAL TEST

Boring No.:	EB1-B
Depth (ft):	21.0-23.0
Sample No.:	ST-1



AASHTO T-297



	WITH PO	RE PRESSURE RI ASTM D4767-11	EADINGS	
Client: Client Reference: Project No.: Lab ID:	Kleinfelder BR-0097 R-2022-091-002 R-2022-091-002-0	01 Spe	ecific Gravity (assumed	) 2.68
Visual Description:	Orange Clayey Sill	(UNDISTURBED)		
	SAMPLE	CONDITION SI	JMMARY	
Boring No.: Depth (ft): Sample No.:		EB1-B 21.0-23.0 ST-1	EB1-B 21.0-23.0 ST-1	EB1-B 21.0-23.0 ST-1
Test No. Deformation Rate (ir Back Pressure (psi) Consolidation Time		T1 0.002 50.0 1	T2 0.002 50.0 1	T3 0.002 50.0 1
Moisture Content (% Total Unit Weight (p Dry Unit Weight (pcf Moisture Content (% Initial State Void Rat Void Ratio at Shear,	cf) ) ) (FINAL) tio,e	47.8 100.6 68.0 58.9 1.459 1.380	47.8 103.9 70.3 45.6 1.381 1.258	47.8 108.5 73.4 42.6 1.279 1.014
Ĩ				
Tested By: 129-07-04	11 Date: 4/27/2	20	ut Checked By: GE	M Date: 5/5

page 10 of 10 DCN: CT-S28 DATE: 4/12/13 REVISION: 3



# CONSOLIDATED UNDRAINED TRIAXIAL TEST

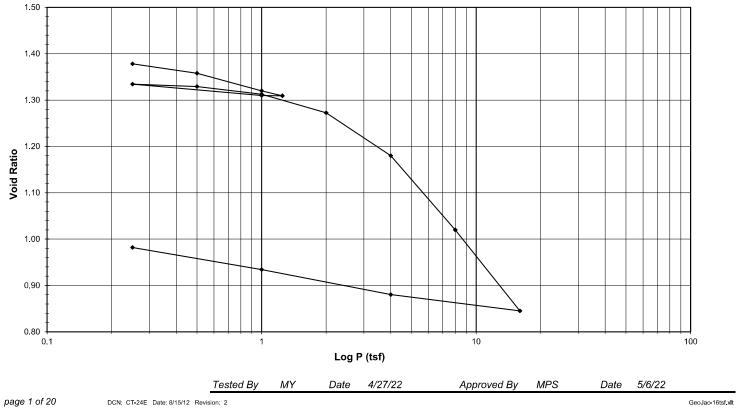
	Specific Gravity	(assumed)	2.68
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#### ONE DIMENSIONAL CONSOLIDATION AASHTO T-216

EB1-B Client: Kleinfelder Boring No.: 21.0-23.0 Depth (ft): Sample No.: Client Project: BR-0097 ST-1 R-2022-091-002 Project No.: Lab ID: R-2022-091-002-001 Visual Description: Orange Elastic Silt

Sample Conditions: Undisturbed, Inundated, Double Drained



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ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client:	Kleinfelder
Client Project:	BR-0097
Project No.:	R-2022-091-002
Lab ID:	R-2022-091-002-001
Sample Conditions:	Undisturbed, Inundated, Double Drained
Consolidometer No.	R-409
1 Division =	0.0001 (in.)

			•								
Water Content				Applied	Final Dial	Machine	Corrected	Height of	Volume	Dry	Void
Tare Number	485	473		Pressure	Reading	Deflection	Reading	Sample		Density	Ratio
Wt. of Tare & WS (g)	412.41	222.53		(tsf)	(div)	(div)	(div)	(mm)	(cm <sup>3</sup> )	(g/cm <sup>3</sup> )	
Wt. of Tare & DS (g)	311.15	189.13				· · ·	· · ·	· · ·			
Wt. of Water (g)	101.26	33.40		Seating	0	0	0	25.400	80.440	1.12050	1.3918
Wt. of Tare (g)	99.33	97.81		0.25	106.2	49.4	56.8	25.256	79.983	1.12689	1.3782
Wt. of DS (g)	211.82	91.32		0.5	208.6	67.4	141.2	25.041	79.304	1.13655	1.3580
Water Content (%)	47.80	36.57		1	385.6	84.9	300.7	24.636	78.021	1.15523	1.3198
				1.25	437.7	92.9	344.8	24.524	77.666	1.16051	1.3093
Sample Parameters				1	435.2	91.7	343.5	24.528	77.677	1.16035	1.3096
Sample Diameter (in)	2.5	2.5		0.25	313.4	73.2	240.2	24.790	78.507	1.14808	1.3343
Sample Height (in)	1.0000	0.8286		0.5	341.4	79.5	261.9	24.735	78.333	1.15063	1.3291
Sample Volume (cm <sup>3</sup> )	80.44	66.65		1	420.8	89.0	331.8	24.557	77.771	1.15895	1.3124
Wt. of Wet Sample + Ring (g)	347.89	337.77		2	612.9	114.4	498.5	24.134	76.430	1.17929	1.2725
Wt. of Ring (g)	214.67	214.67		4	1033.5	148.1	885.5	23.151	73.317	1.22935	1.1800
Wt. of Wet Sample (g)	133.22	123.10		8	1742.6	188.0	1554.6	21.451	67.934	1.32676	1.0199
Wet Density (pcf)	103.34	115.24		16	2520.6	234.8	2285.7	19.594	62.053	1.45250	0.8451
Wet Density (g/cm <sup>3</sup> )	1.66	1.85		4	2314.8	175.5	2139.3	19.966	63.232	1.42543	0.8801
Water Content (%)	47,80	36.57		1	2054.7	142.1	1912.6	20,542	65,055	1.38549	0.9343
Wt. of Dry Sample (g)	90.13	90.13		0.25	1823.7	109.9	1713.8	21.047	66.654	1.35225	0.9818
Dry Density (pcf)	69.92	84.38									
Dry Density (g/cm <sup>3</sup> )	1.12	1.35									
Void Ratio	1.3918	0.9819									
Saturation (%)	92.05	99.83									
Specific Gravity	2.68	Assumed									
			Tested By	MY	Date	4/27/22	С	hecked By	MPS	Date	5/6/22



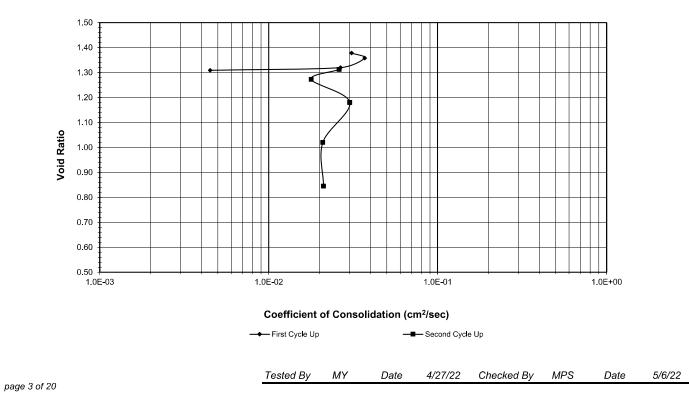
EB1-B 21.0-23.0 Boring No.: Depth (ft): ST-1 Sample No : Visual Description: Orange Elastic Silt

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AASHTO T-216

Client:	Kleinfelder	Boring No.:	EB1-B
Client Project:	BR-0097	Depth (ft):	21.0-25.0
Project No :	R-2022-091-002	Sample No :	ST-1 & ST-2
Lab ID:	R-2022-091-002-001	Visual Description:	Orange Elastic Silt

Sample Conditions: Undisturbed, Inundated, Double Drained



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AASHTO T-216

Client:	Kleinfelder
Client Project:	BR-0097
Project No.:	R-2022-091-002
Lab ID:	R-2022-091-002-001
Sample Conditions:	Undisturbed, Inundated, Double Drained
Consolidometer No.	R-409
1 Division =	0.0001 (in.)

