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2 R 4400C REFERENCE

CONTENTS

DESCRIPTION

SUBSURFACE INVESTIGATION, 2001

TITLE SHEET

SITE PLAN

SHEET NO.

2

3-31

36030 PROJEC

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

HENDERSON

COUNTY _

I-4400C, I-26 FROM US 25 PROJECT DESCRIPTION TO NC 280

BRIDGE NO. 233 ON I-26 SITE DESCRIPTION OVER CANE CREEK

NOTE: BORING LOCATIONS UPDATED TO LOCATIONS ON ALIGNMENT FOR I-4400C, SEPTEMBER, 2018

STATE	STATE PROJECT	REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-4700C	440233	1	31

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNIKG AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOLI TEST DATA AVAILABLE MAY BE REVEWED OR INSPECTED IN RALEICH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-6860. THE SUBSIFACE 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 UNPELACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLI MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLI MOISTURE CONDITIONS MAY YARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

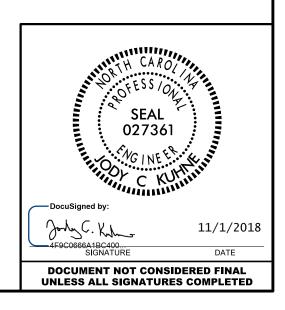
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT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

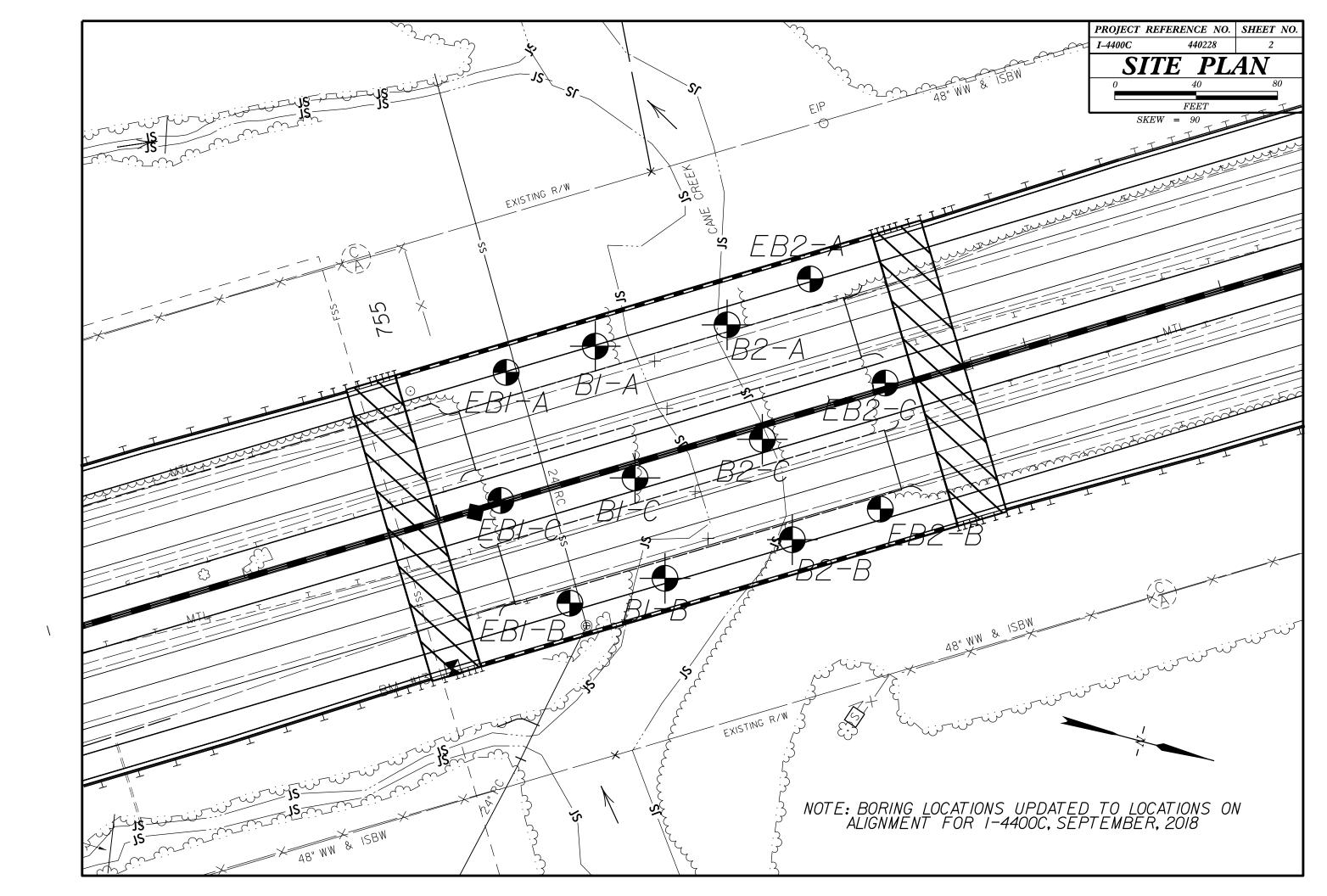
- NOTES: I. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT. 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

FOR CUNSULIANTS
B HOWEY
L GILCHRIST
INVESTIGATED BY
DRAWN BY
CHECKED BY
SUBMITTED BYJ KUHNE
DATEUPDATE 10/2018

FAD CONCULTANTS





CONTENTS:

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 8.1952001 I.D. NO. 1-4400 F.A. PROJECT__NHF-26-1-(62)23 COUNTY HENDERSON PROJECT DESCRIPTION 1-26 FROM NC 225 (US 25 CONNECTOR) TO NC 280 IN HENDERSON AND BUNCOMBE COUNTIES SITE DESCRIPTION BRIDGE NOS. 233 & 234 ON I-26 OVER CANE CREEK

00

STATE	STATE P	ROJECT REFERENCE NO.	SHEET	TOTAL SHEETS			
N.C.		I-4400	1				
STATE P	ROLNO.	F.A. PROJ. NO.	DESCRIP	TION			
8.1952	2001	NHF-26-1-(62)23	P.E.	• • • • •			
			CONST.				

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REGUEST FOR PROPOSAL. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED ON INSPECTED IN RALEGIA BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT & (39) 250-4088. THE SUBSURFACE PLANS, FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

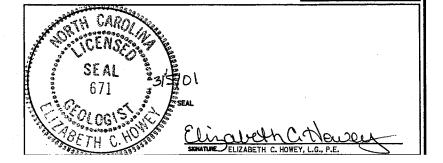
SOL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEDTECHNCAL INTERPRETATION UNLESS Encountered in a sample. Interpreted boundaries may not necessarily reflect actual subsurface conditions between sampled strata, and borehole information SUBSUMPALE CONDITIONS BETWEEN SAMPLED STRATA AND BURENCLE REGULATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNES, THE LABORATORY SAMPLE DATA AND THE IN SITU GN-PLACE TEST DATA CAN BE RELED ON ONLY TO THE DEGREE OF RELIABLITY INHERDIT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION, THESE WATER LEVELS OR SOLL MOISTURE CONDITIONS MAY VARY CONSDERABLY WITH THE ACCORDING TO CLIMATIC CONDITIONS INCLUDING DESTINGTIONS AND THAT IN THE DEGREE OF THE INVESTIGATION. TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE Investigation made or the opnion of the department as to the type of materials and conditions to be encountered, the bidder or contractor is cautioned to make such independent CONTINUES TO BE EXCOUNTERED, THE BIDDER OF CONTRACTOR IS CALIFORD TO MARE SUCH ROBERDARD SUSJURFACE INVESTIGATIONS AS HE DEBUS NECESSARY TO SATISFY INVESTIGATIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBJURFACE INFORMATION.

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - 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.

INVESTIGATED BYL.D. GILCHRIST	PERSUNNEL CARR
CHECKED BY E.C. HOWEY, L.G., P.E.	J. GILCHRIST
SUBMITTED BY F&R, INC.	M. RENZA
DATE	J. LOWERY





NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

1. 1. S. S.

DIVISION OF HIGHWAYS

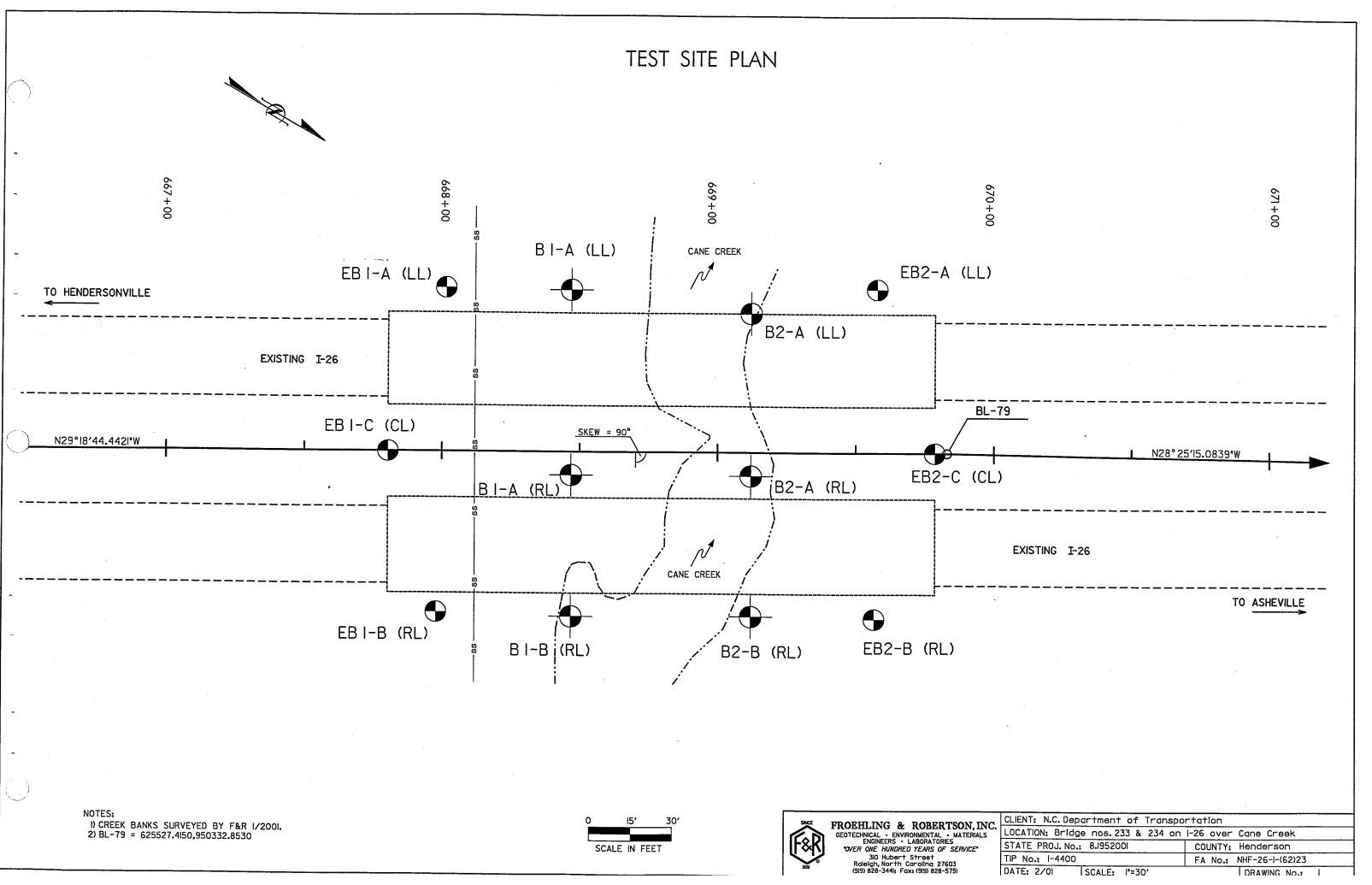
GEOTECHNICAL UNIT

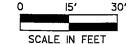
SUBSURFACE INVESTIGATION

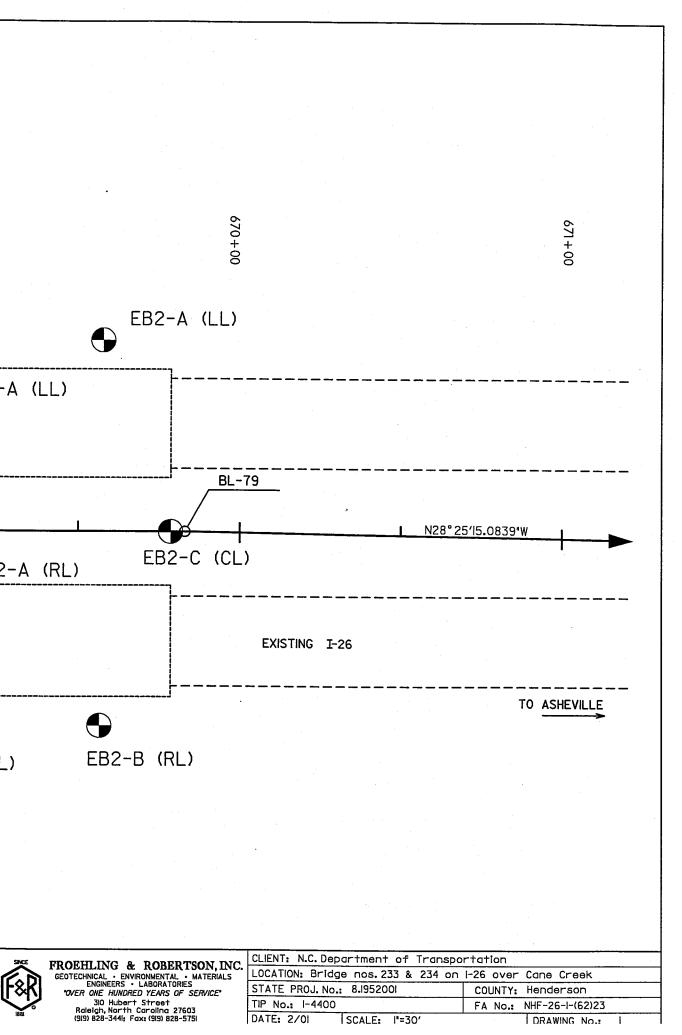
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

		AS, SYMBOLS, AND ABBREVIATIONS	
	GRADATION	ROCK DESCRIPTION HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED	TERMS AND DEFINITIONS
Soil is considered to be the unconsolidated, semi-consolidated or weathered earth materials which can be penetrated with a continuous flight power auger, and which yields less than	UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE, (ALSO PORLY GRADED)	ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.
100 Blows per foot according to standard penetration test (Aashto 1206, Astm D-1586), soil Classification is based on the Aashto system and basic descriptions generally shall include:	GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES 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 REPRESENTED BY A ZONE	<u>AQUIFER</u> - A WATER BEARING FORMATION OR STRATA. <u>ARENACEDUS</u> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS; ANGULAR,	OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLOWS:	ARGILLACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERLYED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,
VERY STIFF, GRAY SLIY CLAY, MOIST WITH INTERBEDDED FINE SAND LAVERS, INGHLY PLASTIC, 1-7-6	SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION		ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	CRYSTALLINE PINE TO CUARSE GRAIN IGNEUDS AND METAMORPHIC ROCK THAT	GROUND SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5		NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN	CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-5 A-2-7 A-7-8 A-3 A-6, A-7	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30	ROCK (NCR)	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL DEGECORDER TO THE STATE OF THE STATE	MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD 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
7 PASSING	PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC.	LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
* 48 38 MX58 MX51 MN	ORGANIC MATERIAL GRANULAR SILT- CLAY OTHER MATERIAL SOILS SOILS		\underline{DIKE} - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
• 200 15 MX 25 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 18%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL
LIXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	MODERATELY ORGANIC 5 - 18% 12 - 28% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF
GROUP INDEX 8 8 8 8 4 4 MX 8 MX 12 MX 16 MX No MX MODERATE DREAMING	HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE	(V.SLL) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
USUAL TYPES STONE FRAGS. FINE STI TY OP CLAYEY STUTY CLAYEY OBSANIC	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLL) 1 INCH, OPEN JOINTS MAY CONTAIN CLAY, IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
DF MAJOR GRAVEL AND SAND GRAVEL AND SAND SOILS SOILS MATTER	STATIC WATER LEVEL AFTER 24-48 HOURS.	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
GEN. RATING		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
SUBGRADE		Dull sound under hammer blows and shows significant loss of strength as compared	PARENT MATERIAL. FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY
P.I. OF A-7-5 ≤ L.L 30 : P.I. OF A-7-6 > L.L 30	- O-M- SPRING OR SEEPAGE	WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	<u>FLOOD PLAIN (F.P.) -</u> LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM,
	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 'CLINK'SOUND WHEN STRUCK.	EORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
MARY SOIL TYPE COMPACTNESS OR CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT ²)		IF TESTED, WOULD YIELD SPT. REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE <4		SEVERE ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED (SEV.) IN STRENGTH TO STRONG SOIL, IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
GRANULAR LODSE 4 TO 10 MATERIA MEDIUM DENSE 10 TO 30 N/A		EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	ITS LATERAL EXTENT.
(NON-COHESIVE) DENSE 30 TO 50	ARTIFICIAL FILL OTHER THAN RDADWAY EMBANKMENTS CORE BORING SAMPLE	IF TESTED, YIELDS SPT N VALUES > 100 BPF VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS.MOTTLING IN
	ST- SHELBY TUBE	(V. SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
GENERALLY SOFT 2 TO 4 0.25 TO 0.5	MONITORING WELL SAMPLE	REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN, <u>IF TESTED YIELDS SPIN VALUES (100 BPF</u>	<u>PERCHED WATER</u> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
MATERIAL STIFF 8 TO 15 1 TO 2		COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
(COHESIVE) VERY STIFF 15 TO 38 2 TO 4 HARD >38 >4	SLOPE INDICATOR TRIAXIAL SAMPLE	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY; TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND
TEXTURE OR GRAIN SIZE	ROCK STRUCTURES	ROCK HARDNESS	RUCK SEGMENTS EQUAL TO DE GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
U.S. STD. SIEVE SIZE 4 18 40 60 200 270	SOUNDING ROD GEP- SPT N-VALUE	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
OPENING (MM) 4.76 2.8 9.42 8.25 8.875 8.853		Several Hard Blows of the geologists pick. Hard Can be scratched by Knife or pick only with difficulty. Hard Hammer Blows required	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY		TO DETACH HAND SPECIMEN.	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS
(BLDR.) (COB.) (GR.) (CSE. SD.) (F. SD.) (SL.) (CL.)	BT - BORING TERMINATED SD SAND, SANDY	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 8/25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGISTS PICK, HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
GRAIN MM 305 75 2.0 0.25 0.005 SIZE IN. 12' 3'	CL CLAY SL SILT, SILTY CPT - CONE PENETRATION TEST SLI SLIGHTLY	BY MODERATE BLOWS.	SLIP PLANE.
SOIL MOISTURE - CORRELATION OF TERMS	CSE COARSE TCR - TRICONE REFUSAL	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 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH
SOIL MOISTURE SCALE FIELD MOISTURE OUTDE SOR FIELD MOISTURE	DPT - DYNAMIC PENETRATION TEST	POINT OF A GEOLOGISTS PICK.	A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS LESS THAN Ø1 FOOT PENETRATION WITH 60 BLOWS.
(ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	F FINE W - MOISTURE CONTENT	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 ISREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	FOSS FOSSILIFEROUS V VERY	PIECES CAN BE BROKEN BY FINGER PRESSURE.	OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (S.R.Q.Q.) - A MEASURE OF ROCK QUALITY DESCRIBED BY:
	FRAGE - FRAGMENTS MED MEDIUM	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	TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE
RANGE SEMISOLID, REQUIRES DRYING TO	EQUIPMENT USED ON SUBJECT PROJECT	FINGERNAIL.	TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. <u>TOPSOIL (T.S.) -</u> SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
		FRACTURE SPACING BEDDING IERM SPACING IERM IHICKNESS	
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET	BENCH MARK: BL POINT #79 NORTHING=625,527.4150 EASTING=950,332.8530
SL_SHRINKAGE LIMIT		WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	ELEVATION: 2070.3460'
- DRY - (D) REQUIRES ADDITIONAL WATER TO	6' CONTINUOUS FLIGHT AUGER CORE SIZE:	CLOSE 8.16 TO 1 FEET VERY THINLY BEDDED 8.83 - 8.16 FEET	NOTES:
	BK-51 BK-51 B' HOLLOW AUGERS	VENT CLOSE LESS THAN \$18 FEET THINLY LAMINATED < 0.008 FEET	
	CME-45 HARD FACED FINGER BITS	INDURATION	
PLASTICITY INDEX (PI) DRY STRENGTH		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
PLASTICITY 6-15 SLIGHT	CASING W/ ADVANCER	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
Piinitik PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE:	
COLOR	OTHER CME-550 TRACK TRICONE 2 % 'TUNGCARB.	BREAKS EASILY WHEN HIT WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY)		INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	OTHER OTHER VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	
		SAMPLE BREAKS ACROSS GRAINS.	55VICED 09/15/00

