STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33453.1.1 (B-4095)	1	31

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33453.1.1 (B-4095) F.A. PROJ. BRSTP-29(19)

COUNTY DAVIDSON

PROJECT DESCRIPTION BRIDGE NO. 128 (NBL) & NO. 130 (SBL) OVER ABBOTT'S CREEK ON US 29/70 AND I-85 BUSINESS LOOP

SITE DESCRIPTION

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CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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PERSONNEL

C.C. MURRAY

J.E. ESTEP

L.N. HARPER

INVESTIGATED BY C.C. MURRAY

CHECKED BY C.B. LITTLE

SUBMITTED BY C.B. LITTLE

DATE MARCH 2006

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

PROJECT: 33453.1.1

ID: B-4095

DRAWN BY: J.K. McCLURE

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.

PROJECT REFERENCE NO.	SHEET NO.
33453.1.1 (B-4095)	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING 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 THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. 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	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
# 40	30 MX	50 MX	51 MN											
# 200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
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

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT^2)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

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
GRAIN SIZE 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) PL — PLASTIC LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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, YELLOW-BROWN, 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 IS 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 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
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 SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT 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 - CALIFORNIA BEARING RATIO 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, FRACTURES
- FRAGS. - FRAGMENTS
- HI. - HIGHLY
- MED. - MEDIUM
- MICA. - MICACEOUS
- MOD. - MODERATELY
- NP - NON PLASTIC
- ORG. - ORGANIC
- PMT - PRESSUREMETER TEST
- SAP. - SAPROLITIC
- SD. - SAND, SANDY
- SL. - SILT, SILTY
- SLI. - SLIGHTLY
- TCR - TRICONE REFUSAL
- w - MOISTURE CONTENT
- V - VERY
- VST - VANE SHEAR TEST
- WEA. - WEATHERED
- γ - UNIT WEIGHT
- γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

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

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [X] TUNG.-CARBIDE INSERTS
- [X] CASING [X] W/ ADVANCER
- [ ] TRICONE ____" STEEL TEETH
- [X] TRICONE 2 15/16" TUNG.-CARB.
- [X] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

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

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF 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 0.1 FOOT PER 60 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 WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
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 1 INCH. 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 ROCK 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 BPF*
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 BPF*
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 0.25 INCHES 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 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH 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 INCHES 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 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

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 THAT 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 IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT 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 (FP) - 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 (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT 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, THAT 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 OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BL3
28+45.73 -BL-
ELEVATION: 668.85 FT.

NOTES:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

March 27, 2006

STATE PROJECT: 33453.1.1 (B-4095)
FEDERAL PROJECT: BRSTP-29(19)
COUNTY: Davidson

DESCRIPTION: Bridge 128& 130 over Abbott's Creek on US 29/70/I-85 Business Loop

SUBJECT: Geotechnical Report – Bridge Foundation Investigation

The site is on Business I-85 between Lexington and Thomasville. The area is in the Piedmont physiographic province, Charlotte Geologic Belt. The predominant rock types on the site are granite and meta-granodiorite with minor occurrence of meta-basalt. The existing roadway is at an elevation of about 670; the base of the stream channel is near elevation 642. The Lexington Water Treatment Plant is adjacent to the project, just upstream.

Proposed construction includes replacement of two bridges: Bridge 128 on the NBL and Bridge 130 on the SBL of US 29/US 70/Business I-85. A median cross-over will be utilized for an on-site detour. Both proposed bridges are three span structures with spans of 70', 80', and 70', 39' 3" overall width, and skew angle of 112°.

The bridges cross Abbott's Creek. The stream channel is 40' wide at this point, with a large floodplain. Depth of water at normal flow (Elevation 645') is two feet. Per the Hydraulics report, the five year flood elevation is 653.9' and the 50 year flood is 659.8'. The Tom-A-Lex Lake dam is about 1.5 miles upstream from the project.

The Geotechnical Structure Investigation was conducted in January and February 2006. A total of eleven test borings were conducted with a CME-550 drill with automatic drop hammer using hollow stem augers or NW casing plus NXWL coring tools. Two borings were performed at End Bent One with three borings at each of the remaining bents. Two of the end bent borings were conducted in the median of the existing roadway and three at the base of the existing embankment. All of the interior bent borings were conducted on the floodplain, just outside of or between the existing bridges. NX wireline rock core was obtained in all interior bent borings to total depths between thirty and fifty feet.

Area of Special Geotechnical Interest

As discussed below under **Bent One,** there is concrete and wood debris in the vicinity of the proposed bent. This is likely an old bridge footing on wooden piles. This material will create difficult drilling conditions for drilled shaft installations.

Foundation Materials

End Bent One:

The borings found about 18 feet of existing roadway fill. The fill is soft, wet, and moderately plastic sandy to silty clay (A-6, A-7-6) and clayey sandy silt (A-4). Residual soils below the fill are about 10' thick, consisting of silty sand and sandy silt (A-4, A-2-4) that terminates abruptly on hard rock. The top of rock elevation ranged from 640 (left) to 635 (centerline). Static groundwater was found up into the existing embankment at 15' depth, elevation 654. A significant layer of rip-rap and boulder fill was encountered in Boring EB1-A (83' left of centerline) at the toe of the existing fill slope. It is not believed to extend under the fill.

Bent One:

The left side boring found rip-rap and boulders to a depth of about nine feet. The center boring found debris – concrete and creosoted wood buried under sand and rip-rap. This may be an old bridge foundation. We made four attempts to start borings that had to be abandoned due to the casing skating off on the debris and one attempt that refused on wood material; it appeared the boring might have been coring into an old wooden pile. The right side boring penetrated 10 feet of alluvial sand and gravel. The above materials rest on weathered or hard rock; little or no residual soil was present. Top of weathered rock was between elevation 642 and 635. Top of hard rock was between 638 and 633 (9 to 16 feet depth in the borings).

Bent Two:

The borings found 17' of alluvial sand. A small layer (three feet or less in thickness) of rip-rap was encountered at the center and right side borings. Residual soil (A-4, A-2-4) was encountered at elevation 631-632 with a thickness of 6 to 10 feet. The residual soil rests on weathered or hard rock. Top of weathered rock is between elevations 622 – 625. The weathered rock thickness increases from essentially zero on the left to about four feet on the right.

End Bent Two

Existing roadway fill is present across the bent. The typical thickness is 22'. The fill is soft to medium stiff, moist, low to moderately plastic silty clay (A-7). The fill rests on alluvial soils, predominantly sand (A-1, A-2) with a lens of medium stiff clay (A-6). The top of residual materials is near elevation 631. The residual material is rock at the centerline and left boring locations, and dense silty sand on the right side (Boring EB2-B). The EB2-B boring found rock near elevation 615.

Groundwater

Static water readings were at elevation 650 - 654 (within the roadway fill) at the End Bents and approximately coincident with the stream level of 645 at the interior bents.

