STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JOSH STEIN
GOVERNOR

J.R. "JOEY" HOPKINS
SECRETARY

December 9, 2025

MEMORANDUM TO: Tierre Peterson, P.E.
Project Management Team Lead

ATTENTION: Sara J. Sherman, P.E.
Project Manager

FROM: Thomas G. Santee, P.E.
Eastern Region Manager
Geotechnical Engineering Unit

DocuSigned by:
JYP
Thomas G Santee
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STATE PROJECT: 30001.WIUM.002
FEDERAL PROJECT: NA
COUNTY: Wake
DESCRIPTION: Bridge 911473 over Crabtree Creek on South Turkey Creek Trail

SUBJECT: Bridge Inventory Memorandum

Upon notification of the Umstead Bridge project, the Eastern Region Geotechnical office provided the B-3259 Bridge Inventory based on proximity. This inventory was then determined acceptable for use in providing the needed geotechnical recommendations based on the limited scope of foundation construction work needed for the repairs of the Umstead Bridge. Please note, the Eastern Region Geotechnical office also understood the project had limited budget available to develop the needed design/repair plans.

Please contact Jinyoung Park or Tom Santee at (984) 920-8900 if there are any questions concerning this memorandum.

DocuSigned by:
12/09/2025
A713DB5C81BA498...
Jinyoung Park, Ph.D, P.E.
Eastern Region Design Supervisor
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Location:
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GARNER NC, 27529

PROJECT: 8.2405201 ID: B-3259

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STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 8.2405201 I.D. NO. B-3259

F.A. PROJECT N/A

COUNTY WAKE

PROJECT DESCRIPTION BRIDGE # 44 ON SR 1649 OVER CRABTREE CREEK

SITE DESCRIPTION

METRIC	STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
	N.C.	8.2405201 (B-3259)	1	12
	STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
			P.E.	
			CONST.	

CAUTION NOTICE

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INVESTIGATED BY EC CAMPBELL PERSONNEL BA PARKS

CHECKED BY RS JOHNSON HR CONLEY

SUBMITTED BY RS JOHNSON RB BRANON

DATE 8/01

DRAWN BY: ECC MBA TTW

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.

NORTH CAROLINA LICENSED SEAL 604 GEOLOGIST RICHARD S. JOHNSON

SEAL

Richard S. Johnson

SIGNATURE

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-3259	8.2405201	2	12

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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 100 BLOWS PER 30 cm ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT	6 MX		N.P.	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (kN/m^2)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<25
	SOFT	2 TO 4	25 TO 50
	MEDIUM STIFF	4 TO 8	50 TO 100
	STIFF	8 TO 15	100 TO 200
	VERY STIFF	15 TO 30	200 TO 400
	HARD	>30	>400

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12"	3"				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT (PLASTIC RANGE (PI))		
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE
UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE (ALSO POORLY GRADED).
GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT- CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.
- STATIC WATER LEVEL AFTER 24 HOURS.
- PW — PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA
- SPRING OR SEEPAGE

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP/DIP DIRECTION OF ROCK STRUCTURES
- SOUNDING ROD
- SPT CPT DPT DMT PMT VST — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

SAMPLE DESIGNATIONS
S- BULK SAMPLE
SS- SPLIT SPOON SAMPLE
ST- SHELBY TUBE SAMPLE
RS- ROCK SAMPLE
RT- RECOMPACTED TRIAXIAL SAMPLE
CBR - CBR SAMPLE

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F. - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED
FRAGS. - FRAGMENTS
MED. - MEDIUM
PMT - PRESSUREMETER TEST
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT
V. - VERY
VST - VANE SHEAR TEST
WOH - WEIGHT OF HAMMER

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [X] CME-45
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] OTHER _____
- [ ] OTHER _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [X] 152 mm CONTINUOUS FLIGHT AUGER
- [X] 203 mm HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [X] W/ ADVANCER
- [ ] TRICONE _____ mm STEEL TEETH
- [ ] TRICONE _____ mm TUNG.-CARB.
- [X] CORE BIT
- [ ] OTHER _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [X] -N XWL
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] OTHER _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 2.5 cm PER 50 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER 30 cm.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V. SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 2.5 cm. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BLOWS PER 30 cm.*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BLOWS PER 30 cm.*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 6 mm DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 1 mm DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 25 mm MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL CENTIMETERS IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 25 mm OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 3 m
WIDE	1 TO 3 m
MODERATELY CLOSE	30 TO 100 cm
CLOSE	5 TO 30 cm
VERY CLOSE	LESS THAN 5 cm

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 1 m
THICKLY BEDDED	0.5 - 1 m
THINLY BEDDED	0.05 - 0.5 m
VERY THINLY BEDDED	10 - 50 mm
THICKLY LAMINATED	2.5 - 10 mm
THINLY LAMINATED	< 2.5 mm

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N) OF A 63.5 kg HAMMER FALLING 0.76 METERS REQUIRED TO PRODUCE A PENETRATION OF 30 cm INTO SOIL WITH A 5 cm OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 2.5 cm PENETRATION WITH 50 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

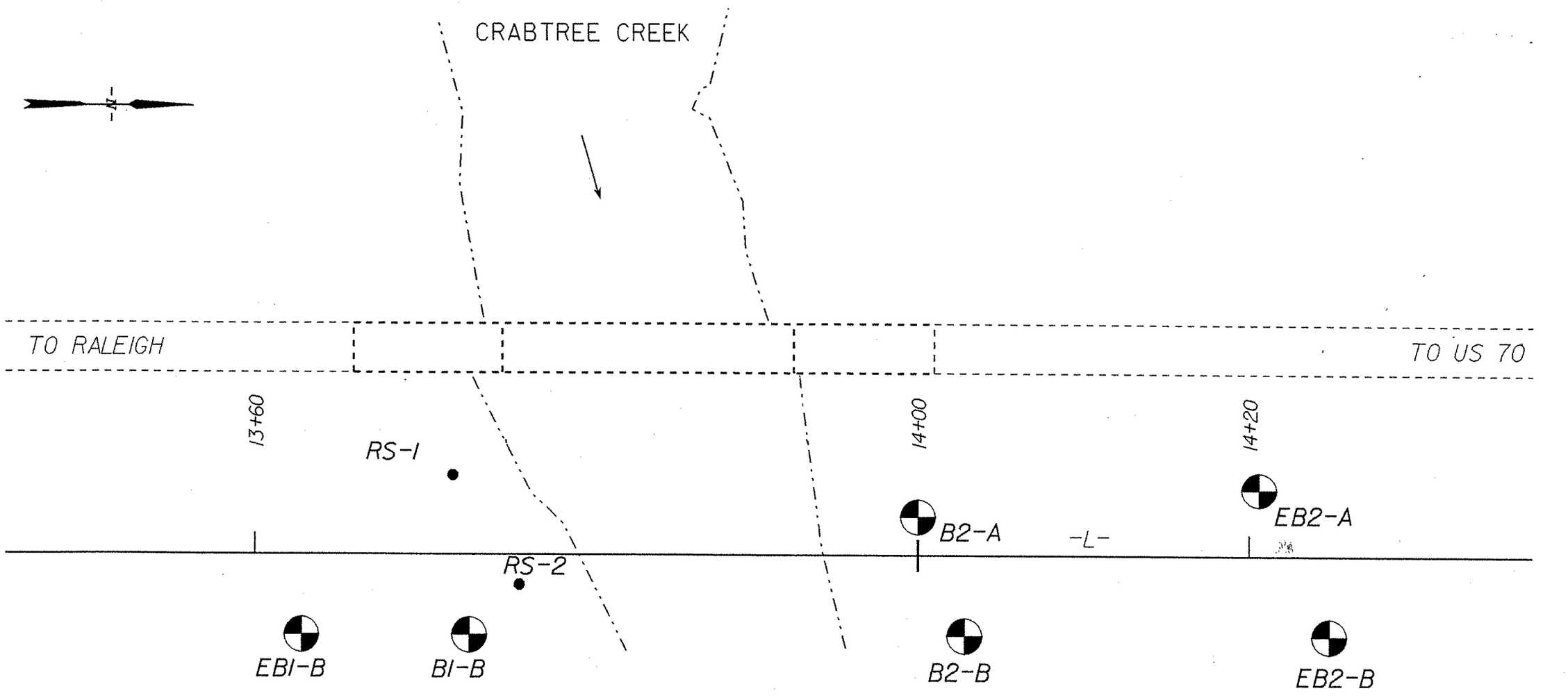
BENCH MARK: BM-4 DISK ON GROUND AT BL STATION
9+75.8, 18.49 m RT.
ELEVATION: 75.12