						U <sub>v</sub> _	est Data Sumn	lai y		
Sample Properties	Initial	Final		Load	Dial	Machine	Corrected	Sample	Time	C,
Water Content				Increment			Dial Reading	Height	t 50	U <sub>v</sub>
Tare Number	485	473			$@ t_{50}$		@ t <sub>50</sub>	$@ t_{50}$	- 50	
Wt. of Tare & WS (g)	412.41	222.53		(tsf)	(div)	(div)	(div)	(cm)	(min.)	(cm²/sec)
Wt. of Tare & DS (g)	311.15	189.13	-	(10.)	()	()	(0.1)	(0)	()	(000.000)
Wt. of Water (q)	101.26	33.40		0 - 0.25	77.9	49.4	28.5	2.533	0.17	0.0310
Wt. of Tare (g)	99.33	97.81		0.25 - 0.5	176.6	67.4	109.1	2.512	0.14	0.0370
Wt. of DS (g)	211.82	91.32		0.5 - 1	314.6	84.9	229.7	2.482	0.19	0.0266
Water Content (%)	47.80	36.57		1 - 1.25	421.6	92.9	328.7	2.457	1.10	0.0045
. ,				1.25 - 1	NA	91.7	NA	NA	NA	NA
Sample Parameters				1 - 0.25	NA	NA	NA	NA	NA	NA
Sample Diameter (in)	2.5	2.5		0.25 - 0.5	NA	NA	NA	NA	NA	NA
Sample Height (in)	1.0000	0.8286		0.5 - 1	405.7	89.0	316.7	2.460	0.19	0.0261
Sample Volume (cm <sup>3</sup> )	80.44	66.65		1 - 2	573.0	114.4	458.6	2.424	0.27	0.0179
Wt. of Wet Sample + Ring (g)	347.89	337.77		2 - 4	899.1	148.1	751.0	2.349	0.15	0.0302
Wt. of Ring (g)	214.67	214.67		4 - 8	1532.2	188.0	1344.2	2.199	0.19	0.0209
Wt. of Wet Sample (g)	133.22	123.10		8 - 16	2247.9	234.8	2013.1	2.029	0.16	0.0211
Wet Density (pcf)	103.34	115.24		16 - 4	NA	175.5	NA	NA	NA	NA
Wet Density (g/cm <sup>3</sup> )	1.66	1.85		4 - 1	NA	NA	NA	NA	NA	NA
Water Content (%)	47.80	36.57		1 - 0.25	NA	NA	NA	NA	NA	NA
Wt. of Dry Sample (g)	90.13	90.13		0.25 - 0	NA	NA	NA	NA	NA	NA
Dry Density (pcf)	69.92	84.38								
Dry Density (g/cm <sup>3</sup> )	1,12	1.35								
Void Ratio	1.3918	0.9819								
Saturation (%)	92.05	99.83								
Specific Gravity	2.68	Assumed								
· •			Tested By	MY	Date	4/27/22	Checked Bv	MPS	Date	5/6/22

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#### ONE DIMENSIONAL CONSOLIDATION

Boring No.:	EB1-B
Depth (ft):	21.0-23.0
• • •	ST-1
Sample No.:	0
Visual Description:	Orange Elastic Silt

#### C<sub>v</sub> Test Data Summary

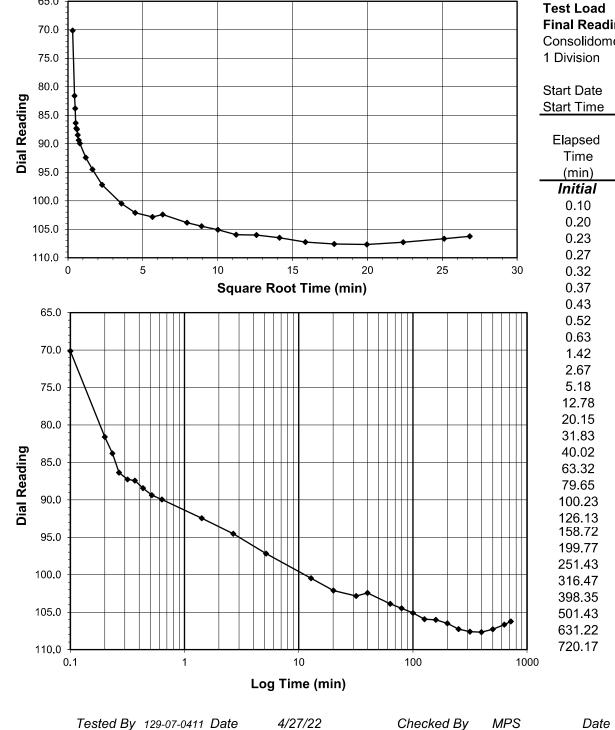
AASHTO T-216



### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Client: Kleinfelder Boring No.: Client: Kleinfelder EB1-B 21.0-23.0 **Client Project:** BR-0097 Depth (ft): **Client Project:** BR-0097 ST-1 Project No.: R-2022-091-002 Sample No.: Project No.: R-2022-091-002 Lab ID: R-2022-091-002-001 Visual Description: **Orange Elastic Silt** Lab ID: Sample Conditions: Undisturbed, Inundated, Double Drained 65.0