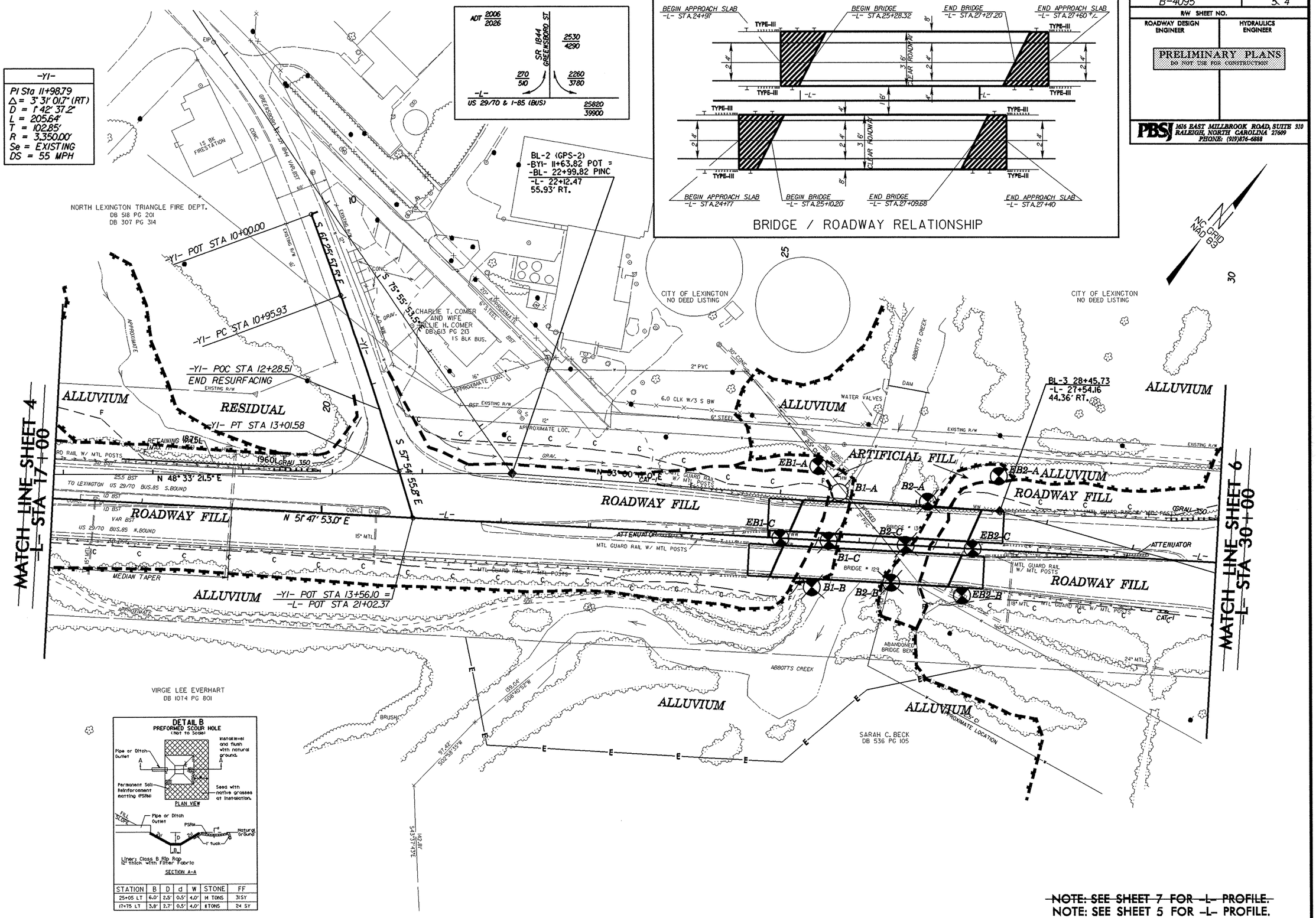
Respectfully submitted,

Clint Little
Project Engineering Geologist

PROJECT REFERENCE NO.	SHEET NO.
B-4095	5.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PBSJ
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
PHONE: (919)876-6888



~~NOTE: SEE SHEET 7 FOR -L- PROFILE.~~
NOTE: SEE SHEET 5 FOR -L- PROFILE.

REVISIONS

8/17/99

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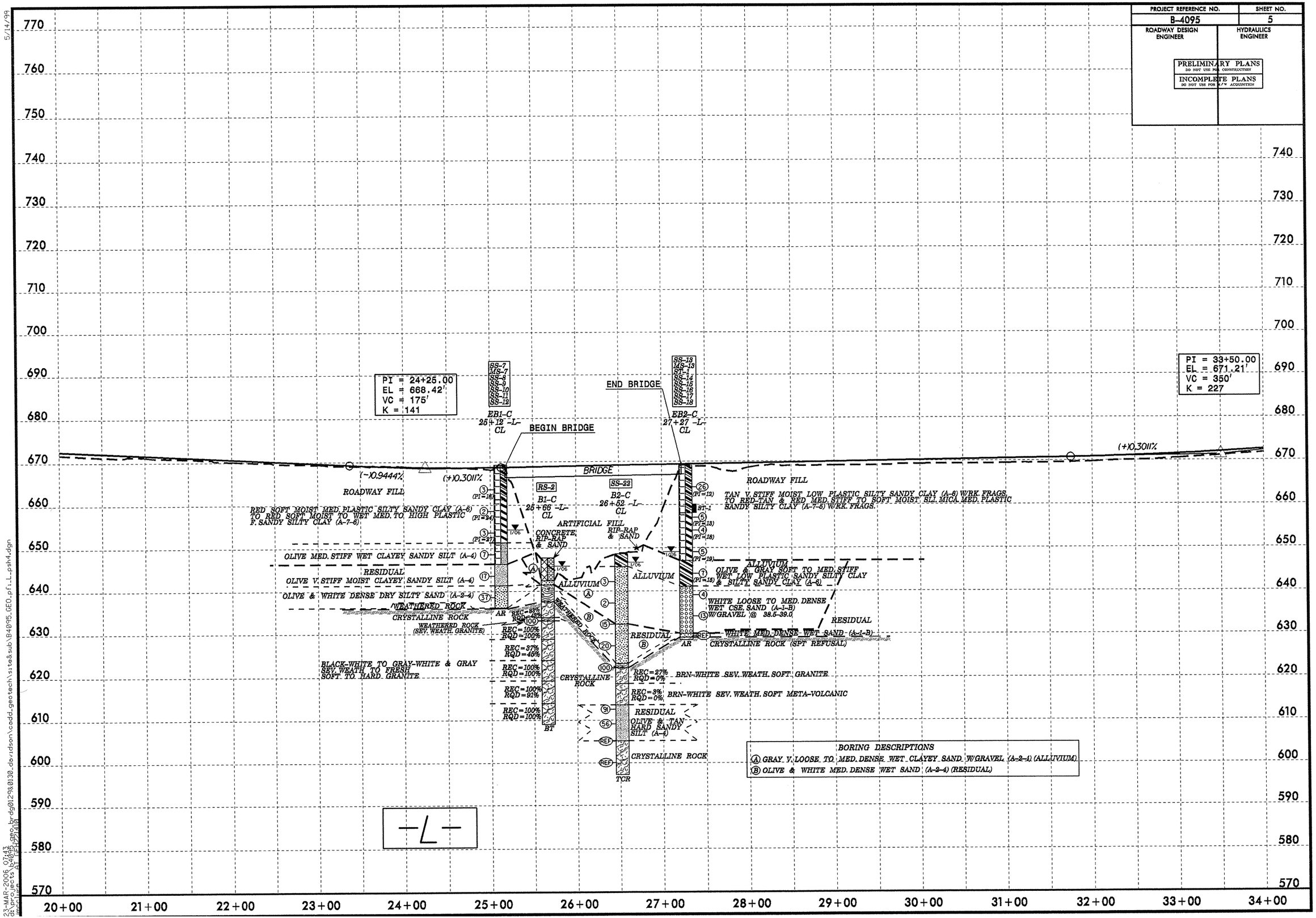
PROJECT REFERENCE NO.	SHEET NO.
B-4095	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