ID	STATE PROJECT	NO.	SHEET	NO.	TOTAL	SHEETS
I-4400	8.1952001		2			
	<u>ID</u>					











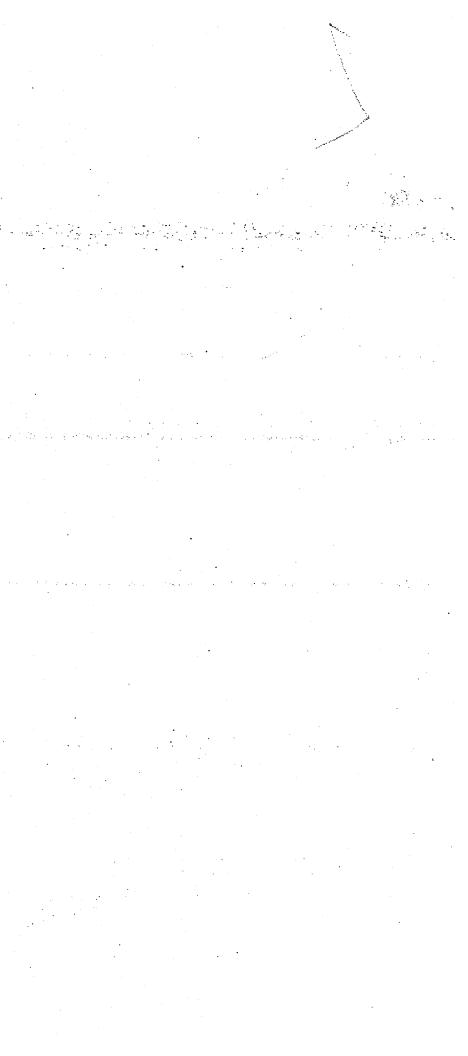
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No or	<u>unite</u>			1	881									SHEET	1 OF 1	
PROJE	CT NO.	8.195	52001			ID.	1-4400		c	OUNTY	Hend	lerson		GEOLOGIST D. Car		
SITE D	ESCRIP	TION	Bridge	Nos. 2	33 & 2	234 on	-26 ove	er Cane Cr	eek						GROUND WATER	(ft)
BORING	G NO.	EB1-A	(LL)	ВС	RING	LOCA	TION	X61684-101.74	55+52	OFFS	ET 39	юXX	61 I	LTALIGNMENT 38K-L	0 HR. 26.0	
COLLA	RELEV	. 2056	5.1 ft	NORT	HING	625	,339.84	755	+52	EAST	ING 9	50,369	. 81		48 HR. 9.2	2
TOTAL	DEPTH	28.6	ft	DRILL	. MAC	HINE	CME	550 Track	DRILL	METH	OD 2	.25" IC) HS	A HAMMER	TYPE Automatic	
DATES	TARTE	D 1/1	17/01			COM	PLETE	D 1/17/01		SURF	ACE W	ATER	DEF	PTH N/A		
ELEV.	DEPTH	BLC	ow cou	JNT			BLOW	S PER FOO	т	<u>.</u>	SAMP.	V /				
(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	20	40	60	80	100	NO.	MO	0 G	SOIL AND ROCK DE	SCRIPTION	
2056.1							•	10.0			ľ					
2055-	_				1.		Grou	Ind Surface	• • • • •					2056.1ft		0.0ft
	-				11	•••	· · · ·	· · · · ·	· · · · ·					ARTIFICIAL Rip Rap 1.0'-4.0' in		
	-				: :	•••	· · · ·	• • • • • • • • • • •	• • • •					2051.1ft		5.0ft
2050-	- 6.5 -	2	2	3	: ŀ	· · ·	• • • •	· · · · · ·				м		-ALLUVIU Light tan-orange,	M- SILT (A-4),	
	- 8.5 -	1	2	2	:]	5	• • • • • • • •	· · · · ·	· · · ·		SS-2			Light tan-orange, s 2047.3ft with trace coars	e sand.	8.8ft
2045-	-		~	-	: !	۱ <u></u> ۱	· · · ·				33-2	23.8%	1	Tan and brown, fine sand	y SILT (A-4), with	· ·]
	_ - 13.5					\mathbf{Y}	· · · ·	• • • • •						trace coarse sand a	trace clay.	
		7	10	8		18				• • • •		w	m	- 2041 1ft Gray, tan & green, sl. f. to	se. SAND (A-1-b),	13.5ft 15.0ft
2040-	Ξ					L							IF (1)	2040.1ft w/ some f. to cse. rndd. c -RESIDUA	<u>ravel 0.12' in dia.</u> _/-	16.0ft
	- 18.5	100/0.3'				• • •								Lusterous gray, SILT (
2035-	-	100/0.5				• • •				100+		м		WEATHERED Lusterous gray, thin PHYLLONI		
2035-	- 23.5					•••	••••						5(1	PHYLLONI	ŤE.	
		100/0.5'				• • •	· · · ·			100+		M				
2030-						•••	· · · · ·					ĮΣ.	-Mai			
	- 28.5					· · ·	• • • • • • • •	••••						- 2027.5ft		28.6ft
1	-	100/0.1'						•		100+				- Boring terminated at ele	v. 2027.5 feet in	
	-													PHYLLONI	TE.	
	-													μ.		
	-													Notes:		
	-			.										1) Geologist indicates strat spoon at 8.8'.	a change in split	
	. .			· .										2) Wet spoon at 13.5'. 3) Geologist indicates strat of split spoon at 15.0'.	a abanan in battan	
	7													 of split spoon at 15.0'. 4) Driller indicates resistant 		
	-										1			- 4) Uniter indicates resistan	se at 16.0°.	
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No. or	<u>ANNES</u>			1	881	i.									SHEE	ET 1 OF ⁻	l
PROJE	CT NO.	8.195	52001	<u> </u>		ID.	1-4400	<u> </u>	C	DUNTY	Hend	lerson		GEOLO	GIST D.		-
SITE DI	ESCRIP	TION	Bridge	Nos. 23	33 & 2	234 on	I-26 over	r Cane Cree	∍k							GROUND	WATER (ft)
BORING	g NO.	EB1-C	(CL)	BO	RING	LOCA	TION	667,80,4	755+3]OFFS	ET CL			ALIGNMENT X	K-L	0 HR.	30.7
COLLA	R ELEV	. 2070).4 ft	NORT	HING	625	,350.71			EAST	ING 9	50,432	2.06			48 HR.	25.3
TOTAL	DEPTH	34.5	ft	DRILL	. MAC	HINE	CME 5	550 Track	DRILL	METH	OD 2	.25" IC	HS/	A	HAMN		Automatic
_	STARTE	D 1/1	5/01			СОМ	PLETED	1/15/01		SURF	ACE W	ATER	DEP	TH N/A			
	DEPTH		ow cou					PER FOO			SAMP.			SOIL		(DESCRIPTIO	N
(ft)	(ft)	0.5ft	0.5ft	0.5ft	<u> </u>	20	40	60	80 1	100	NO.						
. •				ł													•
2070.4							Grour	nd Surface						2070.4ft			0.
2070-	0.0	2	3	4		7 • •		•••••		····		M	H	-			
	3.5						••••						F.	Tan clay	yey SILT (A	-4), with trace the sand.	ine to
2065-	_	6	3	4		7	••••	· · · · · · ·		•••	SS-2	27.5%	F	-	coars	e sanu.	
-	-					•••	· · · · · · · ·	· · · · · · ·	· · ·	••••			F.	-			
	8.5	10	4	3		· · · ·	••••• ••••	· · · · · · ·	· · · · · ·	· · · · · ·		м	H	- 2061.6ft		· · · · · · · · · · · · · · · · · · ·	
2060-						[••••	· · · · · · ·	•••	· · · · · ·			FN	- Light gray	-green to t	an, silty CLAY	(A-7-5),
-	13.5					1:::	· · · ·	· · · · · · ·	· · ·				FN	2056.9ft	e angulai g	ravel 0.1' in dia	ineler. 13.
2055-		2	2	8]::	∳ 10 :	• • • •		· · ·	· · ·	SS-4	29.3%	È	- Grav-green	& tan claw	ον SILT (Δ_4)	
2000	_					<u> :::</u>	· · · ·	· · · · · · ·	• • •	· · ·			H		fine to co	ey SILT (A-4), v barse sand.	
	18.5	4	4	2	::	[:::				· · ·	SS-5	35.6%		_ 2051.7ft			18.
2050-	-			-				· · · · · ·	· · ·	•••		-		- ·		UVIUM-	_
-	23.5					• • •	••••		• • •	· · ·				- Gray, clay 2046.9ft trace c	ey SILT (A- coarse sand	4), with organic d & some fine s	s, mica, and. 23.
	-	Ź	2	4	1:	6				• • •	SS-6			- Gray, fine	to coarse	SAND (A-3), wi	th trace
2045-					$ \cdot $	• • •								- rounde - 2043.4ft	trace siit d	05'-0.1' in diam & trace clay.	eter, 27.
1	28.5	100/0.3'				• • •				 100+			F (()		-WEATHE	RED ROCK-	
2040-	-	100/0.5			· · ·			••••		100+		₽	BN	- Lus		, thinly laminate LONITE.	be
-	33.5				::	• • •		• • • • • •						-			
		100/0,2'				<u> </u>	<u></u>	<u></u>	<u> </u>	100+		D		2035.9ft			34.
-	-													_ Auger	refusal at o	elev. 2035.9 fee LONITE.	t on
-	-														PHYLI	LONITE.	
-	-							•						- Notes:			
· -	 -			-										-	t indicator	strata change i	n onlit
	-													spoon at	8.8'.	strata change i	
_	 -													spoon at	18.7'.	•	•
-	- '		-											4) No moist		istance at 27.0' SS-6.	•
-												.					
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N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

No. of	TANAL			1	881	•									SHEE	T 1 OF	1
PROJE	CT NO.	8.19	52001			ID. I	-4400			OUNTY	Hend	lerson		GEOLO	GIST D.		
SITE D	ESCRIP	TION	Bridge	Nos. 23	33 & 2	234 on i	-26 over	Cane Cre	ek					· · · · · · · · · · · · · · · · · · ·		GROUN	D WATER (ft)
BORIN	g NO.	EB1-B	(RL)	ВО	RING	LOCA	TION	66779870	755+	490FFS	ET 58.	.6' Rt.			K- L	0 HR.	20.7
COLLA	RELEV	. 205	5.2 ft	NORT	HING	625,	,394.75			EAST	NG 9	50,474	4.54			48 HR.	10.7
-	DEPTH			DRILL	MAC	HINE	CME 5	50 Track	DRIL			.25" IC			HAMN	IER TYPE	Automatic
	STARTE		17/01			COM		1/17/01		SURF	ACE W	· · ·	<u> </u>	TH N/A			
ELEV.	DEPTH			JNT 0.5ft	0	20		PER FOO		100	SAMP.	1.7	0	SOIL	AND ROCK	DESCRIPTI	ON
(ft)	(ft)	0.5ft	0.5ft	0.51	Ľ.	20	40	60	80	100	NO.	<u>/ MOI</u>	G	· · · · · · · · · · · · · · · · · · ·			<u> </u>
2056.2				<u> </u>			Groun	d Surface	•	·		ŀ		2058.2ft			0.0ft
2055-	-				:\:	· · · ·	 	· · · · · ·	: :	• • • •						AL FILL-	
:	- 5.0				:\	· · · · ·	••••	· • · · · •	•••	· · · · · · · ·				Rir 7 2051.2ft	Rap 1.0-4	l.0' in diamet	
2050-	_	2	4	4		8	• • • • • • • • • • •		••••	••••		M	N		-ALLL	JVIUM-	5.0ft
	8.5	2		- 40			· · · · · ·			••••			N	with trace to	little dark	vn, silty CLA) gray organics ittle mica,	
00.45	-	2	2	40			•	12				₩		2046.7ft	-RES	DUAL-	9.5ft
2045-	_ _ 13.5													- G - 2042.7ft	ray, SILT (A	-4), saproliti	
	-	70	30/0.1'			• • • •	 			100+		м	5(1)	- 2042.711		RED ROCK-	13.5ft
2040-	-					· · · ·	 		· · ·	:::			\mathbb{R}	– Lust		thinly lamina	ated
-	<u> 18.5 </u>	100/0.2			•••	• • • • •	 		· · ·	· 100+		м				ONITE.	
2035-	-				::	••••	 		· · ·	:::		⊻	100	- 			
	- - 23.5					• • • •	 	· · · · · ·	· · · · · ·				PAX	- - 2032.5ft			23.7ft
-	-	100/0.2								100+		р			erminated a	it elev, 2032.	
-															PHYLL	ONITE.	5 1861 M
	-							P						-			
-	- 							,				1		-			
-														-			
									•					- Notes:			•
														- 1) Geologis	t indicates	strata change	e in split
:	-	1												spoon at 9 2) Wet spoo	35'		•
-	-																•
	-													-			
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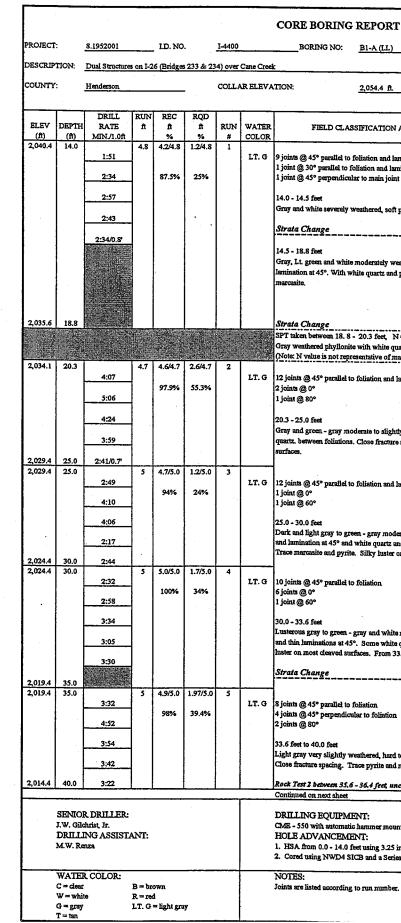
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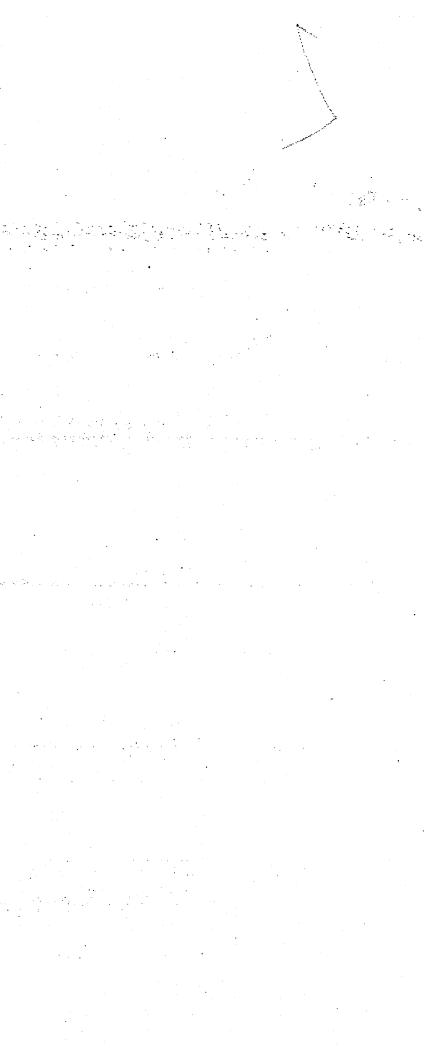
N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

