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40096.1.

STATE OF NORTH CAROLINA

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

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SITE PHOTOGRAPH(S)

STRUCTURE SUBSURFACE INVESTIGATION

OUNTY <u>CABARRUS</u>				
ROJECT DESCRIPTION	BRIDGE	227 OVER	ROCKY	<u>RIV</u> ER
ON SR 1006 (MT. PI				
ITE DESCRIPTION				

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAI SHEET
N.C.	B-4972	1	26

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 SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION GEOTECHNICAL ENGINEERING UNIT AT 1999 707-8850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

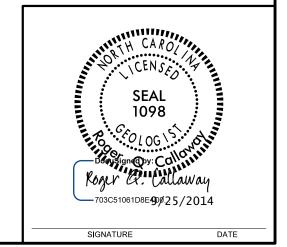
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (MIN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS MOLCATED IN THE SUBSURFACE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MICKLORY OF THE INVESTIGATION. THE SUBSURFACE INVESTIGATION THE SUBSURFACE INVESTIGATION THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED ANY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MICKLORY. 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 DES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION 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 OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS.

- TES:
 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.
 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.

J.K. STICKNEY
C.L. SMITH
INVESTIGATED BY R.Q. CALLAWAY
DRAWN BY _J.K. McCLURE
CHECKED BY
SUBMITTED BY R.Q. CALLAWAY
SUBMITTED BY N.Q. CALLAWAT
DATE SEPTEMBER 2014

PERSONNEL



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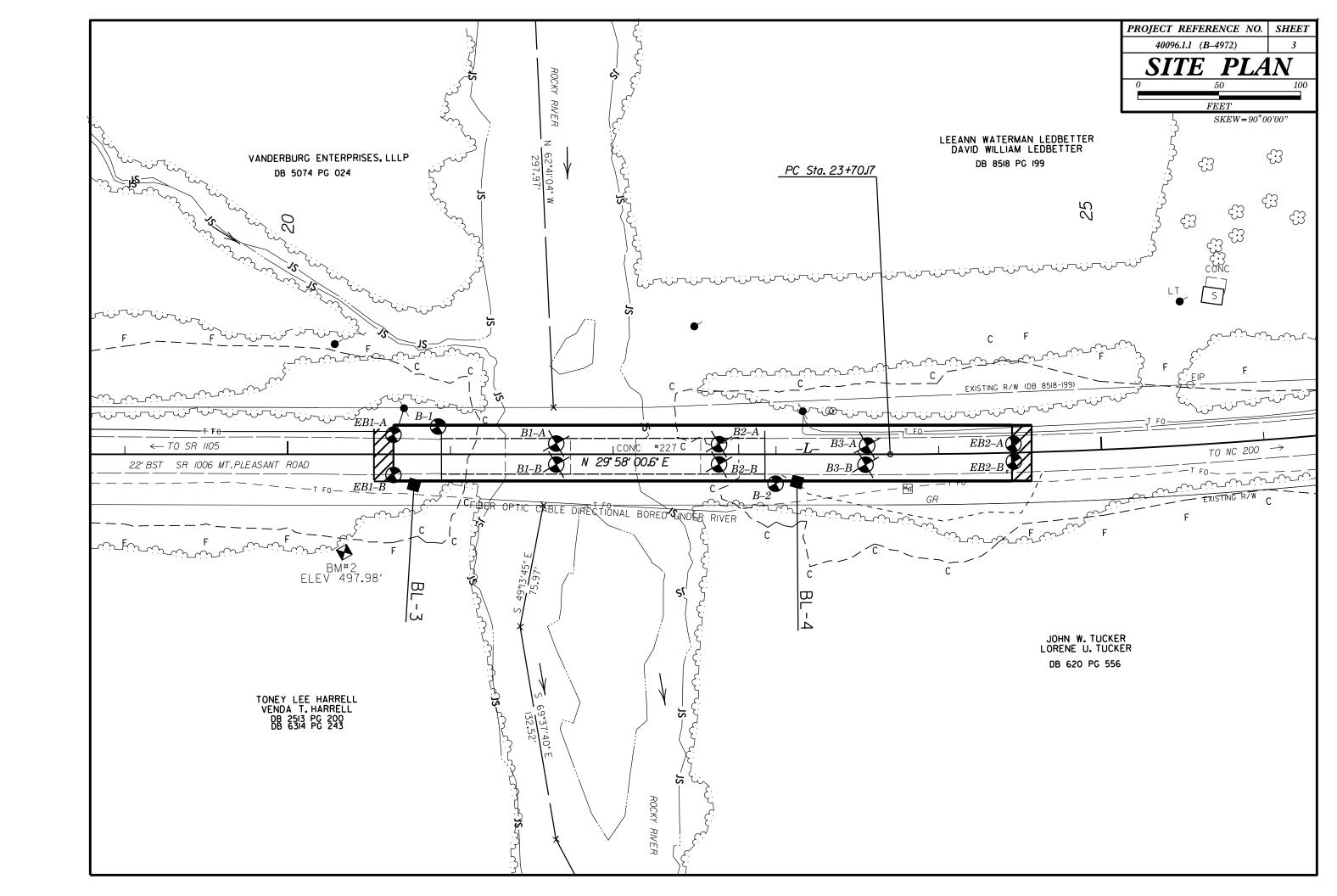
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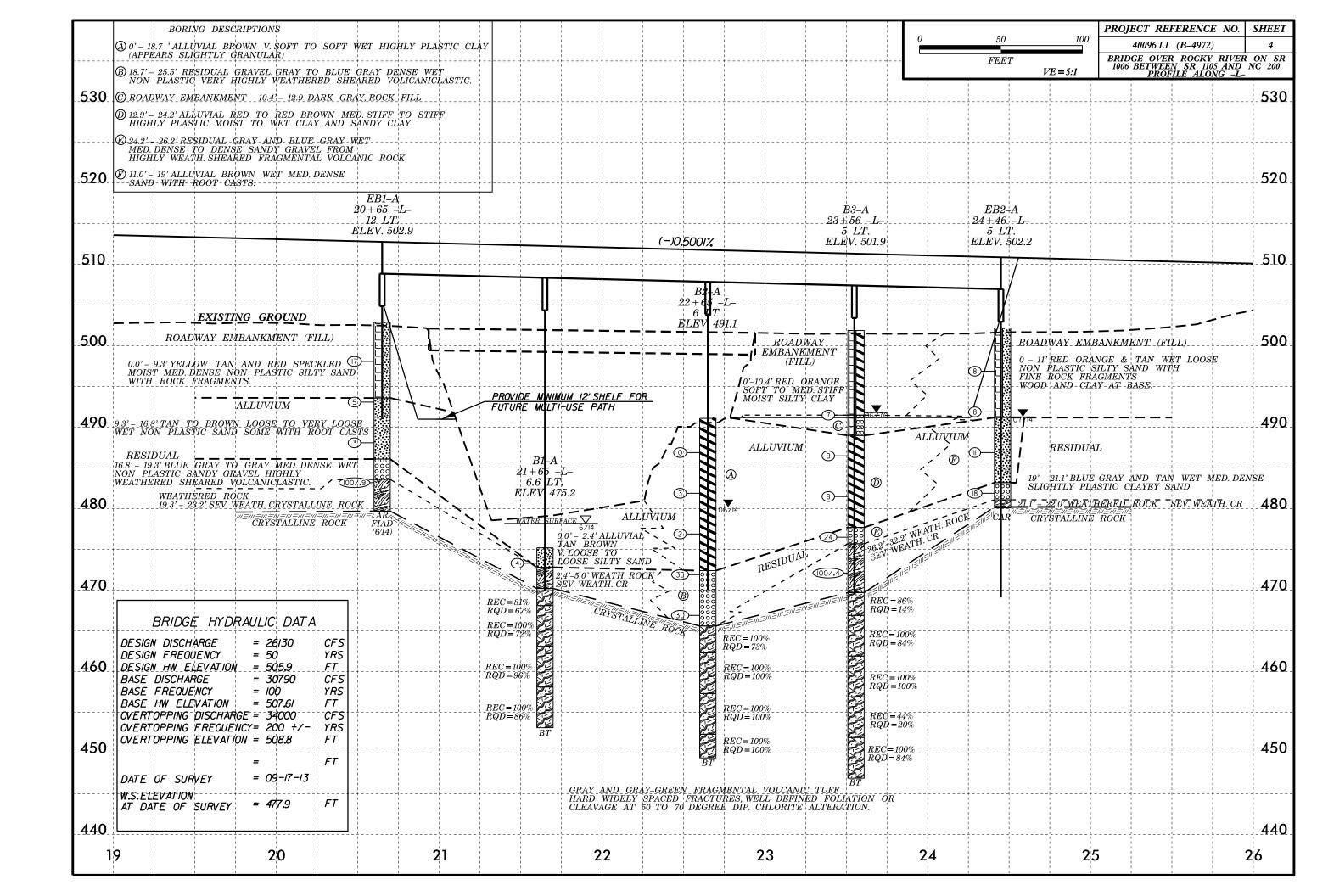
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