5/14/99

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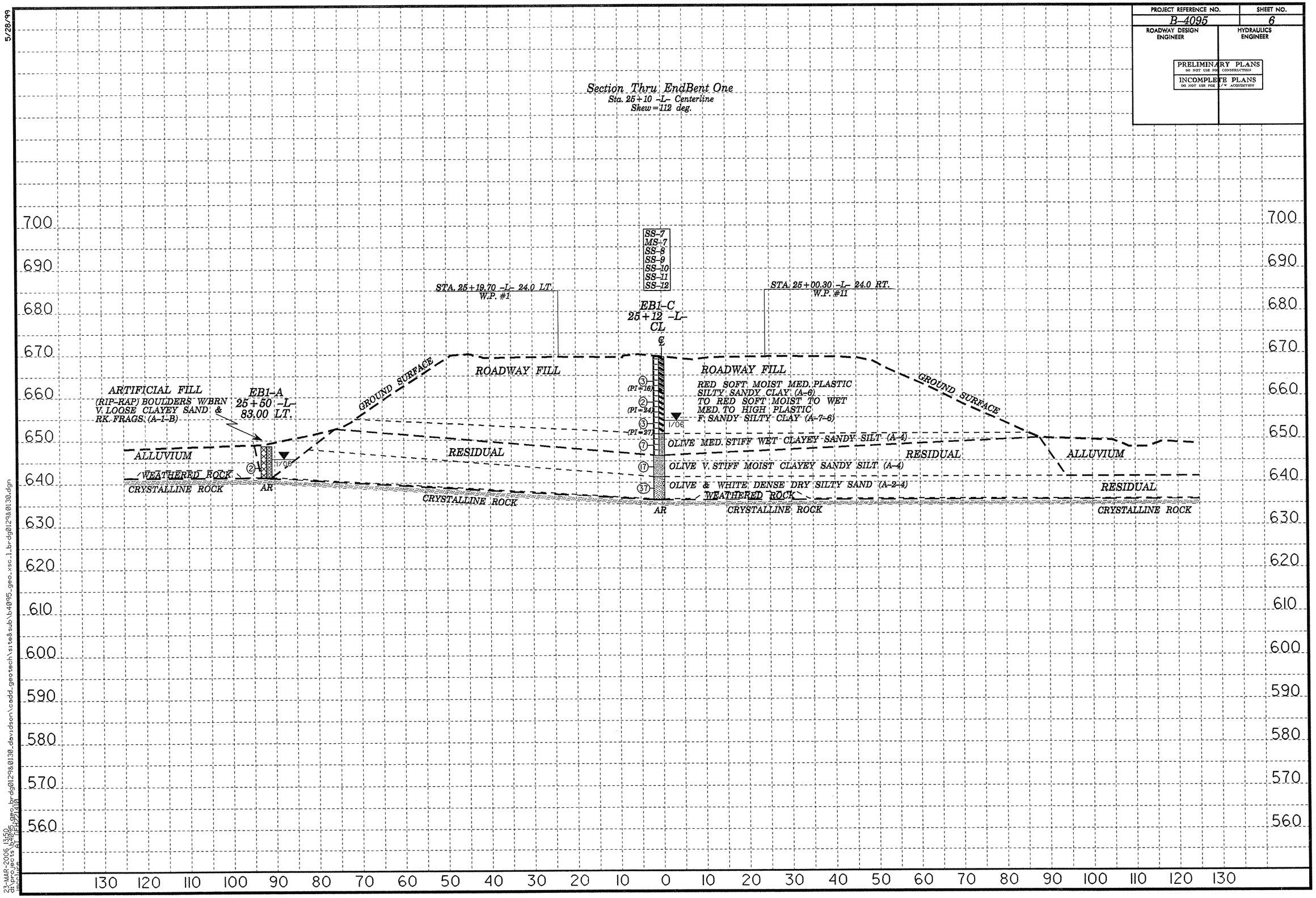
PROJECT REFERENCE NO.	SHEET NO.
B-4095	6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



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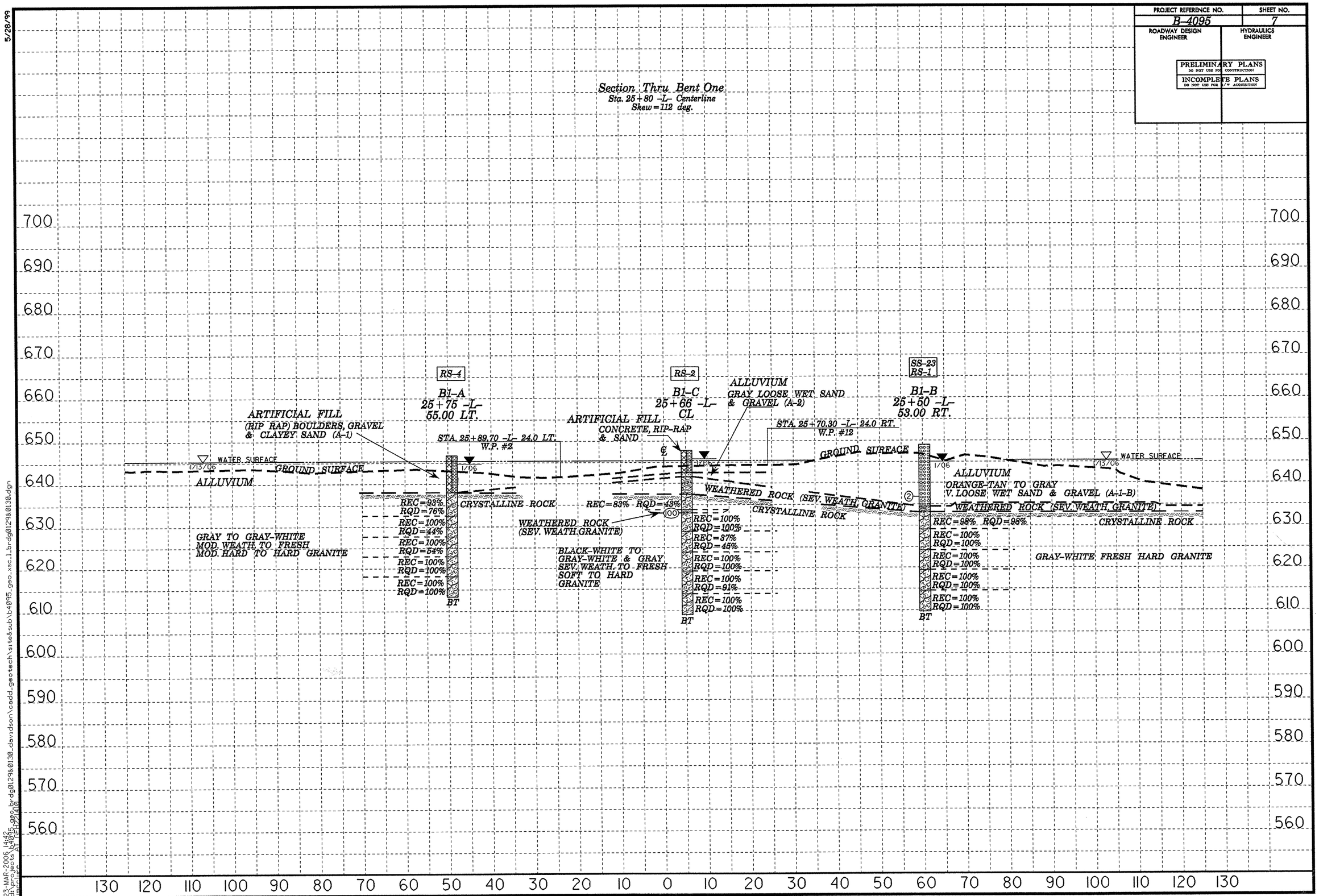
PROJECT REFERENCE NO.	SHEET NO.
B-4095	7
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



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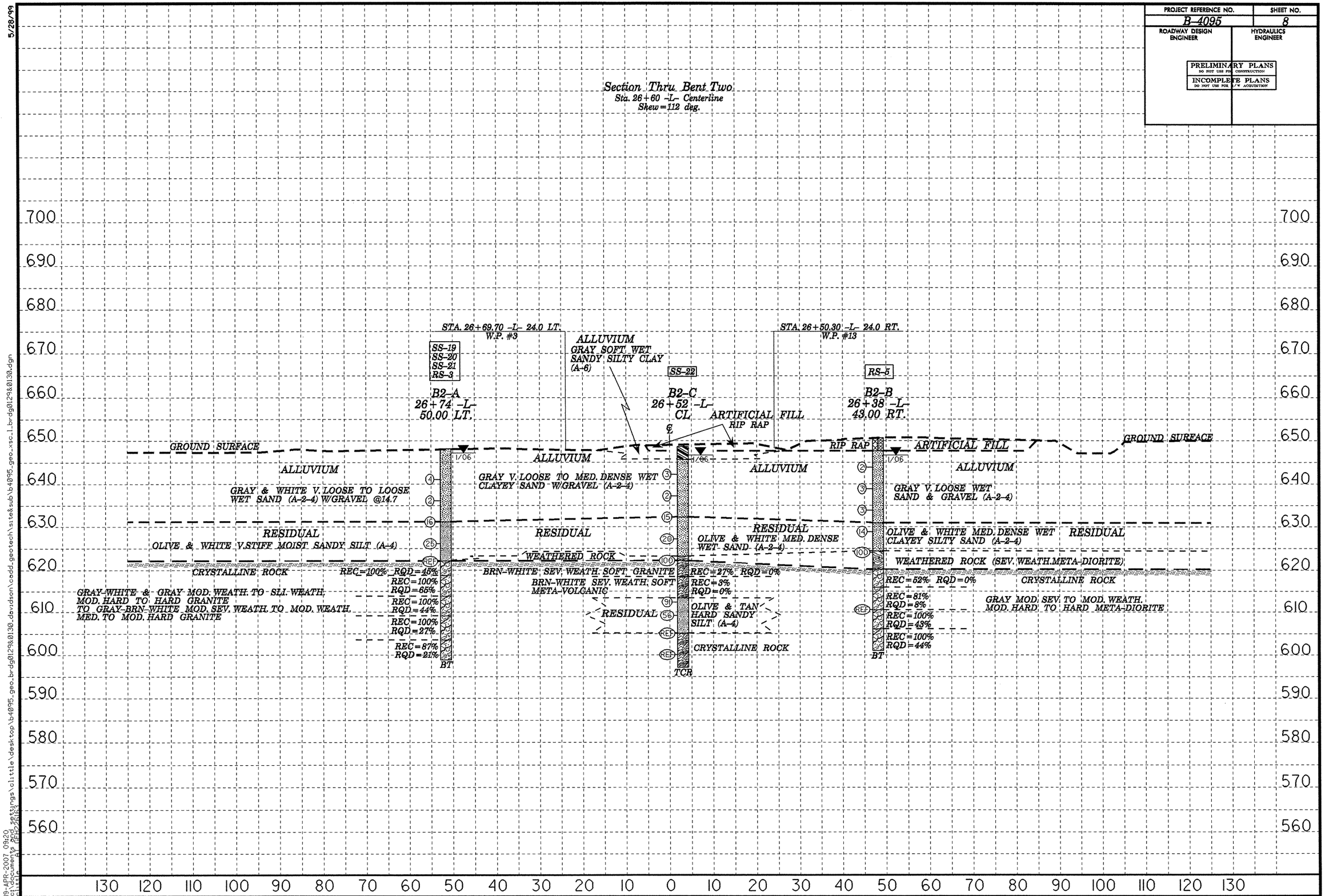
PROJECT REFERENCE NO.	SHEET NO.
B-4095	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR RW ACQUISITION