NOTES:

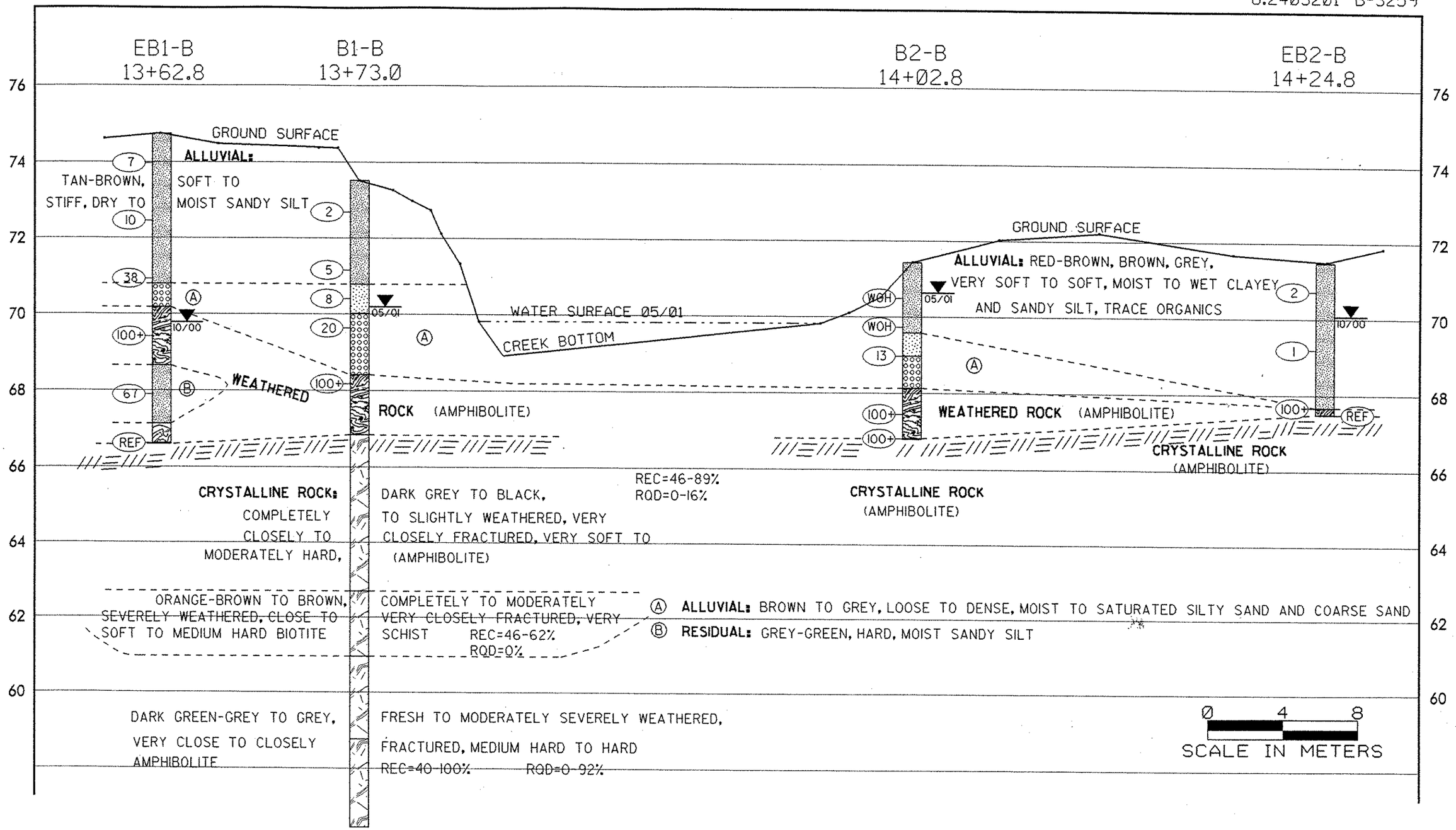
REVISED 09/15/00

TEST SITE PLAN

8.2405201
B-3259
WAKE CO.

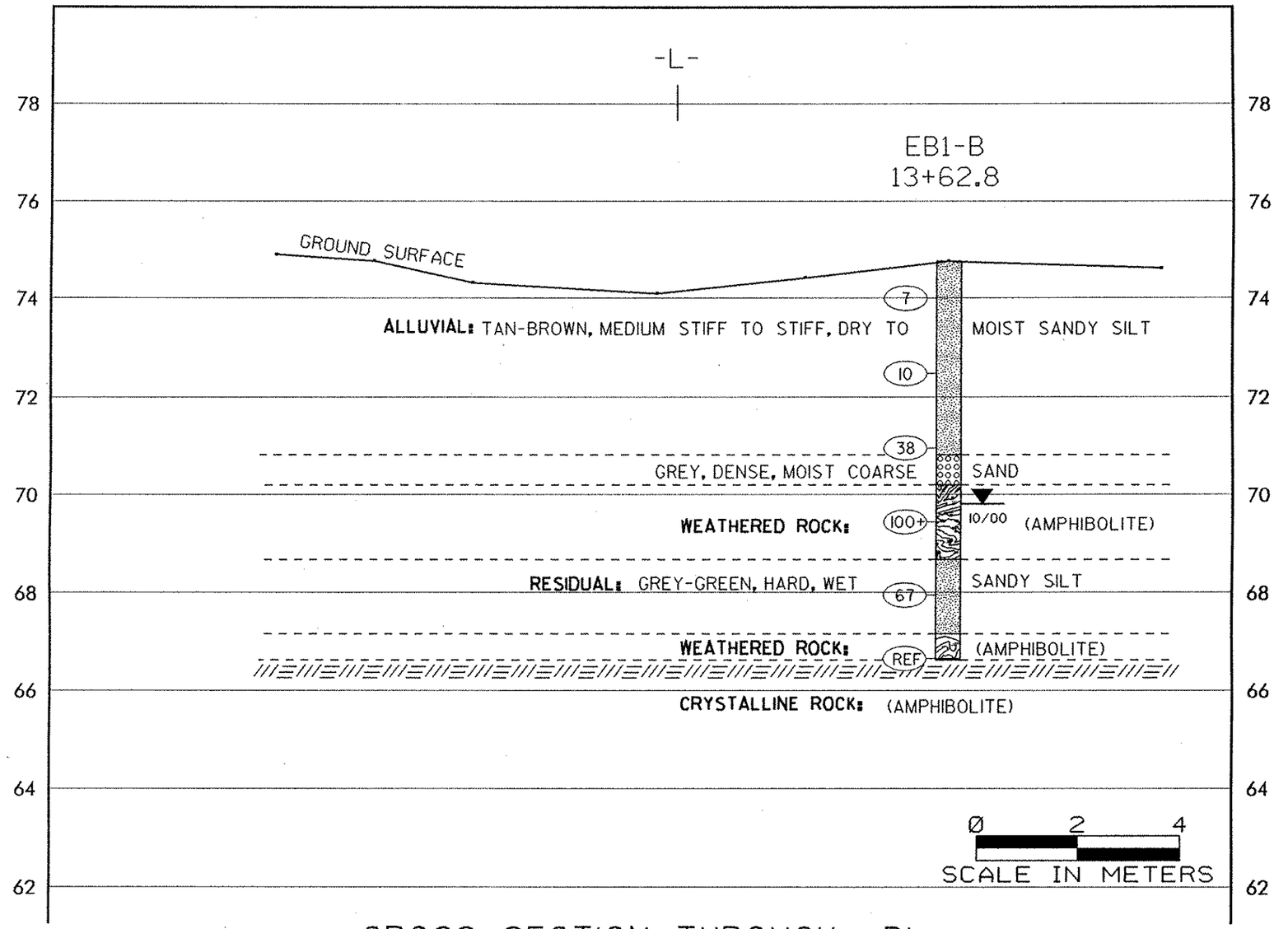