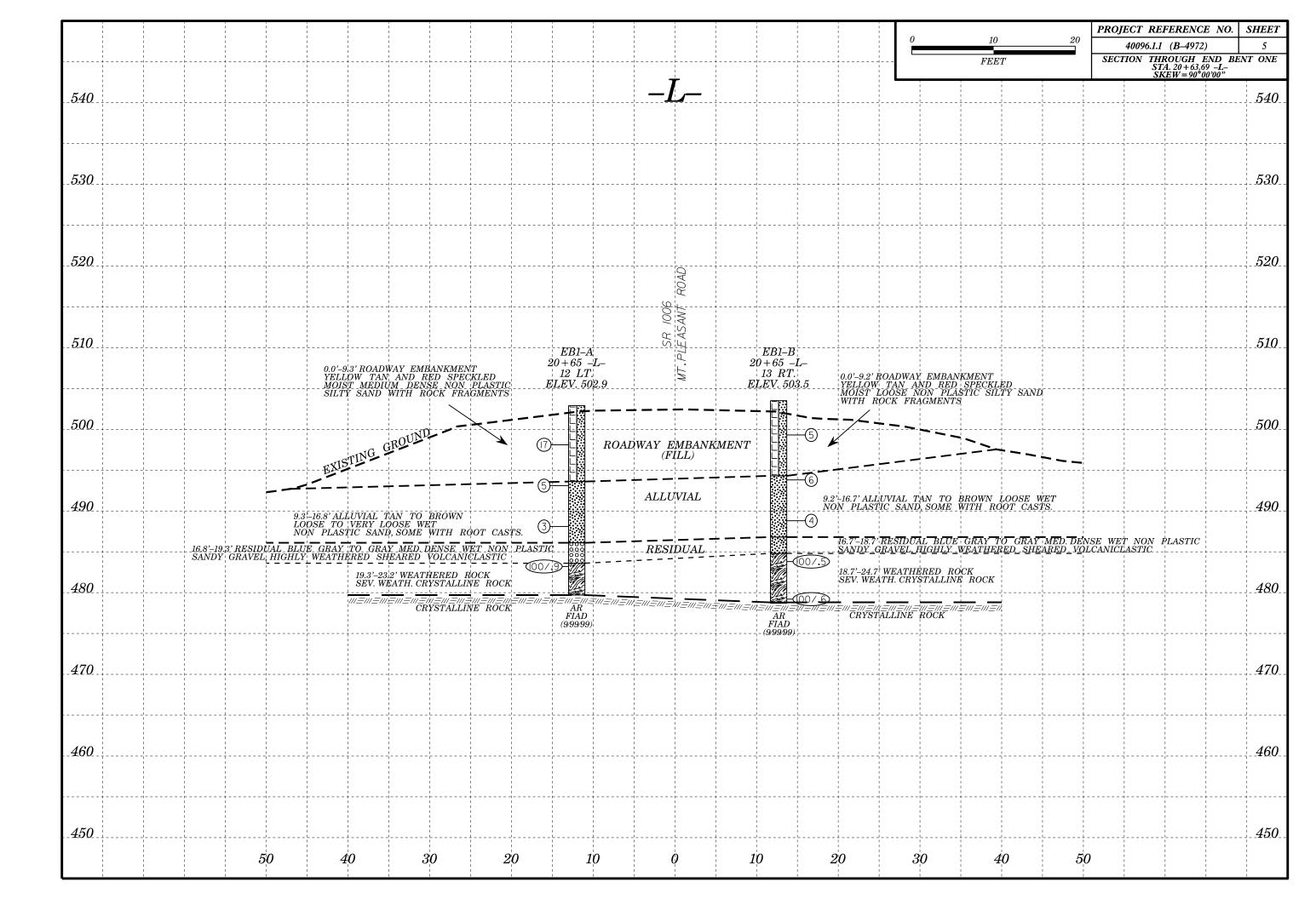
SUBSURFACE INVESTIGATION

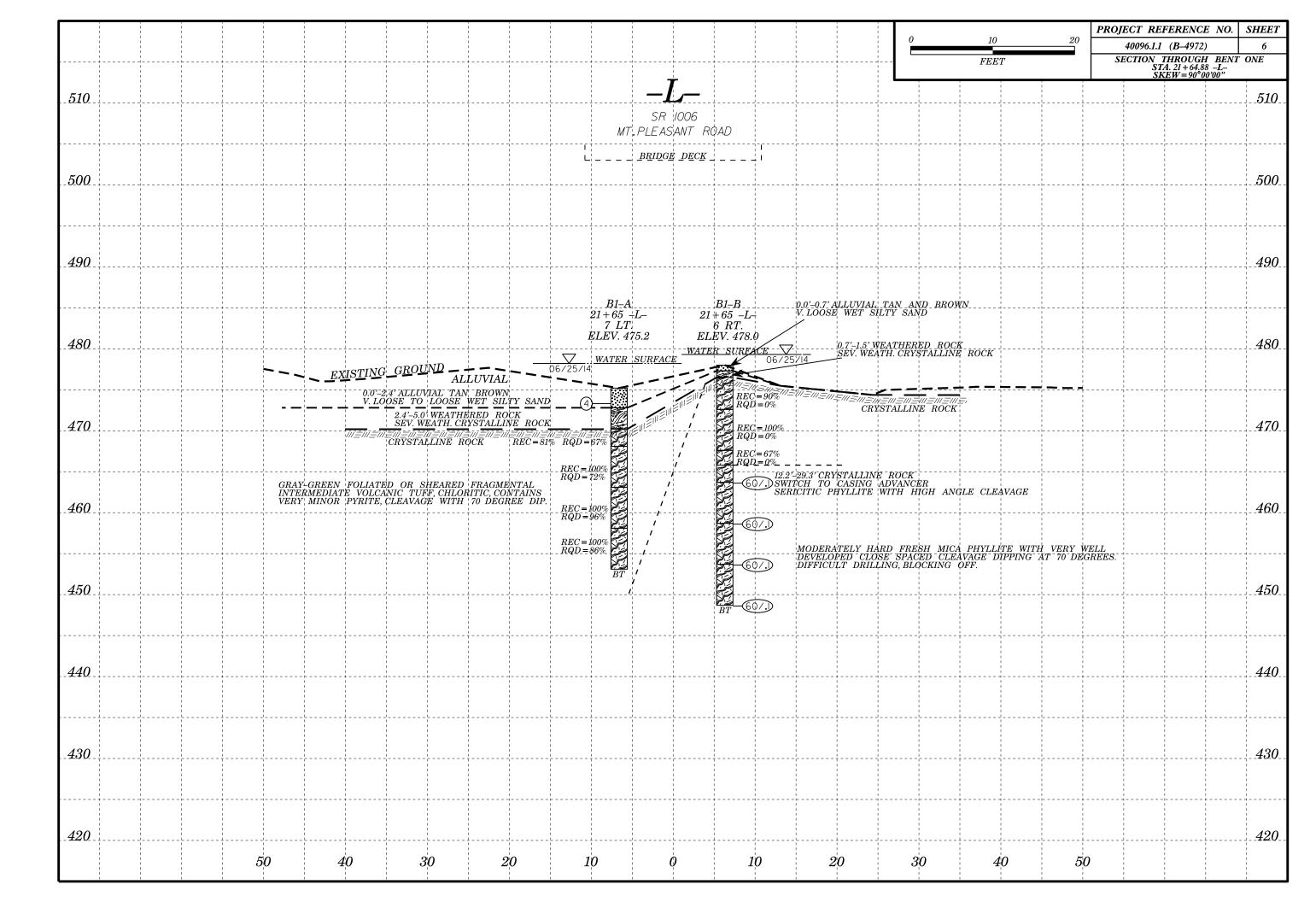
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT	<u>WELL GRADED</u> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <u>UNIFORMLY GRADED</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.	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.
ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	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 BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN	AQUIFER - 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	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 > 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
CENERAL CRANIII AR MATERIALS SILT-CLAY MATERIALS	MINERALOGICAL COMPOSITION	FINE TO COARSE CRAIN ICNEOUS AND METAMORPHIC POCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
CLASS. (≤ 35% PASSING *200) CRGANIC MATERIALS ORGANIC MATERIALS ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	NON CRYSTALLING FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
00000000000000000000000000000000000000	COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 00000d00000	MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
% PASSING SILT-	HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
*10 50 MX GRANULAR GRANULAR CLAY PEAT	PERCENTAGE OF MATERIAL	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
*200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
MATERIAL DESCRIPTION	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	HAMMER IF CRYSTALLINE.	HORIZONTAL.
PASSING *40 LL - 48 MX 41 MN 4	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 18 MX 18 MX 11 MN 11 MN 18 MX 18 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN MODERATE OPENING	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	OF A CRYSTALLINE NATURE.	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 8 8 8 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF ORGANIC SOILS	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
USUAL TYPES STUNE FRAUS. FINE STITY OR CLAYEY STITY CLAYEY MATTER		(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
OF MAJOR GRAVEL, AND SAND GRAVEL AND SAND SOILS SOILS	$lacksquare$ static water level after $\underline{24}$ hours	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN. RATING EXCELLENT TO COOD FAIR TO POOR POOR UNSUITABLE	∇ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL.
AS SUBLIKADE PUUR	SPRING OR SEEP	WITH FRESH ROCK.	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		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 FIELD.
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH (MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	IF TESTED, WOULD YIELD SPT REFUSAL	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
CONSISTENCY (N-VALUE) (TONS/FT ²)	₩ITH SOIL DESCRIPTION → OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE	SOIL SYMBOL SOIL SYMBOL SOIL SYMBOL SPOT DMT TEST BORING SLOPE INDICATOR INSTALLATION	(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.
MATERIAL 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	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER TEST	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		(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	MW -	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 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	INFERRED ROCK LINE MONITORING WELL WITH CORE	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
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4	ALLUVIAL SOIL BOUNDARY APIEZOMETER SPT N-VALUE	ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
HARD > 30 > 4		ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES	ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE ACCEPTABLE, BUT NOT TO BE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	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
COADCE	SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRAVEL SAND SAND SILT CLAY		MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT
(CSE. SD.) (F SD.)	ABBREVIATIONS	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 SIZE IN. 12 3	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA, - MICACEOUS WEA, - WEATHERED	BY MODERATE BLOWS. MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	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
	CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 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 SOIL MOISTURE SCALE FIELD MOISTURE COURS FOR THE AMERICAN ASSOCIATION.	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) OESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	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	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	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON 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	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.
PLASTIC CONTROL IN DEPULDED DRYING TO	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
BANGE - WET - (W) SEMISULIU; REGUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK: BL-4
(PI) PL PLASTIC LIMITATTAIN OPTIMUM MOISTURE	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS	STA. 2I+08.56 -BL-
- MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	N 572558.9429 E I558978.6030 ELEVATION: 500.80 FEET
OM OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	NOTES:
PEGLITIES ADDITIONAL WATER TO	CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	
- DRY - (D) ATTAIN OPTIMUM MOISTURE	CME-55 G* CONTINUOUS FLIGHT AUGER CORE SIZE:	THINLY LAMINATED < 0.008 FEET	SOIL STRATIGRAPHY IS THROUGH THE BORINGS FOR PROFILE AND CROSS-SECTIONS.
PLASTICITY	X 8" HOLLOW AUGERS	INDURATION	
PLASTICITY INDEX (PI) DRY STRENGTH	X CME-550 HARD FACED FINGER BITS X -N O/NO	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NON PLASTIC 0-5 VERY LOW	X TUNGCARBIDE INSERTS	RUBBING WITH FINGER FREES NUMEROUS GRAINS;	
SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM	VANE SHEAR TEST X CASING X W/ ADVANCER HAND TOOLS:	GENILE BLUW BY HAMMER DISINIEGRATES SAMPLE.	
HIGHLY PLASTIC 26 OR MORE HIGH	POST ABLE MOTES TESTING POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TOLOGUE 3 15/ 1 TIME CAPE	COAING ARE DISEIGNED TO SEPARATE WITH STEEL PROPE.	
		INDURATED DIFFICULT TO BREAK WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	CORE BIT VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	
		SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-1