~	TRANS			1	1881	ı 												SHEE	ET 1 OF	1	
PROJE	CT NO.	8.19	52001					-4400				COUNT	Y Hend	lerson			GEOLOG	SIST D	. Carr		_
SITE D	ESCRIP	TION	Bridge	Nos. 2	-				/er Ca	ne Cra	eek								GROUN	D WATER	(ft
BORIN	G NO.	B1-A (LL)	BC	ORIN	NGLO	JCA7	TION	166	X46X9	755+	97 0FF	SET 59	.0' Lt.		ALIGNM	ENT XB	K-L	0 HR.	10.5	5
OLLA	AR ELEV	. 205	4.4 ft	NORT	rhin	IG	625,	379.8	1			EAS	TING S	50,348	3,06				24 HR.	9.1	1
OTAL	DEPTH	45.0	ft	DRILL	L M/	ACHI	NE	CME	550	Track	DRIL	L MET	HOD 3	.25" IE) HSA	4		НАМ	MER TYPE	Automatic	
ATE	STARTE	D 1/	17/01	1		c	OMF	LETE				1	FACE W			·····					,
	DEPTH		ow co	UNT	Τ					RFOC			SAMP								
(ft)	(ft)	0.5ft	0.5ft	0.5ft	ļ		20		0	60	80	10			O G		SOIL A	ND ROCI	K DESCRIPTI	ON	
<u></u>					┿		<u></u>	I	ł			l					<u> </u>				
054.4								Gro	und S	urface						2054.4ft					
-	‡ 0.0	1	1	. 2	1.4	s · ·	•••	• • •	• • •	• •	• • •	•••••	SS-1	22.4%		- 8	TOUR fine	-ALL			
-	3.5				1:	ţ::	• • •	•••		•••	•••					2050.9ft	rown, ine	little coa	T (A-4), with arse sand.	ittle clay &	
2050~	± I	2	2	3	1:	6 5	· · ·	•••	· · ·	•••	• • •	· · · ·	SS-2	6.4%			Cap fina to				_
	F				1:	1::	 			•••	•••	• • • •				- '	silt	trace cla	AND (A-2-4), ly & trace mic:	with trace a.	
-	8.5		<u> </u>	<u> </u>	·	· • •	•••	• • •	•••	• • •	• • •			W		2045.9ft					
2045-	‡	2	2	5		•7	•••	•••	•••	•••	· · ·	••••	1	Ž		- \		fine), with trace m sand.	· /	
-			Ì		1:	: ::	•••	•••	· · ·	•••		· · · ·				. ⁶	rown-oran	ge, silty, f.	to cse. SAN	D (A-3), w/	
]	13.5	100/0.5	 '		1:	:Ŀ:	<u></u>	<u> </u>	<u></u>	<u></u>	<u></u>	· · · ·		1		2040.9ft 2039.9ft			dia. rounded	gravel.	1
040-	F.		. 			••••		• • •	•••	• • •	• • •	100+					Grav. seve	relv weat	RED ROCK-	aminated Γ	_
-	‡		- -		:		••••	•••		•••	•••	· · · ·				· L	PHYLLO -NO	NITE, reli N-CRYST	ct foliation at ALLINE ROC	45 deg.	
035-	- 18.8	4	3	5	1:	•••	••••	••••	· · ·	· · ·	••••	· · · ·			翩		Gray, light	green & v	vhite, mod, we	eathered.	
-	╞╴╵┃				1:	•••	· · ·	•••	· · ·	· · ·	•••				Ш		•	WEATHE	RED ROCK-		
-	F					• • •	•••	• • •	•••	• • •						: \'	Gray, comp with	oletely we 1 white au	athered PHYL artz fragment	LONITE,	
030-	<u>t</u>]						••••	••••		•••	· · ·	· · · ·			鬪					<u></u>	
			Ì			••••	· · ·		· · ·	•••	· · ·	· · · ·				-	-NO	N-CRYST	ALLINE ROC	K-	
-	+				:	· · ·		•••		· · ·	•••					- (Gray to gre Weathere	d. mediur	rately severe n to moderate	to slightly elv hard	
025-	F				:	•••	•••	•••	•••	••.•	· · ·	• • • •				-		PHYLI	LONITE.		
1	F				•	• • •	•••	• • •	•••	••••	••••	, 				-					
j					1:	••••		• • •		•••	· · ·	 			1	2020.8ft					3
020-	E				1:	: : :	•••	•••		•••	· · ·	· · · ·					1 talké				_
ļ	-		* ·		:	•••		•••		• • •		••••					hard to ver	very sligh y hard QL	itly weathered JARTZ PHYL	to fresh, LONITE.	
]	F				:	•••	•••	•••	••	•••	•••	••••									
015-	F					• • •	•••	• • •	•••	•••	••••	• • • •				_					
-	<u>t</u>				1:	••••	•••	••••	•••	•••	· · · · · ·	• • • •				2011.9ft					4
010-	£ I				1:	· · · · · ·	•••	•••	•••	•••	· · · · · ·	 					Gray to g	reen, mo	derately weat hard PHYLL	hered,	
- 10-	╞───┤				\vdash				<u>-</u>	·						-2009.4ft					
-	F				1											•	Coring ter	minated a יועשם	at elev. 2009.4 _ONITE.	feet in	
_	t l														1 E	-		rniL	JUNIE.		
-	t l												·		-						
-	Εl				1											•					
-	- 1															-			1		
1	F				Ľ											No	ites:				
ł	t l]	-	1)	Geologist	ndicates	strata change	in split	
Ⅎ	Εİ													.		5	spoon at 9.	3'.	oring techniqu		
-	$ \mid $				[6	at 14.0'.		-		
‡	F) 	of material	recovered	ot representat I.	ive	
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	Sheet 1 of 2	
E BORING REPORT	DATE:	01/22/01
·		
ORING NO: <u>B1-A (LL)</u>	GEOLOGIST: D. Carr	
····	····	
2,054.4 ft.	TOTAL DEPTH: 45.0 ft	
FIELD CLASSIFICATION AND REMARKS		
		2,040.4 ft (14.0 ft)
9,45° parallel to foliation and lamination 30° parallel to foliation and lamination		STRATA REC 80%
45° perpendicular to main joint set		STRATA RQD. = 0%
.5 feet		1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -
white severely weathered, soft phyllonite		
Change		2,039.9 ft. (14.5 ft.)
.8 feet		
green and white moderately weathered, medium ha n at 45°. With white quartz and plagioclase between	rd to moderately hard phyllon	nite with wavy foliation and
	t de faimlatons, crose risch	re spacing. Trace pyrite and
		STRATA REC. = 88% STRATA RQD. = 28%
Change		
n between 18.8 - 20.3 feet, N=8		2,035.6 ft. (18.8 ft.)
thered phyllonite with white quartz fragments value is not representative of material recovered)	Strata Change	2,034.1 ft. (20.3 ft.)
@ 45° parallel to foliation and lamination		
₿ 0°		STRATA REC 97%
80°		STRATA RQD 41%
.0 feet		
green - gray moderate to slightly weathered, moder tween foliations. Close fracture spacing. Trace pyr		
A 450		
Ø 45° parallel to foliation and lamination 0°		
60°		
0 feet light gray to green - gray moderately severe to mod	derately weathered modium h	and phyllopite with foliation
ation at 45° and white quartz and plagioclase betwe	en foliations. Very close to c	ose fracture spacing.
rcasite and pyrite. Silky luster on cleavage.		
@ 45° parallel to foliation		
٥٥° ٥٥°	•	
6 feet		
gray to green - gray and white moderate to alightly		
aminations at 45°. Some white quatrz interfolded. most cleaved surfaces. From 33.6 to 35.0 feet the r	Close fracture spacing. Trac ock is composed of mostly qu	e pyrite and marcasite. Silky Iartz.
Change		2,020.8 ft. (33.6 ft.)
	ا این این این این می خد این این چر چر چر چر این اگ ^{این}	
\$45° parallel to foliation		STRATA REC. = 99%
9,45° perpendicular to foliation 9,80°		STRATA RQD. = 43%
to 40.0 <u>feet</u>		
y very slightly weathered, hard to very hard quartz ;	phyllonite with interbedded th	inly laminated phyllonite layers.
sture spacing. Trace pyrite and marcasite. White ve	zining throughout the quartz p	hyllonite.
t 2 between 35.6 - 36.4 feet, unconfined compressi i on next sheet	ve strength = 7144.74 psi	
NG EQUIPMENT; 0 with automatic hammer mounted on a track carrie	a.	
DVANCEMENT: from 0.0 - 14.0 feet using 3.25 inch hollow stem au		
using NWD4 SICB and a Series 8 NWD4 diamond		45.0 feet .

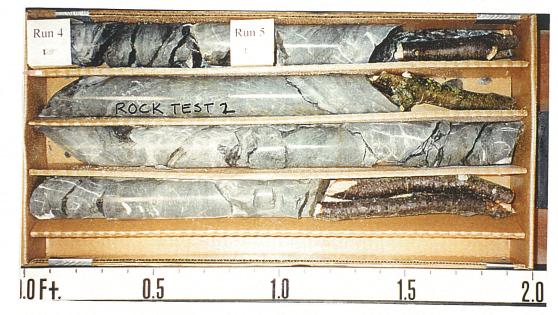
								Sheet 2 of 2
								CORE BORING REPORT
PROJEC	T:	8.1952001		I.D. NC) .	<u>I-4400</u>		BORING NO: B1-A (LL) GEOLOGIST: D. Catt
DESCRI	PTION:	Dual Structure	s on I-	26 (Bridge	as 233 & 2	34) over	r Cane Cre	
COUNT	Y:	Henderson			-	COLL	AR ELEV	ATION: 2,054.4 ft. TOTAL DEPTH: 45.0 ft.
		DRILL	RUN	REC	T		·	•
ELEV (ft)	DEPTH (ft)	1	ft	ft %	RQD ft %	RUN #	WATER	
2014.4	40.0	2:10	5	5.0/5.0	1.85/5.0	6	LT. G	2,014.4 ft. (40.0 f 5 joints between 15° and 30° along foliation
· .		2:26		100%	37%			40.0 - 42.5 feet
		3:10						Light gray fresh, hard quartz phyllonite with white quartz veining. Close to moderately close fracture spacing.
		3:09						Strata Change 2,011.9 ft (42.5
		2:30						8 joints between 0° and 15° along foliation STRATA REC. = 100% STRATA RQD. = 0%
								42.5 - 45.0 feet Dark gray to light gray and gray green moderately weathered, moderately hard to hard phyllonite with white quartz and
2009.4	45.0							plagioclase between foliations. Close fracture spacing. 2,009.4 ft. (45.0 ft
			ļ					
			<u> </u>					
·								
			İ					
				1. 1.				
				<u> </u>				Coring terminated at elev. 2,009.4 feet in phyllonite
	J.W. Gil	R DRILLER: christ, Jr. ING ASSISTA enza	ANT:					DRILLING EQUIPMENT: CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 14.0 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 14.0 - 45.0 feet.
	WATEI C = clear W = whi G = gray T = tan	te	B = br R = re LT. G		ay			NOTES: Joints are listed according to run number.