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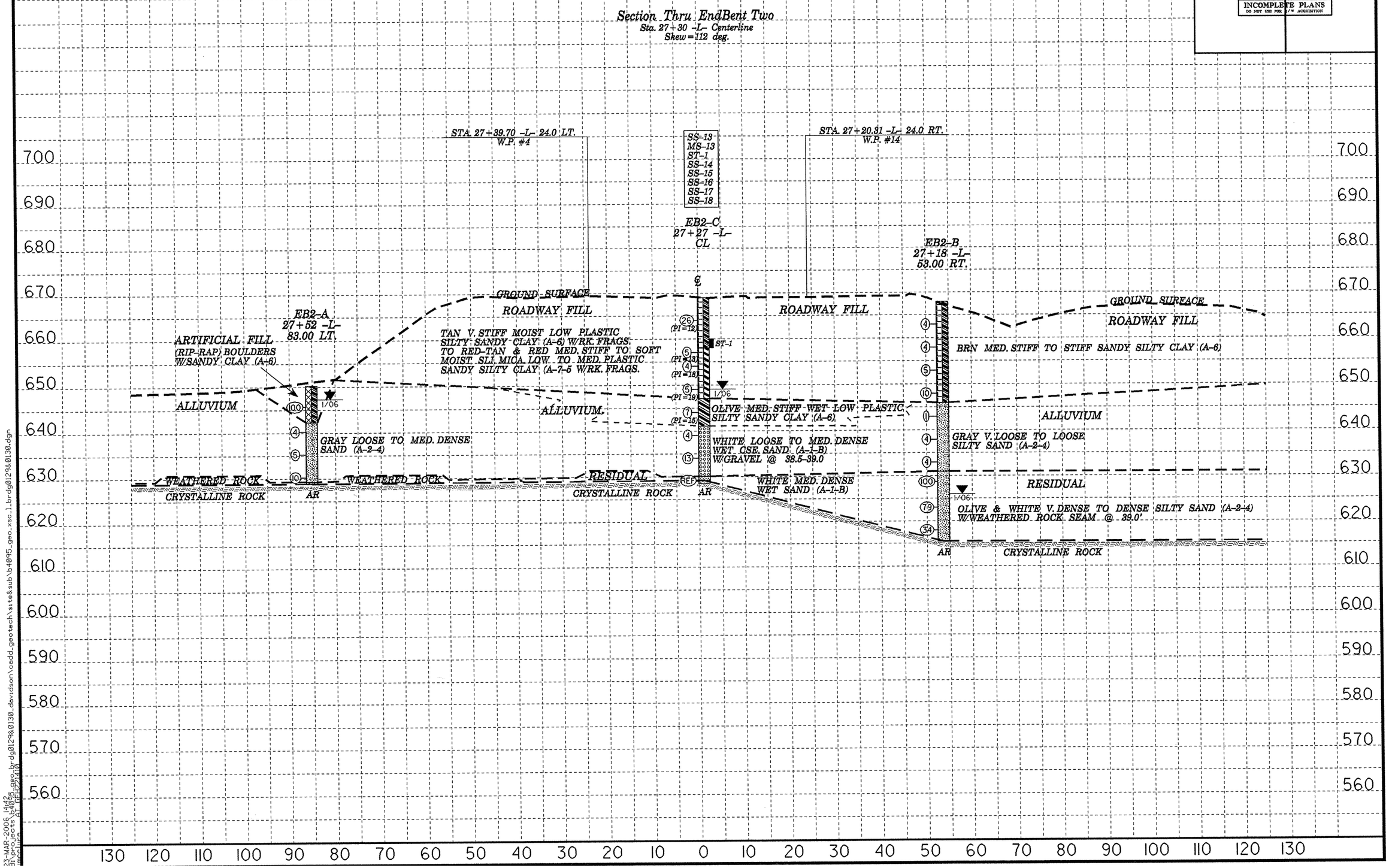
PROJECT REFERENCE NO.	SHEET NO.
B-4095	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
INCOMPLETE PLANS
DO NOT USE FOR RW ACQUISITION



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mcclure
AT REF\21410

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	**ID** B-4095	**COUNTY** DAVIDSON	**GEOLOGIST** C.C. MURRAY
SITE DESCRIPTION BR.-128 & BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			**GND WATER**
BORING NO EB1-A	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 25+50.000	**OFFSET** 83.00ft LT	**24 HR** 3.00ft
COLLAR ELEV 648.66ft	**TOTAL DEPTH** 7.40ft	**START DATE** 1/10/06	**COMPLETION DATE** 01/10/06
DRILL MACHINE CME-550	**DRILL METHOD** H.S. AUGERS		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** 7.40ft		Log EB1-A, Page 1 of 1

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
648.66						Ground Surface				
	4.00	0	1	1	1.0	2				0-7.3 (ARTIFICIAL FILL) (RIP-RAP) BOULDERS W/ BRN V. LOOSE CLAYEY SAND & RK. FRAGS. (A-1-B)
641.26						AUGER REFUSAL AT ELEV. 641.26 ON HARD ROCK				7.3-7.4 WEATHERED ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	**ID** B-4095	**COUNTY** DAVIDSON	**GEOLOGIST** C.C. MURRAY
SITE DESCRIPTION BR.-128 & BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			**GND WATER**
BORING NO EB1-C	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 25+12.000	**OFFSET** 0.00ft	**24 HR** 15.00ft
COLLAR ELEV 669.28ft	**TOTAL DEPTH** 33.40ft	**START DATE** 1/10/06	**COMPLETION DATE** 01/10/06
DRILL MACHINE CME-550	**DRILL METHOD** H.S. AUGERS		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** 33.40ft		Log EB1-C, Page 1 of 1

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
669.28						Ground Surface				
	4.70	1	1	2	1.0	3	SS-7 MS-7	M		(ROADWAY FILL) RED SOFT MOIST SILTY SANDY CLAY (A-6)
660.00	9.70	1	1	1	1.0	2	SS-8	M		RED SOFT MOIST TO WET MED. PLASTIC (PI=24) F. SANDY SILTY CLAY (A-7-6)
	14.70	0	1	2	1.0	3	SS-9	W		
650.00	19.70	3	4	3	1.0	7	SS-10	W		OLIVE MED. STIFF WET CLAYEY SANDY SILT (A-4)
	24.70	3	6	11	1.0	17	SS-11	M		(RESIDUAL) OLIVE V. STIFF MOIST CLAYEY SANDY SILT (A-4)
640.00	29.70	26	21	16	1.0	37	SS-12	D		OLIVE & WHITE DENSE DRY SILTY SAND (A-2-4)
635.88						AUGER REFUSAL AT ELEV. 635.88 ON HARD ROCK				WEATHERED ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	ID B-4095	COUNTY DAVIDSON	GEOLOGIST C.C. MURRAY
SITE DESCRIPTION BR.-128 & BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			GND WATER
BORING NO B1-A	NORTHING 0.00	EASTING 0.00	0 HR N/A
ALIGNMENT L	BORING LOCATION 25+75.000	OFFSET 55.00ft LT	24 HR 2.00ft
COLLAR ELEV 646.73ft	TOTAL DEPTH 33.40ft	START DATE 2/02/06	COMPLETION DATE 02/02/06
DRILL MACHINE CME-550	DRILL METHOD NXWIRELINE		HAMMER TYPE AUTOMATIC
SURFACE WATER DEPTH	DEPTH TO ROCK 8.70ft		Log B1-A, Page 1 of 1