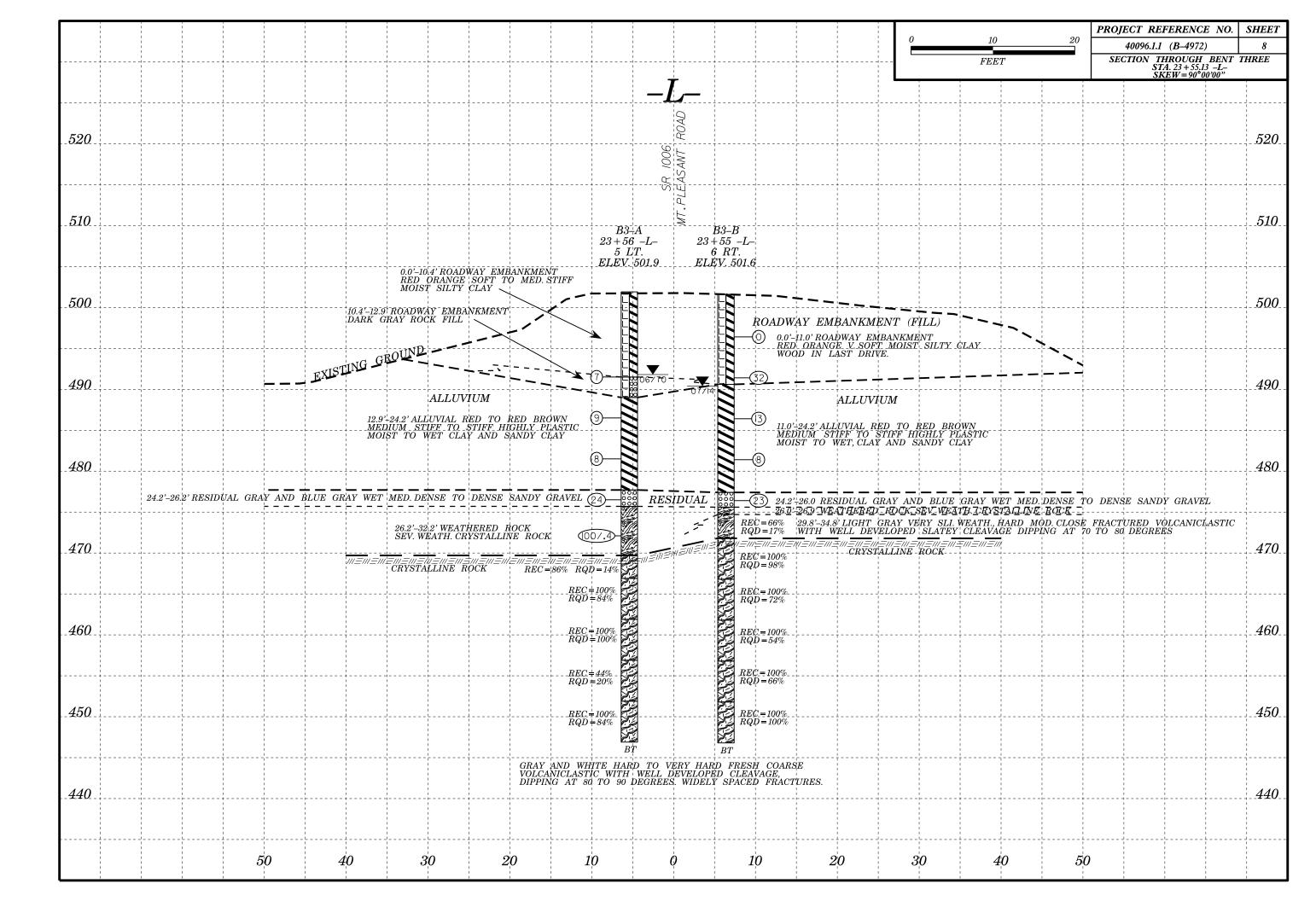


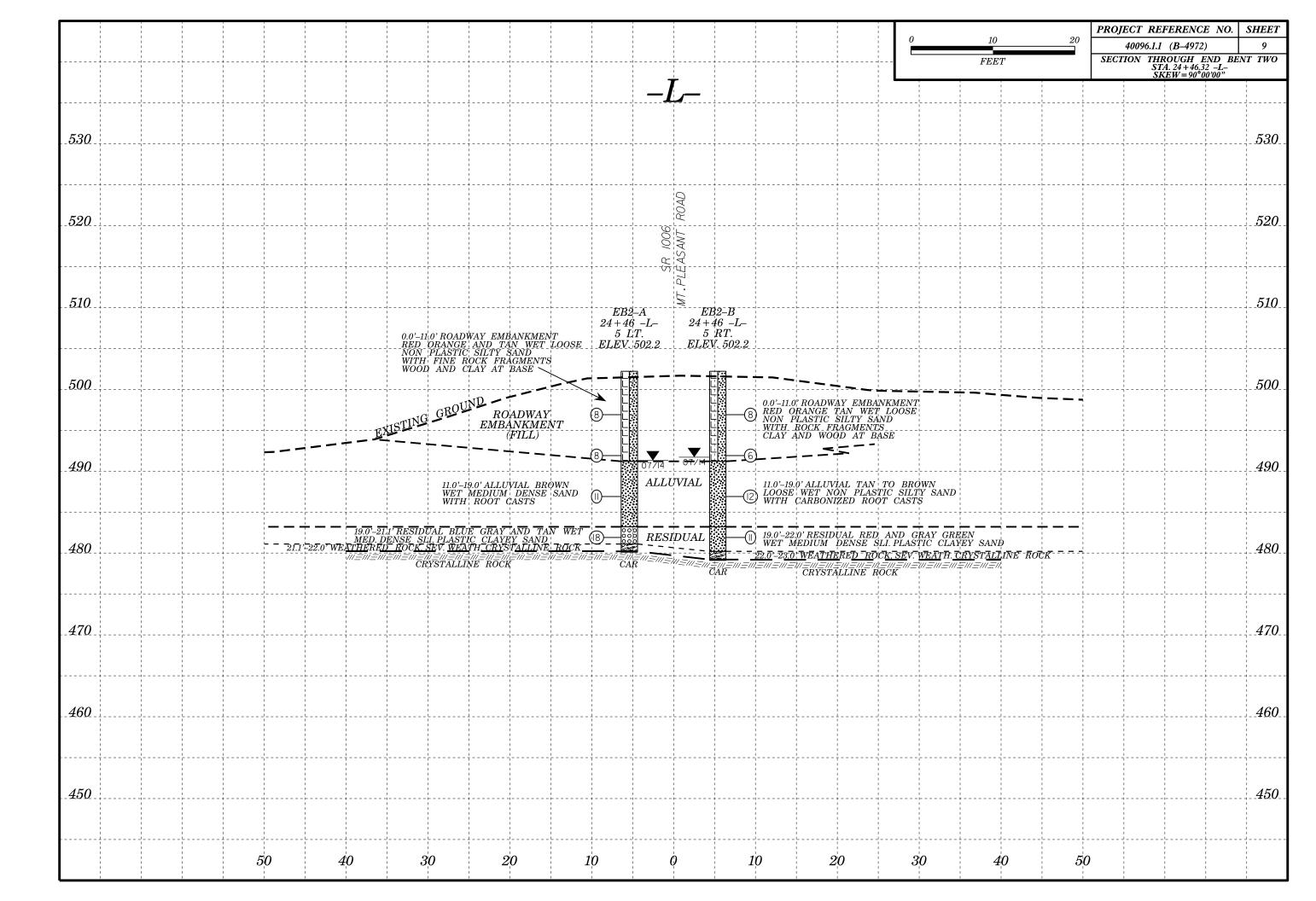


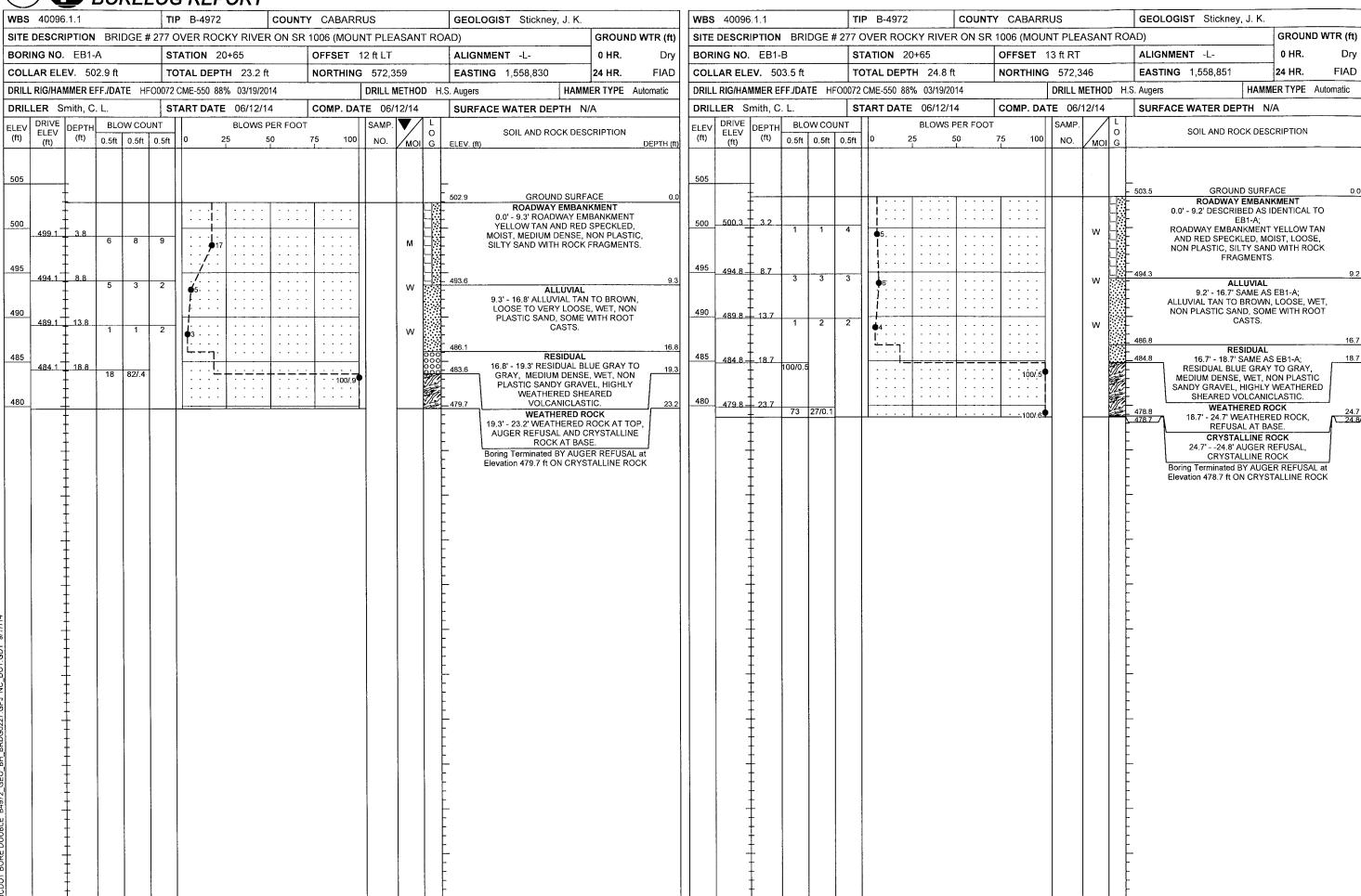




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.490	- /				ELEV	LT. V. 491.1	ELÌ	EV. 690.0					<i>_EX</i> [STING G	ROUND			490
480			0.0'–18.7' ALLUVI VERY SOFT, TO WET HIGHLY F	IAL BROWN O SOFT PLASTIC CLAY	3	706/14		06/	(1) 0.0'-	17.1' ALLU HIGHLY	VIAL RE	D BROW	N VERY SANDY S	SOFT TO	SOFT			480
470	– –	18.7'-25.5' RESIDUAL GRAY TO BLUE GRA VERY HIGHLY WEAT	GRAVEL AY DENSE WE'T N HERED SHEARED	ION PLASTIC VOLICANICL	35 ASTIC 30	RESI	DUAL		33 17.1' 	+22.0' RES ISE_NON HLY_WEA	IDUAL G PLASTIC THERED	RAY TO SAND FROM		RAY WET ALL GRAVE VOLCANIO	L CLASTIC			470
_460		III≡III≡III≡III CR	GRAVEL AY DENSE WET N HERED SHEARED FINE THE THE TOOK	<u> - - - - - - - - - </u>	REC = 100% RQD = 100% RQD = 100%			RE RQ	$ \frac{22.0'-24.1}{20'-20'-20'-20'} $ $ \frac{20.0'-24.1}{20'-20'-20'-20'} $ $ \frac{20.0'-24.1}{20'-20'-20'-20'-20'} $ $ \frac{20.0'-24.1}{20'-20'-20'-20'-20'-20'-20'} $ $ \frac{20.0'-24.1}{20'-20'-20'-20'-20'-20'-20'-20'-20'-20'-$	CRYSTAL	LLINE_R	OCK						460
450					REC=100% RQD=100%	BT		-RQ	C = 100% D = 100% - $C = 100%$									450
440			HARD TO V WIDELY FRZ VOLCANICLA CONTAINS I GOOD ROCK	VERY HARD I ACTURED, WE ASTIC ROCK LESS THAN I	FRESH MODERA LL FOLIATED O POSSIBLY SLIG 1% SULPHIDE N	ĀTĒLY ČLO OR SHEAR GHTLY SILI MINERALS.	ŠĒ-TŌ ED CIFIED.	RQ	C=100% D=96%									440
	50	40	30	20	10		0		10	2	0	3	 O	40	5	0		