DCN: CT-24E Date: 8/15/12 Revision: 2

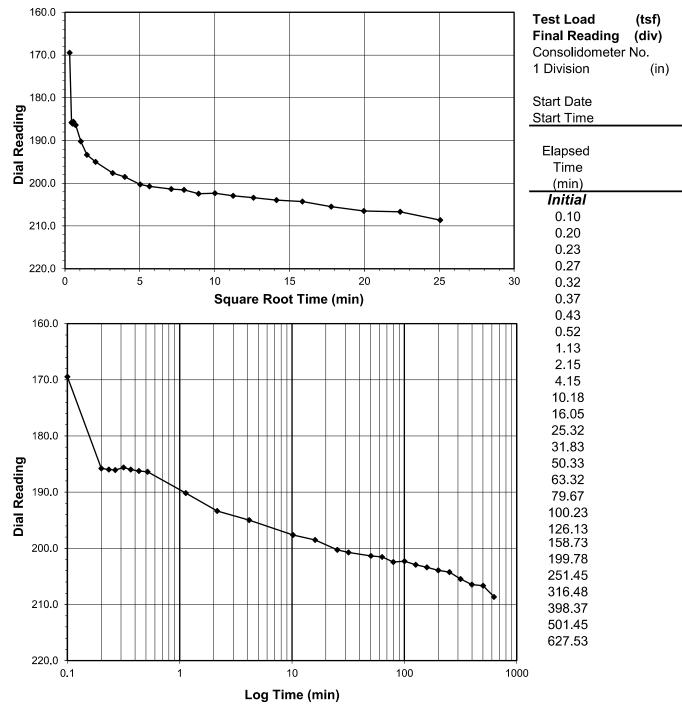
page 5 of 20

<b>Test Load (tsf)</b>	0 - 0.25
Final Reading (div)	106.2
Consolidometer No.	R-409
1 Division (in)	0.0001
Start Date	4/27/22
Start Time	10:41:22
Elapsed	Dial
Time	Reading
(min)	(div)
<b>Initial</b>	<b>0.0</b>
0.10	70.1
0.20	81.6
0.23	83.8
0.27	86.4
0.32	87.3
0.37	87.4
0.43	88.4
0.52	89.4
0.63	89.9
1.42	92.4
2.67	94.5
5.18	97.2
12.78	100.5
20.15	102.1
31.83	102.8
40.02	102.4
63.32	103.9
79.65	104.5
100.23	105.1
126.13	106.0
158.72	106.0
199.77	106.5
251.43	107.3
316.47	107.6
398.35	107.7
501.43	107.3
631.22	106.7
720.17	106.2

5/6/22

GeoJac-16tsf.xlt

R-2022-091-002-001 Sample Conditions: Undisturbed, Inundated, Double Drained



Tested By 129-07-041: Date 4/27/22 page 6 of 20 DCN: CT-24E Date: 8/15/12 Revision: 2



0.25 - 0.5

208.6

R-409

0.0001

4/27/22

22:41:32

Dial

Reading

(div)

106.2

169.4

185.8

186.0

186.1

185.6

186.0

186.2

186.4

190.2

193.4

195.0

197.6

198.5

200.3

200.7

201.4

201.6

202.5

202.3

202.9

203.4

203.9 204.3

205.5

206.5

206.7 208.6

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

EB1-B 21.0-23.0 ST-1 Orange Elastic Silt

Checked By MPS Date 5/6/22

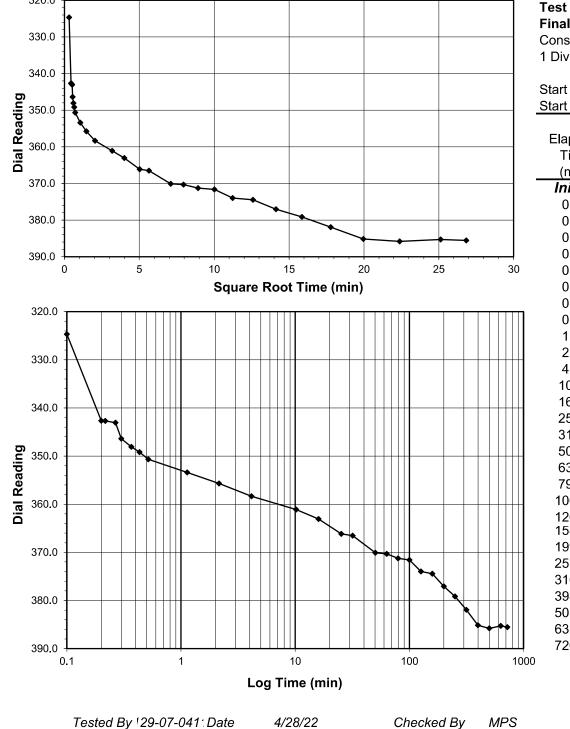
AASHTO T-216



### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Client: Kleinfelder Boring No.: Client: Kleinfelder EB1-B 21.0-23.0 **Client Project:** BR-0097 **Client Project:** BR-0097 Depth (ft): ST-1 Project No.: R-2022-091-002 Sample No .: Project No.: R-2022-091-002 Lab ID: R-2022-091-002-001 Visual Description: Orange Elastic Silt Lab ID: Sample Conditions: Undisturbed, Inundated, Double Drained 320.0 410.0



DCN: CT-24E Date: 8/15/12 Revision: 2

page 7 of 20

<b>Test Load</b> <b>Final Readin</b> Consolidome 1 Division		<b>0.5 - 1</b> <b>385.6</b> <b>R-409</b> 0.0001
Start Date Start Time		4/28/22 9:09:05
Elapsed Time (min) <i>Initial</i> 0.10 0.20 0.22 0.27 0.30 0.37 0.43 0.52 1.13 2.15 4.15 10.17 16.03 25.30 31.82 50.32 63.30 79.63 100.22 126.12 158.72 199.75 251.42 316.47 398.35 501.43 621.20		Dial Reading (div) <b>208.6</b> 324.7 342.7 342.7 342.7 343.1 346.4 348.1 349.2 350.7 353.4 355.7 358.3 361.1 366.1 366.5 370.1 366.5 370.1 366.5 370.1 366.5 370.1 371.6 371.6 371.6 374.0 374.4 377.1 379.1 381.9 385.2 385.8 285.8
631.20 720.37 00		385.3 385.6
Date	5/6/22	