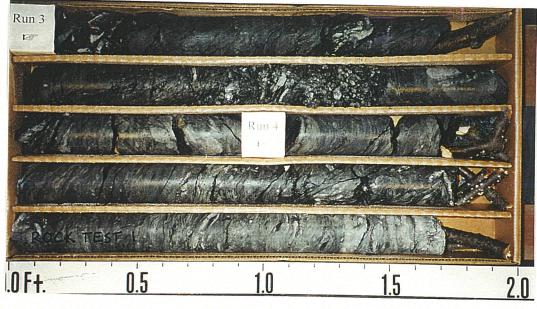


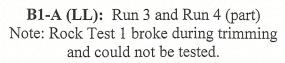


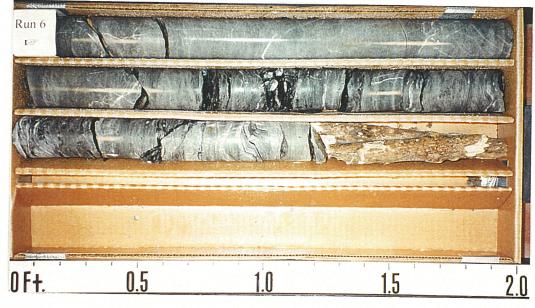
B1-A (LL): Run 1 and Run 2



B1-A (LL): Run 4 (cont.) and Run 5







B1-A (LL): Run 6

0

0





. 1

G ≖ gray

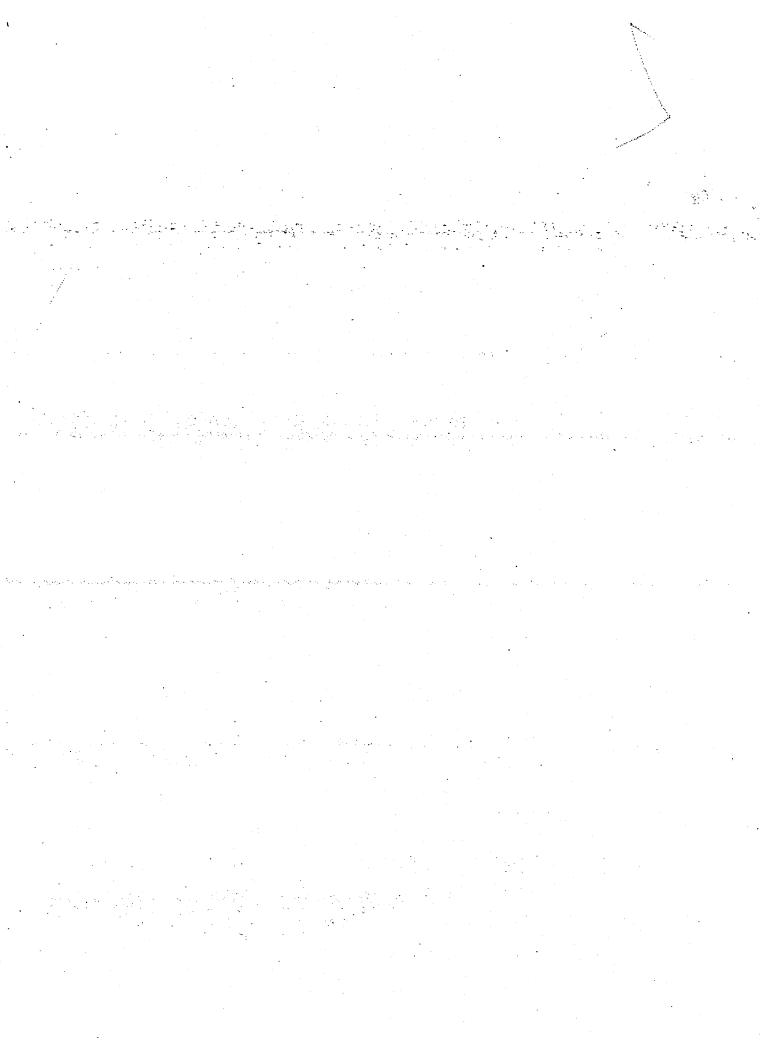
T ≃ tan

LT. G = light gray

ESCRIPTION Bridge Nos. 233 & 234 on 1-26 over Cane Creek GROUND WATER (ft) 3 NO. BYAX R3C)B1-C BORING LOCATION REPORT Cane Creek GROUND WATER (ft) 3 NO. BYAX R3C)B1-C BORING LOCATION REPORT Cane Creek GROUND WATER (ft) 3 NO. BYAX R3C)B1-C BORING LOCATION REPORT Cane Creek GROUND WATER (ft) 0 HR. 7.1 NORTHING 625,412.86 EASTING 950,406.92 48 HR. 5.8 DEPTH 47.4 ft DRILL MACHINE CME 550 Track DRILL METHOD 3.25" ID HSA HAMMER TYPE Automatic STARTED 1/23/01 SURFACE WATER DEPTH N/A HAMMER TYPE Automatic TARTED 1/23/01 BLOWS PER FOOT SAMP. SOIL AND ROCK DESCRIPTION 6 (ft) 0.5ft 0.5ft 0.20 40 60 80 100 NO. MOI G SOIL AND ROCK DESCRIPTION ALLUVIUM- (ft) 0.5ft 0.5ft 0.20 40 60 80 100 NO. MOI G SOIL AND ROCK DESCRI				SHEET 1 OF 1	
3 NO. KNAK (RC)B1-C BORING LOCATION REPRASE/755+9 ¹ OFFSET &XK.K & RT ALIONMENT YEX.1. 0.0H /r. 7.1 4 R LL5V.2051.7t MORTHING 025412.86 EASTING 900,06.92 1 48 HR. 5.8 DEPTH 47.4 R DRILL MACHINE CMPLETED 1/2301 SUBLIX METHOD 3.25'ID HSA HAMMER TYPE Automatic TARTED 1/2301 DCMPLETED 1/2301 SUBMAR 20' VALUE REPTH N/A Yes 5 DEPTH 47.4 R DRILL MACHINE CMPLETED 1/2301 SUBMAR 20' VALUE REPTH N/A 1 0.0Å 0.6R 0.0R 20 9 60 100' NO. 1 4 4 - - M - - 1 2 4 - - M - - 1 2 4 - - M - - 1000.4 - - - M - - - 1000.4 - - - M - - - 1000.4 - - - M - - - 1000.4 - - - - M - - 1000.4 - - - </td <td></td> <td><u> </u></td> <td>erson</td> <td>GEOLOGIST D. Carr</td> <td></td>		<u> </u>	erson	GEOLOGIST D. Carr	
NO. BNA: BKX:BDI-C BORING LOCATION REBER 49755+07 OFSET & XX KS & RT ALIONMENT YEL: 0 HR. 7.1 R ELEV. 2051.7 ft NORTHING 625.412.86 EASTING 950,065.92 48 HA. 6.8 DEPTH 47.41 ORIL MACHINE CMES 50 Track [DRILL MARTER 0 3.25 ID IBSA HAMMER TYPE Automatic TARTED 12201 COMPLETED 1/2201 SURFACE WITER DEPTH NA DEPTH 47.41 PL AUCONS PER POOT SAMP 10 0 6.81 0.81 9 20 90 90 10 No SOL AND ROCK DESCRIPTION 0 6.81 0.81 9 20 90 90 10 No SOL AND ROCK DESCRIPTION 12.0	DESCRIPTION Bridge Nos. 233 & 234 on I-26 over Cane Creek	؛k	· · ·	GROUND	VATER (ft)
R ELEV 2051.7 ft NORTHING 625,412.86 EASTING 960,408.92 48 HR 5.8 DEPTH 47.4 ft DOMLL MACHINE CALE 550 Track DRILL METHOD 3.25" ID HSA HAMMER TYPE Automatic TARTED 1/2301 COMMULETED 1/2301 SURPACE WATER DEPTH NA DEPTH BLOW COUNT BLOWS PER FOOT SAMP NO SOIL AND ROCK DESCRIPTION 0 0.58 0.58 0.58 0.58 0.57 0.00 0.00 1 4 4 9 0 0 100 0 301.7 0.00 12.0	IG NO. KAKKAKABI-C BORING LOCATION 668446,975	55+97 OFFSET XX	KK 8 RT ALIGNA		
DEFTH 47.4 R DRULL MACHINE CME 550 Track DRUL METHOD 3.25" ID HSA HAMMER TYPE Automatic STARTED 12301 COMPLETED 1/2301 SURFACE WATER DEFTH NA DEPTH BLOWS OUNT BLOWS PER POOT SAMP V SOIL AND ROCK DESCRIPTION 00 0.5R 0.5R 9 20 40 60 50 100 No. 1 4 4 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -			······		
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DEPTH BLOWS PER FOOT SAMP. SOL AND ROCK DESCRIPTION (0) 0.5R					
m 0.5R 0.			VL		
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20 ALLUVIUM. 70 Tan, silly fine SAND (A2-4), with trace to little mice. 70 20437 1 2 4 4 70 20437 1 2 1 2 1 2 10004 100** 10004 100** 10004 100** 10004 100** 10004 100** 10004 100** 10004 100** 10004 100** 10004 100** 10004 100** 10004 100** 10004 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100** 100**				·····	· · ·
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1 4 4 20 1 2 4 1 2 4 10004 20037 Brown, silty GLAVA-/5, with some fine, az mice, and fine, and fin	Ground Surface		2051.7ft		0.0
1 4 4 7.0 1 2 4 1 2 4 4 1 2 4 4 1 2 4 4 1 2 4 4 1 2 4 4 1 2 4 4 1 2 4 4 1 2 4 4 1 2 4 4 1 2 100.4 100.4 1 100.4 100.4 100.4 1 100.4 100.4 100.4 1 100.4 100.4 100.4 1 100.4 100.4 100.4 1 100.4 100.4 100.4 1 100.4 100.4 100.4 1 100.4 100.4 100.4 1 100.4 100.4 100.4 1 100.4 100.4 100.4 1 100.4 100.4 10.4				-ALLUVIUM-	
7.0 1 2 4 0 204.2 m 204.2 m 300.4 mon, silly CLAY (A-7-5), with some fire 0.2 12.0 100.0.4 100.0 100.0 100.0 100.0 100.0 12.0 100.0.4 100.0 100.0 100.0 100.0 100.0 100.0.4 100.0 100.0 100.0 100.0 100.0 100.0 100.0.4 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0.4 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 <	$\begin{array}{c c c c c c c c c c c c c c c c c c c $		M	Tan, silty fine SAND (A-2-4), with trace	to little
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100-4 Gray PHYLLONITE. Image: second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se	Ŧ ₁₂₀ : <u>·········</u>		2040.7ft	Silty, fine to coarse SAND (A-1-b) and dia. rounded gravel	10.15
NON-CRYSTALLINE ROCK- Gray-green & while, moderately severe to moderately weathered, medium to moderately hard PHYLLONITE. 2004.3R 47.49 Coring terminated at elev. 2004.3 feet in PHYLLONITE. Notes: 1) Geologist indicates strata change in split Second at 2.2 2) Driller michaetes resistance at 11.0, 3) Driller strate do coring testingues		100+	2039.3ft		
Gray-green & while, moderately severe to moderately weethered, mediantian to moderately hard PHYLLONITE. 204.9t 47.4t Coring terminated at elev. 2004.3 feet in PHYLLONITE. 1) Geologist indicates strata change in split spon at 8.2. 2) Differ subcode to coring terminate at 1.0. 3) Differ subcode to coring terminate at 1.0.				Giay PHTLLONITE.	
204.3ft 67.4f Coring terminated at elev. 2004.3 feet in PHYLLONITE. 1) Geologist indicates strata change in split spoon at 8.2. 1) Geologist indicates strata change in split spoon at 8.2. 2) Driller indicates et 11.0'. 2) Driller indicates et 11.0'. 3) Driller indicates et 11.0'.			-	-NON-CRYSTALLINE ROCK-	
204.3ft 47.4f Coring terminated at elev. 2004.3 feet in PHYLLONITE. 1) Geologist indicates strata change in split spoon at 8.2. 2) Driller indicates strata change in split spoon at 8.2. 2) Driller indicates resistance at 11.0'. 3) Driller indicates resistance at 11.0'. 3) Driller indicates resistance at 11.0'.	$\begin{bmatrix} - & - & - & - & - & - & - & - & - & - $			Gray-green & white, moderately seve moderately weathered, medium to mod	ere to lerately
Coring terminated at elev. 2004.3 feet in PHYLLONITE. Notes: 1) Geologist indicates strata change in split spcon at 8.2'. 2) Driller indicates resistance at 11.0'. 3) Driller switched to coring techniques	\mathbf{F}			hard PHYLLONITE.	
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Coring terminated at elev. 2004.3 feet in PHYLLONITE. Notes: 1) Geologist indicates strata change in split spoon at 8.2'. 2) Driller indicates resistance at 11.0'. 3) Driller switched to coring techniques		,			
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Coring terminated at elev. 2004.3 feet in PHYLLONITE. Notes: 1) Geologist indicates strata change in split spcon at 8.2'. 2) Driller indicates resistance at 11.0'. 3) Driller switched to coring techniques					
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Coring terminated at elev. 2004.3 feet in PHYLLONITE. Notes: 1) Geologist indicates strata change in split spcon at 8.2'. 2) Driller indicates resistance at 11.0'. 3) Driller switched to coring techniques		· · · · · · ·	2004.3ft		A7 A
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- 1) Geologist indicates strata change in split - spoon at 8.2'. - 2) Driller indicates resistance at 11.0'. - 3) Driller switched to coring techniques	$F \mid I \mid I \mid I$			· ·	
- 1) Geologist indicates strata change in split - spoon at 8.2'. - 2) Driller indicates resistance at 11.0'. - 3) Driller switched to coring techniques					
- spoon at 8.2'. - 2) Driller indicates resistance at 11.0'. - 3) Driller switched to coring techniques				lotes:	
- spoon at 8.2'. - 2) Driller indicates resistance at 11.0'. - 3) Driller switched to coring techniques) Geologist indicates strata change in s	split
3) Driller switched to coring techniques			2	spoon at 8.2'. Driller indicates resistance at 11 0'	
	$F \mid I \mid I$			b) Driller switched to coring techniques	
				u. 14,7,	
	$F \mid I \mid I$				
	\mathbf{F}		l E		. '

Sheet 1 of 2 DATE: 01/23/01 CORE BORING REPORT ROJECT: 8.1952001 LD. NO. I-4400 BORING NO: B1-A (RL) GEOLOGIST: D. Carr ESCRIPTION: Dual Structures on I-26 (Bridges 233 & 234) over Cane Creek OUNTY: Henderson COLLAR ELEVATION: TOTAL DEPTH: 47.4 ft. 2,051.7 ft. DRILL REC RQD ELEV DEPTH RATE RUN WATER ft ft ft FIELD CLASSIFICATION AND REMARKS (ft) (ft) MIN/1.0ft % % # COLOR 2,039.3 ft. (12.4 ft) 2,039.3 12.4 0.0/5.0 5.0/5.0 1 5 4:37 LT. G 18 joints @ 45° parallel to foliation and laminations STRATA REC. = 94% 100% 0% 6 joints between 0° and 10° STRATA RQD. = 11% 4:08 1 joint @ 80° 1 joint @ 45° perpendicular to main joint set 3:35 12.4 - 17.4 feet 3:24 Gray and white moderately severe to moderately weathered, medium hard thinly laminated phyllonite with white plagioclas and quartz lenses and augens between foliations. Close fracture spacing. Trace pyrite, marcasite and garnet, 2,034.3 17.4 3:50 2,034.3 17.4 5 4.8/5.0 0.72/5.0 2 14 joints @ 45° parallel to foliation and lamination 3:52 LT. G 3 joints @ 60° parallel to foliation and lamination 96% 14.4% 12 joints @ 0° parallel to foliation and lamination 3:29 1 joint @ 80° 5:18 17.4 - 22.4 feet Gray - green and white moderately weathered, medium hard thinly laminated phyllonite with white plagioclase and quartz 4:58 lenses and augens between foliations. Close fracture spacing. Trace pyrite, marcasite and garnet. Lusterous gray on cleave surfaces. Very severely weathered from 17.7 to 17.8 feet. Very close fracture spacing from 17.4 to 17.6 feet. The missing 2,029.3 22.4 4:46 covery washed out in this zone. 2,029.3 22.4 5 3.85/5.0 0.0/5.0 3 3:57 LT. G 13 joints @ 45° parallel to foliation 77% 0% 8 joints @ 0° 4:45 22.4 - 27.4 feet 4:58 Gray and white moderately weathered, moderately hard phyllonite with some white quartz and plagioclase lenses and auger between foliations. Close fracture spacing. Trace pyrite, marcasite and garnet. Increased percentage of quartz in the rock 3:51 matrix. Lusterous gray on cleaved surfaces. Very close fracture spacing from 25.2 to 25.3 feet. Missing recovery washed out in this zone. 2,024.3 27.4 3:06 ,024.3 27.4 4.35/5.0 0.75/5.0 5 4 3:04 LT. G 10 joints @ 45° parallel to foliation 87% 15% 15 joints @ 0° 3:31 1 joint @ 60° 3:55 27.4 - 32.4 feet Gray - white and green - gray moderately weathered, moderately hard phyllonite with some white quartz and plagioclase 3:52 lenses and augens between foliations. Close fracture spacing. Trace pyrite, marcasite and garnets. Decreased percentage of quartz in the rock matrix. Lusterous gray on cleaved surfaces. Very close fracture spacing from 31.1 to 31.2 feet ,019.3 32.4 4:11 Missing recovery washed out in this zone. ,019.3 32.4 5.0/5.0 0.5/5.0 5 5 LT. G 15 joints @ 45° parallel to foliation 3:49 9 joints @ 0° 1 joint @ 80° 100% 10% 4:42 4:15 32.4 - 37.4 feet Gray - white and green - gray moderately weathered, moderately hard phyllonite with some white quartz and plagioclase 4:00 lenses and augens between foliations. Close fracture spacing. Trace marcasite. Lusterous gray on cleaved surfaces. Very close fracture spacing from 36.2 to 36.4 feet. ,014.3 37.4 4:12 2,014.3 ft. (37.4 ft.) Continued on next sheet SENIOR DRILLER: DRILLING EQUIPMENT: J.W. Gilchrist, Jr. CME - 550 with automatic hammer mounted on a track carrier. DRILLING ASSISTANT: HOLE ADVANCEMENT: M.W. Renza 1. HSA from 0.0 - 12.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 12.4 - 47.4 feet. WATER COLOR: NOTES: C = clear B = brownJoints are listed according to run number. W = white $\mathbf{R} = \operatorname{red}$

	· •				_			Sheet 2 of 2
								CORE BORING REPORT
					•			CORE BORING REPORT
ROJECT:		8.1952001		LD. NO	•	I-4400		BORING NO: B1-A (RL) GEOLOGIST: D. Carr
DESCRIPT	ION:	Dual Structure	s on I-	26 (Bridge	s 233 & 2	34) ove	r Cane Cre	eek
COUNTY:		Henderson				COLL	AR ELEVA	ATION:
ELEV	DENTL	DRILL RATE	RUN ft	REC ft	RQD	DIDI	NV A TED	
(ft.)	DEPTH (ft)	MIN./1.0ft		%	%	RUN #	WATER COLOR	
2,014.30	37.4	2:38	5	5.0/5.0	1.15/5.0	6	G	18 @ 45° parallel to foliation
·			1	100%	23%			8 joints between 0° and 10°
		3:41						37.4 - 42.4 feet
		3:51						Dark gray to gray - white and green - gray slightly weathered, moderately hard phyllonite with some white quartz and plagiocla
		3:40						lenses and augens between foliations. Close fracture spacing. Trace marcasite. Lusterous dark gray on cleaved surfaces. Very close fracture spacing from 41.95 to 42.1 feet.
2,009.30	42.4	4:03						Foliation and lamination generally @ 45° , but the foliation is also wavy and recumbant. Rock Test 3 between 40.0 and 40.5 feet, unconfined compressive strength = 975,08 psi
,009.30	42.4		5	5.0/5.0	0.74/5.0	7		
		2:45		100%	14.8%		G	12 @ 45° parallel to foliation 9 joints between 0° and 10°
		3:16						
		4:08						42.4 - 47.4 feet Dark gray to gray - white and green - gray slightly weathered, moderately hard phyllonite with some white quartz and plagiools
		4:15	1					lenses and augens between foliations. Close fracture spacing. Trace marcasite and pyrite. Lusterous dark gray on cleaved.
			1					surfaces. Very close fracture spacing from 43.3 to 43.6 feet.
,004.30	47.4	4:36	<u> </u>					2,004.3 ft. (47.4 ft.
			ļ					
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			4			l.		
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	· · · · -		<u> </u>					-
1.5								
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L			L	·	· · · · · · · · · · · · · · · · · · ·	ı	· · · · · · · · · · · · · · · · · · ·	Coring terminated at elev. 2,004.3 feet in phyllonite
	I.W. Gil	R DRILLER: christ, Jr. ING ASSIST. enza						DRILLING EQUIPMENT: CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 12.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 12.4 - 47.4 feet.
	WATE C = clea W = whi G = gray T = tan	te	B = bı R = re LT. G		ay			NOTES: Joints are listed according to run number.



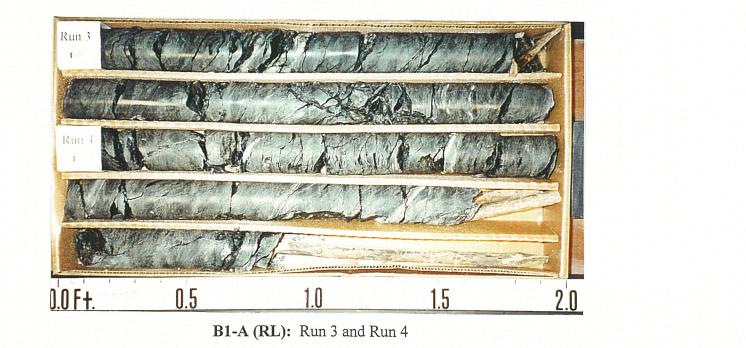




B1-A (RL): Run 1 and Run 2



B1-A (RL): Run 5 and Run 6 (part)





B1-A (RL): Run 6 (cont.) and Run 7

8.1952001 (I-4400) Henderson County Bridge Nos. 233 & 234 on I-26 over Cane Creek

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N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG . L