VBS	40096					P B-		OR		COUNT	Υ	CABARR	US			GEOL	OGIST Stickney	, J. K.		
SITE	DESCR	PTION	BR	IDGE :	# 277 (OVER	ROC	KY RI\	/ER	ON SR	100	6 (MOUI	NT PLE	ASAN	TRC	AD)			GROUN	D WTR (f
ORI	NG NO.	B1-A	١		S	TATIC	N 21	+65			OF	FSET	ft LT			ALIGI	NMENT -L-		0 HR.	N
OLL	AR ELE	V. 47	75.2 ft		Т	DTAL	DEPT	H 22.	1 ft		NC	RTHING	572,4	43		EAST	ING 1,558,884		24 HR.	N/
RILL	RIG/HAN	MER E	FF./DA	TE H	FO0072	CME-	50 889	% 03/19	9/2014	4	<u> </u>		DRILL N	METHO	D N	W Casing	W/SPT & Core	HAMM	ER TYPE	Automatio
RII	LER SI	mith C	. L.		s ⁻	TART	DATE	06/2	5/14		CC	MP. DA					ACE WATER DEF	TH 3.	Oft	
EV	DRIVE	DEPTH		ow co		П				ER FOO	ــــــــــــــــــــــــــــــــــــــ		SAMP.	r	L					
ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	1 0	2	5	50)	75	100	NO.	мог	O G	ELEV. (ft	SOIL AND RO	CK DES	CRIPTION	DEPTH
\neg			ļ					L						*			4			
30		_																		
	-	- - -														- - -				
75	474.3	0.9	ļ	· 	ļ	ļ										475.2	GROUN	D SURF	ACE	
	9/4.5	- 0.3	0	1	3	4	 		_:	 		· · · ·		w		472.8	0.0' - 2.4' ALLU\	IAL TAN		/. _
	-								:		: :			Ì		- 470.0	LOOSE TO LO			/
0_	-	_						 								470.2	2.4' - 5.0' PROBABL CASING ADVANCI			
	7	-							-		: :					468.1	CRYSTA	LLINE R	OCK	<u></u>
_	-	-			<u> </u> .								1			-	5.0 '- 7.1' CRYSTA			
5	_	-														— - 463.1	7.1' - 12.1'			
	-	-									: :					403.1	CRYSTA			
0	-					-					•					-	12.1' - 17.1	CORED	ROCK	
	-					-			-		- -					458.1			-	
	-										[] :					-	CRYSTA 17.1' - 22.1			
5	_					lĿ			-							-		OUNCE		
		_		ļ		<u> · </u>			·		· ·		_			453.1	, D T	-4 F1	No. 450 44	4 IA?
	٠ -	_		}												_	Boring Terminated CRYSTA			TIN
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	40096			RE B	T	B-497				Υ	CABARF	RUS	GEOLOGIST Stickney	, J. K.		
			BRI	DGE # 2	ــــــــــــــــــــــــــــــــــــــ							NT PLEASANT ROA			GROUNI	WTR (ft
	NG NO.						21+65				FSET		ALIGNMENT -L-		0 HR.	N/A
	AR ELI				 		PTH 22	1 ft		┼		572,443	EASTING 1,558,884		24 HR.	N/A
				TE HFOO	L					1		DRILL METHOD NW	L	HAMM	ER TYPE	
	LER S				·		TE 06/2			Co	MP. DA	TE 06/25/14	SURFACE WATER DEF			
	E SIZE				 		N 17.1 f						L			
ELEV	RUN ELEV	DEPTH		DRILL RATE	REC.	JN RQD	SAMP.	STR REC.	ATA RQD	L		D	ESCRIPTION AND REMARK	s		
(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	G	ELEV. ((t)	Paris Order O 5 0 ft			DEPTH (f
47,002	470.2	5.0	2.1		(1.7)	(1.4)		(1.7)	(1.4)		470.2		Begin Coring @ 5.0 ft CRYSTALLINE ROCK			5.0
	468.1	7.1	5.0		(5.0)	(3.6)		81% (5.0)	(3.6)		468.1		REEN, FOLIATED OR SHEA CANIC TUFF. CHLORITIC, C			
465	-	F				72%		100%			F		'AGE WITH 70 DEGREE DIP. R1:4 R2:13 R3:20 R4:20 R5		IG AT 90.	
	463.1	12.1									463,1		GOOD ROCK, CLASS II, RO CRYSTALLINE ROCK		D	
	_		5.0		(5.0) 100%	(4.8) 96%		(5.0) 100%	(4.8) 96%		-		AY FOLIATED OR SHEARED			
460	_	-						,			-		MENTAL VOLCANIC ROCK BE FROM CORE REMOVAL		ED ZONE N	IAY
	458.1	17.1	5.0		(5.0)	(4.3)		(5.0)	(4.3)		458.1		R1:4 R2:13 R3:20 R4:20 R5 GOOD ROCK, CLASS II, RO		E D	17.
455	-	<u> </u>	0.0			86%		100%			-	12 1' - 17 1' GRAY AN	CRYSTALLINE ROCK ND GRAY GREEN, SHEAREI) FRAGI	MENTAL TI	FF
400_	453.1 ⁻	22.1									453.1		ACED FRACTURES. WELL D SHEARING.			
	100.7										-		R1:7 R2:20 R3:25 R4:20 R8			
	-	 									-		GOOD ROCK, CLASS II, RO CRYSTALLINE ROCK			
	-	‡									-		ND GRAY-GREEN FRAGMEN SED FRACTURES, WELL DE			
	-	‡									-		F 50 DEGREE DIP. CHLORIT R1:12 R2:17 R3:25 R4:20 R		RATION.	
	_	<u> </u>									_	RMR 78,	GOOD ROCK, CLASS II, RO	CK TYPE		
	-	-									-	Boring Terminate	ed at Elevation 453.1 ft IN CR	YSTALLI	NE ROCK	
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NBS	40096	.1.1			T	ΊP	B-4972	COUNTY	CABARF	RUS			GEOLOGIST Stickney, J. K.	
SITE	DESCRI	PTION	BRI	DGE ;	# 277	0\	VER ROCKY RIVER	ON SR	1006 (MOU	NT PLE	ASAN	T ROA	AD)	GROUND WTR (
ORII	NG NO.	B1-B	*****		s	TA	ATION 21+65		OFFSET	6 ft RT			ALIGNMENT -L-	OHR. N
OLL	AR ELE	V. 47	8.0 ft		T	ОТ	TAL DEPTH 29.4 ft		NORTHING	572,4	36		EASTING 1,558,895	24 HR. N
RILL	RIG/HAN	MER E	FF./DA	TE H	FO0072	2 CI	CME-550 88% 03/19/20	14		DRILL	METHO	NN C	/ Casing W/SPT & Core HAMM	ER TYPE Automatic
RILL	ER Sr	nith, C	. L.		s	TA	ART DATE 06/25/1	1	COMP. DA	TE 06/	25/14		SURFACE WATER DEPTH 1.	3ft
ΕV	DRIVE	DEPTH	BLC	w co	UNT	П	BLOWS F	ER FOOT		SAMP.	V /	L	COIL AND DOOK DEG	ODIDTION
ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft		0 25 5	0	75 100	NO.	MOI	O G	SOIL AND ROCK DESC ELEV. (ft)	DEPTH DEPTH
80		-												
	1	-				Ш						<u> </u>	478.0 GROUND SURFA	ACE
	1	-				11			+ -		"	27	0-0.7' ALLUVIAL, TAN AN	
75	-	_			,	11			1				LOOSE WET SILTY WEATHERED RO	
ĺ	1	_							1::::				472.6 0.7' - 1.5' WEATHERED RO ADVANCER REFUSAL	OCK, CASING
0		_											CRYSTALLINE R	оск
	-	-							!				1.5' - 5.4' CORED 467.6 CRYSTALLINE R	
	-				-								5.4' - 10.4' CORED 465.8 CRYSTALLINE R	ROCK
5	400.7	- 44.2				1							10.4' - 12.2' CORED	ROCK
ŀ	463.7	- 14.3 -	60/.1						60/.1		l	7	12.2' - 14.3' SWITCH T	O CASING
。	1												ADVANCER, SERICITIC PA HIGH ANGLE CLEAVAGE.	
	458.7	- - 19.3	60/,1						60/.1				458.7 SPT REFUSAL AT BAS	
	1	_	607.1										14.3' - 19.3' SPT REFUSAL	. AT TOP AND
5	-	-											BASE; ROCK CRYSTALLINE R	оск
 	453.7	- 24.3	60/.1						60/.1				19.3' - 24.3' SPT REFUSAI BASE; ROCK	
		-			1								CRYSTALLINE R 24.3' - 29.3' SPT REFUSAL	
0	448.7 -	- - 29.3									1		448.7 BASE; ROCK	
Ī		-	60/.1						60/.1	7			Boring Terminated WITH PENETRATION TEST R	
		_		}									Elevation 448.6 ft IN CRYST	
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WBS	40096			RE B	TIP	B-497					CABARRU	IS	GEOLOGIST Stickney	/, J. K.		
SITE	DESCR	IPTION	BRI	DGE # 2	77 OV	ER RO	OCKY RI	VER C	N SR	100	6 (MOUN	T PLEASANT ROA	.D)		GROUN	ID WTR (ft)
BOR	ING NO.	B1-B			STAT	TION	21+65			OF	FSET 6	ft RT	ALIGNMENT -L-		0 HR.	N/A
COL	LAR ELE	V . 47	8.0 ft		TOTA	AL DE	PTH 29	.4 ft		NC	RTHING	572,436	EASTING 1,558,895		24 HR.	N/A
DRIL	L RIG/HAI	MMER E	FF./DA	TE HFO0	072 CM	E-550	88% 03/1	9/2014				ORILL METHOD NW	Casing W/SPT & Core	HAMN	IER TYPE	Automatic
DRIL	LER S	mith, C	. L.		STAF	RT DA	TE 06/2	5/14		CC	MP. DATI	06/25/14	SURFACE WATER DEF	PTH 1.	3ft	
COF	E SIZE	NO/NO	2		TOTA	AL RU	N 10.7 f	t								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	L O G	ELEV. (ft)		ESCRIPTION AND REMARK	(S		DEPTH (f
476.5													Begin Coring @ 1.5 ft			
475	476.5 - 472.6 -	-	3.9 5.0		(3.5) 90% (5.0)	(0.0)		(3.5) 90% (5.0)	(0.0) 0% (0.0)		476.5 - 472.6	WELL DEVELOPE	CRYSTALLINE ROCK FELY HARD, FRESH, MICA I D CLOSE SPACED CLEAVA DIFFICULT DRILLING, BLC R1:4 R2:3 R3:10 R4:6 R5:	AGE, DIP OCKING	PING AT 7	
470	467.6 -	- - - 10.4			100%	0%		100%	0%		467.6		POOR ROCK, CLASS IV, RC CRYSTALLINE ROCK TELY HARD, FRESH, MICA	OCK TYP	, , , , , , , , , , , , , , , , , , , ,	 ELL 10
465	465.8		1.8		(1.2) 67%	(0.0) 0%		(1.2) 67%	(0.0) 0%		465.8		D CLEAVAGE DIPPING AT R1:4 R2:3 R3:5 R4:6 R5: POOR ROCK, CLASS IV, RC	4		12.
460				N=60/.1							463.7	DEVELOPED CLE	CRYSTALLINE ROCK TELY HARD, FRESH, MICA AVAGE, DIFFICULT DRILLIN R1:4 R2:3 R3:5 R4:6 R5:0	NG; BLO 4	CKING OFF	
	-	-		N=60/.1							458.7	RMR 22, I	CRYSTALLINE ROCK CRYSTALLINE ROCK CRYSTALLINE ROCK CRYSTALLINE ROCK CRYSTALLINE ROCK	JCK TYP	EB	
455	-	-									453.7					24.
450	-	- -		N=60/.1							<u>}</u>		CRYSTALLINE ROCK			
100		- - -		N=60/.1						مِيَّرِ الْجِي الرياب	448 <u>.</u> 7		TH STANDARD PENETRAT			29.: L at