PROFILE 4.8m RT OF -L-

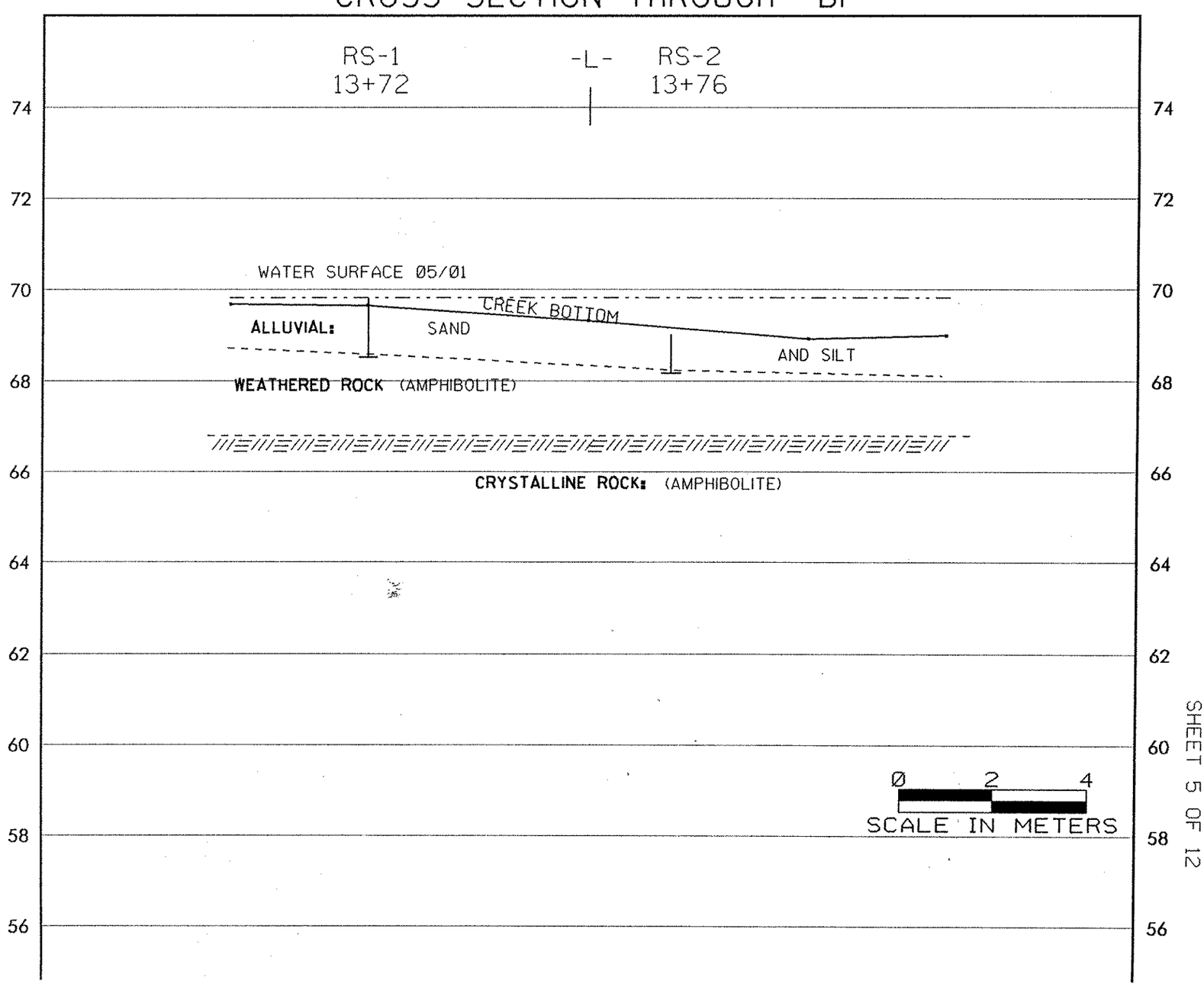


CROSS SECTION THROUGH EB1

8.2405201 (B-3259)