	TIALE				881							SHEE	ET 1 OF 1	_
PROJE	CT NO.	8.19	52001		ID. i-4400			UNTY	Hend	erson		GEOLOGIST D.	. Carr] [
SITE D	ESCRIP	TION	Bridge	e Nos. 2	33 & 234 on I-26 o	er Cane Creek	<u></u>						GROUND WATER (ft)]]
BORIN	g No.	B1-B (RL)	BC	RING LOCATION	668X46X975	55+97	OFFSE	ET 60.0	0'. Rt.		ALIGNMENT XBLX L	0 HR. See Notes	
COLLA	RELEV	. 204	4.3 ft	NORT	HING 625,438.0	7		EASTI	NG 95	50,451	.83		24 HR. See Notes	
TOTAL	DEPTH	27.5	ft	DRILL	MACHINE CMI	550 Track D	RILL	METHO	DD 3.	25" ID	HSA	HAMIN	MER TYPE Automatic	-
DATE	STARTE	D 1/	31/01	1	COMPLET							TH 1.1'		-
	DEPTH		ow co			VS PER FOOT			SAMP.					-
(ft)	(ft)	0.5ft	0.5ft	0.5ft		0 60	80	100			ō	SOIL AND ROCK	CDESCRIPTION	[
	(1)	0.51	0.01		<u> </u>	ï	<u> </u>		NO.	/моі	G			4 .
						•						x		I I
2045.4					w	iter Surface		· · ·						
2045-	-					und Surface		•				- 2044.3ft	0.01	
-	2.5					• • • • • • • • •	•••	• • •				-ALLI	UVIUM- SAND (A-2-4) and fine 25	
-		100/0.2				• • • • • • •	• • • •	100+		м		2041.pm sandy SILT,	with little mica.	
2040-	_					• • • • • • • • •	• • •	::					RED ROCK- YLLONITE.	
	7.5	1.1			••••		•••	::				NON-CRYST	ALLINE ROCK-	
. <u>]</u>	-	50/0.1'			•••••••		••••	100+•				Gray-green, moderat	ely weathered, medium YLLONITE.	
2035-	-					• • • • • • • •	••••					- nard PH	LLONIE.	
-	-			1	• • • • • • • • •	• • • • • • • •	•••					-		
2030-	-				· · · · · · · · · ·	· · · · · · · · ·		:::				-		
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]	-				* * * * * * * * *	•••••	••••					• · · · · · · · · · · · · · · · · · · ·		
2025-	_				• • • • • • • • •	· · · · · · · · ·						•		
	-				• • • • • • • • •		• • •	•••				•	· · ·	
1	-				• • • • • • • •	••••••						•		
2020-	-				· · · · · · · · ·	· • • • • • • • • •	•••					- 		
ł	.				· · · · · · · · · ·	• • • • • • • • •		: : :				•		
-				ļ	•••••	· · · · · · · ·						2016.8ft	27.5f	t
1	-				· ·		7					- Coring terminated a	at elev. 2016.8 feet in	
]	-											- PHYLL	at elev. 2016.8 feet in LONITE.	
	-											•		
-	~											<u> </u>		
-	-											Notes:		
]	-											1) Driller switched to c	oring techniques at 2.7'.	
-	-				-							2) Boring in creek. 3) Core barrel sheared	f off in boring. Unable to	
+	-										-	recover core from 22	5'-27.5'.	
-	-											•		
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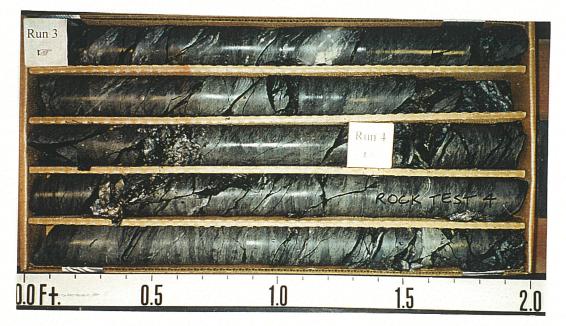
CORE <u>I-4400</u> ECT: 8.1952001 I.D. NO. BOI CRIPTION: Dual Structures on I-26 (Bridges 233 & 234) over Cane Creek NTY: COLLAR ELEVATION: Henderson RQD ft % DRILL RUN REC ft % V DEPTH RUN WATER RATE ft) (ft) MIN./1.0ft 1.6 2.7 # COLOR 4.8 4.17/4.80 0/4.80 1 16 joints @ 3:38 LT. G 6 joints betw 86.9% 0% 2 joints @ 8 4:19 2.7 - 7.5 fee 4:35 Gray to gre lenses and a 4:27 Very close f Missing rec 5.8 7.5 5:02/0.8 SPT taken t Gray phyllo -----7.6 4.9 4.6/4.90 0/4.90 2 LT. G 15 joints @ 3:01 92.8% 5 joints betw 0% 3:07 2 joints @ 4 1 joint @ 80 4:38 7.6 - 12.5 fe 4:23 Gray to gree lenses and a 1.8 12.5 4:39/0.9 1.8 12,5 4.8/5.0 1.38/5.0 5 3 LT. G 14 joints @ 4:33 96% 27.6% 7 joints bet 5:14 3 joints @ (5:12 12.5 - 17.5 Gray to gree 5:11 lenses and a 5.8 17.5 5:06 5.8 17.5 5 4.75/5.0 1.68/5.0 20 joints @ 4 4:26 LT. G 2 joints betw 95% 33.6% 1 joint @ 80 5:11 17.5 - 22.5 5:07 Gray to gre lenses and 4:51 Very close 1.8 22.5 5:00 Rock Test 1.8 22.5 5 5 LT. G 22.5 - 27.5 3:52 Core barrel 4:39 3:51 3:40 27.5 4:39 Coring term SENIOR DRILLER: DRILLIN J.W. Gilchrist, Jr. DRILLING ASSISTANT: CME - 550 HOLE AL M.W. Renza 1. HSA fro 2. Cored us WATER COLOR: NOTES: C = clear B = brown Joints are listed according to run number. W = white R = red G = gray LT. G = light gray T = tan

		Sheet 1 of 1	
BUDINIC	י שניסמיום		DATE: 01/31/01
DURING	REPORT		
RING NO:	B1-B (RL)	GEOLOGIST:	D. Carr
			· · · · · · · · · · · · · · · · · · ·
	2,044.3 ft.	TOTAL DEPTH:	27.5 ft.
	<u></u>		
		······	
FIELD CLAS	SSIFICATION AND REMARK	13	
460 11 1 1			2,041.6 ft.(2.7 ft.
. 45° parallel t ween 0° and 1			
30°	•		STRATA REC. = 93%
			STRATA RQD. = 16%
et .	••• • ••		
	white moderately weathered, n in foliations. Close fracture spa		with some white quartz and plagioclase
			fracture spacing from 5.6 to 5.8 feet
	shed out in these two zones.		I =
		1	
onite -WR-	7.6 feet, N = 50/.1		
		<i>-</i>	
45° parallel f			
ween 0° and 1	0° ular to foliation		
0o berberinter	mar to rollation		
eet			
			te with some white quartz and plagioclase
augens betwee	en foliations. Close fracture spa	acing. Trace pyrite, ma	arcasite and garnet.
45° parallel t	o foliation		
ween 0° and 1	0° .		
60°			
feet			
en - gray and	white moderately weathered, n	noderately hard phylloni	te with some white quartz and plagioclase
augens betwee	en foliations. Close fracture spa	acing. Trace pyrite and	marcasite.
45° parallel t	o foliation		
ween 0° and 1	.0°		
0°			
feet			
en - gray and	white moderately weathered, n	noderately hard phylloni	ite with little quartz and plagioclase
augens betwee	en foliations. Close fracture spa	acing. Trace pyrite, ma	rcasite and gamet.
fracture spaci	ng from 17.5 to 17.6 feet. Miss	sing recovery washed or	ut in this zone.
f between 19.	45 and 19.95 feet, unconfined	compressive strength =	963.62 psi
	, , , , , , , , , , , , , , ,		
feet			
sneared off in	a boring. Unable to recover con	re.	
			• .
			2,016.8 ft.(27.5 ft.
ninated at elev	7. 2,016.8 feet in		
	עאד.		
G EQUIPM with automati	ENT: ic hammer mounted on a track (carrier	
DVANCEM			
om 0.0 - 2.7 fe	et using 3.25 inch hollow stem		
sing NWD4 S	ICB and a Series 8 NWD4 dian	nond impregnated bit fro	om 2.7 - 27.5 feet.





B1-B (RL): Run 1 and Run 2



B1-B (RL): Run 3 and Run 4

8.1952001 (1-4400) Henderson County Bridge Nos. 233 & 234 on I-26 over Cane Creek

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February, 2001





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COLLAR ELEVATION:

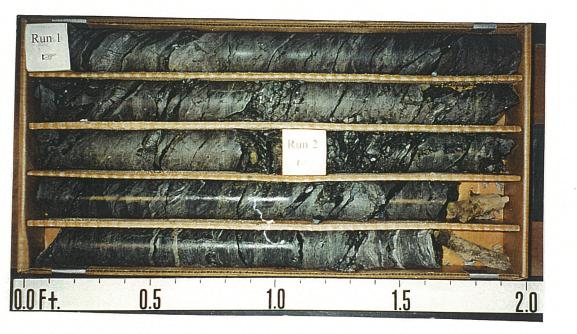
	THAT			1	881											<u>ET 1 OF</u>	<u> 1 </u>	_									
PROJE	CT NO.	8.19	52001				400			COUNT	Y Hen	dersor	n		GEOLOGIST C	. Carr		_									
SITE D	ESCRIP	TION	Bridge	Nos. 23	33 & 234	on I-2	6 over (Cane (Creek							GROU	ND WATER (ft)]									
BORIN	g No.	B2-A	(LL)	во	RING LO	OCATI	ON Ģ	X59 X12	X 776	6+63 0FF	SET 50	N7XM.	52 I		ENT 38K-L		. See Notes		PROJEC	Т:	8.1952001		I.D. NO.		I-4400		
COLLA	RELEV	. 204	13.4 ft	NORT	HING	625,44	40.77		<u> </u>	EAS	TING	950,32	23.35	i			. See Notes		DESCRI	DTION	Dual Structure		6 (D-1	-	A)		
TOTAL	DEPTH	38.4	4 ft	DRILL	MACHI	NE O	CME 55	50 Trac			HOD 3	3.25"	D HS	 SA	НАМ		Automatic	1			Dual Structure	s on 1-2	o (Bridges	233 & 234	i) over (Cane Cr	sek
DATE	STARTE	D 1/	/25/01	- L			ETED							PTH 1.7'				1.	COUNT	Y:	Henderson		<u></u>		COLLA	AR ELE	٧A
	DEPTH		OW CO	UNT	<u>_</u>		BLOWS				SAMP			1				-									
(ft)	(ft)	0.5ft	0.5ft	0.5ft	o,	20	40	60		80 10		17			SOIL AND ROC	K DESCRIP	TION		ELEV	DEPTH	DRILL RATE	RUN ft	REC ft	RQD ft	RUN	WATE	R
				<u> </u>			<u>-</u>							+				-	(ft)	(ft)	MIN./1.0ft		%	%	#	COLO	
																			2,020.0	23.4	3:10	5	5.0/5.0	1.24/5.0	1	LT. G	2
2045.1				<u> </u>			Water	Surfac	ce								,						100%	24.8%	1	1	•
	L		·				Ground	d Surfa	ace			-		- 2043.4ft			0.0	n -			3:25	-			1		
						\leq		•••				-			ALI rown, fine to coarse	UVIUM- rounded sa	ndv & clavev]			3:21				1		
2040-	- 3.0	20	24	20	•••		····	•••	•••	• • • • •		s		2039.6ft	rown, fine to coarse SILT (A-4),	with little mid	ca. 3.8	R			2:53				1		
•	F					• • • •	4	4 • •													2.55				1	· .	
•	- 8.0					· · · ·	. : : 1	•••	•••	· · · · ·				ł	-RE	SIDUAL-			2,015.0		2:46	5	5.0/5.0	1.6/5.0	2	—	
2035-		13	23	25		• • • • •	::::	48-	•••	· · · · ·		м		- w	Green-gray & brow ith thin laminations	i, SILT (A-4) (crumbles wi	, saprolitic, nen removed		-,010.0	20.4	2:10		3.0/3.0	1.0/3.0	 	LT. G	ž
-					•••	· · · ·	· · · · ·	\mathbf{X} :	•••	• • • • •				¥-	from s	olit spoon).					3:18		100%	32%	1		
	- 13.0				•••	••••	• • •	· ./.	• • •	• • • • •		1									5:18	1			I		
2030-	-	12	30	35			•••	\vdots	65			м								Į	3:16				1		
•	- ·							<u>/:</u>	•••	• • • • •											3:23				1	1	
2025-	- 18.0	42					<u> </u>	•••	· · ·													1					
	-	12	7	'		14 .	•••	•••	•••	· · · · ·		м							2,010.0 2,010.0		3:26	5	4.9/5.0	2.6/5.0	3	<u> </u>	-
-	-				•••		••••	•••	•••						•						2:36				ı	LT. G	j
2020-	- 23.0	100/0.4	r		l	L	<u> </u>			100+				2020.4ft 2020.0ft	WEATH	RED ROCK	23.0	1			3:11		98%	52%	1		
-					•••	· · · · ·	•••	••••	•••						Gray Pl	YLLONITE.					2:39]			i		
-					•••	· · · · ·	•••	•••		· · · · ·		ł			-NON-CRYS	ALLINE RO	CK-				2.39	1			1 1		
2015-					· · · ·	· · · · ·	•••	· · ·	· · ·			1			Fray-green, moderat moderately ha	ely to slightly rd PHYLLON	weathered,				3:07	-			1 1		
-	-				• • •	• • • • • • • •	• • • •		•••										2,005.0	38.4	3:07				ļ!	·	
	F				•••	• • • •	• • •	• • •	•••																1		
2010-	-				• • •		••••	••••	· · · ·	• • • • •					•							1			1		
-					•••	••••	•••		••••															1	1		
2005					•••	• • • • •	<u> </u>	· · · ·	· · ·					2005.0ft			38.4		1.00		ļ				1		
		•												-	Coring terminated	at elev 2004									1		
-	-													F	Coring terminated PHYL	LONITE.	.o leet in		1		•]			1 .]	-	
-	F													F		-	•										
-	-	· .												E N	otes:						·	-					
	-													F		- 4 4	•										
-	-														Geologist indicates spoon at 3.8'.										1		
														f -	Driller switched to at 23.4'.	coring techni	ques					1			1		
-	-											· ·		F 3)	Boring in creek.					1		$\left \right $					
-	-													F				[<u></u>	L		
-														E												<u> </u>	
-														Ł							R DRILLER				. 1		
•														F							christ, Jr. ING ASSIST	'ANT:					
-	-													F						M.W. R						· ·	
-														<u>-</u>													
-	-													F						WATE C = clea	R COLOR:	D - 1-			- 1		
-														E .						W = whi	ite	B=br R≃re	đ				
-														<u>–</u>						G = gray T = tan		LT. G	= light gra	y		ł	
-											1			F					L	_ voit						L	_
	-													F													
																		1									