GeoJac-16tsf.xlt

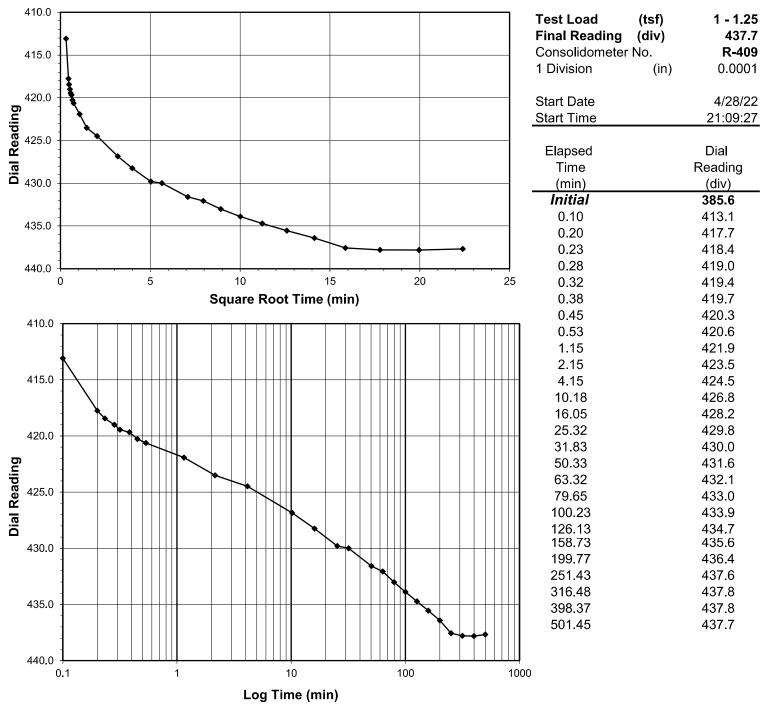
# R-2022-091-002-001

Tested By 129-07-041: Date

DCN: CT-24E Date: 8/15/12 Revision: 2

page 8 of 20

#### Sample Conditions: Undisturbed, Inundated, Double Drained



4/28/22



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

EB1-B 21.0-23.0 ST-1 Orange Elastic Silt

Checked By MPS Date

5/6/22

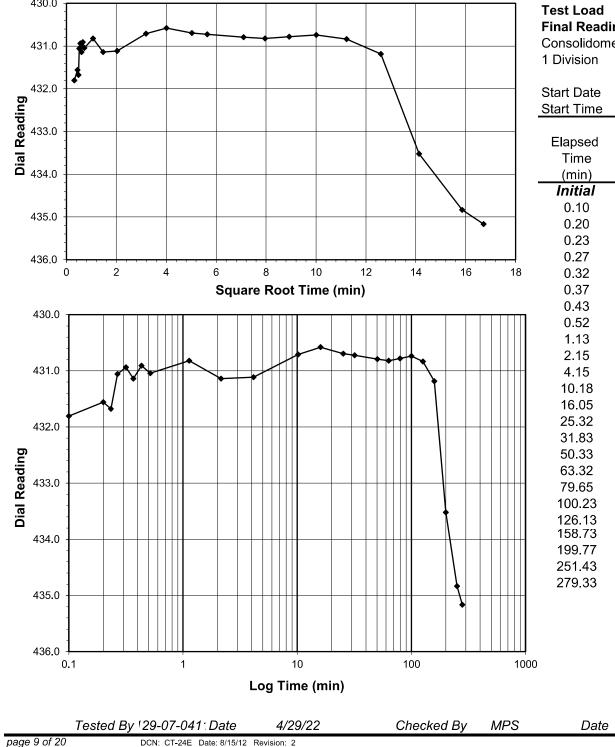
AASHTO T-216

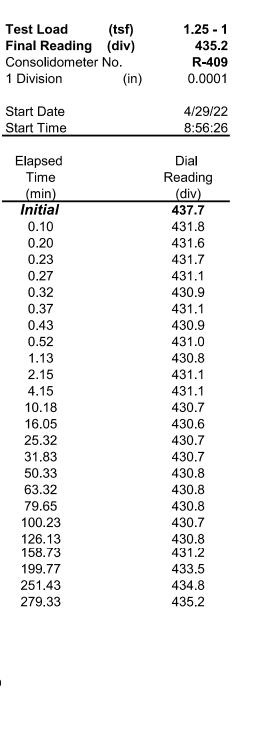


#### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216







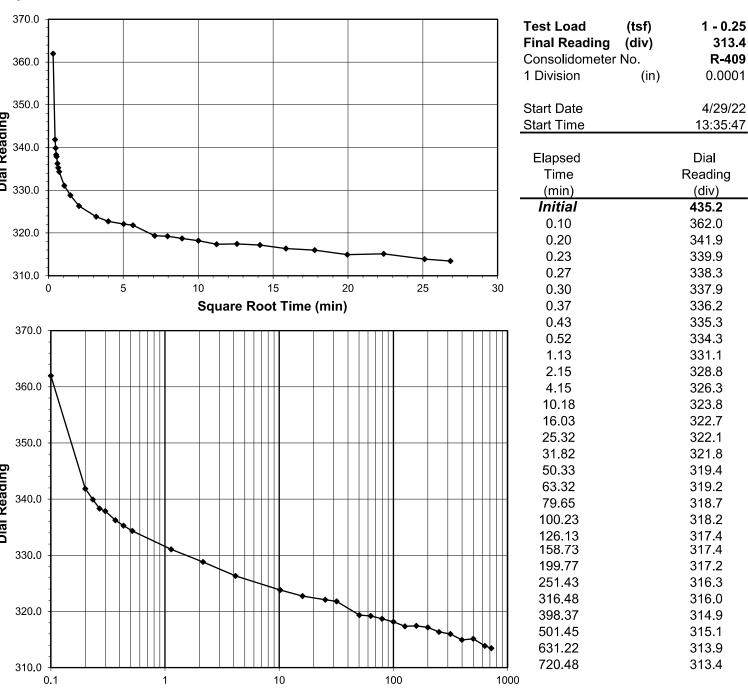
5/6/22

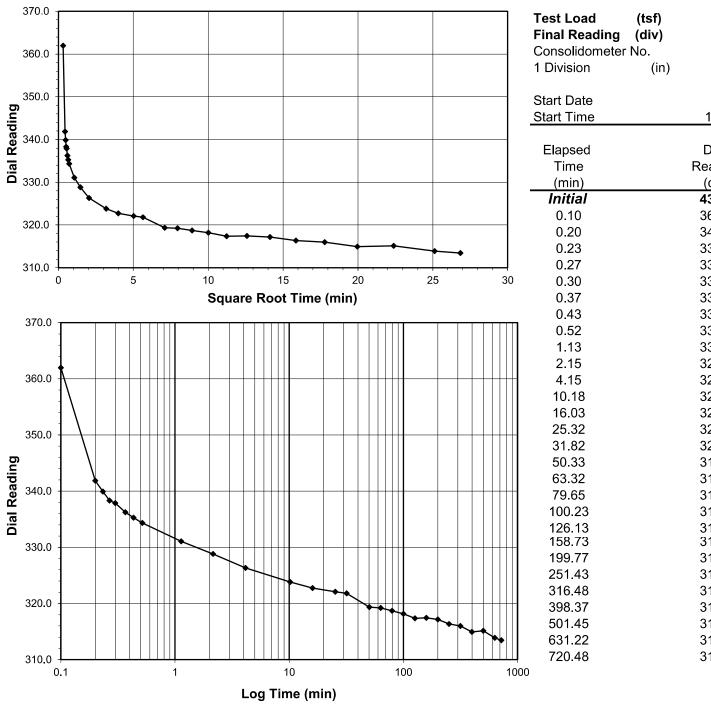
GeoJac-16tsf.xlt

Tested By 129-07-041: Date

DCN: CT-24E Date: 8/15/12 Revision: 2

page 10 of 20





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4/29/22



313.4

R-409

0.0001

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

EB1-B 21.0-23.0 ST-1 Orange Elastic Silt

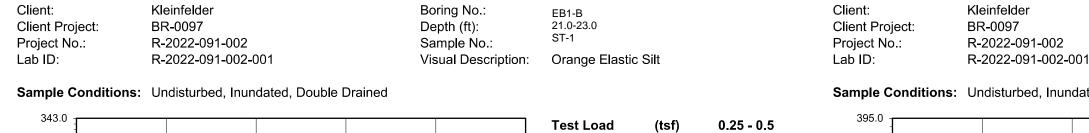
Checked By MPS Date 5/6/22