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
646.73						Ground Surface				
640.00								W W		0.00-8.70 (ARTIFICIAL FILL) BOULDERS, GRAVEL & CLAYEY SAND (A-1) (RIP RAP)
							CORE1			8.70-14.20 (CRYSTALLINE ROCK) GRAY SLI. WEATH. HARD GRANITE REC=93% RQD=76%
630.00							CORE2 RS-4			14.20-49.00 GRAY MOD. TO SLI. WEATH. MOD. HARD TO HARD GRANITE REC=100% RQD=44% (RS-4 @ 14.2-14.6)
							CORE3			
620.00							CORE4			19.00-23.80 GRAY SLI. WEATH. HARD GRANITE REC=100% RQD=54%
							CORE5			23.80-28.60 GRAY-WHITE HARD FRESH GRANITE REC=100% RQD=100%
613.33						BORING TERMINATED AT ELEV. 613.33 IN HARD FRESH GRANITE				28.60-33.40 GRAY-WHITE HARD FRESH GRANITE REC=100% RQD=100%

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT CORE BORING REPORT

PROJECT NO: 33453.1.1 **PROJECT ID:** B-4095 **COUNTY:** DAVIDSON **GEOLOGIST:** C.C. MURRAY
SITE DESCRPTION: BR-128 & BR-130 ON US 29/70 & I-85 BUS LOOP / ABBOTT'S CREEK. **DRILLER:** J.E. ESTEP
BORING NO: B1-A **BORING LOCATION (STA):** 25+75 –L- **OFFSET:** 55.00 LT.
COLLAR ELEV: 646.73 **PERSONNEL:** **CORE SIZE:** NXWL
TOTAL DEPTH: 33.40' **DRILL MACHINE:** CME 55OX **DATE STARTED:** 2/02/06
TOTAL RUN: 24.70' **DRILL EQUIP:** NXWL **DATE COMPLETED:** 2/02/06

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
638.03	8.70		1	93	76		GRAY, SLI. WEATH., HARD, GRANITE. FS = CLOSE
632.53	14.20		2	100	44	RS-4 (14.20-14.60)	GRAY, MOD. TO SLI. WEATH., MOD. HARD TO HARD, GRANITE. 14.90' – 16.70'. NUMEROUS NEAR VERT. FRACS. FS = CLOSE TO MOD. CLOSE
627.73	19.00		3	100	54		GRAY, SLI. WEATH., HARD, GRANITE. FS = CLOSE TO MOD. CLOSE
622.93	23.8		4	100	100		GRAY/WHITE, HARD, FRESH, GRANITE. FS = MOD. CLOSE
618.13	28.60		5	100	100		GRAY/WHITE, HARD, FRESH, GRANITE
613.33	33.40						FS = MOD. CLOSE

NOTES

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	ID B-4095	COUNTY DAVIDSON	GEOLOGIST C.C. MURRAY
SITE DESCRIPTION BR.-128 & BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			GND WATER
BORING NO B1-C	NORTHING 0.00	EASTING 0.00	0 HR N/A
ALIGNMENT L	BORING LOCATION 25+66.000	OFFSET 0.00ft	24 HR 2.00ft
COLLAR ELEV 647.77ft	TOTAL DEPTH 38.70ft	START DATE 1/18/06	COMPLETION DATE 01/18/06
DRILL MACHINE CME-550	DRILL METHOD NWCAS/NXWL		HAMMER TYPE AUTOMATIC
SURFACE WATER DEPTH	DEPTH TO ROCK 10.30ft		Log B1-C, Page 1 of 1

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	▼ MOI	LOG	SOIL AND ROCK DESCRIPTION
647.77						Ground Surface				
								▼		0.0-5.3 (ARTIFICIAL FILL) CONCRETE, RIP-RAP & SAND
640.00										5.3-6.3 (ALLUVIUM) GRAY LOOSE WET SAND & GRAVEL (A-2)
							CORE1			6.3-10.3 WEATHERED ROCK
	14.00	46	54		0.8	100	CORE2			10.3-14.0 (CRYSTALLINE ROCK) BLACK-WHITE SEV. TO MOD WEATH SOFT TO MOD. HARD GRANITE REC=83% RQD=43%
630.00							RS-2 CORE3			14.0-14.8 WEATHERED ROCK (SEV. WEATH. GRANITE)
							CORE4			14.8-19.0 (CRYSTALLINE ROCK) GRAY-WHITE FRESH HARD GRANITE REC=100% RQD=100%
620.00							CORE5			19.0-23.9 GRAY SLI. WEATH. HARD GRANITE REC=37% RQD=45%
							CORE6			23.9-28.6 GRAY-WHITE FRESH HARD GRANITE REC=100% RQD=100%
610.00										28.6-33.9 GRAY SLI. WEATH. HARD GRANITE REC=100% RQD=91%
609.07						BORING TERMINATED AT ELEV. 609.07 IN FRESH HARD GRANITE				33.9-38.7 GRAY-WHITE FRESH HARD GRANITE REC=100% RQD=100%

SHEET OF

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT CORE BORING REPORT

PROJECT NO: 33453.1.1 **PROJECT ID:** B-4095 **COUNTY:** DAVIDSON **GEOLOGIST:** C.C. MURRAY
SITE DESCRPTION: BR-128 & BR-130 ON US 29/70 & I-85 BUS. LOOP / ABBOTT'S CREEK. **DRILLER:** J.E. ESTEP
BORING NO: B1-C **BORING LOCATION (STA):** 25+66 -L- **OFFSET:** CENTERLINE
COLLAR ELEV: 647.77' **PERSONNEL:** **CORE SIZE:** NXWL
TOTAL DEPTH: 38.70' **DRILL MACHINE:** CME-550 **DATE STARTED:** 01/18/06
TOTAL RUN: 27.60' **DRILL EQUIP:** NWCAS/NXWL **DATE COMPLETED:** 01/18/06

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
637.47 633.77	10.30 14.00		1	83	43		BLK./WHITE, SEV. TO MOD. WEATH., SOFT TO MOD. HARD, GRANITE. WEATH. SEAM FROM 12.8' - 14.0' FS = CLOSE
632.97	14.80		2	100	100	RS-2 (18.5-19.0)	GRAY/WHITE, FRESH, HARD, GRANITE. FS = CLOSE TO MOD. CLOSE
628.77	19.00		3	67	45		GRAY, SLI. WEATH., HARD, GRANITE. ROCK CAME OUT OF BARREL ON 1ST ATTEMPT RETRIEVAL. GOT 3.3' ON 2ND ATTEMPT. FS = CLOSE
623.87	23.90		4	100	100		GRAY/WHITE, FRESH, HARD, GRANITE. FS = WIDE
619.17	28.60		5	100	91		GRAY, SLI. WEATH., HARD, GRANITE. FS = CLOSE TO MOD. CLOSE
613.87 609.07	33.90 38.70		6	100	100		GRAY/WHITE, FRESH, HARD, GRANITE. FS = CLOSE TO MOD. CLOSE

NOTES

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	**ID** B-4095	**COUNTY** DAVIDSON	**GEOLOGIST** C.C. MURRAY
SITE DESCRIPTION BR.-128 & BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			**GND WATER**
BORING NO B1-B	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 25+50.000	**OFFSET** 53.00ft RT	**24 HR** 4.00ft
COLLAR ELEV 648.98ft	**TOTAL DEPTH** 39.20ft	**START DATE** 1/18/06	**COMPLETION DATE** 01/18/06
DRILL MACHINE CME-550	**DRILL METHOD** NWCAS/NXWL		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** 15.90ft		**Log B1-B, Page 1 of 1**