WBS	40096	5.1.1			TI	IP	B-4972		COUNT	Y CABAF	RUS			GEOLOGIST Stickney, J. K		
SITE	DESCR	IPTION	ı BRI	DGE :	# 277	ΟV	/ER ROC	KY RIVER	R ON SR	1006 (MO	UNT PLI	EASAN	T RO	AD)	GROUN	ID WTR (f
BORI	NG NO.	B2-A	١		S	TA	TION 22	+65		OFFSET	6 ft LT			ALIGNMENT -L-	0 HR.	10.
	AR ELE				T	OT.	AL DEPT	H 41.7 ft		NORTHIN	I G 572	,529		EASTING 1,558,935	24 HR.	10.
					FO0072	2 CN	ME-550 88%	6 03/19/20	14	L	DRILL	METHO	D N	_ 	MER TYPE	Automatic
	LER S						RT DATE			COMP. D				SURFACE WATER DEPTH	N/A	·
LEV	DRIVE	DEPTH		OW CO		П			PER FOOT	l	SAME		1-1			
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft		0 2		50	75 10	1 1	мо	O G	SOIL AND ROCK DI	ESCRIPTION	DEPTH
						П	,		1-,,-							
495						П										
	-	r F												•		
	-	F												491.1 GROUND SU		
190	-				,	T					+			ALLUVIA 0' - 18.7 ' (FROM B2		
	487.9	3.2	-	0	0	$\ \cdot \ $								ALLUVIAL, BROWN, PLASTIC, VERY SOFT	WET, HIGHĹ`	Y
185	-	<u> </u>		"		1	0							APPEARS SLIGHTLY		
100	-	<u> </u>					1				11			- -		
	482.9	8.2	1	2	1	╢,	3							<u>.</u>		
80	-	<u> </u>					1				41		1	- -		
	477.9	13.2					<u> :::: </u>							- -		
		<u> </u>	0	0	2		2			.				_		
75	-	_				H	 				$\left\{ \left[\right] \right\}$					
	472.9	18.2	1	12	23	-						l _w	000	- 472.4		
70	-	ļ.						· ∮ 35 ·				"	000	- RESIDUA - 18.7' - 25.5' RESIDUAL	GRAVEL. GI	
		† 						<i>:</i> }			11		000	TO BLUE GRAY, DEN PLASTIC. VERY HIGHI		
	467.9	23.2	73	18	12	1	: : : :	30					000	SHEARED VOLICA		
165	-	<u> </u>						1			4		000	- 465.6 - CRYSTALLINI	ROCK	····
	-	<u> </u>												- 25.5' - 28.8' COR - 462.3	ED ROCK	
	-	<u> </u>												CRYSTALLINI 28.8' - 33.8' COR		
60	-	ł				$\ \cdot\ $			 		11				LD NOCK	
	-	ł								.				- 457.3 CRYSTALLINI	BOCK	·····
55		-									_ _			33.8' - 38.8' COR		
		Ī								.				.		
		Ŧ					: : : :			.				- 452.3 CRYSTALLINI		
50	_	<u> </u>				l								38.8' - 41.7' COR		
						Ī								Boring Terminated at Ele CRYSTALLINI		ft IN
	-	<u> </u>												-		
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WBS	40096	5.1.1		· · · · · · · · · · · · · · · · · · ·	TIP	B-497	'2	C	OUNT	Υ	CABARR	US	GEOLOGIST Stickney	, J. K.		·
SITE	DESCR	IPTION	BRI	DGE # 2	77 OV	ER RO	OCKY RI	VER C	N SR	100	OG (MOU	NT PLEASANT ROA	D)		GROUN	D WTR (ft
BOR	ING NO.	B2- A	١		STA	TION	22+65			OF	FSET 6	oft LT	ALIGNMENT -L-		0 HR.	10.8
COL	LAR ELI	E V . 49	91.1 ft		тот	AL DE	PTH 41	.7 ft		NC	ORTHING	572,529	EASTING 1,558,935		24 HR.	10.9
DRILI	. RIG/HAI	MMER E	FF./DA	TE HFOO	072 CN	1E-550	88% 03/1	9/2014				DRILL METHOD NW	Casing W/SPT & Core	НАММ	ER TYPE	Automatic
DRIL	LER S	mith, C	. L.		STAI	RT DA	TE 06/2	6/14		cc	OMP. DAT	re 06/26/14	SURFACE WATER DEF	TH N/	Ά	
COR	E SIZE	NO/N	Q				N 16.2 f									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)		UN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	L O G	ELEV. (fi		ESCRIPTION AND REMARK	s		DEPTH (1
465,6 465	465.6	25.5				ļ.,							Begin Coring @ 25.5 ft			
<u> </u>	465.6 <u> </u>	+	3.3		(3.3) 100%	(2.4) 73%		(3.3) 100%	(2.4) 73%		465.6 462.3		CRYSTALLINE ROCK O VERY HARD FRESH, MO OLIATED OR SHEARED, VO			
400	402.3	20.0	5.0		(5.0)	(5.0) 100%		(5.0)	(5.0) 100%		402.3		SILICIFIED. CONTAINS LES MINERALS.			
460	-	-			100%	100%		100%	100%		_		R1:7 R2:13 R3:20 R4:12 R5		_	
	457.3	33.8	5,0		(5.0)	(5.0)		(5.0)	(F 0)		457.3	\	FAIR ROCK, CLASS III, ROC CRYSTALLINE ROCK	·	······	33.
455	-	-	3.0			100%			(5.0) 100%		_	WIDELY FRA	D VERY HARD FRESH, MOI CTURED, WELL FOLIATED	OR SHE	ARED,	1
	452.3 ⁻	388									_ 452.3		OCK. POSSIBLY SLIGHTLY 5 THAN 1% SULPHIDE MINE		D. CONTA	
		- 50.0	2.9		(2.9)	(2.9) 100%		(2.9)			452.3		.1:12 R2:20 R3:25 R4:20 R RY GOOD ROCK, CLASS I, I		PE D	38.
450	449.4 -	41.7			100%	100%		100%	100%		449.4		CRYSTALLINE ROCK O VERY HARD FRESH, MOD			TO 41.
	-	_									-	WIDELY FRA	CTURED, WELL FOLIATED OCK. POSSIBLY SLIGHTLY	OR SHEA	ARED,	- 1
	-	_									L	LESS	THAN 1% SULPHIDE MINE	RALS.	.D. CONTA	1110
	-										Ŀ	RMR 81, VE	1:12 R2:20 R3:25 R4:20 R RY GOOD ROCK, CLASS I, I	ROCK TY	PE D	
	-	_									E	38.8' - 41.7' HARD TO	CRYSTALLINE ROCK O VERY HARD FRESH, MOD	DERATEL	Y CLOSE	то
	_	-									Ŀ	WIDELY FRA	CTURED, WELL FOLIATED OCK. POSSIBLY SLIGHTLY	OR SHEA	ARED, D. CONTA	JINS
	_										E	LESS	THAN 1% SULPHIDE MINE 1:12 R2:20 R3:25 R4:20 R	RALS.		
	-										_	RMR 81, VEF	RY GOOD ROCK, CLASS I, I	ROCK TY		
	-										F	Boring Terminate	d at Elevation 449.4 ft IN CR	YSTALLII	NE ROCK	
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	40096						B-4972			Y CABAR				GEOLOGIST Stickney, J. K.		
SITE	DESCR	IPTIO	N BR	IDGE:	# 277	O٧	VER ROCKY	RIVER	ON SR	1006 (MOL	INT PLE	ASAN	TRO	DAD)	GROUND WTR	(ft)
BOR	ING NO	B2-8	3		S	TA	ATION 22+6	5		OFFSET	6 ft RT			ALIGNMENT -L-	0 HR. 1	11.1
COL	LAR ELI	EV. 4	90.0 ft		T	ОТ	TAL DEPTH	45.1 ft		NORTHIN	3 572,	523		EASTING 1,558,945	24 HR. 1	11.3
DRILI	RIG/HA	MMER E	FF./DA	TE H	FO0072	2 CN	ME-550 88% (03/19/201	14		DRILL	METHO	D N	IW Casing W/SPT & Core HAMM	ER TYPE Automat	atic
DRIL	LER S	mith, C). L.		S	TA	ART DATE 0	06/26/14	1	COMP. DA	TE 06/	26/14		SURFACE WATER DEPTH N	'A	
ELEV	DRIVE ELEV	DEPTH	BLO	ow co	UNT	\prod	ВІ	LOWS P	ER FOOT		SAMP.	V /	LO	SOIL AND ROCK DES	POIDTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft		0 25	51 	0	75 100	NO.	МО		ELEV. (ff)	DEPT	TH (fi
490			ļ	ļ	ļ	\coprod				·	<u> </u>			490.0 GROUND SURFA	ACE	0.
	487.9	2.1	0	0	0									ALLUVIAL 0-17.1' ALLUVIAL, RED BI		
485	-		"	"	wo	Ŕ	0					W		L SOFT TO SOFT, WET, HIG FINE SANDY SILTY		
400	-	-			,		1							•		
	482.9	Z.1_	1	1-1-	2	11	3					l w		_		
480	-						<u> </u>					_		<u>-</u>		
	477.9	12.1				ľ	<u> </u>									
	-	-	0	0	0 WO	₽ф	0	: : :				w				
475	-	-								 				<u> </u>		
	472.9	1.71	2	15	18		\	33: -				w	000	472.9 RESIDUAL		17.1
470	-							33				**	0000	17.1' - 22.0' RESIDUAL, GF GRAY,WET, DENSE, NON F		
	467.9	22.1				\prod				T			000	AND SMALL GRAVEL	HIGHLY	22.0
	-	-	60/.1	1						60/.1				VOLCANICLAST	IC.	24.1
465	_	-				-								CRYSTALLINE R 22.0' - 24.1' CRYSTALLLII	JUK	2.7.1
	-	_												TOP, CASING ADVANCER BASE.	REFUSAL AT	27.6
460	-	-												CRYSTALLINE R		
	-	-				$\ \cdot\ $								24.1' - 27.6' CORED - CRYSTALLINE R	ОСК	
	-	-												- 457.4 27.6' - 32.6' CORED CRYSTALLINE R		32.6
455	-	-				┞						ŀ		32.6' - 37.6' CORED		
	-	-												- - 452.4		37.6
450	-	-												CRYSTALLINE R 37.6' - 42.6' CORED	оск	
700	-	-				lŀ				 				_	Kook	
	-	- -												- 447.4 - CRYSTALLINE R		42.6
445						L								444.9 42.6' - 45.1' CORED	ROCK	45.1
	-	-												Boring Terminated at Elevat CRYSTALLINE RO		
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WBS	40096	40096.1.1 TIP B-4972 COUN DESCRIPTION BRIDGE # 277 OVER ROCKY RIVER ON S							оиит	Υ	ABARRU	JS	GEOLOGIST Stickney, J. K.						
SITE	DESCR								N SR	100	6 (MOUN	T PLEASANT ROA	AD) GROUND W						
BOR	NG NO	. B2-B			STA	TION	22+65			OF	FSET 6	ft RT	ALIGNMENT -L-	0 HR.	0 HR. 11.				
COLI	AR EL	EV. 49	0.0 ft		TOT	AL DE	PTH 45.	1 ft		NO	NORTHING 572,523 EASTING 1,558,945 24								
DRILL	RIG/HA	MMER E	FF./DA	TE HFOO	0072 CN	IE-550	88% 03/1	9/2014				DRILL METHOD NW	Casing W/SPT & Core HA	MMER TYPE	Automatic				
DRIL	L ER S	mith, C	. L.		STAI	RT DA	TE 06/2	6/14		СО	MP. DAT	E 06/26/14	SURFACE WATER DEPTH	N/A					
COR	E SIZE	NO/NO	2		i		N 21.0 f												
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)		JN RQD (ft)	SAMP. NO.	STR REC. (ft) %	ATA RQD (ft) %	100	ELEV. (ft)	J	DEPTH (
165.9 465	465.9	24.1	3.5		(3.5)	(3.0)		(3.5)	(3.0) 86%		465.9		Begin Coring @ 24.1 ft CRYSTALLINE ROCK		24				
	462.4	27.6			100%	86%		100%	86%		- - 462.4		D, FRESH, LIGHT GRAY, MODEF CANICLASTIC ROCK, WITH WE						
	402.4	27.0	5.0		(3.5)	(1.2)		(3.5)	(1.2)		402.4	CLEAVAGE, 26.1'	TO 27' MEDIUM GRAY, WITH M ENT SIMILAR TO FOLLOWNG R	ORE SULPHIDE					
460		_			70%	24%		70%	24%		-	· .	R1:7 R2:17 R3:10 R4:12 R5:4 FAIR ROCK, CLASS III, ROCK T		- 1				
	457.4	32.6	5.0		(F 0)	(F O)		(5.0)	(F. 0)		457.4		CRYSTALLINE ROCK		J ₃₂				
455		ł	5.0		(5.0) 100%	(5.0) 100%		(5.0) 100%	(5.0) 100%		-	VOLCANICLASTIC, SI	RD CLOSE FRACTURED SULPHI HATTERED IN LOWER TWO FEE	T. RESISTANT	то				
	452.4 -	37.6									-		NG; MAY CONTAIN A LITTLE CL R1:4 R2:3 R3:10 R4:12 R5:4						
	432.4	37.0	5.0		(5.0)	(5.0)	:	(5.0)	(5.0)		- 452.4	RMR 33, F	POOR ROCK, CLASS IV, ROCK T CRYSTALLINE ROCK	YPE D	37				
450	-	<u> </u>			100%	100%		100%	100%		-		RD, FRESH, LIGHT GRAY, WIDE ARSE GRAINED, VOLCANICLAS		,				
ļ	447.4	42.6	0.5		(0.5)	(0.4)		(0.5)	/a //		447.4	DEVELOP	PED CLEAVE AT 80 TO 90 DEGRI R1:12 R2:20 R3:20 R4:20 R5:4		42				
445	444.9	45.1	2.5		(2.5) 100%	(2.4) 96%		(2.5) 100%	(2.4) 96%		- - 444.9		GOOD ROCK, CLASS II, ROCK	YPE D					
	-						•					37.6' - 42.6' HAI	CRYSTALLINE ROCK RD, FRESH, LIGHT GRAY, WIDE	LY SPACED					
	-	Ī									- [FRACTURED, COA DEVELOP	ARSE GRAINED, VOLCANICLAST ED CLEAVE AT 80 TO 90 DEGRI	'IC WITH WELI E DIP.	-				
	_	-									_		R1:12 R2:20 R3:25 R4:20 R5:4 RY GOOD ROCK, CLASS I, ROC	CTYPE D					
											- "		CRYSTALLINE ROCK RD, FRESH, LIGHT GRAY, WIDE						
	-	-			}						.	FRACTURED, COA	ARSE GRAINED, VOLCANICLAST D CLEAVAGE AT 80 TO 90 DEGI	IC WITH WELL	_				
	-	F					'				-	R	R1:12 R2:20 R3:25 R4:20 R5:4		Ì				
	-	F									- l	Boring Terminate	RY GOOD ROCK, CLASS I, ROC d at Elevation 444.9 ft IN CRYSTA	LLINE ROCK					
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BORING NO. B3.A	BORING NO. B3-A	BORI COLL			BRI	DGE #	# 277 I	OVI	FR ROCKY RI	/	201100							00011	