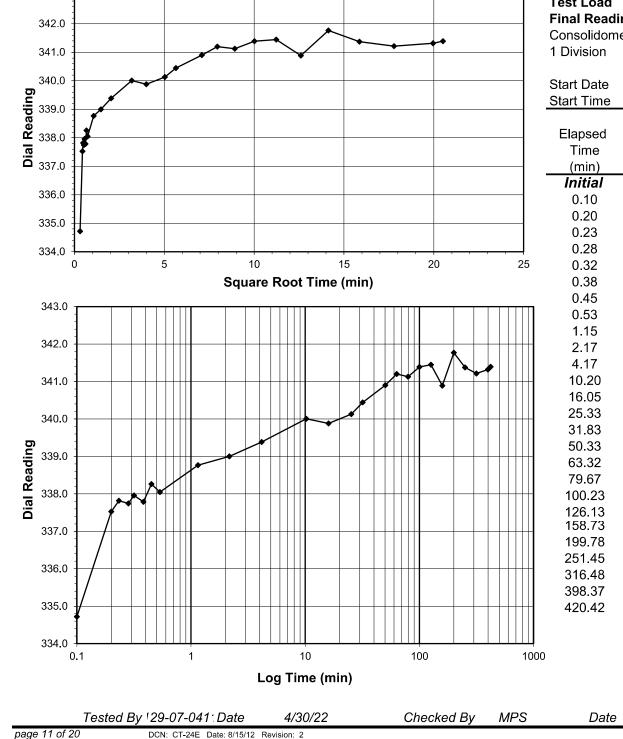
AASHTO T-216

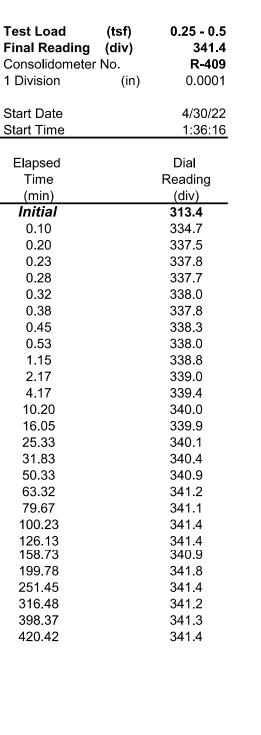


### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216







5/6/22

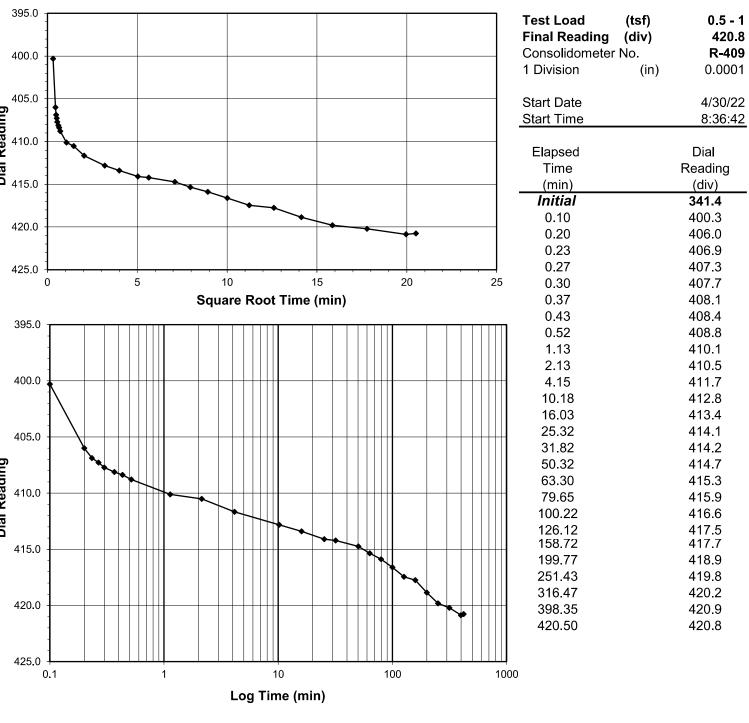
GeoJac-16tsf.xlt

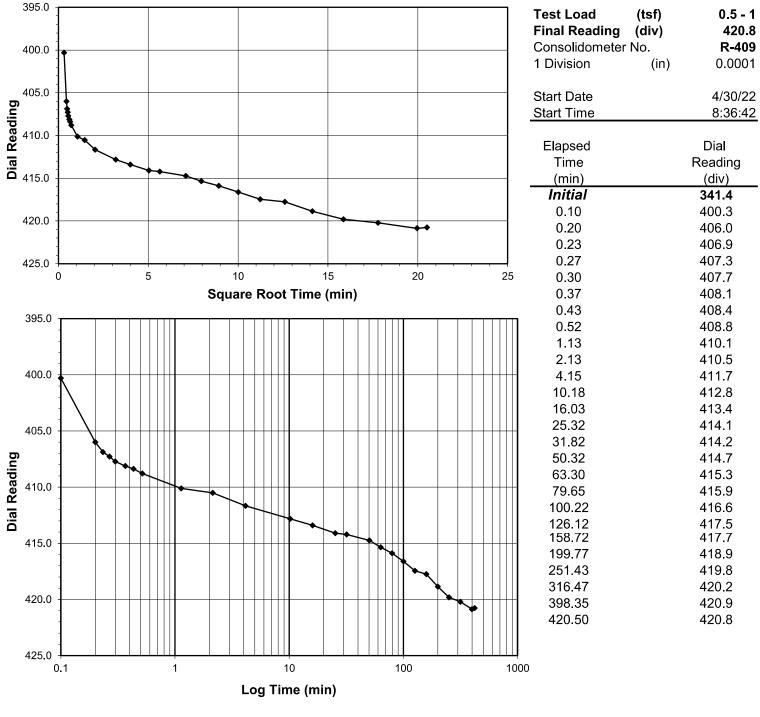
### Sample Conditions: Undisturbed, Inundated, Double Drained

Tested By 129-07-041: Date

DCN: CT-24E Date: 8/15/12 Revision: 2

page 12 of 20





4/30/22



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

EB1-B 21.0-23.0 ST-1 Orange Elastic Silt

Checked By MPS Date 5/6/22

AASHTO T-216



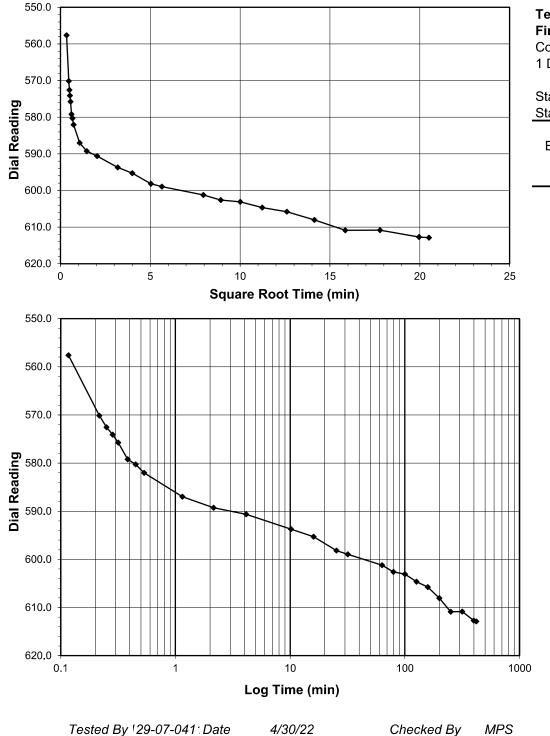
### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Client:	Kleinfelder	Boring No.:	EB1-B	Client:	Kleinfelder
Client Project:	BR-0097	Depth (ft):	21.0-23.0	Client Project:	BR-0097
Project No.:	R-2022-091-002	Sample No.:	ST-1	Project No.:	R-2022-09
Lab ID:	R-2022-091-002-001	Visual Description:	Orange Elastic Silt	Lab ID:	R-2022-09