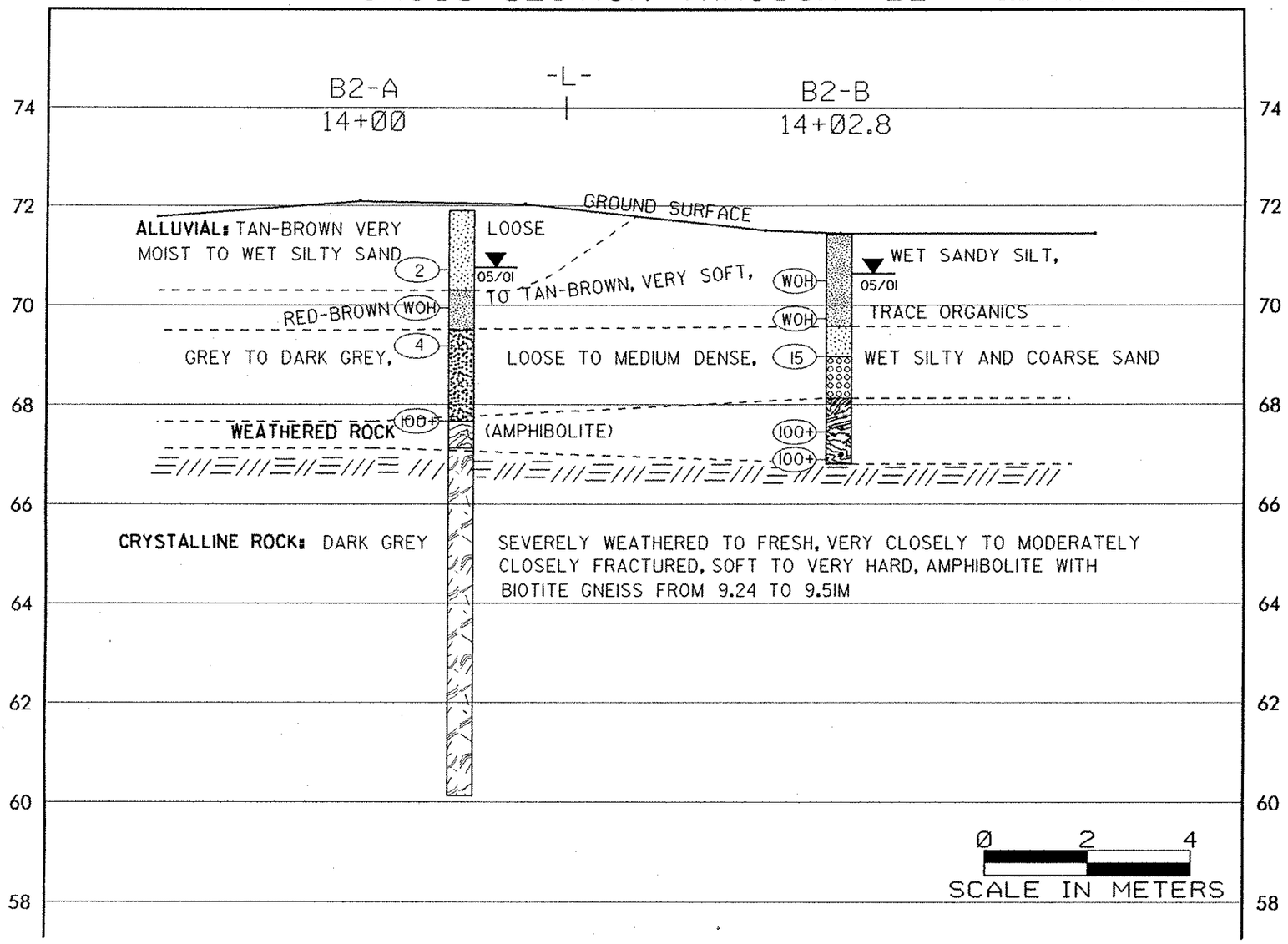


CROSS SECTION THROUGH BI

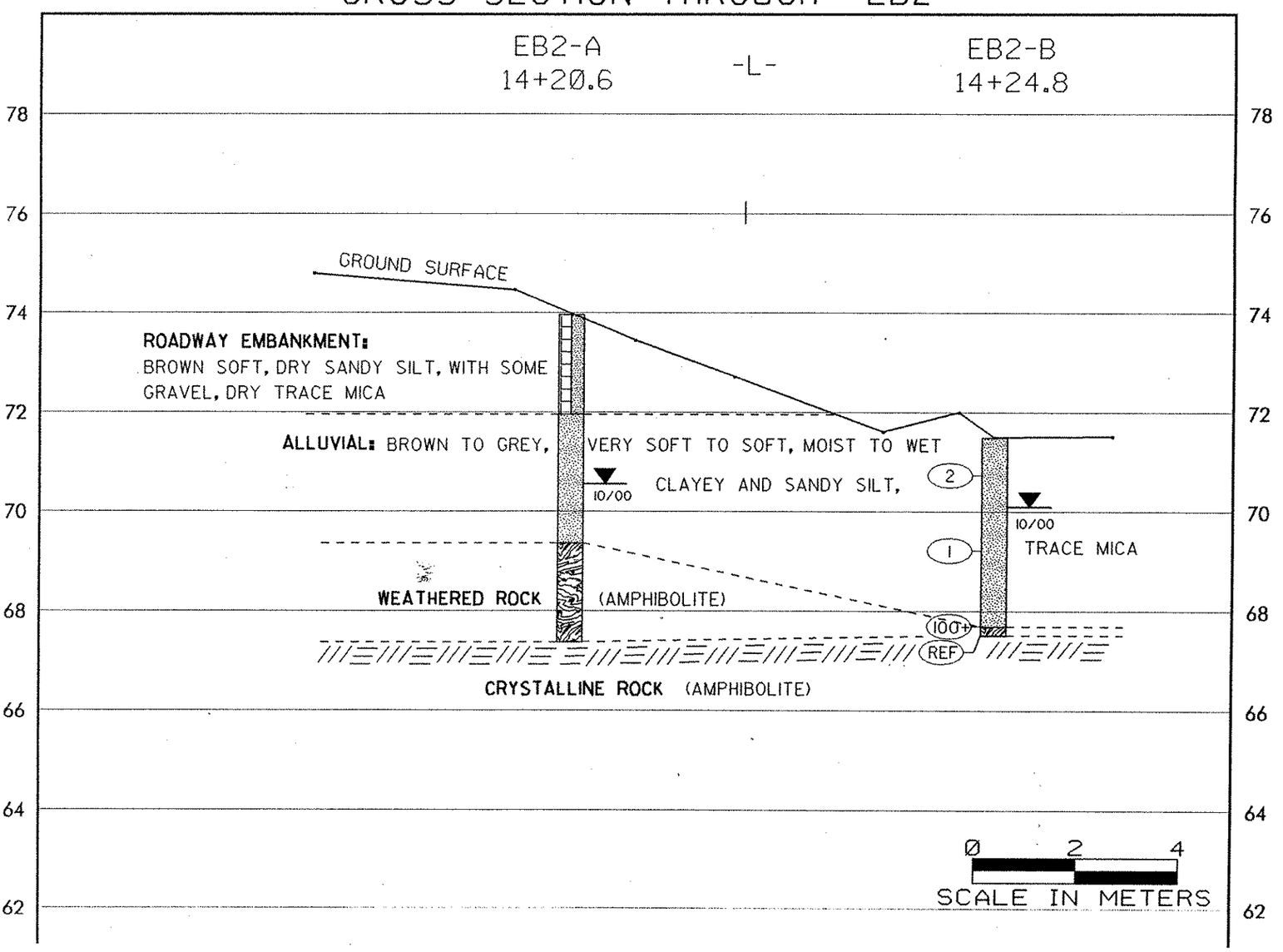


CROSS SECTION THROUGH B2

8.2405201 (B-3259)



CROSS SECTION THROUGH EB2



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO. 8.2405201	**ID.** B-3259	**COUNTY** WAKE	**GEOLOGIST** CA. YOUNGBLOOD
SITE DESCRIPTION BRIDGE # 44 ON SR 1649 OVER CRABTREE CREEK			**GROUND WATER**
BORING NO. EBI-B	**BORING LOCATION** 13+62.80	**OFFSET** 4.80 m RT	**ALIGNMENT** -L-	**0 HR.** 7.60
COLLAR ELEV. 74.75	**NORTHING** 232,468.28	**EASTING** 634,505.07		**24 HR.** 4.95
TOTAL DEPTH 8.13	**DRILL MACHINE** CME-45C	**DRILL METHOD** H.S. AUGERS	**HAMMER TYPE** AUTOMATIC	
START DATE 10/18/00	**COMPLETION DATE** 10/19/00	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 8.11	