COLLAR ELEV. 501.9 ↑ TOTAL DEPTH 55.0 ↑ NORTHING 572,607 EASTING 1,558,981 24 HR. DRILL RIGHAMMER EFF,02072 CME-550 88%, 93/19/2014 DRILL METHOD NVC 2sing WISST 8 Corp. HAMMER TYPE. Aut. DRILL RIGHAMMER EFF,02072 CME-550 88%, 93/19/2014 DRILL RIGHAMMER TYPE. Aut. DRILLER Smith, C. L. START DATE 0,62/27/70 SMC 20072 SURFACE WATER DEPTH N/A ELEV 087VE 6 10 5 No. 0 5 No. 0 25 5 50 7,5 100 No. 0 No. 0 0 ELEV. III SOIL AND ROCK DESCRIPTION ELEV. III SOIL A	COLLAR ELEV. 501.9 ft TOTAL DEPTH 55.0 ft NORTHING 572,607 EASTING 1,558,981 24 HR. DRILL RIGHAMMER EFF. DATE HEXOUR CHESSO 83% 03192014 DRILL METHOD NV Cesting WISPT & Core HAMMER TYPE Auton DRILLER Smith, C. L. START DATE 0627770 COMP. DATE 0627770 SURFACE WATER DEPTH N/A ELEV DRIVE ELEV (10) 0.5ft	COLL	NG NO.							VEF	CONSR				ASAN	T RO	T		
DRILLER Smith, C. L. START DATE HP00072 CME-550 88% 03/19/2014 DRILL METHOD NIV Casing WiSPT & Core HAMMER TYPE Audit DRILLER Smith, C. L. START DATE 08/27/70 COMP. DATE 08/27/70 SURFACE WATER DEPTH NIA ELEV DRIVE CRYPT 01.0W COUNT 0.5%	DRILL RIGHIAMMER EFF, IDATE HF00072 CME-550 88% 03/19/2014 DRILL METHOD NW Casing WISPT & Color HAMMER TYPE Autom DRILLER Smith, C. L. START DATE 08/22/770 COMP. DATE 06/22/770 SURFACE WATER DEPTH N/A ELLEY DRIVE 0EPTH ELLOW 08/10 0 058 0 058 0 058 0 058 0 058 0 058 0 0 0 0																		0.0 N/
DRILLER Smith, C. L. START DATE 06/27/70 COMP. DATE 06/27/70 SURFACE WATER DEPTH N/A	DRILLER Smith, C. L. START DATE 06/27/70 COMP, DATE 06/27/70 SURFACE WATER DEPTH N/A BLEV 00 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	DRILL										NOR	THING						10.
ELEV (10) BLOW COUNT BLOW COUNT BLOW SPER FOOT SAMP NO. SAMP NO. SOIL AND ROCK DESCRIPTION SOIL	ELEV (10) CRIVE DELTY (10) 0.5R 0.5R 0.5R 0.5R 0.5R 0.5R 0.5R 0.5R					TE. HI					···					D NV			Automatic
SOLAND ROCK DESCRIPTION SOLAND ROCK DESCRIPTION RO	SOLLAND ROCK DESCRIPTION O.SR 0.5R 0	DRILI		r				TAF				COM	P. DA	7	1	1 7 1	SURFACE WATER DEPTH	N/A	
500	500 S01.9 CROUND SURFACE S01.9 CROWNY EBRANKINEST CROWNY EBRANKINEST CROWNY EBRANKINEST CROWNY EBRANKINEST CROWNY EBRANKINEST CROWNY EBRANKINEST CROWNY EBRANKINEST CROWNY EBRANKINEST CROWNY EBRANKINEST CROWNY EBRANKINEST CROWN CROWNY EBRANKINEST CROW		ELEV	ı		r	-	0				75 .l	100		'/	0		SCRIPTION	DEPTH
ROADWAY EMBANKMENT, RED ORANGE, SOFT TO MED, STIFF MOIST, RESIDUAL A92 5 9.4 2 2 5 5 7 7	SODDWAY EMBANKMENT RED ORANGE, SOFT TO MED. STIFF MOIST, STEP ORANGE, SOFT TO MED. STIFF MOIST, STEP ORANGE, SOFT TO MED. STIFF MOIST, STEP ORANGE, SOFT TO MED. STIFF MOIST, STEP ORANGE, SOFT TO MED. STIFF MOIST, STEP ORANGE, SOFT TO MED. STIFF MOIST, STEP ORANGE, SOFT TO MED. STIFF MOIST, STEP ORANGE, SOFT TO MED. STIFF MOIST, STEP ORANGE, SOFT TO MED. STIFF, MOIST TO MED. STIFF, STEP ORANGE, SOFT TO MED. STIFF, STEP ORANGE, SOFT TO MED. STIFF, MOIST TO MED. STIFF, MOIST TO MED. STIFF, MOIST TO MED. STIFF, MOIST TO MED. STIFF, MOIST TO MET. STI	505	-													 - -	- CROUND CUE	EACE	
495 496 497 498 498 497 498 498 497 498 498 498 498 498 498 498 498 498 498	495 490 497.5 14.4 2 3 6 6 9 489.0 477.7 RESIDUAL, RED TO RED. ART AND SANDY CLAY. 480 487.5 19.4 2 3 5 6 9 9 489.0 477.7 RESIDUAL, RED TO RED. ART AND SANDY CLAY. 480 487.5 19.4 2 3 5 6 9 9 489.0 477.7 RESIDUAL, RED TO RED. ART AND SANDY CLAY. 480 487.5 19.4 2 11 12 12 12 12 12 12 12 12 12 12 12 1	500	-	<u> </u>		ļ	 	Ħ				Τ			 		ROADWAY EMBA	NKMENT	
495 492.5 9.4 2 2 5 97 496 487.5 14.4 2 3 6 98 488.5 19.4 2 3 5 98 488.5 19.4 2 3 5 98 489.0 10.4 - 12.9 DARK GRAY, ROCK FILL ALLUVIAL 12.9 - 24.2 ALLUVIAL, RED TO RED BROWN, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, MOIST TO WET, CLAY AND SANDY CLAY. 480 477.5 24.4 11 12 12 475 476 477.7 RESIDUAL GRAY, WET, MEDIUM DENSE TO DENSE, SANDY GRAVEL FROM HIGHLY WEATHERED SHEARED, PRAGMENTAL WEATHER SHEARED, PRAGMENTAL WEATHER SHEA	495 492.5 9.4 2 2 5 7 7 800 10.4 - 12.9 DARK GRAY, ROCK FILL 485 482.5 19.4 2 3 6 8 9 9 4 7 10.4 - 12.9 DARK GRAY, ROCK FILL 486 487.5 14.4 1 1 12 12 12 24 17.7 RESIDUAL 487.5 24.4 11 12 12 12 24 100.4 10	300	 							 							ORANGE, SOFT TO ME SILTY CLAY, PROBABLY	D. STIFF MO DERIVED FI	IST, ROM
480	480	495	- - -	-				-									-		
485	485		492.5	9.4	2	2	5	11	• 7			: :			w_			NUCEACHT	1
487.5 14.4 2 3 6 485 485 487.5 14.4 2 3 6 488 488 488 488 488 488 488 488 488 4	487.5 14.4 2 3 6 8 12.9 - 24.2 ALLUVIAL, RED TO RED BROWN, MEDIUM STIFF TO STIFF, HIGHLY PLASTIC, MOIST TO WET, CLAY AND SANDY CLAY. 480 477.5 24.4 11 12 12 24 24 27.5 29.4 1007.4 475.7 24.2 - 26.2 RESIDUAL, GRAY AND BLUE GRAY, WET, MEDIUM DENSE TO DENSE, SANDY GRAVEL FROM HIGHLY WEATHERED SHEARED, FRAGMENTAL VIOLANIC ROCK 26.2 - 32.2 WEATHERED ROCK CASING ADVANCER REFUSAL AT BASE. 465 466 767 26.2 - 32.2 WEATHERED ROCK CASING ADVANCER REFUSAL AT BASE. 466 67 27 28.2 WEATHERED ROCK CASING ADVANCER REFUSAL AT BASE. 467 28.2 - 32.5 WEATHERED ROCK CASING ADVANCER REFUSAL AT BASE. 468 68 9 CRYSTALLINE ROCK 45.0 * CRYSTALLINE ROCK 45.0 * - 50.0 * CORED ROCK 45.0 * CORED ROCK 45.0 * - 50.0 * CORED ROCK 45.0 * - 50.0 * CORED ROCK 45.0 * CORED ROCK 45.0 * CORED ROCK 45.	490	_	E				1	1	- · 		+					489.0 10.4' - 12.9 DARK GRA	Y, ROCK FIL	.L 1:
482.5 19.4 2 3 5 6 8 W A77.7 RESIDUAL 477.5 24.4 11 12 12 24 W SSS 475.7 24.2°-26.2° RESIDUAL GRAY AND BLUE GRAY, WET, MEDIUM DENSE TO DENSE, SANDY GRAYEL FROM HIGHLY WEATHERED SHEARED, FRAGMENTAL VOLCANIC ROCK. 469.9 CRYSTALLINE ROCK GRAY, WET, MEDIUM DENSE TO DENSE, SANDY GRAYEL FROM HIGHLY WEATHERED SHEARED, FRAGMENTAL VOLCANIC ROCK. CRYSTALLINE ROCK 32.2° -32.2° WEATHERED ROCK CRYSTALLINE ROCK 469.9 CRYSTALLINE ROCK 461.9 CRYSTALLINE ROCK 450.0° -55.0° CORED ROCK 451.9 CRYSTALLINE ROCK 451.9 CRYSTALLINE ROCK 450.0° -55.0° CORED ROCK	480 482.5 19.4 2 3 5 9 9 W W 477.7 RESIDUAL 475 24.4 11 12 12 24 W 600 475.7 24.2'-26.2' RESIDUAL, GRAY AND BLUE GRAY, WET, MEDIUM DENSE TO DENSE, SANDY GRAVEL FROM HIGHLY WEATHERED SHEARED, FRAGMENTAL VOLCANIC ROCK WEATHERED ROCK CASING ADVANCER REFUSAL AT BASE. CRYSTALLINE ROCK 35.0'-40.0' CORED ROCK 461.9 CRYSTALLINE ROCK 450.9 CRYSTALLINE ROCK	485	487.5	14.4	2	3	6		9	 					w		12.9' - 24.2' ALLUVIAL BROWN, MEDIUM ST	RED TO RE	Ξ,
477.5 24.4 11 12 12 24	477.5 24.4 11 12 12 24.4 27.5 29.4 11 12 12 24.4 27.5 29.4 100/.4 477.7 RESIDUAL. 478. 479. 470. 470. 470. 470. 470. 470. 470. 470	700	482.5	19.4						- <i>-</i>									LAT
## 100/.4 11 12 12 12 12 12 12 1	## 17.5	480_	_		2	3	5	lL	. ∳8						W		_		
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472.5 29.4 1007.	## 100/.4 ## 100	475	-		11	12	12		24	 : <u></u> -		· ·	· · ·		w		475.7 24.2' - 26.2' RESIDUAL, 0	RAY AND B	
465 466.9 467.00 - 40.0° CASING ADVANCER REFUSAL AT BASE. 468.9 468.9 468.9 468.9 CRYSTALLINE ROCK 32.2° -35.0° CORED ROCK CRYSTALLINE ROCK 35.0° - 40.0° CORED ROCK 461.9 CRYSTALLINE ROCK 40.0° - 45.0° CORED ROCK 456.9 CRYSTALLINE ROCK 45.0° - 50.0° CORED ROCK 451.9 CRYSTALLINE ROCK 50.0° - 55.0° CORED ROCK	465 466.9 CRYSTALLINE ROCK 32.2' - 35.0' CORED ROCK CRYSTALLINE ROCK 35.0' - 40.0' CORED ROCK 461.9 CRYSTALLINE ROCK 40.0' - 45.0' CORED ROCK 456.9 CRYSTALLINE ROCK 456.9 CRYSTALLINE ROCK 450' - 50.0' CORED ROCK 450' - 50.0' CORED ROCK 451.9 CRYSTALLINE ROCK 450.0' - 55.0' CORED ROCK 451.9 CRYSTALLINE ROCK 450.0' - 55.0' CORED ROCK 451.9 CRYSTALLINE ROCK 450.0' - 55.0' CORED ROCK		472.5	29.4	100/.4					 			100/.4	,			SANDY GRAVEL FR WEATHERED SHEARED	OM HIGHLY , FRAGMEN	
465 460 460 461.9 CRYSTALLINE ROCK 35.0' - 40.0' CORED ROCK 461.9 CRYSTALLINE ROCK 40.0' - 45.0' CORED ROCK 456.9 CRYSTALLINE ROCK 45.0' - 50.0' CORED ROCK 450.0' - 55.0' CORED ROCK	465 460 460 461.9 CRYSTALLINE ROCK 456.9 CRYSTALLINE ROCK 45.0' - 40.0' CORED ROCK 451.9 CRYSTALLINE ROCK 45.0' - 50.0' CORED ROCK 451.9 CRYSTALLINE ROCK 450.0' - 55.0' CORED ROCK 446.9 Boring Terminated at Elevation 446.9 ft IN	470	_							 							26.2' - 32,2' WEATHEREI	ROCK, CAS	SING 3
460 461.9 CRYSTALLINE ROCK 461.9 CRYSTALLINE ROCK 40.0' - 45.0' CORED ROCK 456.9 CRYSTALLINE ROCK 45.0' - 50.0' CORED ROCK 451.9 CRYSTALLINE ROCK 50.0' - 55.0' CORED ROCK	460 461.9 CRYSTALLINE ROCK 461.9 CRYSTALLINE ROCK 40.0' - 45.0' CORED ROCK 456.9 CRYSTALLINE ROCK 45.0' - 50.0' CORED ROCK 451.9 CRYSTALLINE ROCK 50.0' - 55.0' CORED ROCK	465	-														32.2' - 35.0' COR	D ROCK	
455 CRYSTALLINE ROCK 40.0' - 45.0' CORED ROCK 456.9 CRYSTALLINE ROCK 45.0' - 50.0' CORED ROCK 451.9 CRYSTALLINE ROCK 50.0' - 55.0' CORED ROCK	455 456.9 CRYSTALLINE ROCK 40.0' - 45.0' CORED ROCK 456.9 CRYSTALLINE ROCK 45.0' - 50.0' CORED ROCK 451.9 CRYSTALLINE ROCK 50.0' - 55.0' CORED ROCK 446.9 Boring Terminated at Elevation 446.9 ft IN			_							:	: :					35.0' - 40.0' COR		4
455 CRYSTALLINE ROCK 45.0' - 50.0' CORED ROCK 451.9 CRYSTALLINE ROCK 50.0' - 55.0' CORED ROCK	455 CRYSTALLINE ROCK 45.0' - 50.0' CORED ROCK 451.9 CRYSTALLINE ROCK 50.0' - 55.0' CORED ROCK 446.9 Boring Terminated at Elevation 446.9 ft IN	460								 		· ·					CRYSTALLINE		
450 451.9 CRYSTALLINE ROCK 50.0' - 55.0' CORED ROCK	450 CRYSTALLINE ROCK 50.0' - 55.0' CORED ROCK 446.9 Boring Terminated at Elevation 446.9 ft IN		-							 							CRYSTALLINE		4.
450 CRYSTALLINE ROCK 50.0' - 55.0' CORED ROCK	450 CRYSTALLINE ROCK 50.0' - 55.0' CORED ROCK 446.9 Boring Terminated at Elevation 446.9 ft IN	455_	-	_						· ·								ED ROCK	_
446.9	446.9 Boring Terminated at Elevation 446.9 ft IN	450	-	-						 		: :					CRYSTALLINE		5
	Boring Terminated at Elevation 446.9 ft IN		-	-						· ·								LD NOOK	5
			-	-						••	l						Boring Terminated at Ele		
			- - -														-		