### Sample Conditions: Undisturbed, Inundated, Double Drained

page 13 of 20



DCN: CT-24E Date: 8/15/12 Revision: 2

<b>Test Load (t</b> : <b>Final Reading (d</b> Consolidometer No 1 Division	•
Start Date Start Time	4/30/22 15:37:13
Elapsed Time (min) <i>Initial</i> 0.12 0.22 0.25 0.28 0.32 0.38 0.45 0.53 1.15 2.15 4.15 10.18 16.05 25.32 31.83 63.30 79.65 100.22 126.12 158.72	Dial Reading (div) <b>420.8</b> 557.6 570.1 572.6 574.1 575.7 579.2 580.3 582.0 587.0 587.0 589.3 590.6 593.7 595.3 598.2 599.0 601.2 602.6 603.1 604.6 605.8
199.75 251.42 316.47 398.35 420.48	608.1 610.9 610.9 612.7 612.9
	2

Date 5/6/22

GeoJac-16tsf.xlt

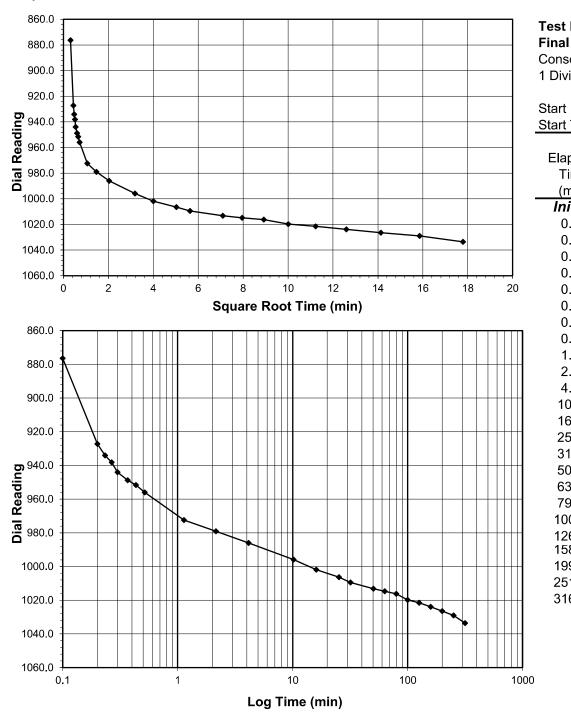
ient:	Kleinfelder
ient Project:	BR-0097
oject No.:	R-2022-091-002
b ID:	R-2022-091-002-001

Tested By 129-07-041: Date

DCN: CT-24E Date: 8/15/12 Revision: 2

page 14 of 20

#### Sample Conditions: Undisturbed, Inundated, Double Drained



4/30/22



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

EB1-B 21.0-23.0 ST-1 Orange Elastic Silt

<b>Test Load Final Reading</b> Consolidometer I 1 Division	<b>(tsf)</b> (div) No. (in)	<b>2 - 4</b> <b>1033.5</b> <b>R-409</b> 0.0001
Start Date Start Time		4/30/22 22:37:41
Elapsed Time (min) <i>Initial</i> 0.10 0.20 0.23 0.27 0.30 0.37 0.43 0.52 1.13 2.15 4.15 10.18 16.05 25.32 31.83 50.33 63.32 79.65 100.23		Dial Reading (div) <b>612.9</b> 876.4 927.3 934.1 938.1 944.0 948.8 951.6 955.9 972.5 979.1 986.0 995.9 1001.9 1006.4 1009.5 1013.2 1014.7 1016.2 1019.8
126.13 158.73 199.77 251.43 316.48		1021.5 1023.9 1026.4 1029.0 1033.5

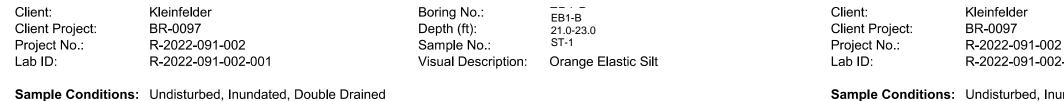
Checked By MPS Date 5/6/22

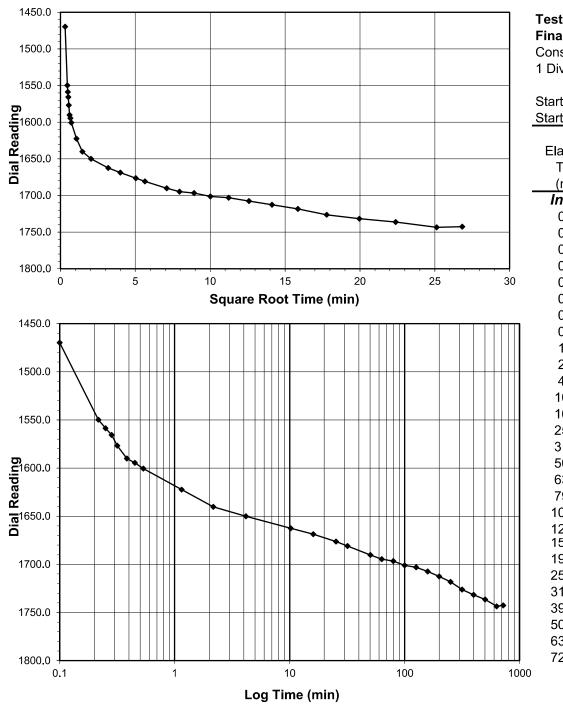
AASHTO T-216



### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216





5/1/22

Tested By 129-07-041: Date

DCN: CT-24E Date: 8/15/12 Revision: 2

page 15 of 20

<b>Test Load Final Readin</b> Consolidome 1 Division	• • •	<b>4 - 8</b> <b>1742.6</b> <b>R-409</b> 0.0001
Start Date Start Time		5/1/22 5:38:00
Elapsed Time (min) <b>Initial</b> 0.10 0.22 0.25 0.28 0.32 0.38 0.45 0.53 1.15 2.17 4.17 10.20 16.05 25.33 31.85 50.35 63.33 79.67 100.25 126.15 158.75 199.78		Dial Reading (div) <b>1033.5</b> 1469.7 1549.8 1558.6 1565.7 1576.8 1590.1 1594.6 1600.5 1622.4 1640.3 1650.1 1662.4 1668.7 1676.4 1680.9 1690.2 1694.7 1696.7 1701.2 1703.1 1707.5 1712.5
251.45 316.50 398.38 501.47 631.23 720.22		1718.2 1726.2 1731.7 1736.4 1743.5 1742.6
00 Date	5/6/22	