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
648.98						Ground Surface				
640.00	11.20	2	1	1	1.0	2	SS-23	W		0.0-14.5 (ALLUVIUM) ORANGE-TAN TO GRAY V. LOOSE SAND & GRAVEL (A-1-B)
630.00							CORE1 RS-1			14.5-15.9 WEATHERED ROCK (SEV. WEATH. GRANITE)
							CORE2			15.9-19.9 (CRYSTALLINE ROCK) GRAY-WHITE FRESH HARD GRANITE REC=98% RQD=98%
620.00							CORE3			19.9-24.8 GRAY-WHITE FRESH HARD GRANITE REC=100% RQD=100%
							CORE4			24.8-29.6 GRAY-WHITE FRESH HARD GRANITE REC=100% RQD=100%
							CORE5			29.6-34.4 GRAY-WHITE FRESH HARD GRANITE REC=100% RQD=100%
609.78						BORING TERMINATED AT ELEV. 609.78 IN FRESH HARD GRANITE				34.4-39.2 GRAY-WHITE FRESH HARD GRANITE REC=100% RQD=100%

SHEET OF

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT CORE BORING REPORT

PROJECT NO: 33453.1.1 **PROJECT ID:** B-4095 **COUNTY:** DAVIDSON **GEOLOGIST:** C.C. MURRAY
SITE DESCRPTION: BR-128 & BR-130 ON US 29/70 & I-85 BUS. LOOP / ABBOTT'S CREEK **DRILLER:** J.E. ESTEP
BORING NO: B1-B **BORING LOCATION (STA):** 25+50 -L- **OFFSET:** 53.0' RT.
COLLAR ELEV: 648.98' **PERSONNEL:** **CORE SIZE:** NXWL
TOTAL DEPTH: 39.20' **DRILL MACHINE:** CME-550 **DATE STARTED:** 01/18/06
TOTAL RUN: 23.30' **DRILL EQUIP:** NWCAS/NXWL **DATE COMPLETED:** 01/18/06

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
633.08	15.90		1	98	98	RS-1 (17.0-17.8)	GRAY/WHITE, FRESH, HARD, GRANITE. FS = CLOSE TO MOD. CLOSE
629.08	19.90		2	100	100		GRAY/WHITE, FRESH, HARD, GRANITE. FS = CLOSE TO MOD. CLOSE
624.18	24.80		3	100	100		GRAY/WHITE, FRESH, HARD, GRANITE. FS = CLOSE TO MOD. CLOSE
619.38	29.60		4	100	100		GRAY/WHITE, FRESH, HARD, GRANITE. FS = CLOSE TO MOD. CLOSE
614.58	34.40		5	100	100		GRAY/WHITE, FRESH, HARD, GRANITE.
609.78	39.20						FS = CLOSE TO MOD. CLOSE

NOTES

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	**ID** B-4095	**COUNTY** DAVIDSON	**GEOLOGIST** C.C. MURRAY
SITE DESCRIPTION BR.-128 & BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			**GND WATER**
BORING NO B2-A	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 26+74.000	**OFFSET** 50.00ft LT	**24 HR** 1.00ft
COLLAR ELEV 648.19ft	**TOTAL DEPTH** 49.30ft	**START DATE** 1/11/06	**COMPLETION DATE** 01/11/06
DRILL MACHINE CME-550	**DRILL METHOD** NWCAS/NXWL		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH N/A	**DEPTH TO ROCK** 26.10ft		Log B2-A, Page 1 of 1

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT (0 25 50 75 100)	SAMPLE NO	▼/MOI	LOG	SOIL AND ROCK DESCRIPTION
648.19						Ground Surface				
	6.10	2	2	2	1.0	4	SS-19	W		0-17.1 (ALLUVIUM) GRAY & WHITE V. LOOSE TO LOOSE WET SAND (A-2-4) W/ GRAVEL @ 14.7
640.00	11.10	1	1	1	1.0	2	SS-20	W		
	16.10	2	6	10	1.0	16	SS-21	M		
630.00	21.10	4	12	13	1.0	25				17.1-26.1 (RESIDUAL) OLIVE & WHITE V. STIFF MOIST SANDY SILT (A-4)
	26.10	100			0.1	100	CORE1			26.1-29.4 (CRYSTALLINE ROCK) GRAY MOD. WEATH. MOD. HARD GRANITE REC=100% RQD=45%
620.00							CORE2 RS-3			
							CORE3			29.4-34.3 GRAY-WHITE SLI. WEATH. HARD GRANITE REC=100% RQD=65%
610.00							CORE4			34.3-39.1 GRAY MOD. WEATH. MOD. HARD GRANITE REC=100% RQD=44%
							CORE5			39.1-44.6 GRAY MOD. WEATH. MOD. HARD GRANITE REC=100% RQD=27%
600.00										44.6-49.3 GRAY-BRN-WHITE MOD. SEV. TO MOD. WEATH. MED. TO MOD. HARD GRANITE REC=87% RQD=21%
598.89						TERMINATED BORING AT ELEV. 598.89 IN MOD. SEV. TO MOD. WEATH. MED. TO MOD. HARD GRANITE				

SHEET OF

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT CORE BORING REPORT

PROJECT NO: 33453.1.1 **PROJECT ID:** B-4095 **COUNTY:** DAVIDSON **GEOLOGIST:** C.C. MURRAY
SITE DESCRPTION: BR-128 & BR-130 ON US 29/70 & I-85 BUS. LOOP / ABBOTT'S CREEK. **DRILLER:** J.E. ESTEP
BORING NO: B2-A **BORING LOCATION (STA):** 26+74 -L- **OFFSET:** 50.0' LT.
COLLAR ELEV: 648.19' **PERSONNEL:** **CORE SIZE:** NXWL
TOTAL DEPTH: 49.30' **DRILL MACHINE:** CME-550 **DATE STARTED:** 01/11/06
TOTAL RUN: 23.20' **DRILL EQUIP:** NWCAS/NXWL **DATE COMPLETED:** 01/11/06

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
622.09	26.10		1	100	45		GRAY, MOD. WEATH., MOD. HARD, GRANITE 60+ DEGREE FRACS. THROUGHOUT RUN. FS = CLOSE
618.79	29.40		2	100	65	RS-3 (30.0-30.6)	GRAY/WHITE, SLI. WEATH., HARD, GRANITE. FS = CLOSE TO MOD. CLOSE
613.89	34.30		3	100	44		GRAY, MOD. WEATH., MOD. HARD, GRANITE FS = CLOSE
609.09	39.10		4	100	27		GRAY, MOD. WEATH., MOD. HARD, GRANITE FS = CLOSE
603.59	44.60		5	87	21		GRAY/BRN./WHITE, MOD. SEV. TO MOD. WEATH., MEDIUM TO MOD. HARD, GRANITE.
598.89	49.30						FS = CLOSE

NOTES

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	ID B-4095	COUNTY DAVIDSON	GEOLOGIST C.C. MURRAY
SITE DESCRIPTION BR.-128& BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			GND WATER
BORING NO B2-C	NORTHING 0.00	EASTING 0.00	0 HR N/A
ALIGNMENT L	BORING LOCATION 26+52.000	OFFSET 0.00ft	24 HR 2.00ft
COLLAR ELEV 648.66ft	TOTAL DEPTH 51.50ft	START DATE 1/12/06	COMPLETION DATE 01/12/06
DRILL MACHINE CME-550	DRILL METHOD NWCAS/NXWL		HAMMER TYPE AUTOMATIC
SURFACE WATER DEPTH	DEPTH TO ROCK 26.50ft		Log B2-C, Page 1 of 1

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT (0 25 50 75 100)	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
648.66						Ground Surface				
								▼		(ALLUVIUM) GRAY SOFT WET SANDY SILTY CLAY (A-6)
	5.50	1	2	1	1.0	3				GRAY V. LOOSE TO MED. DENSE WET CLAYEY SAND W/ GRAVEL (A-2-4)
640.00	10.50	1	1	1	1.0	2				
	15.50	1	3	12	1.0	15				
630.00	20.50	8	8	12	1.0	20				(RESIDUAL) OLIVE & WHITE MED. DENSE WET SAND (A-2-4)
	25.50	39	61		1.0	100	CORE1			WEATHERED ROCK
620.00							CORE2			26.5-30.2 (WEATHERED ROCK) BRN-WHITE SEV. WEATH. SOFT GRANITE REC=27% RQD=0%
	35.20	36	48	43	1.0	91				30.2-35.2 BRN-WHITE SEV. WEATH. SOFT META-VOLCANIC REC=3% RQD=0%
610.00	38.50	22	29	27	1.0	56	SS-22			35.2-43.5 (RESIDUAL) OLIVE & TAN HARD SANDY SILT (A-4)
	43.50	50	100		0.1	100				43.5-51.5 ALTERNATING CRYSTALLINE AND WEATHERED ROCK (SEVERELY WEATHERED METAVOLCANIC ROCK)
600.00	48.50	65	100		0.1	100				
597.16						TRI-CONE REFUSAL AT ELEV. 597.16 (SPT REFUSAL @ ELEV. 605.16) ON CRYSTALLINE ROCK				