LT. G 20 joints @ 45° parallel to foliation STRATA REC. = 99% 1 joint @ 80° STRATA RQD. = 36% 23.4 - 28.4 feet Gray and green gray moderately weathered, moderately hard thinly laminated phyllonite with little white quartz and plagioclase lenses and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky gray huster. LT. G 11 joints @ 45° parallel to foliation 4 joints between 0° and 10° 1 1 joint @ 45° perpendicular to foliation 28.4 - 33.4 feet Gray and green - gray moderately weathered, moderately hard thinly laminated phyllonite with some white quartz and plagioclase lenses and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky light gray luster. Very close fracture spacing from 28.4 to 28.85 feet. LT. G 5 joints @ 45° parallel to foliation and lamination 9 joints between 0° and 10° 33.4 - 38.4 feet Gray and green - gray slightly weathered, moderately hard thinly laminated phyllonite with some white quartz and plagioclase lenses and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky light gray luster. LT. G 5 joints @ 45° parallel to foliation and lamination 9 joints between 0° and 10° 33.4 - 38.4 feet Gray and green - gray slightly weathered, moderately hard thinly laminated phyllonite with some white quartz and plagioclase lenses and augens. Close fracture spacing. Trace pyrite and mar			· · · · · · · · · · · · · · · · · · ·	Sheet 1 of 1		
		CORE BORING	REPORT		DATE: 01/25/2001 & 01/26/2	001
Size Creck						
R ELEVATION: 2003.4 ft TOTAL DEFTH: 38.4 ft. WATER COLOR FIELD CLASSIFICATION AND REMARKS 2,020.0 L1: 6 2) joints (§ 45° parallel to foliation juint (§ 45° parallel to foliation physicolase) and green gray moderately weathered, moderately hard thinly laminated phylionite with little white quartz and physicolase lanese and sugars. Close fineture specing. Trace pyrite and marcenate. Cleaved surfaces have a alky gray hater. L1: 6 11 joints (§ 45° parallel to foliation dynamical control of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the st		BORING NO:	<u>B2-A (LL)</u>	GEOLOGIST:	D. Carr	-
WATER COLOR FIELD CLASSIFICATION AND REMARKS 2020.0 L1. 0 20 joints @ 45° parallel to foliation 1 joint @ 30° STRATA REC. = 39% STRATA REC. = 39% STRATA REC. = 39% 2020.0 L1. 0 20 joints @ 45° parallel to foliation phylocitae lances and augurs. Close firsture spacing. Trace pyrite and marcusite. Cleaved surfaces have a silky gray hater. L1. 0 11 joint @ 45° parallel to foliation phylocitae lances and augurs. Close firsture spacing. Trace pyrite and marcusite. Cleaved surfaces have a silky gray hater. L1. 0 11 joint @ 45° parallel to foliation 28.4 - 33.4 foet Gray and green = gray moderately weathered, moderately hard thinly laminated phylocits with some white quartz and phylocitae lenses and augurs. Close firsture spacing. Trace pyrite and marcusite. Cleaved surfaces have a silky light gray hater. Very close fracture spacing from 28.4 to 28.5 feet. L7. 0 5 joints @ 45° parallel to foliation and lamination 23.4 - 38.4 feet Gray and green. gray lightly weathered, moderately hard thinly laminated phylocits with some white quartz and plagiocitae lances and augurs. Close fincture spacing. Trace pyrite and marcusite. Cleaved surfaces have a silky light gray latter. Z3.4 - 38.4 feet Gray and green. gray alightly weathered, moderately hard thinly laminated phylocits with some white quartz and plagiocitae lances and augurs. Close fincture spacing. Trace pyrite and marcusite. Cleaved surfaces have a silky light gray latter. Rock Test 5 between 36.3 and 36.9 feet, uncomfined compressive strength = 3732.51 pri 2,005.01 2,005.01 DRILLING EQUIPMENT: CM	ane Creek	<u>د</u>	<u> </u>			-
COLOR 2,020.0 LT. G 20 joints @ 45° parallel to foliation STRATA REC. = 99% 1 joint @ 50° STRATA REC. = 99% 2.4 - 28.4 feet Gray and green gray moderately weathered, moderately hard thinly laminated phyllonite with little while quartz and plajoclase lenses and angens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky gray hater. 1.7. G 11 joints @ 45° parallel to foliation. 4 joints between 0° and 10° 1 joints @ 45° parallel to foliation. 2.4 - 33.4 feet Gray and green - gray understely weathered, moderately hard thinly laminated phyllonite with some white quartz and plajoclase lenses and angens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky light gray hater. 1.7. G 5 joints @ 45° parallel to foliation and lamination 9 joints between 0° and 10° 3.4 - 3.8 / feet 1.7. G 5 joints @ 4.5° parallel to foliation and lamination 9 joints between 0° and 10° 3.4 - 3.8 / feet 1.7. G 5 joints @ 4.5° parallel to foliation and lamination 9 joints between 0° and 10° 3.4 - 3.8 / feet 1.7. G 1 joints @ 4.5° parallel to foliation and lamination 9 joints between 0° and 10° 3.4 - 3.8 / feet 1.7. Coring terminented at elev. 2,005.0 feet in phyllonite <	R ELEVA	TION:	2,043.4 ft.	TOTAL DEPTH:	<u>38.4 ft.</u>	
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LT. G 20 joints @ 45° parallel to foliation STRATA REC. = 99% 1 joint @ 45° STRATA REC. = 99% 23.4 - 28.4 feet Gray and green gray moderately weathered, moderately hard thinly laminated phyllonite with lifts while quartz and phylosite set and agens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky gray hater. LT. G 11 joints @ 45° parallel to foliation 4 joints between 0° and 10° 1 joint @ 45° parallel to foliation 28.4 - 33.4 feet Gray and green _ gray moderately weathered, moderately hard thinly laminated phyllonite with some while quartz and phylicolise lance and marcasite. Cleaved surfaces have a silky light gray hater. Very close fincture spacing from 28.4 to 28.85 feet. LT. G 5 joints @ 45° parallel to foliation and lamination 9 joints between 0° and 10° 33.4 - 38.4 feet Gray and green - gray diightly weathered, moderately hard thinly laminated phyllonits with some white quartz and plagioclase lances and argens. Close fincture spacing. Trace pyrite and marcasits. Cleaved surfaces have a silky light gray hater. IT. G 5 joints between 0° and 10° 33.4 - 38.4 feet Gray and green - gray diightly weathered, moderately hard thinly laminated phyllonits with some white quartz and plagioclase lances and argen. State feet. Rock Test 5 between 36.3 and 36.9 feet, unconfined compressive strength = 3752.51 pri 2,005.01 DRILLING EQUIPMENT: Coring terminated at elev.	WATER	FIELD CLASS	SIFICATION AND REMARI	(3		
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Z3.4 - 28.4 feet Gray and green gray moderately weathered, moderately hard thinly laminated phyllonite with little while quartz and plagocitase leases and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky gray hater. LT. 6 11 joints (@ 45° parallel to foliation 4 joints between 0° and 10° 1 joint @ 45° perpendicular to foliation 28.4 - 33.4 feet Z8.4 - 33.4 feet Trace pyrite and marcasite. Cleaved surfaces have a silky light gray bater. Vary close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky light gray bater. Vary close fracture spacing from 28.4 to 28.85 feet. LT. 5 5 joints @ 45° parallel to foliation and lamination 9 joints between 0° and 10° 33.4 - 38.4 feet Gray and green _gray slightly weathered, moderately hard thinly laminated phyllonite with some white quartz and plagioclase leases and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky light gray hater. LT. 5 joints develow 0° and 10° 33.4 - 38.4 feet Gray and green _gray slightly weathered, moderately hard thinly laminated phyllonite with some white quartz and plagioclase leases and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky light gray hater. Rock Test 5 between 36.3 and 36.9 feet, unconfined compressive strength = 3732.51 psi 2,005.01 DRILLING EQUIPMENT: Coring terminated at elev. 2,005.0 feet in phyllonite DRILLING EQUIPMENT: Coring terminated at elev. 2,005.0 feet in phyllonite DRILLING EQUIPME	LT. G		foliation		STRATA REC. = 99%	
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Plagicalas Janses and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky gray hater. II. joints @ 45° parallel to foliation 4 joints between 0° and 10° 1 joints @ 45° parallel to foliation. 28.4 - 33.4 feet Gray and green - gray moderately westhered, moderately hard thinly laminated phyllonite with some white quartz and phagicolase lenses and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky light gray luster. Very close fracture spacing from 28.4 to 28.85 feet. LT. G 5 joints @ 45° parallel to foliation and lamination 9 joints between 0° and 10° 33.4 - 38.4 feet Gray and green - gray slightly weathered, moderately hard thinly laminated phyllonite with some white quartz and plagicolase lenses and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky light gray hater. <i>Rock Test 5 between 36.3 and 36.9 feet, unconfined compressive strength = 3752.51 psi 2,005.01 DRILLING EQUIPMENT: CMB - 350 with automatic harmer mounted on a track carrier. HOLE ADVANCEMENT: 1. H8A from 0.0 - 32.4 feet umg 3.25 inch hollow stam anger. 2. Cord umg KNDM SICB and a Steise 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. </i>						
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Gray and green - gray moderately weathered, moderately hard thinly laminated phyllonite with some white quartz and plagioclase leases and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky light gray luster. Very close fracture spacing from 28.4 to 28.85 feet. LT. G 5 joints @ 45° parallel to foliation and lamination 9 joints between 0° and 10° 33.4 - 38.4 feet Gray and green - gray slightly weathered, moderately hard thinly laminated phyllonite with some white quartz and plagioclase leases and augens. Close fracture spacing. Trace pyrite and marcasite. Cleaved surfaces have a silky light gray luster. Rock Test 5 between 36.3 and 36.9 feet, unconfined compressive strength = 3752.51 psi 2,005.0 fm Coring terminated at elev. 2,005.0 feet in phyllonite 2,005.0 fm DRILLING EQUIPMENT: CME - 530 with automatic harmer mounted on a track carrier. HOLE ADVANCEMENT: 1. Hash from 0.0 - 23.4 feet using 3.25 inch hollow stam augers. 2. Cord using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet.		28.4 - 33.4 feet				
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Coring terminated at elev. 2,005.0 feet in phyllonite DRILLING EQUIPMENT: CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 23.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. NOTES:		lenses and augens. Close	fracture spacing. Trace pyrit	e and marcasite. Cleave	d surfaces have a silky light gra	y luster.
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DRILLING EQUIPMENT: CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 23.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. NOTES:		KOCK LESI 5 Detween 36,3	and 36.9 feet, unconfined co	mpressive strength = 37.	52.51 psi	2,005.0 ft. (38.4 ft.)
DRILLING EQUIPMENT: CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 23.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. NOTES:						
DRILLING EQUIPMENT: CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 23.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. NOTES:						
DRILLING EQUIPMENT: CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 23.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. NOTES:						
DRILLING EQUIPMENT: CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 23.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. NOTES:			ан сайтаан ал ал ал ал ал ал ал ал ал ал ал ал ал			
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 CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 23.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. NOTES: 		coring terminated at elev.	2,005.0 feet in phyllonite			
HOLE ADVANCEMENT: 1. HSA from 0.0 - 23.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. NOTES:						
 HSA from 0.0 - 23.4 feet using 3.25 inch hollow stem augers. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. NOTES: 				carrier.		
2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 23.4 - 38.4 feet. NOTES:		1. HSA from 0.0 - 23.4 fe	et using 3.25 inch hollow ster	n augers.		
		2. Cored using NWD4 SIC	B and a Series 8 NWD4 diar	nond impregnated bit fro	om 23.4 - 38.4 feet.	
Joints are listed according to run number.						
		Joints are listed according	to run number.			

SUBSURFACE INVENTORY PT 2 OF 2

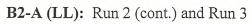
PROJECT REFERENCE NO.	SHEET NO.
I-4400C 440233	
SUBMITTED BY: JODY KUHNE DS	





B2-A (LL): Run 1 and Run 2 (part)





8.1952001 (I-4400) Henderson County Bridge Nos. 233 & 234 on I-26 over Cane Creek

C

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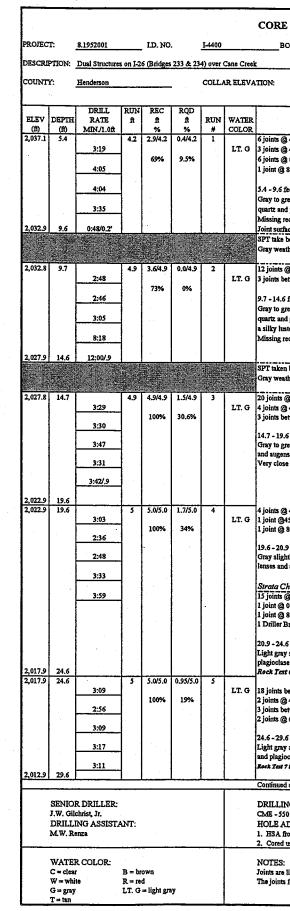
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February, 2001





	TRADE		-	1	881												·······	SHE	ET 1 C	DF 1	
	CT NO.		52001			· · · · · · · · · · · · · · · · · · ·	1-44(OUNTY	Hend	lerson			GEOLOG	ST D	. Carr		
	ESCRIP			Nos. 2					Cane	Cree	k								GRC	UND WATER	(ft)
BORIN			RIQ B2	-C BC	RING	LOC	ATIO	N	669X	12 X 7	56+	630FFS	ET 👯	K R t7	RT	ALIGNN	IENT 384	٠L	01	R. See Note	s
	R ELE	/. 204	2.5 ft	NORT	HING	62	5,469	9.80				EAST	ING S	50,37	5.06				24 ⊦	R. See Note	s
TOTAL	DEPTH	1 34.6	ft	DRILL	MAC	HINE	CN	ME 5	50 Tr	ack I	DRIL	L METH	OD 3	.25" [D HS/	4		HAM	MER TYP	E Automatio	
DATE	STARTE	D 1/	30/01			CON	IPLE	TED	1/31	1/01		SURF	ACE W			TH 3.0'		<u> </u>			
ELEV.	DEPTH	BLO	ow co	UNT			BLC	ows	PER	FOOT		<u>_</u>	SAMP		11			·		·	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	٩ ا	20)	40	e	50	80	100	NO.	Имо			SOIL AN	ID ROCI	K DESCR	IPTION	
															<u> </u>						
2045.5	-						V	Nate	r Surf	ace				1	<u> </u>						
							~			.						- 					
-					$\overline{1}$				<u>id Sur</u>	<u>tace</u>				M	1	- 2042.5ft				-	0.0ft
2040-	-					•••	•••	••••	•••		•••					- .	Brown fine	-ALL		y fine SAND	
-	- - 5.0					•••	•••	•••	• • •		•••	• • • •				- 2037.5ft		(A	-2-4).		
-		100/0.4]	• • •	• • •	•••	• • •	• • •	•••	. 100+		м	5(1)	-					5.0ft
2035-					::	••••	•••	· · ·	· · ·	••••	•••						v- 8 Green-gray	wEATHE white, s	RED ROC	K- eathered, soft ONITE.	
	9.5	50/0.1'			::	••••	•••	· · ·		· · ·	•••	· · · ·			KA	-	to me	dium hai	d PHYLL	ONITE.	
	-				::	· · ·	•••	••••	•••	•••	•••				F ()	-					
2030-	- 14.6				::	•••	•••		• • •	•••	•••				5	-					
-	- 14.0	50/0.1'			1	•••	• • •	••••		••••	•••	100+				2027.8ft			~~~	· · · · · · ·	14.7ft
- 2025 -	-					••••	•••	· · ·		•••	::	••••					-NON	-CRYST	ALLINE F	OCK-	
	-					••••	•••	· · · · · ·	•••	••••	•••	• • • •				- `	moder	ately ha	rd PHYLL	ely weathered, ONITE.	
-	-					· · · · · ·	•••	 		•••	•••	••••				- - 2021.6ft					20.9ft
2020-	-					•••	•••	•••	•••	•••	•••	••••				-	Light gray, m	oderate	ly to slight	ly weathered	
-	-					• • •		· · ·	•••	••••	•••					-	modera	tely hard	to hard C LONITE.	ly weathered, QUARTZ	
]	-					•••	•••	· · ·	•••	· · ·	•••	, · · · · · · ·				-		PHIL	LONITE.		
2015-	-					•••	•••	••••	•••	· · ·	•••	• • • •				-					
-	-					· · ·	•••	•••	•••	· · ·	•••	· · · ·				-					
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2010-	-					•••	• • •	•••	•••	•••	•••	••••		1							
1	-								<u> </u>		<u> </u>			-		2007.9ft		<u> </u>	<u> </u>		34.6ft
1	-											•				-	Coring terr	ninated	at elev. 20	07.9 feet in	
]	-													1		-		- W Y I 4 F			
-	- .															-					
-	- -															-					
-	-															-					
-	-															- N	lotes:				
_	-															- - 1)) Driller swite	hed to c	oring tech	niques at 5.4'.	
	-															- 2)) Boring in cr	eek.		•	
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, 	Sheet 1 of 2
BORING REPORT	DATE: 01/30/2001 & 01/31/2001
ORING NO: B2-A (RL)	GEOLOGIST: D. Carr
<u>2,042.5 ft</u>	TOTAL DEPTH: <u>34.6 ft</u>
FIELD CLASSIFICATION AND REMARKS	
45° parallel to foliation 45° perpendicular to foliation.	2,037.1 ft.(5.4 ft.)
80° 9 0°	
bet	
reen - gray and white severely weathered, soft to m t plagioclase lenses and augens between foliations. ecovery washed out due to very close fracture spac- aces have a silky luster.	Very close to close fracture spacing.
between 9.6 and 9.7 feet, $N = 50/0.1$ therd phyllonite -WR-	
@ 45° parallel to foliation	<u>.</u>
stween 0° and 10°	STRATA REC. = 71% STRATA RQD. = 4%
i plagioclase lenses and augens between foliations.	weathered, soft to medium hard phyllonite with some white Very close to close fracture spacing. Joint surfaces have
ster. ecovery washed out due to very close fracture spac	
between 14.6 and 14.7 feet, $N = 50/0.1$ thered phyllonite -WR-	
@ 45° parallel to foliation	Strata Change 2,027.8 ft. (14.7 ft.)
45° perpendicular to foliation. stween 0° and 10°	STRATA REC 100%
6 feet reen and white moderately weathered, moderately h is between foliations. Close fracture spacing. Trace e fracture spacing from 20.8 to 20.9 feet.	ard phyllonite with little white quartz and plagioclase lenses a pyrite and marcasite. Joint surfaces have a silky luster
945° parallel to foliation 15° perpendicular to foliation	
80°	1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -
9 faet uity to moderately weathered, moderately hard phyl d augens. Close fracture spacing, Very close fractu	lonite with trace white quartz and plagioclase are spacing from 20.8 to 20.9 feet.
hange @ 45° parallel	2,021.6 ft. (20.9 ft.)
80° 0° ·	STRATA REC 99%
Break	STRATA RQD. = 18%
6 feet y slightly to moderately weathered, moderately hard te lenses and augens. Some veining. Close fractur f 6 between 23.55 and 24.05 feet, unconfined comp	
between 30° and 45° parallel to foliation 245° perpendicular to foliation 245° and 10° 260°	
6 feet	
on next sheet	2,012.9 ft.(29.6 ft.)
VG EQUIPMENT: 0 with automatic hammer mounted on a track carrie DVANCEMENT: tom 0.0 - 5.4 feet using 3.25 inch hollow stem auge using NWD4 SICB and a Series 8 NWD4 diamond	H3.
listed according to run number except for Run 4. for Run 4 are listed according to strata.	

8								Sheet 2 of 2	
								DATE: 01/30/2001 & 01/31/2001 CORE BORING REPORT	
PROJEC	:T:	8.1952001		LD. NO		<u>I-4400</u>		BORING NO: B2-A (RL) GEOLOGIST: D. Carr	
DESCR	PTION:	Dual Structure	es on I-	26 (Bridge	<u>s 233 & 2</u>	34) over	Cane Cree	k	
COUNT	Y:	Henderson			•	COLL	AR ELEV.	TION: <u>2,042.5 ft.</u> TOTAL DEPTH: <u>34.6 ft.</u>	
(ft)	DEPTH (ft)	DRILL I RATE MIN./1.0ft	RUN ft	ft %	RQD ft %	RUN #	WATER	FIELD CLASSIFICATION AND REMARKS 2,012.9 ft.(29.6 ft.)	
2012.9	29.6	3:38	5	4.9/5.0 98%	0.8/5.0	6		17 joints @ 45° parallel to foliation 12 joints @ 0°	
		3:02						3 joints @ 80° 2 Driller Breaks	
2007.9	34.6	3:03	 -					29.6 - 34.6 feet Light gray and gray - green and white slightly weathered, moderately hard to hard quartz phyllonite with trace white quartz and plagioclase lenses and augens, some white veining. Close fracture spacing.	
2007.5	54.0		<u>,</u>					2,007.9 ft. (34.6 ft.)	
							·		
			1						and a specific and the second second second second second second second second second second second second seco
	J.W. Gil	R DRILLER: lchrist, Jr. ING ASSIST. enza						Coring terminated at elev. 2,007.9 feet in quartz phyllonite DRILLING EQUIPMENT: CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 5.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 5.4 - 34.6 feet.	
	WATEL C = clear W = whi G = gray	ite	B = b R = re LT. G		ay		1	NOTES: Joints are listed according to run number.	