GeoJac-16tsf.xlt

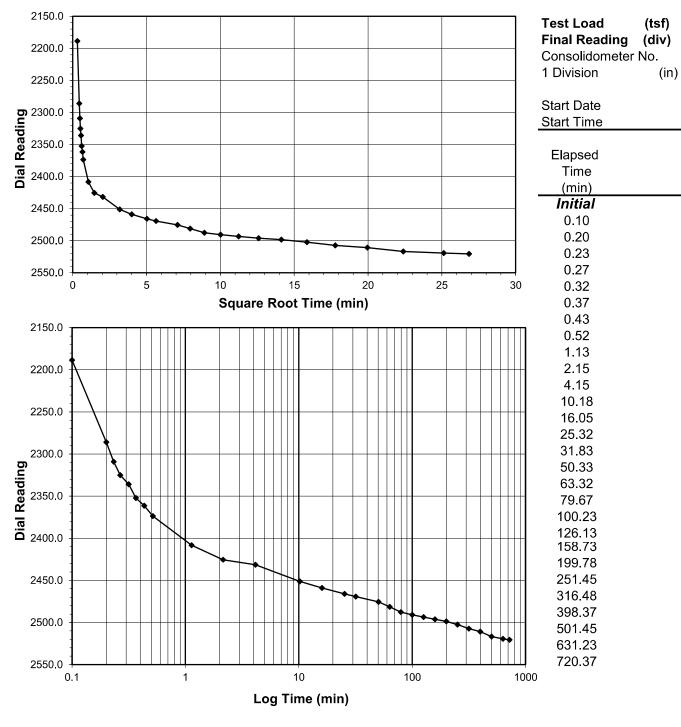
R-2022-091-002-001

Tested By 129-07-041: Date

DCN: CT-24E Date: 8/15/12 Revision: 2

page 16 of 20

#### Sample Conditions: Undisturbed, Inundated, Double Drained



Checked By

MPS

5/1/22



8 - 16

2520.6

R-409

0.0001

5/1/22

17:38:13

Dial

Reading

(div)

1742.6

2188.6

2285.9

2309.2

2325.1

2335.8

2352.4

2361.4

2373.7

2408.3

2425.5

2431.6

2451.2

2458.9

2465.9

2469.3

2475.5

2481.3

2487.6

2490.8

2493.4

2496.2

2498.5

2502.4

2507.3

2510.9

2516.8

2519.4

2520.6

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

EB1-B 21.0-23.0 ST-1 Orange Elastic Silt

Checked By MPS Date 5/6/22

AASHTO T-216



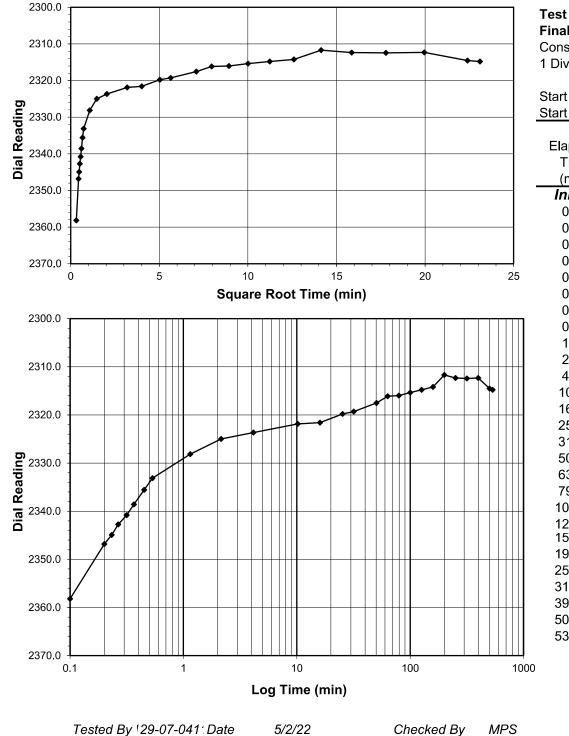
### **ONE DIMENSIONAL CONSOLIDATION**

AASHTO T-216

Client: Client Project:	Kleinfelder BR-0097	Boring No.: Depth (ft):	EB1-B 21.0-23.0	Client: Client Project:	Kleinfelder BR-0097
Project No.:	R-2022-091-002	Sample No.:	ST-1	Project No.:	R-2022-09 <sup>-</sup>
Lab ID:	R-2022-091-002-001	Visual Description:	Orange Elastic Silt	Lab ID:	R-2022-09

#### Sample Conditions: Undisturbed, Inundated, Double Drained

page 17 of 20



DCN: CT-24E Date: 8/15/12 Revision: 2

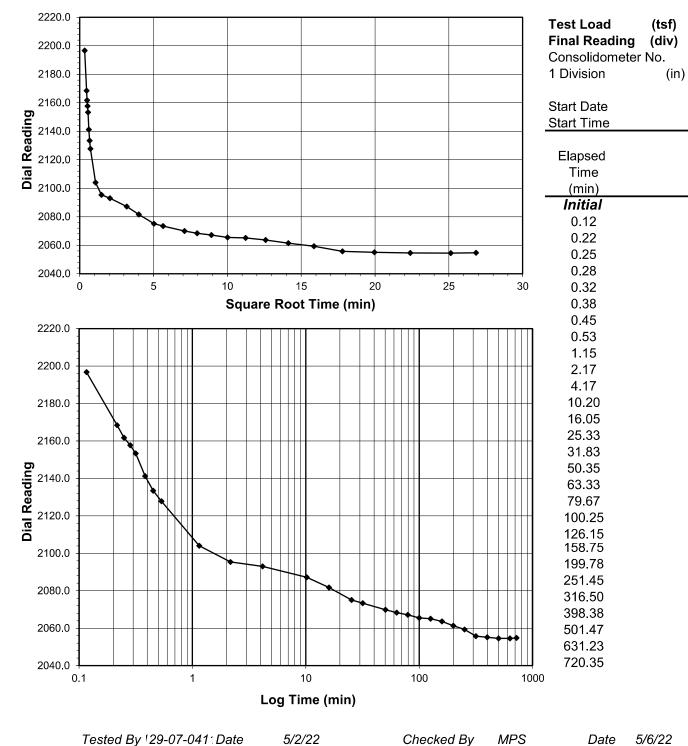
<b>Test Load</b> <b>Final Readin</b> Consolidome 1 Division	• • •	<b>16 - 4</b> <b>2314.8</b> <b>R-409</b> 0.0001
Start Date Start Time		5/2/22 5:38:36
Elapsed Time (min) Initial 0.10 0.20 0.23 0.27 0.32 0.37 0.45 0.53 1.15 2.15 4.15 10.18 16.05 25.32 31.83 50.33 63.32 79.65 100.23 126.13 158.73 199.77 251.43 316.48 398.37 501.45		Dial Reading (div) <b>2520.6</b> 2358.2 2346.8 2344.9 2342.7 2340.8 2335.6 2335.6 2335.6 2335.1 2328.1 2325.0 2323.7 2321.9 2321.6 2319.8 2319.3 2317.5 2316.1 2316.0 2315.4 2316.0 2315.4 2314.8 2314.2 2311.7 2312.3 2312.4 2312.3 2312.4
533.77		2314.8
Date	5/6/22	