NCDOT GEOTECHNICAL ENGINEERING UNIT

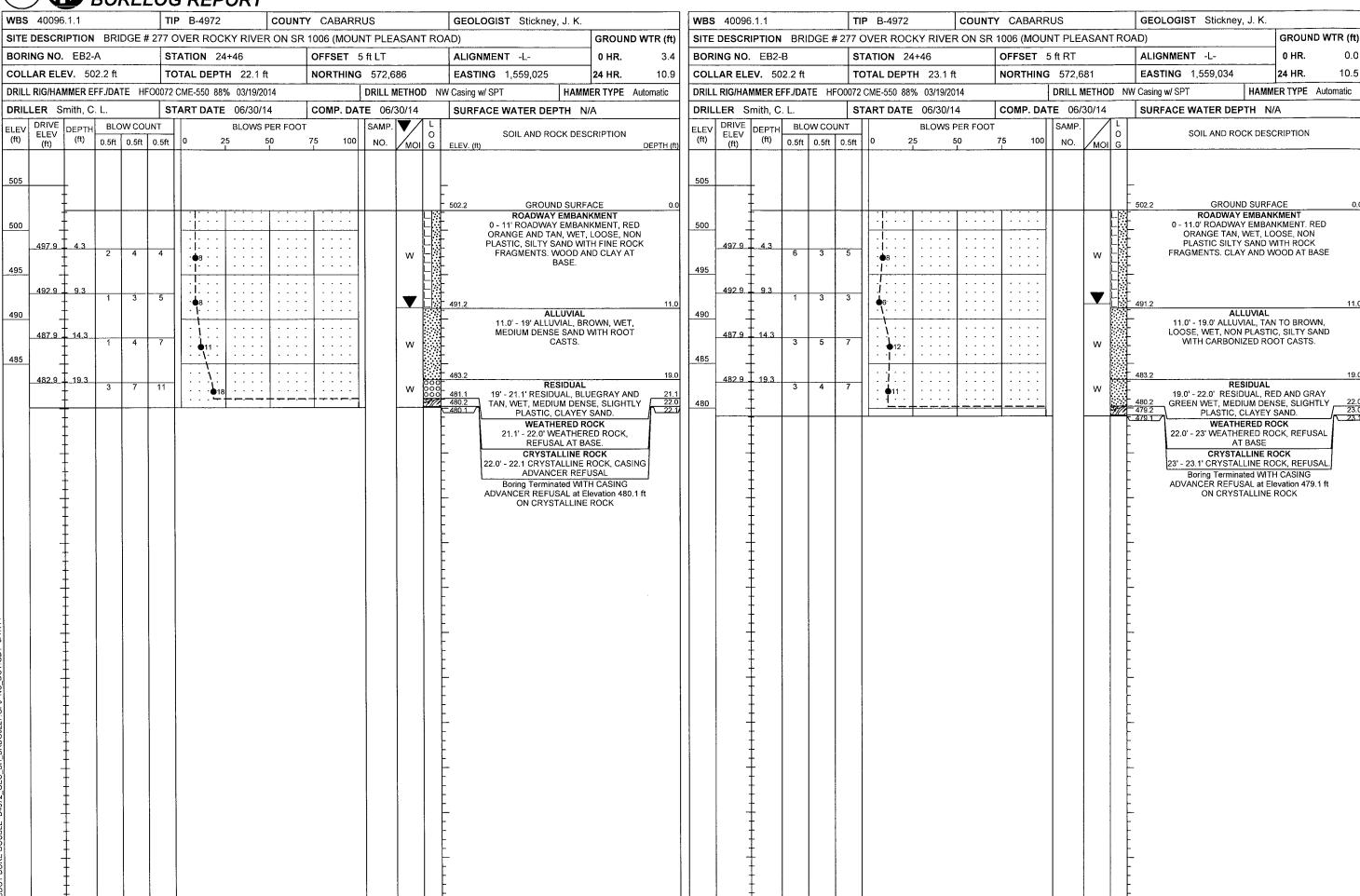
\leq		CUI	KE D	UK	INC	יא ל	-01	K I							
-	40096.1.1			L	B-497					ABARF		GEOLOGIST Stickne	y, J. K.	T	
SITE	DESCRIPTION	BRI	DGE # 2	77 OV	ER RC	CKY RIV	ER O	N SR	100	6 (MOU	NT PLEASANT ROA	AD)		GROUND W	TR (ft)
BORI	NG NO. B3-A	١		STAT	ION	23+56			OF	FSET	5 ft LT	ALIGNMENT -L-		0 HR. 0	0.0 N/A
COLI	AR ELEV. 50	01.9 ft		TOTA	AL DE	PTH 55.6	O ft		NO	RTHING	572,607	EASTING 1,558,981		24 HR.	10.1
DRILL	. RIG/HAMMER E	FF./DA	TE HFOO	072 CM	E-550	88% 03/19	/2014				DRILL METHOD NV	V Casing W/SPT & Core	HAMM	ER TYPE Auto	matic
DRIL	LER Smith, C	. L.	· · · · · · · · · · · · · · · · · · ·	STAF	RT DA	TE 06/27	7/70		co	MP. DA	TE 06/27/70	SURFACE WATER DE	PTH N/	Α	
COR	E SIZE NO/N	Q		L		N 22.8 ft							,		
ELEV (ft)	RUN ELEV (ft) DEPTH	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	STR REC. (ft) %	ATA RQD (ft) %	L O G	ELEV. (DESCRIPTION AND REMAR	<s< td=""><td></td><td>DEPTH (ft</td></s<>		DEPTH (ft
469.7	400 7 20 0			12.13	(5.1)		72 11					Begin Coring @ 32.2 ft			
	469.7 32.2 466.9 35.0	2.8		(2.4) 86%	(0.4) 14%		.(2.4) 86%	(0.4) 14%		- 469.7 - 466.9		CRYSTALLINE ROCK HARD, FRESH, VUGGY SH			32.2 35.0
465	400.9	5.0		(5.0)	(4.2)	1	(5.0)	(4.2) 84%		400.5		D VOLCANICLASTIC WITH I IRE. BROKEN ALONG HIGH	ANGLE F		[
405	†			100%	84%	,	100%	84%		 	RMR 27,	R1:4 R2:3 R3:10 R4:6 R5 POOR ROCK, CLASS IV, R		E D	
	461.9 40.0			(F. 0)	(F, 0)	:	(C 0)	(F.0)		461.9	35 0' - 40 0' CONT	CRYSTALLINE ROCK INUATION OF FIRST RUN, (GRAY HA	RD FRESH	40.0
460	‡	5.0		(5.0) 100%	(5.0) 100%		(5.0) 100%	(5.0) 100%			SHEARED, SLIGHT	LY SILICIFIED VOLCANICLY WITH OPEN SPACE THAT	ASTIC, CU	IT BY PYRITE	
	450.0 7 45.0									- 456,9	TILLEDTRACTORL	AXIS. RETAINS MOISTUR	E.	LLL TO COME	45.0
455	456.9 45.0	5.0		(2.2)	(1.0)		(2.2)	(1.0)		456.9	RMR 51	R1:4 R2:17 R3:20 R4:6 R , FAIR ROCK, CLASS III, RC		D	J 45.0
455	. ‡	-		44%	20%		44%	20%		_		CRYSTALLINE ROCK ND WHITE, HARD TO VERY			
	451.9 50.0	<u> </u>		12.5	-77-23					451.9		MTH WELL- DEVELOPED C DEGREES. WIDELY SPACED			50.0
450	‡	5.0		(5.0) 100%	(4.2) 84%		(5.0) 100%	(4.2) 84%		-		R1:12 R2:20 R3:25 R4:20 ERY GOOD ROCK, CLASS I,		PE D	
	440.0 + 55.0									- 440.0		CRYSTALLINE ROCK ND WHITE, HARD TO VERY			55.0
	446.9 55.0			 				 		446.9	VOLCANICLASTIC \	MITH WELL- DEVELOPED C EES. CLOSELY FRACTURED	LEAVAGE	E, DIPPING AT	55.0
	‡									_		AL OF SHATTERED ROCK L	OST TO R		1
	‡									-	RMR 25,	R1:7 R2:3 R3:5 R4:6 R5 POOR ROCK, CLASS IV, R		E D	_
	‡									-		CRYSTALLINE ROCK ND WHITE, HARD TO VERY			_
	‡									_		MTH WELL- DEVELOPED C ES. CLOSELY FRACTURED			
	†									-		SPACE. R1:7 R2:17 R3:20 R4:20 F			
	+									 		GOOD ROCK, CLASS II, R ted at Elevation 446.9 ft IN CI	OCK TYPE]
	‡									<u>-</u>	boning reminat	ed at Elevation 440.9 it in Ci		NE ROCK	
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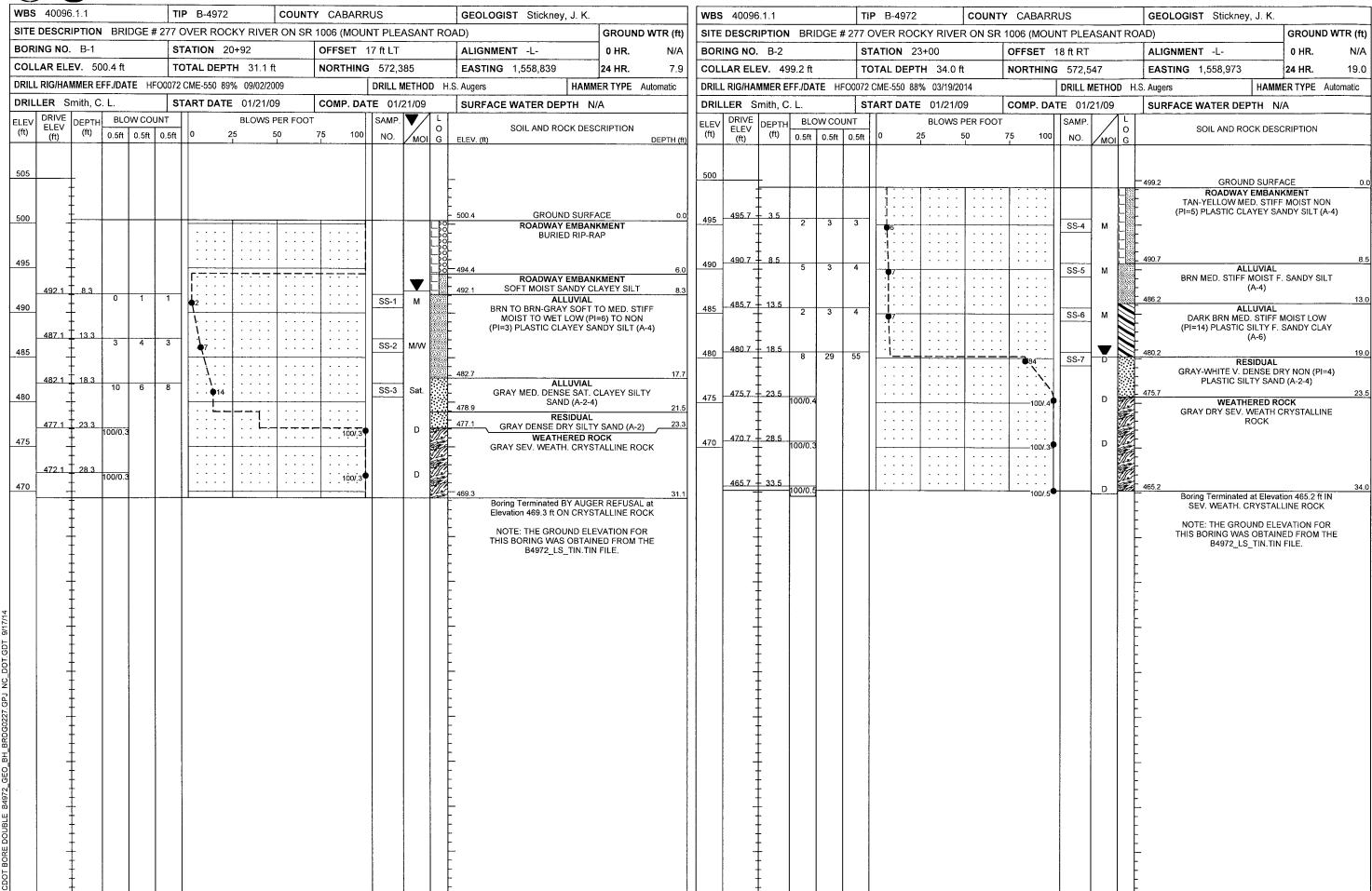