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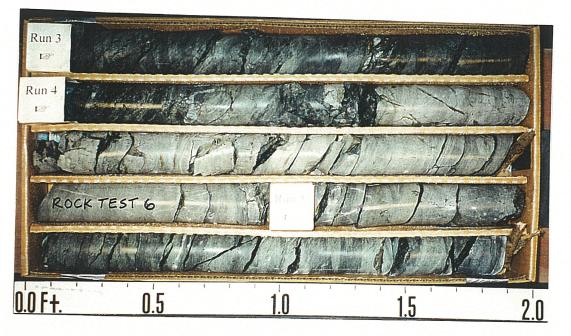


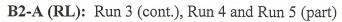


B2-A (RL): Run 1, Run 2 and Run 3 (part)



B2-A (RL): Run 5 (cont.) and Run 6





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February, 2001





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ROJE	CT NO.	8.19	52001			ID.	I-440	0			COUNTY	Hend	erson			GEOLOGIST D.		
	ESCRIP	TION	Bridge	Nos. 2	33 &	234 on	l-26 c	over (Cane Cr	eek							GROUND WATER	(ft)
BORIN	G NO.	B2-B (RL)	BC	RINC	S LOCA	ATION	N	09X12.1	756+6	3 OFFS	ET 59	BXR.	58 R		NMENT XBK-L	0 HR. See Note	
COLLA	RELEV	/. 204	4.2 ft	NORT			5,494.					ING 9					24 HR. See Note	
OTAL	DEPTH	38.4	ft			CHINE			0 Track		L METH		.25" [[-
	STARTE		29/01				_		1/30/01	<u> </u>	···						IER TYPE Automatic	c
	DEPTH	1		INT	1			_			SURF	ACE W		A	PTH 1.0		•	
(ft)	(ft)	0.5ft	0.5ft	0.5ft	<u> </u>	20		40	PER FOC	80 	100	SAMP. NO.	MO			SOIL AND ROCK	DESCRIPTION	
2045.2	<u> </u>								Surface Surface						2044.2ft			
7	2.5				·	• • •	• • •	••		• • •	•••••		М		1	-ALLL	IVIUM-	0.0f
1	- 2.5	45	55/0.4'		┥┞÷	· · · ·		÷÷:	· · · · ·	· · ·	÷÷÷į		м	L II		Fine sdy. SILT & silty fi	ne SAND, w/ little mica. RED ROCK-	2.5f 3.4f
2040	-				1::	•••	• • •	•••	• • • •	•••	. 100+				-	~~~~~	LLONITE.	3,41
+	-				· ·	• • •	• • •	• •	• • • •	• • •						-NON-CRYST	ALLINE ROCK-	
1	-				::	• • •	•••	::	· · · · · · · ·	· · ·	· · · ·					Grav & green mo	derately severe to	
2035	-			ł	::	· · ·	•••	•••	••••	•••	• • • •				-	PHYLL	onite, medium hard ONITE.	
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2030-	-]::	•••	•••	•••	••••	•••	••••							
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2025	-				::	•••	•••	•••	••••	• • •	• • • •				-	•		
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2020-					· ·	•••	•••	•••	••••	•••	••••				- 2019.4ft			24.8f
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t					::	•••	•••	•••	••••	• • • •					-	Gray, green & white, weathered, mode	moderately to slightly rately hard to hard	
2015-	-				• •	•••	•••	• •	••••		••••				Ļ	PHYLL	ONITE.	
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2010-	•					• • •	• • •	•••	· · · · ·	•••	••••			KIII	<u>_ 2010.8ft</u>		· · · · · · · · · · · · · · · · · · ·	33.4ft
. ‡					::	••••	•••	•••	· · · ·	· · ·	· · · ·				┡	-WEATHER	RED ROCK-	
+					::	•••	•••	•••	• • • •	•••	••••		17 - E	121		to medium hard	everely weathered, soft	
Ŧ	-					- <u>: : :</u>	<u></u>	• • •	<u>· · · ·</u>	<u></u>	· · · ·			N C <i>i</i>	_ 2005.8ft		· · · · · · · · · · · · · · · · · · ·	38.4ft
±															F	Coring terminated a	t elev. 2005.8 feet in ONITE.	
ł															F	PHILL	UNITE.	
Ŧ	-													1	L			
±							,				. · · ·				╞	Notes:	~	
ŧ															E F	1) Driller switched to cc 2) Boring in creek.	ring techniques at 3.4'.	
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CORE PROJECT: 8.1952001 I.D. NO. <u>I-4400</u> · _____BOH DESCRIPTION: Dual Structures on I-26 (Bridges 233 & 234) over Cane Creek COUNTY: Henderson COLLAR ELEVATION: RQD ft DRILL RUN REC ELEV DEPTH RATE ft RUN WATER ft (ft) (ft) MIN./1.0ft 2,040.8 3.4 % # COLOR % 5 1.2/5.0 0.0/5.0 1 1:10 LT. G 6 joints @ 4 24% 0% 2 joints @ 8 2:20 3.4 - 8.4 fee 2:54 Gray and wh Very close 1 2:53 Missing rec 2,035.8 8.4 3:57 2,035.8 8.4 5 2.55/5.0 0.4/5.0 2 3:45 LT. G 5 joints @ 4 51% 8% 2 joints @ 09 2:47 1 joint @ 80 4:19 8.4 - 13.4 fee Gray and gre 3:13 lenses and au Missing reco 2,030.8 13.4 2:43 2,030.8 13.4 5 2.9/5.0 0.0/5.0 3 3:01 LT. G 9 joints @ 4 58% 0% 9 joints @ 0 3:27 3:00 13.4 - 18.4 f Gray and gre 2:45 lenses and an Missing reco 2,025.8 18.4 3:10 2,025.8 18.4 5 3.35/5.0 0.0/5.0 4 LT. G 24 joints bet 1:59 67% 0% 1 joint @ 45° 3:18 1 joint @ 804 2:44 18.4 - 23.4 f Gray and gre lenses and au Missing reco 3:08 2,020.8 23.4 3:37 2,020.8 23.4 5 5.0/5.0 1.25/5.0 5 3:01 LT. G 6 joints @ 4: 100% 25% 13 joints bet 3:56 23.4 - 24.8 fe 4:25 Gray and gre lenses and au Strata Cha 4:33 24.8 - 28.4 fe 4:45 Gray and gro lenses and a 2,015.8 28.4 Continued or SENIOR DRILLER: DRILLING J.W. Gilchrist, Jr. CME - 550 v DRILLING ASSISTANT: HOLE AD M.W. Renza 1. HSA from 2. Cored usin WATER COLOR: NOTES: C = clearB = brown Joints are list W = white R = redG = gray LT. G = light gray

T = tan

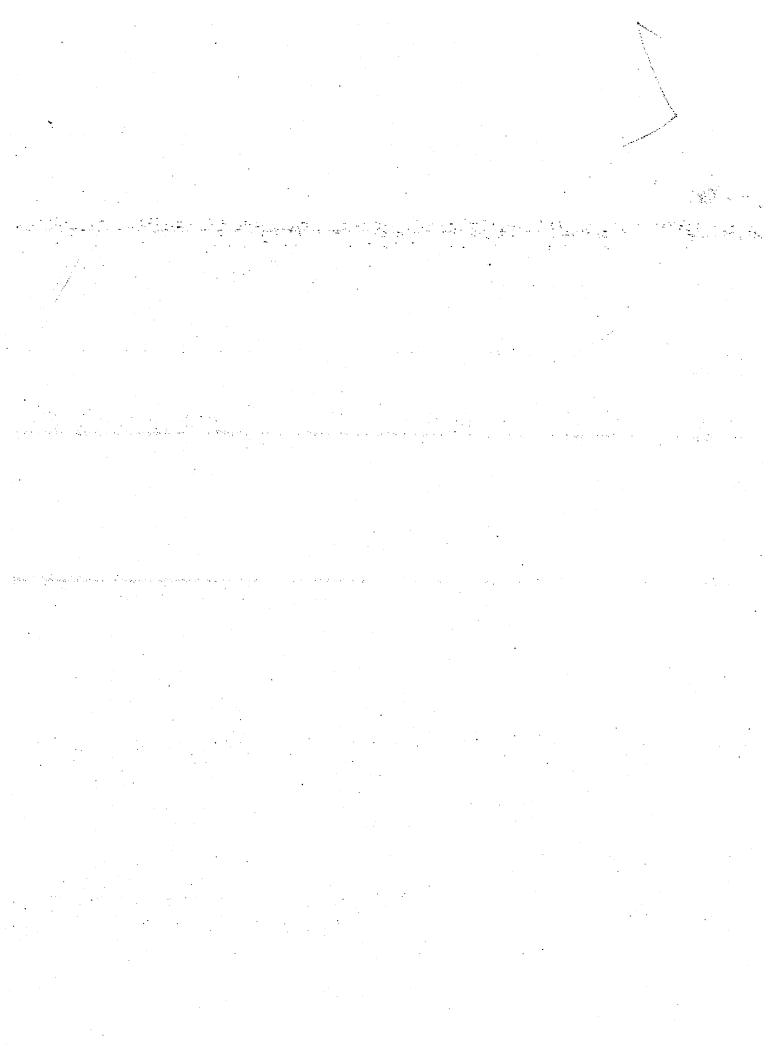
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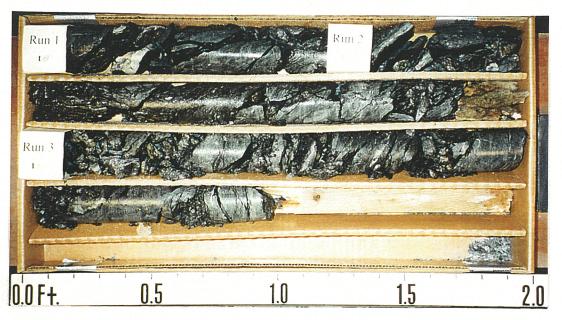
S	heet 1 of 2		
ODING DEDODT		DATE: 01/29/2001 & 01	/30/2001
ORING REPORT			
NG NO: <u>B2-B (RL)</u>	GEOLOGIST:	D. Carr	
<u>2,044.2 ft.</u> T	OTAL DEPTH:	38.4 ft.	
· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	
ELD CLASSIFICATION AND REMARKS			
	··		2,040.8 ft.(3.4 ft
parallel to foliation		*I one of united simulation	
		*Loss of water circulation	@ 0.4 leet
•			
e moderately weathered, medium hard phyllonite close fracture spacing for entire run. Trace pyrite	with some white	quartz and plagioclase len	ses and augens
ary washed out due to very close fracture spacing	for the entire ru	n	
,		•	
parallel to foliation			
Paranter to tottattoff		STRATA REC. = 53% STRATA RQD. = 2%	
		~	
n - gray moderately severe weathered, medium ha	ard phyllonite wi	th little white quartz and pl	agioclase
ens. Very close to close fracture spacing. Trace	pyrite and marca	asite	
ery washed out due to very close fracture spacing	for the entire ru	n	
parallel to foliation			
- - 			
	ard phyllonite wi	th some white quartz and p	lagioclase
t n - gray moderately severe weathered, medium ha ens. Very close to close fracture spacing. Trace	pyrite and marca	asite	lagioclase
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t a - gray moderately severe weathered, medium ha ens. Very close to close fracture spacing. Trace rry washed out due to very close fracture spacing ben 0° and 10° parallel to foliation t a - gray moderately severe weathered, medium ha ens. Very close to close fracture spacing. Trace rry washed out due to very close fracture spacing parallel to foliation ten 0° and 10° ten 10° ten 10° ten 20° and white moderately severe weathered, 10° ten 20° and white moderately severe weathered, 10° ten 20° and white moderately severe weathered, 10° ten 20° and white moderately severe weathered, 10° ten 20° and white moderately severe weathered, 10° ten 20° and white moderately severe weathered, 10° ten 20° and white moderately severe weathered, 10° ten 20° and white moderately severe weathered, 10° ten 20° and white moderately severe weathered, 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten 20° and 10° ten	pyrite and marca for the entire run ard phyllonite wi pyrite and marca for the entire run	asite a th some white quartz and p asite a	lagioclase artz and plagioclase
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t a - gray moderately severe weathered, medium ha ens. Very close to close fracture spacing. Trace ry washed out due to very close fracture spacing ben 0° and 10° parallel to foliation t a - gray moderately severe weathered, medium ha ens. Very close to close fracture spacing. Trace ry washed out due to very close fracture spacing parallel to foliation ten 0° and 10° t a - gray and white moderately severe weathered, a ens. Very close fracture spacing. f a - gray and white slightly weathered, moderately	pyrite and marca for the entire run ard phyllonite wi pyrite and marca for the entire run medium hard phy-	asite n th some white quartz and p asite a yllonite with some white qu	lagioclase artz and plagioclase 2,019.4 ft (24.8 ft
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t a - gray moderately severe weathered, medium ha ens. Very close to close fracture spacing. Trace rry washed out due to very close fracture spacing en 0° and 10° parallel to foliation t a - gray moderately severe weathered, medium ha ens. Very close to close fracture spacing. Trace ry washed out due to very close fracture spacing parallel to foliation en 0° and 10° t a - gray and white moderately severe weathered, 1 ms. Very close fracture spacing. ge a - gray and white moderately severe weathered, 1 ms. Very close fracture spacing. ge a - gray and white slightly weathered, moderately ms. Close fracture spacing. Trace pyrite and ma mext sheet GQUIPMENT: h automatic harmer mounted on a track carrier. ANCEMENT:	pyrite and marca for the entire run ard phyllonite wi pyrite and marca for the entire run medium hard phy-	asite a th some white quartz and p asite a yllonite with some white qu with some white quartz and STRATA REC. = 99%	artz and plagioclase 2,019.4 ft. (24.8 ft. 1 plagioclase
t a - gray moderately severe weathered, medium ha ens. Very close to close fracture spacing. Trace ary washed out due to very close fracture spacing ben 0° and 10° parallel to foliation t a - gray moderately severe weathered, medium ha ens. Very close to close fracture spacing. Trace ry washed out due to very close fracture spacing parallel to foliation t a - gray and white moderately severe weathered, a ens. Very close fracture spacing. get t a - gray and white moderately severe weathered, a ens. Close fracture spacing. Trace pyrite and ma text sheet EQUIPMENT:	pyrite and marca for the entire run ard phyllonite wi pyrite and marca for the entire run medium hard phy medium hard phy hard phyllonite measite.	asite a th some white quartz and p asite a villonite with some white qu with some white quartz and STRATA REC. = 99% STRATA RQD. = 31%	agioclase artz and plagioclase _2,019.4 ft_ (24.8 ft

								Sheet 2 of 2	
								CORE BORING REPORT	01/30/2001
PROJECT	r.	8.1952001				1 4 400			
				I.D. NO		<u>I-4400</u>		BORING NO: B2-B (RL) GEOLOGIST: D. Cart	. <u> </u>
		Dual Structure	s on 1-2	6 (Bridges	233 & 23	4) over (Cane Creek		·
COUNTY	f :	Henderson			-	COLL	AR ELEVA	TION: 2,044.2 ft. TOTAL DEPTH: 38.4 ft.	
		DRILL	RUN	REC	RQD	T		I	
	DEPTH	RATE MIN./1.0ft	ft	ft %	ft	RUN	WATER	FIELD CLASSIFICATION AND REMARKS	
(ft) 2,015.8	(ft) 28.4		5	4.9/5.0	% 1.4/5.0	# 6	COLOR		2015.8 ft.(28.4 f
		4:38		98%	28%		LT. G	 15 joints @ 45° parallel to foliation 1 joint @ 45°, perpendicular to foliation. 5 joints between 0 and 10°. 	
		4:12					· ·		
								28.4 - 33.4 feet Gray and green - gray moderately weathered, moderately hard to hard phyllonite with some white quartz a	nd plagioclase
		4:41						lenses and augens. Close fracture spacing. Trace pyrite and marcasite. Thinly laminated.	
2,010.8	33.4	4:57	5	2.0/5.0			ļ	Strata Change	2,010.8 ft. (33.4 1
2,010.8	55.4	2:11]]	3.0/5.0	0.4/5.0	7	LT.G	9 joints @ 45° parallel to foliation	
		3:23		60%	8%			3 joints @ 0° STRATA REC. = 60% STRATA RQD. = 8%	
			1					33.4 - 38.4 feet	
		3:18						Gray and green - gray and white moderately severe to severely weathered, soft to medium hard phyllonite quartz and plagioclase lenses and augens. Close fracture spacing. Trace pyrite and marcasite.	with some white
		4:27						Very close fracture spacing from 33.4 to 34.3 feet. The missing recovery was washed out of this zone. Driller measured 1.35 feet of rock left in boring. Driller was unable to retreive the core left in the hole.	
2,005.8	38.4	4:33			<u> </u>		ļ		2,005.8 ft. (38.4
		· · ·	1.		ĺ				
						-			
			-						
Ì									
			1						
1					L	Ļ		Coring terminated at elev. 2,005.8 feet in phyllonite	2,005.8 ft.(38.4 ft
1 1	.W. Gilo	R DRILLER: hrist, Jr. NG ASSISTA nza			· · · · · · · · · · · · · · · · · · ·			DRILLING EQUIPMENT: CME - 550 with automatic hammer mounted on a track carrier. HOLE ADVANCEMENT: 1. HSA from 0.0 - 3.4 feet using 3.25 inch hollow stem augers. 2. Cored using NWD4 SICB and a Series 8 NWD4 diamond impregnated bit from 3.4 - 38.4 feet.	
	WATEF C = clear W = whit G = gray f = tan	e	B = br R = rea LT. G		iy .		· .	NOTES: Joints are listed according to run number.	