ELEV.	DEPTH	BLOW COUNT 15cm	15cm	15cm	PEN. (m)	BLOWS PER 30cm 0 25 50 75 100	SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION
74.75										
74.00	0.76	5	4	3	0.3	7 + 0	SS-5 SS-6	D		**ALLUVIAL:** TAN-BROWN, SANDY SILT
72.00	2.28	3	5	5	0.3	X		D/M		
	3.80	5	19	19	0.3	38 X	SS-7	M		GREY, COARSE SAND
70.00	5.32	62	38		0.19	100+ X				**WEATHERED ROCK** (AMPHIBOLITE)
68.00	6.84	38	38	29	0.3	67 X	SS-8	W		**RESIDUAL:** GREY-GREEN, SANDY SILT
	8.11	50			0.02	REF X				**WEATHERED ROCK** (AMPHIBOLITE)
	8.13									**CRYSTALLINE ROCK** (AMPHIBOLITE)
66.00						BORING TERMINATED AT AN ELEVATION OF 66.62 METERS IN CRYSTALLINE ROCK (AMPHIBOLITE)				
64.00										
62.00										
60.00										
58.00										
56.00										

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET OF

PROJECT NO. 8.2405201	ID. B-3259	COUNTY WAKE	GEOLOGIST BA PARKS
SITE DESCRIPTION BRIDGE #44 ON SR 1649 OVER CRABTREE CREEK			GROUND WATER
BORING NO. BI-B	BORING LOCATION 13+73.00	OFFSET 4.80 m RT	ALIGNMENT -L-	0 HR. 1.10
COLLAR ELEV. 73.52	NORTHING 232,478.48	EASTING 634,505.35	24 HR. 3.32
TOTAL DEPTH 17.04	DRILL MACHINE CME 550	DRILL METHOD WASH BORING	HAMMER TYPE AUTOMATIC
START DATE 5/14/01	COMPLETION DATE 5/15/01	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 6.67

ELEV.	DEPTH	BLOW COUNT 15cm	15cm	15cm	PEN. (m)	BLOWS PER 30cm 0 25 50 75 100	SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION
73.52										
	0.83	WOH	1	1	0.3	2	SS-15	W		**ALLUVIAL** TAN-BROWN, SANDY SILT
72.00										
	2.35	2	2	3	0.3	5				
	3.11	3	3	5	0.3	8	SS-16	▼		TAN-BROWN SILTY SAND
70.00	3.87	7	7	13	0.3	20	SS-17	SAT		BROWN TO GREY SAND, AND GRAVEL
	5.39	80	20		0.17	100+				**WEATHERED ROCK** (AMPHIBOLITE)
68.00										**CRYSTALLINE ROCK:** DARK GREY TO BLACK COMPLETELY TO SLIGHTLY WEATHERED, VERY CLOSELY TO CLOSELY FRACTURED, VERY SOFT TO MODERATELY HARD AMPHIBOLITE
66.00										
64.00										
62.00										ORANGE-BROWN TO BROWN, COMPLETELY TO MODERATELY SEVERELY WEATHERED, CLOSE TO VERY CLOSELY FRACTURED, VERY SOFT TO MEDIUM HARD BIOTITE SCHIST
60.00										
58.00										DARK GREEN-GREY TO GREY, FRESH TO MODERATELY SEVERELY WEATHERED, VERY CLOSE TO CLOSELY FRACTURED, MEDIUM HARD TO HARD, (AMPHIBOLITE)
56.00	17.04					BORING TERMINATED AT AN ELEVATION OF 56.48 METERS IN CRYSTALLINE ROCK (AMPHIBOLITE)				
54.00										

CORE BORING REPORT

PROJECT: 8.2405201 ID: B-3259 COUNTY: Wake BORING NO: B1-B

DESCRIPTION: Bridge # 44 on SR 1649 over Crabtree Creek

LOCATION OF BORING: 13+73, 4.8mRT, L COMPLETION DATE: 05/15/01

COLLAR or GROUND ELEVATION: 73.52 m CORE SIZE: NXWL GEOLOGIST: BA Parks

CORE EQUIPMENT: CME-550, N casing DRILLER: HR Conley

ELEV (m)	DEPTH (m)	DRILL RATE (min/0.5m)	RUN (m)	REC (m) (%)	RQD (m) (%)	SAMPLE NUMBER	FIELD CLASSIFICATION and REMARKS
66.85	6.67	1:50				RS-4	Dark grey to black, completely to slightly weathered, close to very closely fractured,
		0:57		0.86	0.20		very soft to moderately hard, Amphibolite, 40 degree joint at 7.22m, 45 degree joints at
		0:20	1.25			7.00-7.13m	7.26m and 7.36m.
				(69%)	(16%)		
65.60	7.92						
65.60	7.92	0:57					Dark grey to black, severely to slightly weathered, close to very closely fractured,
		0:54		1.35	0.22		very soft to moderately hard, Amphibolite, 40 degree joints at 8.16m, and 8.65m.
		0:43	1.52				
				(89%)	(14%)		
64.08	9.44						
64.08	9.44	0:36					Dark grey to black, severely weathered, close to very closely fractured,
		0:45		0.70	0.00		medium hard to soft, Amphibolite. Contact at 10.82m with Orange-Brown, completely weathered, very
		0:25	1.52				closely fractured, very soft, Biotite Schist.
				(46%)	(0%)		
62.56	10.96						
62.56	10.96	1:20					Orange-brown to brown, completely to moderately severely weathered, close to very closely fractured,
		1:10		0.94	0.00		very soft to medium hard, Biotite Schist.
		1:15	1.52				
				(62%)	(0%)		
61.04	12.48						
61.04	12.48	1:20					Orange-brown to brown, completely to moderately severely weathered, very closely fractured, very soft
		1:10		0.61	0.00		to soft, Biotite Schist. At 12.56 m dark green-grey, moderately severely weathered,
		1:15	1.52				very closely fractured, medium hard to hard, Amphibolite.
				(40%)	(0%)		
59.52	14.00						
59.52	14.00	1:20				RS-3	Dark green-grey, moderately weathered to fresh, very close to closely fractured, moderately
		1:09		1.52	0.73		hard to hard, Amphibolite. At 14.80m grey, fresh to very slightly weathered, moderately to closely
		1:08	1.52			15.20-15.42m	fractured, moderately hard to hard, Amphibolite.
				(100%)	(48%)		
58.00	15.52						
58.00	15.52	1:25				RS-5	Grey, fresh to very slightly weathered, moderately to closely fractured, hard to very hard, Amphibolite.
		1:30		1.50	1.40		
		1:35	1.52			16.65-16.78m	
				(99%)	(92%)		
56.48	17.04						
		TOTALS:	10.37	7.48 (72%)	2.55 (25%)		BOREHOLE TERMINATED AT ELEVATION OF 56.48 METERS, IN ROCK.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET OF