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SHEET OF

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT CORE BORING REPORT

PROJECT NO: 33453.1.1 **PROJECT ID:** B-4095 **COUNTY:** DAVIDSON **GEOLOGIST:** C.C. MURRAY
SITE DESCRPTION: BR-128 & BR-130 ON US 29/70 & I-85 BUS. LOOP / ABBOTT'S CREEK. **DRILLER:** J.E. ESTEP
BORING NO: B2-C **BORING LOCATION (STA):** 26+52 -L- **OFFSET:** CENTERLINE
COLLAR ELEV: 648.66' **PERSONNEL:** **CORE SIZE:** NXWL
TOTAL DEPTH: 51.50' **DRILL MACHINE:** CME-550 **DATE STARTED:** 01/12/06
TOTAL RUN: 8.70' **DRILL EQUIP:** NWCAS/NXWL **DATE COMPLETED:** 01/12/06

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
622.16	26.50		1	27	0		BRN./WHITE, SEV. WEATH., SOFT, GRANITE FS = VERY CLOSE
618.46	30.20		2	03	0		BRN./WHITE, SEV. WEATH., SOFT, META-VOLCANIC.
613.46	35.20						FS = VERY CLOSE

NOTES

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	ID B-4095	COUNTY DAVIDSON	GEOLOGIST C.C. MURRAY
SITE DESCRIPTION BR.-128 & BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			GND WATER
BORING NO B2-B	NORTHING 0.00	EASTING 0.00	0 HR N/A
ALIGNMENT L	BORING LOCATION 26+38.000	OFFSET 43.00ft RT	24 HR 4.00ft
COLLAR ELEV 650.66ft	TOTAL DEPTH 49.60ft	START DATE 1/12/06	COMPLETION DATE 01/12/06
DRILL MACHINE CME-550	DRILL METHOD NWCAS/NXWL		HAMMER TYPE AUTOMATIC
SURFACE WATER DEPTH N/A	DEPTH TO ROCK 30.50ft		Log B2-B, Page 1 of 2

ELEV	DEPTH	BLOW CT 6in	6in	6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
650.66						Ground Surface				
										0-3.0 (ARTIFICIAL FILL) RIP RAP
	5.80	1	1	1	1.0	2				3.0-19.8 (ALLUVIUM) GRAY V. LOOSE WET SAND & GRAVEL (A-2-4)
640.00	10.80	1	2	1	1.0	3				
	15.80	1	2	1	1.0	3				
630.00	20.80	5	6	8	1.0	14				19.8-26.3 (RESIDUAL) OLIVE & WHITE MED. DENSE WET CLAYEY SILTY SAND (A-2-4)
	25.80	20	14	86	0.8	100				
										26.3-30.5 WEATHERED ROCK (SEV. WEATH. META-DIORITE)
620.00							CORE1			30.5-34.7 (CRYSTALLINE ROCK) GRAY MOD. SEV. TO MOD. WEATH. MOD. HARD META-DIORITE REC=52% RQD=0%
							CORE2			
610.00	40.00	100			0.1	100	RS-5 CORE3			34.7-40.1 GRAY MOD. SEV. TO MOD. WEATH. MOD. HARD META-DIORITE REC=81% RQD=8%
							CORE4			40.1-44.6 GRAY MOD. WEATH. MOD. HARD TO HARD META-DIORITE REC=100% RQD=43%
601.06						BORING TERMINATED AT ELEV. 601.06 IN MOD. WEATH MOD. HARD TO HARD META-DIORITE				44.6-49.6 GRAY MOD. WEATH. MOD. HARD TO HARD META-DIORITE REC=100% RQD=44%

SHEET OF

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT CORE BORING REPORT

PROJECT NO: 33453.1.1 **PROJECT ID:** B-4095 **COUNTY:** DAVIDSON **GEOLOGIST:** C.C. MURRAY
SITE DESCRPTION: BR-128 & BR-130 ON US 29/70 & I-85 BUS. OVER ABBOTT'S CREEK **DRILLER:** J.E. ESTEP
BORING NO: B2-B **BORING LOCATION (STA):** 26+38 -L- **OFFSET:** 43.0' RT.
COLLAR ELEV: 650.66' **PERSONNEL:** **CORE SIZE:** NXWL
TOTAL DEPTH: 49.60' **DRILL MACHINE:** CME-550 **DATE STARTED:** 01/12/06
TOTAL RUN: 19.10' **DRILL EQUIP:** NWCAS/NXWL **DATE COMPLETED:** 01/13/06

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
620.16	30.50		1	52	0		GRAY, MOD. SEV. TO MOD. WEATH., MOD. HARD, META-DIORITE. NEAR VERT. FRACS. THROUGHT RUN. LOSS IN REC. NEAR MIDDLE OF RUN. FS = CLOSE
615.96	34.70		2	81	08	RS-5 (38.4-38.9)	GRAY, MOD. SEV. TO MOD. WEATH., MOD. HARD, META-DIORITE. FS = CLOSE
610.56	40.10		3	100	43		GRAY, MOD. WEATH., MOD. HARD TO HARD, META-DIORITE. FS = CLOSE
606.06	44.60		4	100	44		GRAY, MOD. WEATH., MOD. HARD TO HARD, META-DIORITE. NEAR VERT. FRACS. THROUGHT RUN.
601.06	49.60						FS = CLOSE

NOTES

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	**ID** B-4095	**COUNTY** DAVIDSON	**GEOLOGIST** C.C. MURRAY
SITE DESCRIPTION BR.-128 & BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			**GND WATER**
BORING NO EB2-A	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 27+52.000	**OFFSET** 83.00ft LT	**24 HR** 3.00ft
COLLAR ELEV 650.26ft	**TOTAL DEPTH** 21.50ft	**START DATE** 1/10/06	**COMPLETION DATE** 01/10/06
DRILL MACHINE CME-550	**DRILL METHOD** H.S. AUGERS		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** 21.50ft		Log EB2-A, Page 1 of 1

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT (0 25 50 75 100)	SAMPLE NO	▼ / MOI	LOG	SOIL AND ROCK DESCRIPTION
650.26						Ground Surface				
	4.50	100			0.1	100		▼		0-8 (ARTIFICIAL FILL) (RIP-RAP) BOULDERS W/ SANDY CLAY (A-6)
640.00	9.00	1	2	2	1.0	4				8-21 (ALLUVIUM) GRAY LOOSE TO MED. DENSE SAND (A-2-4)
	14.00	3	2	3	1.0	5				
	19.00	4	5	5	1.0	10				
630.00 / 628.76						AUGER REFUSAL AT ELEV. 628.76 ON HARD ROCK				21-21.5 WEATHERED ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	**ID** B-4095	**COUNTY** DAVIDSON	**GEOLOGIST** C.C. MURRAY
SITE DESCRIPTION BR.-128 & BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			**GND WATER**
BORING NO EB2-C	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 27+27.000	**OFFSET** 0.00ft	**24 HR** 20.00ft
COLLAR ELEV 669.04ft	**TOTAL DEPTH** 40.50ft	**START DATE** 1/10/06	**COMPLETION DATE** 01/10/06
DRILL MACHINE CME-550	**DRILL METHOD** H.S. AUGERS		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH N/A	**DEPTH TO ROCK** 39.90ft		Log EB2-C, Page 1 of 1