GeoJac-16tsf.xlt

ent:	Kleinfelder
ent Project:	BR-0097
ject No.:	R-2022-091-002
DID:	R-2022-091-002-001

page 18 of 20

#### Sample Conditions: Undisturbed, Inundated, Double Drained



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DCN: CT-24E Date: 8/15/12 Revision: 2



4 - 1

2054.7

R-409

0.0001

5/2/22

14:32:23

Dial

Reading

(div)

2314.8

2196.7

2168.5

2161.7

2157.7

2153.3

2141.3

2133.5

2127.7

2104.0

2095.4

2093.0

2087.1

2081.8

2075.1

2073.4

2069.9

2068.3

2067.2

2065.5

2065.1

2063.6

2061.4

2059.3

2055.7

2055.1

2054.5

2054.5

2054.7

Boring No.: Depth (ft): Sample No .: Visual Description: EB1-B 21.0-23.0 ST-1 Orange Elastic Silt

hecked By MPS	
---------------	--

Date 5/6/22



1 - 0.25

1823.7

R-409

0.0001

5/3/22

2:32:43

Dial

Reading

(div)

2054.7 2001.0

1974.8

1966.2

1958.5

1954.1

1950.6 1943.0

1935.7

1905.0

1888.4 1875.5

1861.2

1857.1

1854.9

1852.9

1846.4

1843.7

1837.2 1836.3

1834.9

1832.7

1831.0

1829.2

1828.0

1824.9

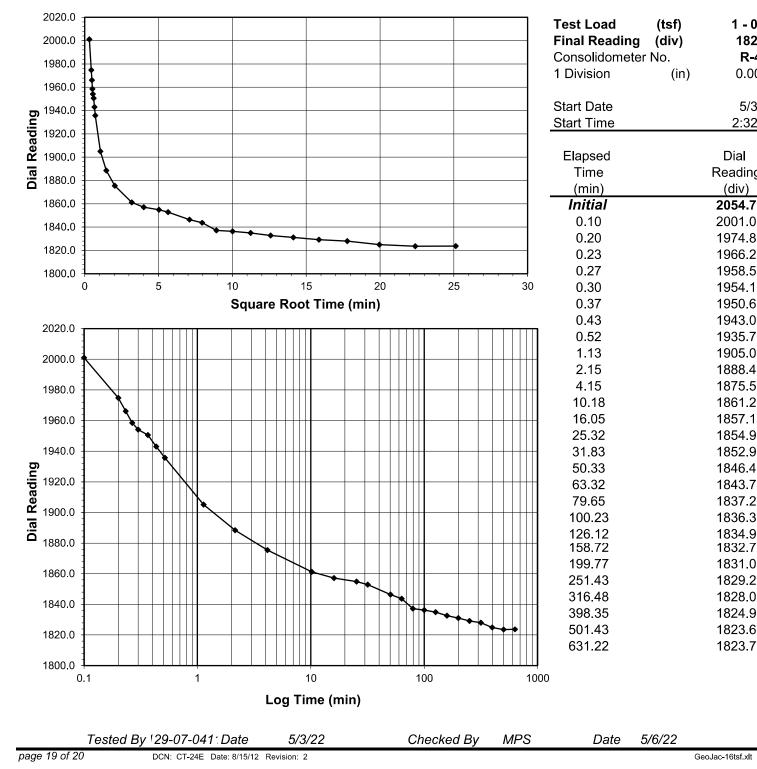
1823.6

1823.7

ASTM D 2435-96 (SOP-S24A)

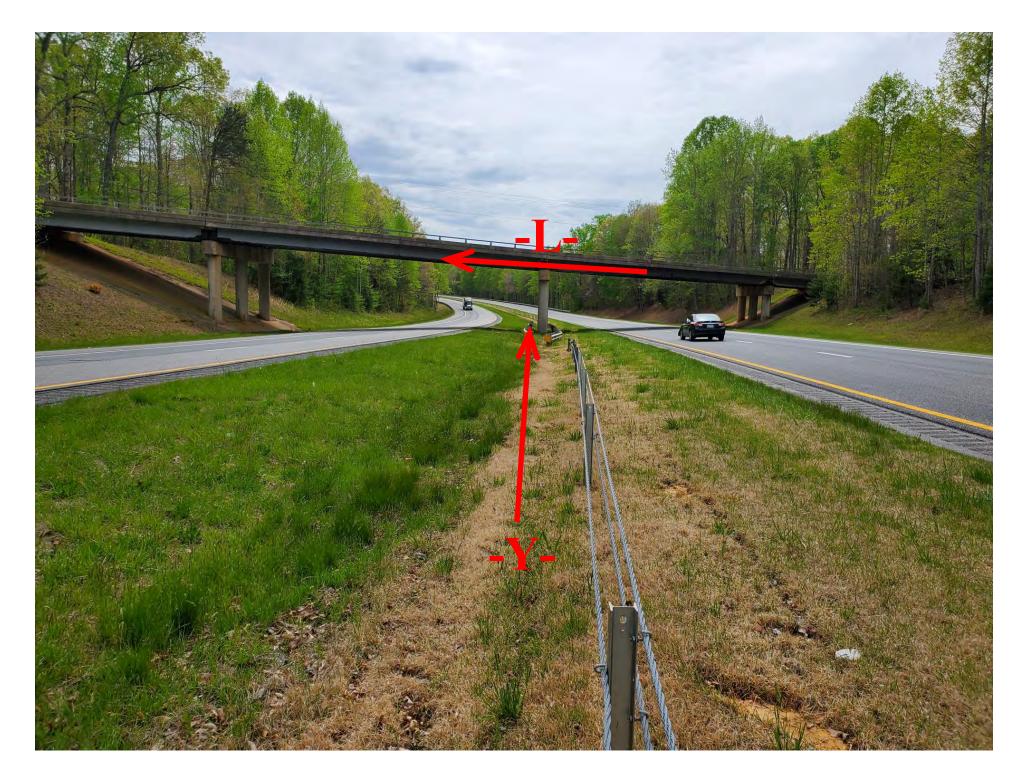
Client:	Kleinfelder	Boring No.:	EB1-B
Client Project:	BR-0097	Depth (ft):	21.0-23.0
Project No.:	R-2022-091-002	Sample No.:	ST-1
Lab ID:	R-2022-091-002-001	Visual Description:	Orange Elastic Silt

#### Sample Conditions: Undisturbed, Inundated, Double Drained



# SITE PHOTOGRAPH

Bridge No. 178 on -L- (SR 1929) over US 29



SHEET 29 WBS: 67097.1.1, TIP: BR-0097 Rockingham County