PROJECT NO. 8.2405201	ID. B-3259	COUNTY WAKE	GEOLOGIST BA PARKS
SITE DESCRIPTION BRIDGE ## 44 ON SR 1649 OVER CRABTREE CREEK			GROUND WATER
BORING NO. B2-A	BORING LOCATION 14+00.00	OFFSET 2.30 m LT	ALIGNMENT -L-
COLLAR ELEV. 71.92	NORTHING 232,505.66	EASTING 634,498.97	0 HR. 3.30
TOTAL DEPTH 11.78	DRILL MACHINE CME 550	DRILL METHOD WASH BORING	HAMMER TYPE AUTOMATIC
START DATE 5/9/01	COMPLETION DATE 5/9/01	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 4.78

ELEV.	DEPTH	BLOW COUNT 15cm 15cm 15cm	PEN. (m)	BLOWS PER 30cm 0 25 50 75 100	SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION
71.92								
	1.2	WOH 1 1	0.3	2	SS-9	M		**ALLUVIAL:** TAN-BROWN, SILTY SAND
70.00	1.96	WOH WOH WOH	0.3	WOH	SS-10	W		TAN-BROWN, SANDY SILT
	2.72	WOH 1 3	0.3	4	SS-11	SAT		GREY TO DARK GREY SILTY SAND
68.00	4.24	100	0.12	100+				**WEATHERED ROCK** (AMPHIBOLITE)
66.00								**CRYSTALLINE ROCK** DARK GREY, SEVERELY WEATHERED TO FRESH, VERY CLOSELY TO MODERATELY CLOSELY FRACTURED, SOFT TO VERY HARD, AMPHIBOLITE, WITH BIOTITE GNEISS FROM 9.24 TO 9.5IM
64.00								
62.00								
60.00	11.78			BORING TERMINATED AT AN ELEVATION OF 60.14 METERS IN CRYSTALLINE ROCK (AMPHIBOLITE)				
58.00								
56.00								
54.00								
52.00								

CORE BORING REPORT

PROJECT: 8.2405201 ID: B-3259 COUNTY: Wake BORING NO: B2-A

DESCRIPTION: Bridge # 44 on SR 1649 over Crabtree Creek

LOCATION OF BORING: 14+00, 2.3mLT, L COMPLETION DATE: 05/09/01

COLLAR or GROUND ELEVATION: 71.92 m CORE SIZE: NXWL GEOLOGIST: BA Parks

CORE EQUIPMENT: CME 550, N casing DRILLER: HR Conley

ELEV (m)	DEPTH (m)	DRILL RATE (min/0.5m)	RUN (m)	REC (m) (%)	RQD (m) (%)	SAMPLE NUMBER	FIELD CLASSIFICATION and REMARKS
67.14	4.78	1:05					Dark grey, very slightly to slightly weathered, moderately close to closely fractured,
		1:09		0.87	0.64		medium hard to very hard, Amphibolite, 45 degree joints at 4.88 m and 4.94 m. 40 degree joint at
			0.92				5.43 m.
				(95%)	(70%)		
66.22	5.70						
66.22	5.70	1:05					Dark grey, severely to very slightly weathered, moderate closely to closely fractured,
		0:59		1.39	0.91		medium hard to hard, Amphibolite. 45 degree joint at 6.16m, 80 degree joint at 6.90m.
		1:07	1.52				
				(91%)	(60%)		
64.70	7.22						
64.70	7.22	1:11				RS-1	Dark grey, severely to very slightly weathered, moderately close to closely fractured,
		1:08		1.49	0.95		soft to very hard, Amphibolite. 15 degree joint at 8.55m.
		1:06	1.52			7.22-	
				(98%)	(63%)	7.45m	
63.18	8.74						
63.18	8.74	0:59				RS-2	Dark grey , severely weathered, very close to closely fractured,
		1:09		1.48	0.71		soft, Amphibolite. At 9.24m grey, slightly weathered to fresh, closely fractured, hard, Biotite Gneiss.
		1:23	1.52			9.90-	50 degree joint at 9.30m. At 9.51m dark grey, very slightly weathered, moderately closely
				(97%)	(47%)	10.15m	fractured, hard to very hard, Amphibolite. 20 degree joint at 9.60m, 55 degree joint at 10.16m.
61.66	10.26						
61.66	10.26	1:12					Dark grey, very slightly weathered, moderately close to closely fractured,
		1:13		1.44	1.15		hard, Amphibolite. 45 degree joint at 10.60m, 80 degree joint at 11.10m, and 35 degree joint at 10.16m.
		1:14	1.52				
				(95%)	(76%)		
60.14	11.78						
		TOTALS:	7.00	6.67 (95%)	4.36 (62%)		BOREHOLE TERMINATED AT ELEVATION OF 60.04 METERS, IN ROCK.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO. 8.2405201	**ID.** B-3259	**COUNTY** WAKE	**GEOLOGIST** BA PARKS
SITE DESCRIPTION BRIDGE # 44 ON SR 1649 OVER CRABTREE CREEK			**GROUND WATER**
BORING NO. B2-B	**BORING LOCATION** 14+02.80	**OFFSET** 4.80 m RT	**ALIGNMENT** -L-	**0 HR.** 0.80
COLLAR ELEV. 71.44	**NORTHING** 232,508.27	**EASTING** 634,506.14		**24 HR.** 0.80
TOTAL DEPTH 4.63	**DRILL MACHINE** CME 550	**DRILL METHOD** WASH BORING	**HAMMER TYPE** AUTOMATIC	
START DATE 5/10/01	**COMPLETION DATE** 5/10/01	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 4.63	

ELEV.	DEPTH	BLOW COUNT 15cm / 15cm / 15cm	PEN. (m)	BLOWS PER 30cm (0 25 50 75 100)	SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION
71.44								
	0.94	WOH WOH WOH	0.3	WOH	SS-12	W		**ALLUVIAL:** RED-BROWN TO GREY SANDY SILT, TRACE ORGANICS
70.00	1.70	WOH WOH WOH	0.3	WOH	SS-13			
	2.46	7 8 5	0.3	13		SAT		GREY, SILTY SAND AND COARSE SAND, TRACE ORGANICS
68.00								
	3.98	26 74	0.28	100+	SS-14			**WEATHERED ROCK** (AMPHIBOLITE)
	4.54	100	0.09	100+				
	4.63							**CRYSTALLINE ROCK** (AMPHIBOLITE)
66.00				BORING TERMINATED AT AN ELEVATION OF 66.81 METERS ON CRYSTALLINE ROCK (AMPHIBOLITE)				
64.00								
62.00								
60.00								
58.00								
56.00								
54.00								
52.00								

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO. 8.2405201	ID. B-3259	COUNTY WAKE	GEOLOGIST CA. YOUNGBLOOD
SITE DESCRIPTION BRIDGE # 44 ON SR 1649 OVER CRABTREE CREEK			GROUND WATER
BORING NO. EB2-A	BORING LOCATION 14+20.60	OFFSET 4.00m LT	ALIGNMENT -L-	0 HR. 3.70
COLLAR ELEV. 74.00	NORTHING 232,526.30	EASTING 634,497.81	24 HR. 3.40
TOTAL DEPTH 6.58	DRILL MACHINE CME 45C	DRILL METHOD SOLID AUGERS	HAMMER TYPE AUTOMATIC
START DATE 10/18/00	COMPLETION DATE 10/18/00	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 6.58