1-1







B2-B (RL): Run 1, Run 2 and Run 3



B2-B (RL): Run 6 and Run 7



B2-B (RL): Run 4 and Run 5

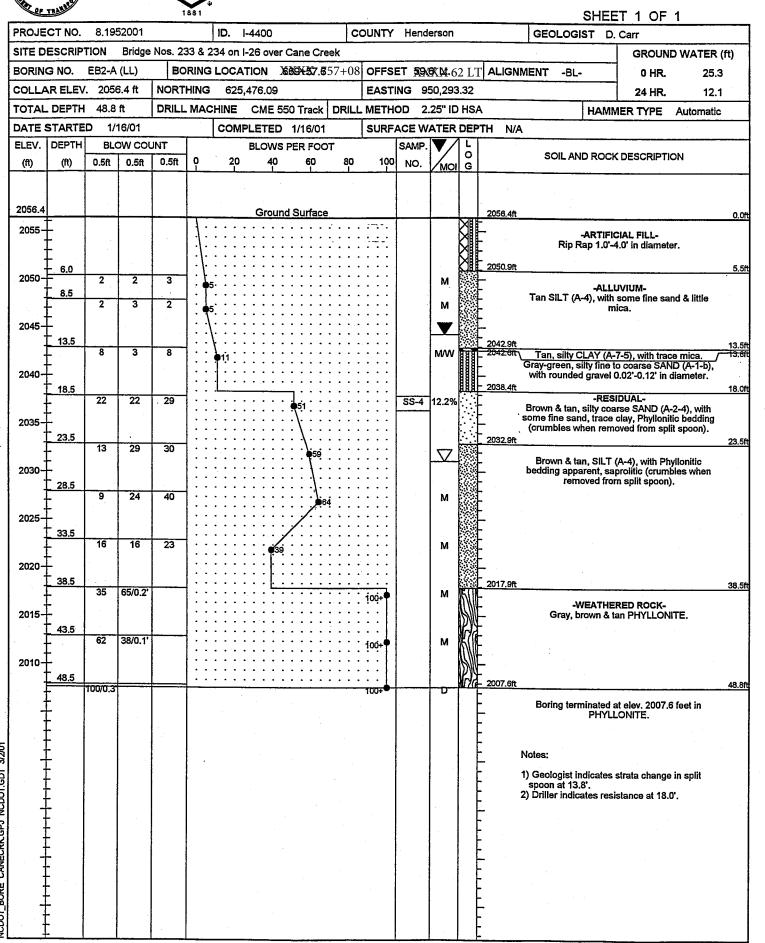
8.1952001 (I-4400) Henderson County Bridge Nos. 233 & 234 on I-26 over Cane Creek

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C





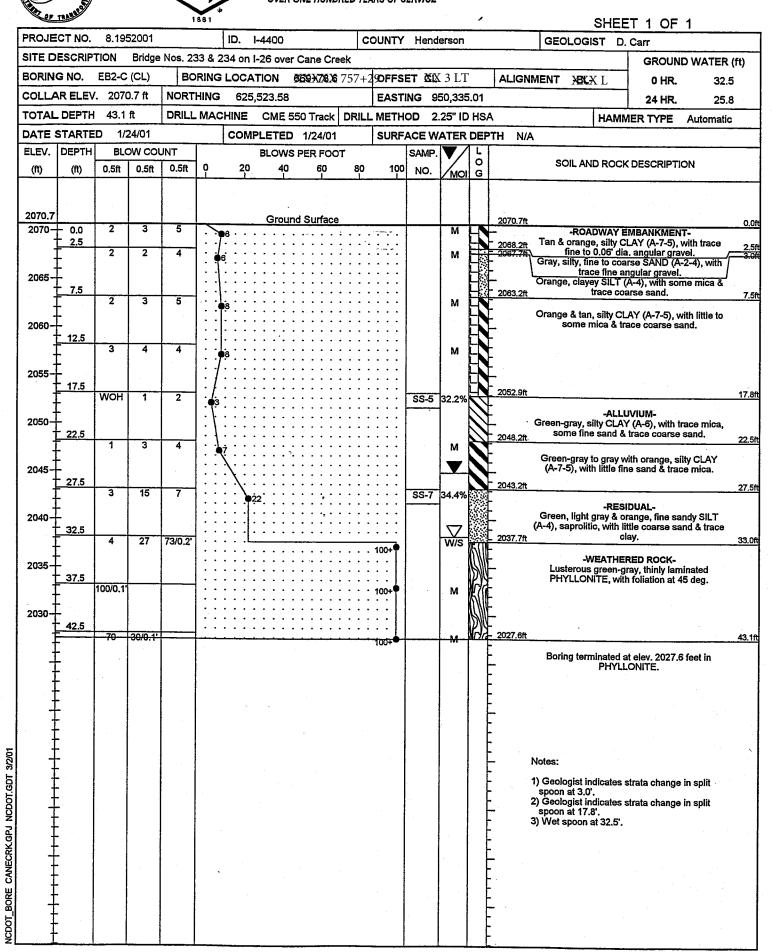


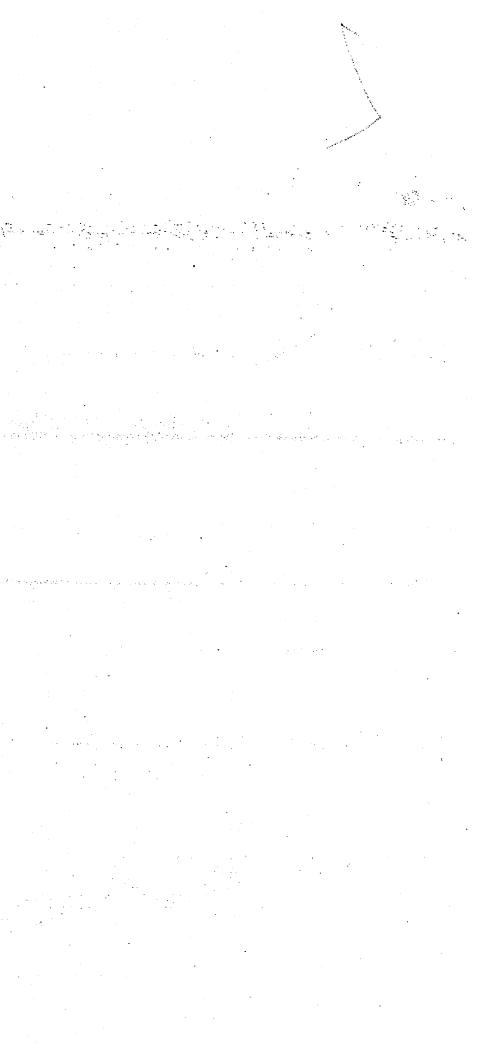


FROEHLING & ROBERTSON, INC. GEOTECHNICAL • ENVIRONMENTAL • MATERIALS ENGINEERS • LABORATORIES "OVER ONE HUNDRED YEARS OF SERVICE"

SINCE

N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG

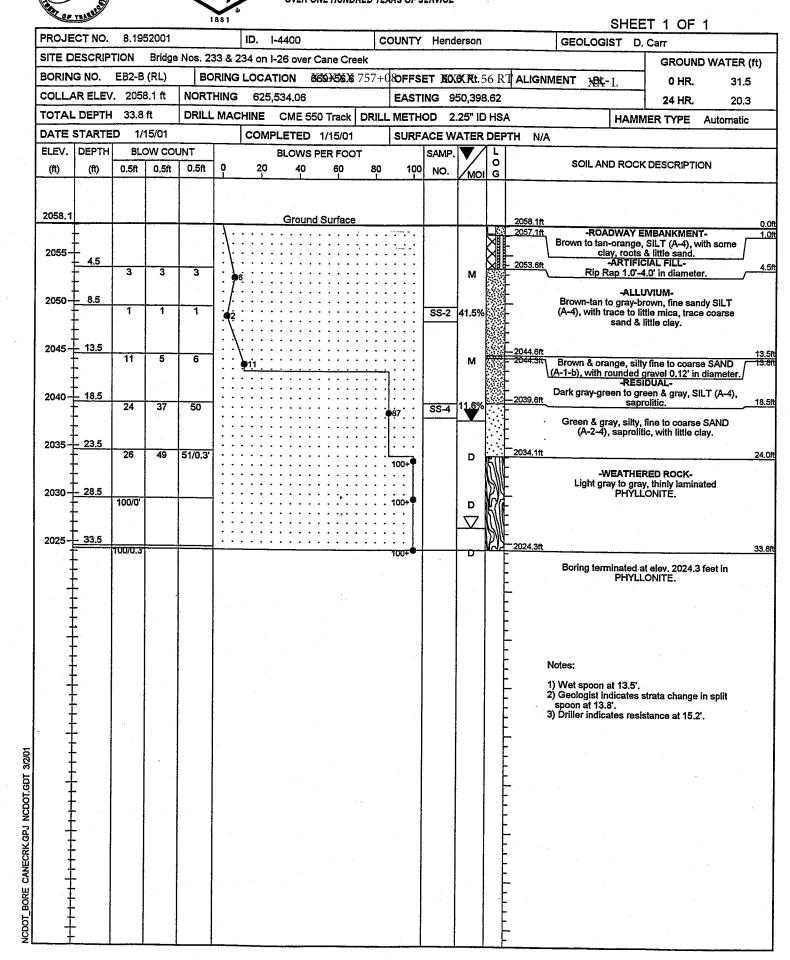




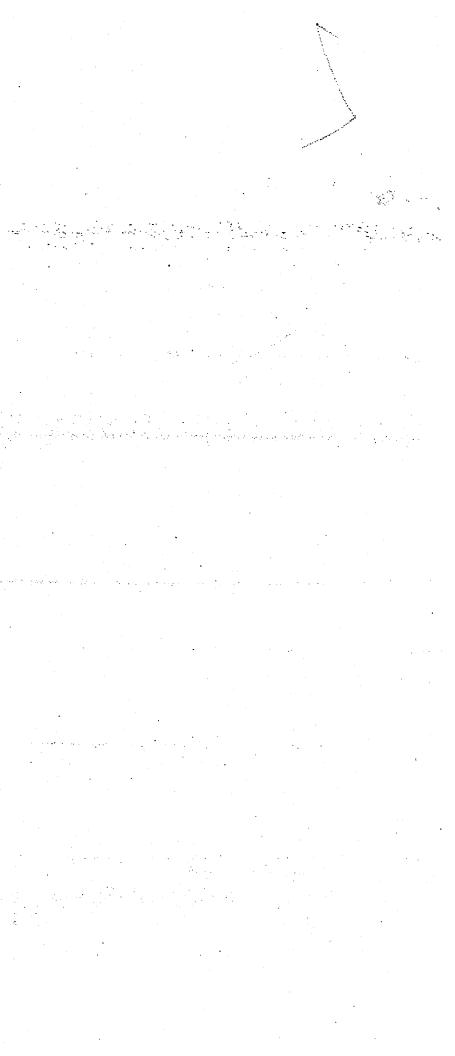
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SINCE

N.C.D.O.T. GEOTECHNICAL UNIT BORING LOG



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LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

PROJECT NO.: 8.1952001 (I-4400) F.A. NO.: NHF-26-1-(62)23 COUNTY: HENDERSON BRIDGE NOS. 233 & 234 ON I-26 OVER CANE CREEK

Sample #	Boring #	Depth (ft)	Rock Type	Geologic Map Unit	Run RQD	Length (ft)	Diameter (ft)	Unit Weight (PCF)	Unconfined Compressive Strength (PSI)	Young's Modulus (PSI)	Splitting Tensile Strength (PSI)	Remarks
RS-2	B1-A (LL)	35.6-36.4	Quartz Phyllonite	fs*	39.4	0.346	0.171	168.2	7144.74			
RS-3	B1-A (RL)	40.0-40.5	Phyllonite	fs*	23.0	0.351	0.170	170.1	975.08			
RS-4	B1-B (RL)	19.45-19.95	Phyllonite	fs*	33.6	0.301	0.171	175.3	963.62			
RS-5	B2-A (LL)	36.3-36.9	Phyllonite	fs*	-52.0	0.353	0.171	169.4	3752.51			
RS-6	B2-A (RL)	23.55-24.05	Quartz Phyllonite	fs*	34.0	0.349	0.172	166.2	1632.65			
RS-7	B2-A (RL)	27.8-28.3	Quartz Phyllonite	fs*	19.0	0.350	0.171	167.1	6902.01			
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										-		
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				-								
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*North Carolina Department of Natural Resources and Community Development Division of Land Resources Geological Survey Section Geological Map and Mineral Resources Summary of the Skyland Quadrangle N.C. MRS 193-NE



North Carolina Department of Transportation Division of Highways Materials and Test Unit Soils Laboratory

M&T Form 503

T.I.P. ID NO.: I-4400

REPORT ON SAMPLES OF: SOIL

SOIL FOR QUALITY

PROJECT:	8.1952001	COUNTY:	Henderson	
DATE SAMPLED:	January 2001	RECEIVED:	1/29/01	
SAMPLED FROM:	<u>-BL</u>	 REPORTED:	1/29/01	
SUBMITTED BY:	E.C. Howey, L.G., P.E.	 BY:	R.H. Calder	

TEST RESULTS

2/14/01		TEST RESULTS		
PROJ. SAMPLE NO.	SS-2	SS-1	SS-2	SS-4
LAB SAMPLE NO.				-
Retained #4 Sieve %	0.0	3.0	0.0	5.0
Passing #10 Sieve %	100.0	95.0	100.0	85.0
Passing #40 Sieve %	99.8	88.8	95.0	57.6
Passing #200 Sieve %	39.1	42.0	19.7	33.7

MINUS #10 FRACTION

SOIL MORTAR - 100%		· ·		
Coarse Sand Ret - #60 %	5.8	17.0	32.1	42.0
Fine Sand Ret - #270 %	60.9	43.6	49.8	21.9
Silt 0.053 - 0.010 mm %	23.9	28.3	8,1	30.5
Clay < 0.010 mm %	9.4	11.1	10.0	5.6
L.L.	34	33	22 ·	37
P.L.	NP	29	NP	35
P.I.	NP .	4	NP	2
AASHTO Classification	A-4(0)	A-4(0)	A-2-4(0)	A-2-4(0)
Northing	625,339.8442	625,379.8125	625,379.8125	625,476.0887
Easting	950,369.8140	950,348.0617	950,348.0617	950,293.3187
Hole No.	EB1-A (LL)	B1-A (LL)	B1-A (LL)	EB2-A (LL)
Depth (ft)	8.8	0.3	3.6	18.5
to	10.0	. 1.5	5.0	20.0
Moisture Content	23.8	22.4	6.4	12.2

E.C. Howey, L.G., P.E. Soils Engineer

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North Carolina Department of Transportation Division of Highways Materials and Test Unit Soils Laboratory

North Carolina Department of Transportation Division of Highways Materials and Test Unit Soils Laboratory

I-4400 T.I.P. ID NO .:

PROJECT:

DATE SAMPLED:

SAMPLED FROM:

SUBMITTED BY:

M&T Form 503

REPORT ON SAMPLES OF:

8.1952001

-BL-

January 2001

E.C. Howey, L.G., P.E.

SOIL FOR QUALITY

PROJECT:	8.1952001
DATE SAMPLED:	January 2001
SAMPLED FROM:	-BL-
SUBMITTED BY:	E.C. Howey, L.G., P.E.

I-4400

T.I.P. ID NO .:

REPORT ON SAMPLES OF:

TEST RESULTS

COUNTY:

RECEIVED:

REPORTED:

BY:

Henderson

R.H. Calder

1/29/01

1/29/01

2/14/01				
PROJ. SAMPLE NO.	SS-2	SS-4	SS-5	SS-6
LAB SAMPLE NO.				
Retained #4 Sieve %	3.0	0.8	1.2	5.0
Passing #10 Sieve %	96.1	98.8	98.6	83.1
Passing #40 Sieve %	89.5	93.6	97.6	69.7
()ing #200 Sieve %	74.9	81.4	79.7	9.0

MINUS #10 FRACTION

SOIL MORTAR - 100%				
Coarse Sand Ret - #60 %	10.8	9.0	1.2	46.3
Fine Sand Ret - #270 %	12.3	9.6	24.7	45.2
Silt 0.053 - 0.010 mm %	56.0	55.6	47.4	6.6
Clay < 0.010 mm %	20.9	25.8	26.7	1.9
. L.L.	33	35	38	18
<u> </u>	32	29	29	NP
P.I.	1	6	9	NP
AASHTO Classification	A-4(1)	A-4(5)	A-4(8)	A-3(0)
Northing	625,350.7115	625,350.7115	625,350.7115	625,350.7115
Easting	950,432.0642	950,432.0642	950,432.0642	950,432.0642
Hole No.	EB1-C (CL)	EB1-C (CL)	EB1-C (CL)	EB1-C (CL)
Depth (ft)	3.5	13.5	18.7	23.5
to	5.0	15.0	20.0	25.0
Moisture Content	27.5	29.3	35.6	*

* No moisture test taken

2/14/01		•	
PROJ. SAMPLE NO.	SS-5	SS-7	
LAB SAMPLE NO.			
· · · · · · · · · · · · · · · · · · ·			
Retained #4 Sieve %	0.0	0.0	
Passing #10 Sieve %	100.0	99.6	
Passing #40 Sieve %	100.0	89.5	
Passing #200 Sieve %	81.0	62.1	

SOIL FOR QUALITY

SOIL MORTAR - 100%			
Coarse Sand Ret - #60 %	0.9	16.7	
Fine Sand Ret - #270 %	22.0	25.3	
Silt 0.053 - 0.010 mm %	55.3	49.8	
Clay < 0.010 mm %	21.8	8.2	
L.L.	40	38	
P.L.	29	34	
P.I.	11	4	
AASHTO Classification	A-6(10)	A-4(2)	
Northing	625,523.5785	625,523.5785	
Easting	950,335.0070	950,335.0070	·
Hole No.	EB2-C (CL)	EB2-C (CL)	
Depth (ft)	17.5	27.5	· .
to	19.0	29.0	
Moisture Content	32.2	34.4	

E.C. Howey, L.G., P.E. Soils Engineer

M&T Form 503

COUNTY:	Henderson	
RECEIVED:	1/29/01	
REPORTED:	1/29/01	
BY:	R.H. Calder	

TEST RESULTS

MINUS #10 FRACTION

E.C. Howey, L.G., P.E. Soils Engineer

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T.I.P. ID NO.: I-4400

M&T Form 503

REPORT ON SAMPLES OF:

SOIL FOR QUALITY

PROJECT:	8.1952001	COUNTY:	Henderson
DATE SAMPLED:	January 2001	RECEIVED:	1/29/01
SAMPLED FROM:	-BL-	 REPORTED:	1/29/01
SUBMITTED BY:	E.C. Howey, L.G., P.E.	 BY:	R.H. Calder

TEST RESULTS

2/14/01	IEST RESULTS			
PROJ. SAMPLE NO.	SS-2	SS-4		
LAB SAMPLE NO.				
Retained #4 Sieve %	0.0	0.8		
Passing #10 Sieve %	100.0	86.9		· · · · · · · · · · · · · · · · · · ·
Passing #40 Sieve %	100.0	63.2		· · · · · · · · · · · · · · · · · · ·
Passing #200 Sieve %	73.7	34.1		

MINUS #10 FRACTION

SOIL MORTAR - 100%			
Coarse Sand Ret - #60 %	0.3	38.8	
Fine Sand Ret - #270 %	31.9	23.9	
Silt 0.053 - 0.010 mm %	51.0	25.3	
Clay < 0.010 mm %	16.8	12.0	
L.L.	39	28	
P.L.	33	22	
P.I	6	6	
AASHTO Classification	A-4(5)	A-2-4(0)	
Northing	625,534.0630	625,534.0630	
Easting	950,398.6185	950,398.6185	
Hole No.	EB2-B (RL)	EB2-B (RL)	
Depth (ft)	8.5	18.5	
to	10.0	20.0	
Moisture Content	41.5	11.6	

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