	40096						B-4972		COUNT						GEOLOGIST Stickney,	J. K.	
SITE	DESCR	IPTION	BR	DGE :	# 277	OV	ER ROC	KY RIVE	R ON SR	1006	(MOU	NT PLE	ASAN	IT RO	PAD)	GROUN	ID WTR (
BORI	NG NO	. В3-Е	3		s	TAT	TION 23	3+55		OFFS	SET	6 ft RT			ALIGNMENT -L-	0 HR.	0
COLL	AR ELI	EV . 50)1.6 ft		Т	OTA	AL DEPT	H 54.81	t	NOR	THING	5 72,6	301		EASTING 1,558,990	24 HR.	11
RILL	RIG/HA	MMER E	FF./DA	TE H	FO0072	2 CM	1E-550 889	% 03/19/2	014			DRILL	METHO	D N	W Casing W/SPT & Core	HAMMER TYPE	Automatic
RILL	LER S	mith, C	. L.		s	TAF	RT DATE	06/30/	14	COM	P. DA	TE 06/	30/14		SURFACE WATER DEPT	H N/A	***************************************
LEV	DRIVE ELEV	DEPTH	BLC	ow co	UNT			BLOWS	PER FOO	ſ		SAMP.	V	L	SOIL AND BOCK	K DESCRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0) 2 	5 L	50 .l	75 	100	NO.	MOI	1 1	ELEV. (ft)		DEPTH
					:												
505		-													_		
		‡													-	011051.05	
500		‡	-			+			T:::			+	 			SURFACE MBANKMENT	
,00	-	‡							1	-					 0 - 11.0' ROADWAY I ORANGE, V. SOFT I 		
-	497.4	4.2	0	0	0	-				: : :			w		PROBABLY DERIV WEATHERED SLAT	'ED FROM HIGHL	_Y
195		‡					,			· · ·	• •		**		LAST		
	492.4	9.2					:: `:\			.					-		
		¥2	15	16	16			32		: : :					- - 490.6		1
190		‡				1	/		 	. 					- ALLU - 11.0' - 24.2' ALLUV	JVIAL /IAL RED TO RE	
-	487.4	14.2	2	5	8	-	/.			: : :			w		BROWN, MEDIUM HIGHLY PLASTIC, M	I STIFF TO STIFF	
185	-		_			11	∮ 13.			· · ·			**		- AND SAN		L/1
	400.4	40.0	}				: [: :			: : : <i>:</i> : :	: :				<u>.</u>		
_	482.4	19.2	2	3	5	1	. / . ♠ 8			.			w		<u>.</u>		
80	-	t				$\ \cdot\ $									_		
-	477.4	24.2	6	8	15	1			· · ·	. : :				000	- 477.4	DUAL	2
175	-	L		"	13			23	<u> </u>				W	000	- 475.6 24.2' - 26.0 RESIDUA	AL, GRAY AND BI	UE2
	-	ł					::::								SANDY GRAVEL	FROM HIGHLY	NSE,
	-	<u> </u>					: : : :								471.8 WEATHERED SHEAR		TAL 2
170	-	ŀ				1										RED ROCK THERED ROCK,	
	-	ł			ĺ										- REFUSAL		
65	-	-								.					- 26.9' - 29.8' CORED	, BUT WEATHER	
	-															INE ROCK	
	-	F								.						ORED ROCK	3
160	_	F				\parallel			 	+					34.8' - 39.8' C	ORED ROCK	
	-	F														ORED ROCK	4
155	-	F								.					CRYSTALL	INE ROCK ORED ROCK	
	-	Ī														ONEDNOON	
	-	ļ.							1	.					451.8 CRYSTALI	INE ROCK	4
150	_	F				-			1	· · ·	• •					ORED ROCK	
	-	F													- - - 446.8		5
ľ		-		 		'	 1			·		1			Boring Terminated at		
-	<u> </u>								1:::			-				Elevation 446.8 f	tIN



\geq	<u> </u>			KE B	T						
	WBS 40096.1.1 SITE DESCRIPTION BRIDGE # 2					B-497					ABARRUS GEOLOGIST Stickney, J. K.
				DGE # 2	T			VER C	ON SR	T	······································
	ING NO.				 		23+55			+	FSET 6 ft RT ALIGNMENT -L- 0 HR. 0
	LAR ELI						PTH 54			NO	RTHING 572,601 EASTING 1,558,990 24 HR. 11.
	-			TE HFOO	 		88% 03/1		·- <u>-</u> -		DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic
	LER S				├		TE 06/3			co	MP. DATE 06/30/14 SURFACE WATER DEPTH N/A
 	E SIZE RUN	r		DRILL	<u> </u>	AL RU JN	N 27.9 f		RATA	 	
(ft)	ELEV (ft)	DEPTH (ft)	RUN (ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	L 0 G	DESCRIPTION AND REMARKS ELEV. (ft) DEPTH
474.7	474.7	26.9	2.9		(1.9) 66%	(0.5) 17%		(1.9) 66%	(0.5) 17%		Begin Coring @ 26.9 ft - 474.7
470	471.8 _	29.8	5.0		(5.0) 100%	(4.9) 98%		(5.0) 100%	(4.9)		- 4/1.8 WEATHERED, VOLCANICLASTIC WITH WELL DEVELOPED CLEAVAGE ON FRAGMENTAL TEXTURE. OXIDISED. R1:1 R2:3 R3:5 R4:0 R5:4
	466.8	34.8	5.0		(5.0)	(3.6)		(5.0)	(3.6)		RMR 13, VERY POOR ROCK, CLASS IV, ROCK TYPE D CRYSTALLINE ROCK 29.8' - 34.8' LIGHT GRAY, VERY SLIGHTLY WEATHERED, HARD, 3.
465	- - 461.8 _	_ _ _ 39.8			100%			100%			MODERATELY CLOSE FRACTURED, VOLCANICLASTIC WITH WELL DEVELOPED SLATEY CLEAVAGE DIPPING AT 70 TO 80 DEGREES. R1:4 R2:13 R3:20 R4:20 R5:4 RMR 68, GOOD ROCK, CLASS II, ROCK TYPE D 33
460		-	5.0		(5.0) 100%	(2.7) 54%		(5.0) 100%			CRYSTALLINE ROCK 34.8' - 39.8' LIGHT GRAY, VERY SLIGHTLY WEATHERED, HARD, MODERATELY CLOSE FRACTURED, VOLCANICLASTIC WITH WELL DEVELOPED SLATEY CLEAVAGE DIPPING AT 70 TO 80 DEGREES, AND
455	456.8 _ - -	_ 44.8 - -	5.0		(5.0) 100%	(3.3) 66%		(5.0) 100%	(3.3) 66%		SECONDARY FRACTURE PARALLEL TO CORE 4-1-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-
450	451.8 <u> </u>	49.8 -	5.0		(5.0) 100%	(5.0) 100%		(5.0) 100%	(5.0) 100%		CRYSTALLINE ROCK 451.8 39.8' - 44.8' LIGHT GRAY, VERY SLIGHTLY WEATHERED, HARD, MODERATELY CLOSE FRACTURED, VOLCANICLASTIC WITH WELL DEVELOPED SLATEY CLEAVAGE DIPPING AT 70 TO 80 DEGREES.
	446.8	54.8		<u> </u>							VERTICAL FRACTURE ALSO EXPRESSED. R1:7 R2:13 R3:20 R4:20 R5:4 RMR 64, GOOD ROCK, CLASS II, ROCK TYPE D CRYSTALLINE ROCK CRYSTALLINE ROCK
		- - - -									44.8' - 49.8' LIGHT GRAY, FRESH, HARD, MODERATELY CLOSE FRACTURED, VOLCANICLASTIC WTH WELL DEVELOPED SLATEY CLEAVAGE DIPPING AT 70 TO 80 DEGREES. SHATTERED INTERVALS REDUCE RQD. R1:12 R2:13 R3:20 R4:20 R5:4
	1111	-									RMR 69, GOOD ROCK, CLASS II, ROCK TYPE D CRYSTALLINE ROCK 49.8' - 54.8' LIGHT GRAY AND WHITE, FRESH, HARD, WIDELY FRACTURED, VOLCANICLASTIC WITH WELL DEVELOPED SLATEY CLEAVAGE DIPPING AT 70 TO 80 DEGREES.
		- - -									R1:12 R2:20 R3:25 R4:20 R5:4 RMR 81, VERY GOOD ROCK, CLASS I, ROCK TYPE D Boring Terminated at Elevation 446.8 ft IN CRYSTALLINE ROCK
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TEST RESULTS

SHEET

19

PROJECT: 40096.1.1 (B-4972)

COUNTY: CABARRUS

SITE DESCRIPTION: BRIDGE NO. 227 OVER ROCKY RIVER ON SR 1006 (MT. PLEASANT RD.)

SOIL S	AMPLE RES	ULTS	ROCK SAMPLE RESULTS																							
SAMPLE NO.	OFFSET	STATION	DEPTH	AASHTO	N	L.L.	P.I.		% BY WEIG	GHT		% PAS	SSING S	IEVES	%	%	UNIT	VOID	SAMF	LE NO.	OFFSET	STATION	DEPTH	RQD UNIT WT	Q(ksf)	E(MPsi)
			INTERVAL	CLASS				C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC	WT. (d)	RATIO					INTERVAL	(pcf)		
		B-1																								
SS-1	17 LT.	20+92 -L-	8.80-9.80	A-4(1)	2	27	6	15.1	37.7	25.1	22.2	90	83	50												
SS-2			13.80-14.80	A-4(0)	7	24	3	2.0	51.6	30.3	16.1	100	100	61												
SS-3			18.80-19.80	A-2-4(0)	14	20	NP	18.9	49.7	19.2	12.1	68	62	27												
		B-2																								
SS-4	18 RT.	23+00 -L-	4.00-5.00	A-4(0)	6	32	5	24.0	51.6	38.4	16.1	80	67	48												
SS-5			9.00-10.00	A-4(0)	7	21	NP	9.5	61.8	20.6	8.1	100	98	39												
SS-6			14.00-15.00	A-6(8)	7	34	14	1.6	40.7	29.5	28.2	100	100	69												
SS-7			19-00-20.00	A-2-4(0)	84	25	4	48.1	24.6	19.2	8.1	84	53	26												











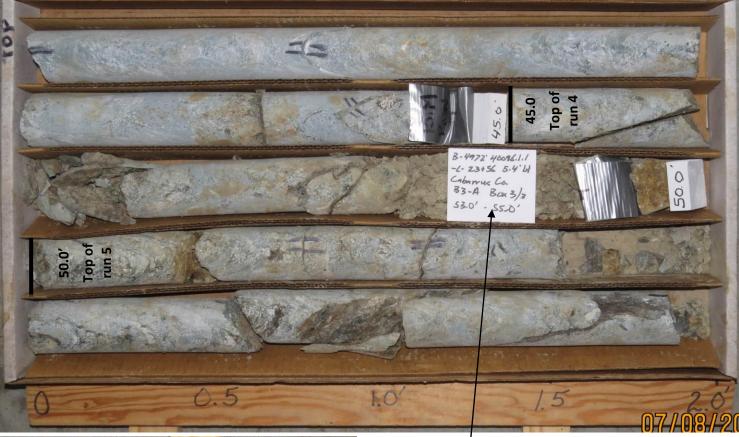














Label cards in core boxes 2 and 3 were switched. Blocks are correct.