ELEV.	DEPTH	BLOW COUNT 15cm 15cm 15cm	PEN. (m)	BLOWS PER 30cm 0 25 50 75 100	SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION
74.00								
					S-3	D		**ROADWAY EMBANKMENT:** BROWN, SANDY WITH SOME GRAVEL, TRACE MICA
72.00					S-4 S-4A	D M ▼ W		**ALLUVIAL** BROWN, SANDY SILT, TRACE MICA
70.00								
68.00								**WEATHERED ROCK** (AMPHIBOLITE)
	6.58			BORING TERMINATED AT AN ELEVATION OF 67.42 METERS ON CRYSTALLINE ROCK (AMPHIBOLITE)				
66.00								
64.00								
62.00								
60.00								
58.00								
56.00								

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO. 8.2405201	ID. B-3259	COUNTY WAKE	GEOLOGIST CA. YOUNGBLOOD
SITE DESCRIPTION BRIDGE # 44 ON SR 1649 OVER CRABTREE CREEK			GROUND WATER
BORING NO. EB2-B	BORING LOCATION 14+24.80	OFFSET 4.80 m RT	ALIGNMENT -L-	0 HR. 2.00
COLLAR ELEV. 71.50	NORTHING 232,530.26	EASTING 634,506.72	24 HR. 1.40
TOTAL DEPTH 3.98	DRILL MACHINE CME 45C	DRILL METHOD H.S. AUGERS	HAMMER TYPE AUTOMATIC
START DATE 10/18/00	COMPLETION DATE 10/18/00	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 3.96

ELEV.	DEPTH	BLOW COUNT 15cm 15cm 15cm	PEN. (m)	BLOWS PER 30cm 0 25 50 75 100	SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION
71.50								
	0.76	WOH WOH 1	0.3	X 2	SS-1	M ▼		**ALLUVIAL:** BROWN TO GREY, CLAYEY AND SANDY SILT
70.00	2.28	WOH WOH 1	0.3	X 1	SS-2	W		
68.00	3.8 3.96	100 50	0.05 0.02	100+			CR	**WEATHERED ROCK** (AMPHIBOLITE)
	3.98			REF BORING TERMINATED AT AN ELEVATION OF 67.52 METERS IN CRYSTALLINE ROCK (AMPHIBOLITE)				**CRYSTALLINE ROCK** (AMPHIBOLITE)
66.00								
64.00								
62.00								
60.00								
58.00								
56.00								
54.00								
52.00								

PROJ. # - 8.2405201
ID NO. - B-3259
COUNTY - WAKE

EB1-B

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-5	4.8mRT	13+62.8	0.76-1.21	A-4(0)	19	2	12.9	42.7	28.2	16.1	91	86	46	-	-
SS-6	4.8mRT	13+62.8	2.28-2.73	A-4(0)	20	NP	9.7	51.0	29.2	10.1	100	98	47	-	-
SS-7	4.8mRT	13+62.8	3.94-4.25	A-1-a(0)	20	NP	59.1	23.8	11.1	6.0	48	28	9	-	-
SS-8	4.8mRT	13+62.8	6.84-7.29	A-4(0)	26	NP	12.1	55.2	28.6	4.0	93	86	40	-	-

B1-B

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-15	4.8mRT	13+73	0.83-1.28	A-4(0)	17	NP	21.2	50.1	16.5	12.2	100	93	37	-	-
SS-16	4.8mRT	13+73	3.11-3.56	A-2-4(0)	22	NP	22.4	61.3	8.1	8.1	96	87	21	-	-
SS-17	4.8mRT	13+73	3.87-4.32	A-1-a(0)	22	NP	50.3	27.7	11.8	10.2	44	28	12	-	-

B2-A

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-9	2.3mLT	14+00	1.20-1.65	A-2-4(0)	20	NP	25.2	48.3	14.4	12.1	100	95	37	-	-
SS-10	2.3mLT	14+00	1.96-2.41	A-4(0)	20	NP	3.4	58.6	21.9	16.1	97	96	49	-	-
SS-11	2.3mLT	14+00	2.72-3.17	A-2-4(0)	28	NP	27.4	55.0	10.6	7.0	100	93	32	-	-

B2-B

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-12	4.8mRT	14+02.8	0.94-1.39	A-4(0)	31	NP	4.6	53.6	25.7	16.1	100	100	53	-	-
SS-13	4.8mRT	14+02.8	1.85-2.15	A-2-4(0)	24	NP	10.9	58.6	18.2	12.1	92	89	35	-	-
SS-14	4.8mRT	14+02.8	2.46-2.91	A-1-b(0)	22	NP	61.8	27.8	6.3	4.0	51	28	7	-	-

EB2-A

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-3	4.0mLT	14+20.6	0.00-2.00	A-4(0)	23	4	9.5	35.5	34.9	20.2	73	70	46	-	-
S-4	4.0mLT	14+20.6	2.00-4.60	A-4(0)	20	3	7.5	52.8	25.6	14.1	100	98	47	-	-
S-4A	4.0mLT	14+20.6	2.00-4.60	A-4(0)	21	3	15.9	49.8	22.2	12.1	99	93	39	-	-

EB2-B

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	4.8mRT	14+24.8	0.76-1.21	A-4(7)	31	10	1.0	22.2	50.6	26.2	100	100	83	32.2	-
SS-2	4.8mRT	14+24.8	2.28-2.73	A-4(3)	27	8	2.6	36.7	38.5	22.2	100	100	67	24.5	-

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: **8.2405201** ID: **B-3259** COUNTY: **Wake**

DESCRIPTION(1): Bridge # 44 on SR 1649 (Ebnezer Church) over Crabtree Creek

INFORMATION ON EXISTING BRIDGE

Information obtained from: ☑ field inspection ☐ microfilm (Reel: ____ Pos: ____) ☐ other: ____

BR. NO.: 44 BR. LENGTH: 35.5 m NO. BENTS: 4 NO. BENTS IN: CHANNEL: 2 FLOODPLAIN: ____

FOUNDATION TYPE: Concrete footings

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: Minor scour at base of end bents slopes.

INTERIOR BENTS: Small scour pockets (<0.3m) exist around each bent.

CHANNEL BED: Scour at base of slopes on south side.

CHANNEL BANKS: Slight erosion noted on banks north of the bridge.

EXISTING SCOUR PROTECTION:

TYPE(3): Some rip-rap at EB-1 as protection.

EXTENT(4): On slope under the bridge.

EFFECTIVENESS(5): Poor.

OBSTRUCTIONS(6) (DAMS,DEBRIS,ETC.): Down trees in river upstream of bridge and out side of right-of-wa

DESIGN INFORMATION

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): SS-13 and SS-14.

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED): SS-12,SS-15, and SS-16

FOUNDATION BEARING MATERIAL(9): Weathered Rock

CHANNEL BANK COVER(10): Trees, grasses, and bushes exist along the bank.

FLOOD PLAIN WIDTH(11): ~400 meters.

FLOOD PLAIN COVER(12): consist of trees, and vegetation.

DESIGN INFORMATION CONT.

STREAM IS: X DEGRADING ____ AGGRADING (13)

OTHER OBSERVATIONS AND COMMENTS: ____

CHANNEL MIGRATION TENDENCY (14): None

GEOTECHNICALLY ADJUSTED SCOUR ELEVATIONS(15):

	Left	Right
Interior Bent 1	68	67
Interior Bent 2	68	68

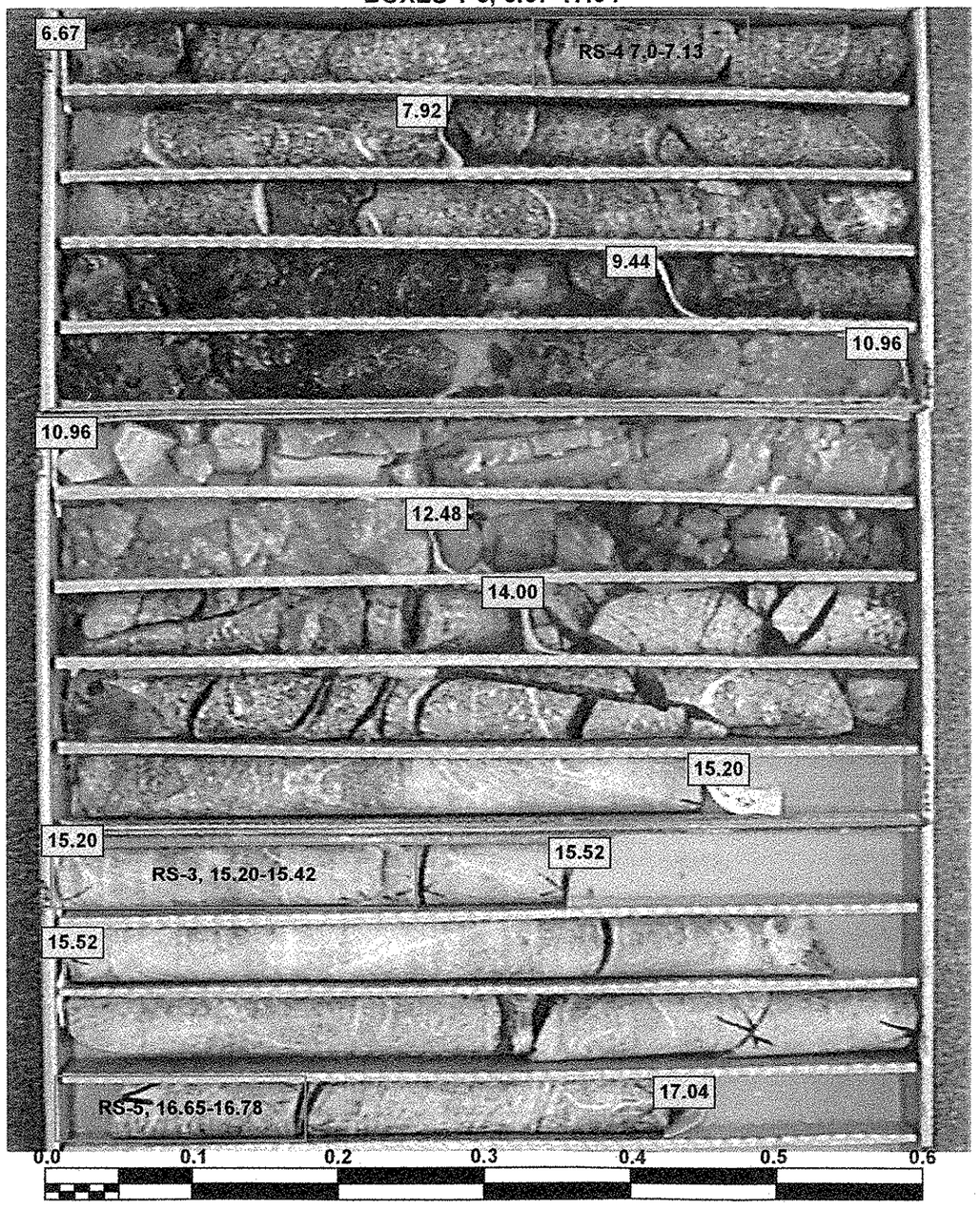
B. A. Parks BY: R. L. Johnson

REPORTED BY: BA Parks DATE: 06/12/01

INSTRUCTIONS

(1) GIVE THE DESCRIPTION OF THE SPECIFIC SITE GIVING ROUTE NUMBER AND BODY OF WATER CROSSED.
(2) NOTE ANY EVIDENCE OF SCOUR AT THE EXISTING END BENTS OR ABUTMENTS (UNDERMINING, SLOUGHING, SCOUR LOCATIONS, DEGRADATIONS, ETC.)
(3) NOTE ANY EXISTING SCOUR PROTECTION (RIR RAP, ETC.)
(4) DESCRIBE THE EXTENT OF ANY EXISTING SCOUR PROTECTION.
(5) DESCRIBE WHETHER OR NOT THE SCOUR PROTECTION APPEARS TO BE WORKING.
(6) NOTE ANY DAMS, FALLEN TREES, DEBRIS AT BENTS,ETC.
(7) DESCRIBE THE CHANNEL BED MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION,
(8) DESCRIBE THE CHANNEL BANK MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
(9) DESCRIBE THE FOUNDATION BEARING MATERIAL,
(10) DESCRIBE THE BANK COVERING (GRASS, TREES, RIP RAP, NONE, ETC.
(11) GIVE THE APPROXIMATE FLOOD PLAIN WIDTH (ESTIMATE).
(12) DESCRIBE THE FLOOD PLAIN COVERING (GRASS, TREES, CROPS, ETC.)
(13) CHECK THE APPROPRIATE SPACE AS TO WHETHER THE STREAM IS DEGRADING OR AGGRADING
(14) DESCRIBE THE POTENTIAL OF THE BODY OF WATER TO MIGRATE LATERALLY DURING THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS).
(15) GIVE THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION EXPECTED OVER THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS). THIS CAN BE GIVEN AS AN ELEVATION RANGE ACROSS THE SITE, OR ON A BENT BY BENT BASIS WHERE VARIATIONS EXIST. DISCUSS THE RELATIONSHIP BETWEEN THE HYDRAULICS THEORETICAL SCOUR AND THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION. IF THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION IS DEPENDENT ON SCOUR COUNTER MEASURES, EXPLAIN. (RIPRAP ARMORING ON SLOPES, ETC.) THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION IS BASED ON THE ERODABILITY OF MATERIALS WITH CONSIDERATION FOR JOINTING, FOLIATION, BEDDING ORIENTATION AND FREQUENCY; CORE RECOVERY PERCENTAGE; PERCENTAGE RQD; DIFFERENTIAL WEATHERING, SHEAR STRENGTH; OBSERVATIONS AT EXISTING STRUCTURES; OTHER TESTS DEEMED APPROPRIATE; AND OVERALL GEOLOGIC CONDITIONS AT THE SITE.

CORE PHOTOGRAPHS
B1-B
BOXES 1-3, 6.67-17.04



CORE PHOTOGRAPHS
B2-A
BOXES 1-3, 4.78-11.88 METERS