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT (0 25 50 75 100)	SAMPLE NO	▼ / MOI	LOG	SOIL AND ROCK DESCRIPTION
669.04						Ground Surface				
	4.00	1	1	25	1.0	26	SS-13 MS-13	M		(ROADWAY FILL) TAN V. STIFF MOIST SILTY SANDY CLAY (A-6) W/ RK. FRAGS.
660.00	11.00	2	2	3	1.0	5	ST-1 SS-14	M M		RED-TAN & RED MED. STIFF TO SOFT MOIST SLI. MICA. SANDY SILTY CLAY (A-7-5) W/ RK. FRAGS.
	14.00	1	2	2	1.0	4	SS-15	M		
650.00	19.00	2	2	3	1.0	5	SS-16	▼		
	24.00	3	4	3	1.0	7	SS-17	W		(ALLUVIUM) OLIVE MED. STIFF WET SILTY SANDY CLAY (A-6)
640.00	29.00	1	2	2	1.0	4	SS-18	W		WHITE LOOSE TO MED. DENSE WET CSE. SAND (A-1-B) W/ GRAVEL @ 38.5-39.0
	34.00	6	6	7	1.0	13				
630.00 / 628.54	39.00	18	130		0.5	100				(RESIDUAL) WHITE MED. DENSE WET SAND (A-1-B)
						AUGER REFUSAL AT ELEV. 628.54 ON HARD ROCK (SPT REFUSAL AT ELEV. 629.14)				CRYSTALLINE ROCK (SPT REFUSAL)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33453.1.1	**ID** B-4095	**COUNTY** DAVIDSON	**GEOLOGIST** C.C. MURRAY
SITE DESCRIPTION BR.-128 & BR-130 / ABBOTTS CRK ON US 29/70 & I-85 BUS. LOOP			**GND WATER**
BORING NO EB2-B	**NORTHING** 0.00	**EASTING** 0.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 27+18.000	**OFFSET** 53.00ft RT	**24 HR** 42.00ft
COLLAR ELEV 667.94ft	**TOTAL DEPTH** 52.50ft	**START DATE** 1/10/06	**COMPLETION DATE** 01/10/06
DRILL MACHINE CME-550	**DRILL METHOD** H.S. AUGERS		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** 52.50ft		**Log EB2-B, Page 1 of 1**

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT (0 25 50 75 100)	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
667.94						Ground Surface				
	4.00	1	2	2	1.0	4				0-22 (ROADWAY FILL) BRN MED. STIFF TO STIFF SANDY SILTY CLAY (A-6)
660.00	9.00	2	2	2	1.0	4				
	14.00	1	2	3	1.0	5				
650.00	19.00	6	6	4	1.0	10				
	24.00	0	0	1	1.0	1				22-37 (ALLUVIUM) GRAY V. LOOSE TO LOOSE SILTY SAND (A-2-4)
640.00	29.00	1	2	2	1.0	4				
	34.00	0	2	2	1.0	4				
630.00	39.00	100			0.3	100		▼		37-52.5 (RESIDUAL) OLIVE & WHITE V. DENSE TO DENSE SILTY SAND (A-2-4) W/ WEATH. ROCK SEAM @ 39.0'
	44.00	7	24	55	1.0	79				
620.00	49.00	12	16	18	1.0	34				
615.44						AUGER REFUSAL AT ELEV. 615.44 ON HARD ROCK				

TEST RESULTS

PROJECT: 33453.1.1 B-4095
COUNTY: DAVIDSON
SITE DESCRIPTION: BRIDGE NO. 128 & BRIDGE NO. 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

SOIL SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	N	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC	UNIT WT. (d)	VOID RATIO
		EB1-C																
SS-7	CL	25+12 -L-	4.70-6.20	A-6(7)	3	39	16	19.4	23.7	28.6	28.3	93	80	58	31.4			
SS-8			9.70-11.20	A-7-6(17)	2	47	24	9.3	22.2	32.1	36.4	97	91	72				
SS-9			14.70-16.20	A-7-6(18)	3	52	27	10.3	20.8	28.4	40.4	95	88	70				
SS-10			19.70-21.20	A-4(1)	7	35	8	17.4	29.5	32.9	20.2	78	69	47				
SS-11			24.70-26.20	A-4(3)	7	34	9	21.6	29.9	34.3	14.2	100	84	57				
SS-12			29.70-31.20	A-2-4(0)	37	24	NP	38.3	36.9	21.7	3.0	88	63	31				
		B1-B																
SS-23	53.00 RT.	25+50 -L-	11.20-12.70	A-1-B(0)	2	24	NP	75.8	17.3	5.8	1.0	89	37	8				
		B2-A																
SS-19	50.00 LT.	26+74 -L-	6.10-7.60	A-2-4(0)	4	24	NP	25.5	63.0	8.5	3.0	100	96	17				
SS-20			11.10-12.60	A-2-4(0)	2	25	NP	44.2	46.2	6.5	3.0	95	69	13				
SS-21			16.10-17.60	A-4(0)	16	38	NP	23.8	34.8	37.4	4.0	99	83	50				
		B2-C																
SS-22	CL	26+52 -L-	38.50-40.00	A-4(3)	56	36	8	28.6	23.4	42.0	6.0	100	77	56				
		EB2-C																
SS-13	CL	27+27 -L-	4.00-5.50	A-6(2)	26	34	12	33.4	20.3	26.1	20.1	92	68	46	18.0			
ST-1			9.00-11.00				CURRENTLY BEING TESTED											
SS-14			11.00-12.50	A-7-5(9)	5	43	13	19.5	22.2	38.2	20.1	93	80	70				
SS-15			14.00-15.50	A-7-5(13)	4	52	18	14.7	21.1	40.0	24.2	98	88	69				
SS-16			19.00-20.50	A-7-5(11)	5	52	19	16.7	21.8	35.3	26.2	93	82	62				
SS-17			24.00-25.50	A-6(8)	7	34	15	11.5	30.6	31.7	26.2	99	91	66				
SS-18			29.00-30.50	A-1-B(0)	4	21	NP	85.2	11.0	2.8	1.0	97	27	5				

ROCK SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	RQD	UNIT WT	Q(MPa) (MPsi)	E(MPa) (MPsi)
		B1-A					
RS-4	55.00 LT.	25+75 -L-	14.20-14.60	44%	CURRENTLY BEING TESTED		
		B1-C					
RS-2	CL	25+66 -L-	18.50-19.00	100%	CURRENTLY BEING TESTED		
		B1-B					
RS-1	53.00 RT.	25+50 -L-	17.00-17..80	98%			
		B2-A					
RS-3	50.00 LT.	26+74 -L-	30.00-30.60	65%			
		B2-B					
RS-5	43.00 RT.	26+38 -L-	38.40-38.90	8%			

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

FIELD SCOUR REPORT

WBS: 33453.1.1 TIP: B-4095 COUNTY: Davidson

DESCRIPTION(1): Bridge 128 & 130 over Abbott's Creek on US 29/70/I-85 Business

EXISTING BRIDGE

Information from: Field Inspection ____ Microfilm ____ (reel ____ pos: ____)
Other (explain) ____

Bridge No.: 129-130 Length: 200' Total Bents: 5* Bents in Channel: 1* Bents in Floodplain: 4*
Foundation Type: concrete abutments, interior concrete footings (on piles?) *per each bridge

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: NONE OBSERVED

Interior Bents: NONE OBSERVED

Channel Bed: NONE OBSERVED

Channel Bank: NONE OBSERVED

EXISTING SCOUR PROTECTION

Type(3): RIP-RAP AROUND INTERIOR BENT ONE

Extent(4): BOTH BRIDGES

Effectiveness(5): GOOD

Obstructions(6): NONE OBSERVED

DESIGN INFORMATION

Channel Bed Material(7): LOOSE COARSE SAND

Channel Bank Material(8): LOOSE SILTY SAND AS SAMPLE SS-19

Channel Bank Cover(9): TREES,WEEDS

Floodplain Width(10): 500'

Floodplain Cover(11): TREES (LEXINGTON WATER PLANT JUST UPSTREAM)

Stream is(12): Aggrading ____ Degrading X Static ____

Channel Migration Tendency(13): MINIMAL, TOWARDS END BENT ONE

Observations and Other Comments: ____

DESIGN SCOUR ELEVATIONS(14) Feet ____ Meters ____

	BENTS B1	B2	B3	B4							
LEFT	638	641									
RIGHT	634	641									

Comparison of DSE to Hydraulics Unit theoretical scour:
B1 (100 YR) THEORETICAL SCOUR = 633, RAISED DUE TO PRESENCE OF ROCK
B2 (100 YR) THEORETICAL SCOUR = 641

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank							
Sample No.							
Retained #4							
Passed #10							
Passed #40	SEE	SAMPLE	RESULTS	PAGE 19			
Passed #200							
Coarse Sand							
Fine Sand							
Silt							
Clay							
LL							
PI							
AASHTO							
Station							
Offset							
Depth							

Template Revised 02/07/06

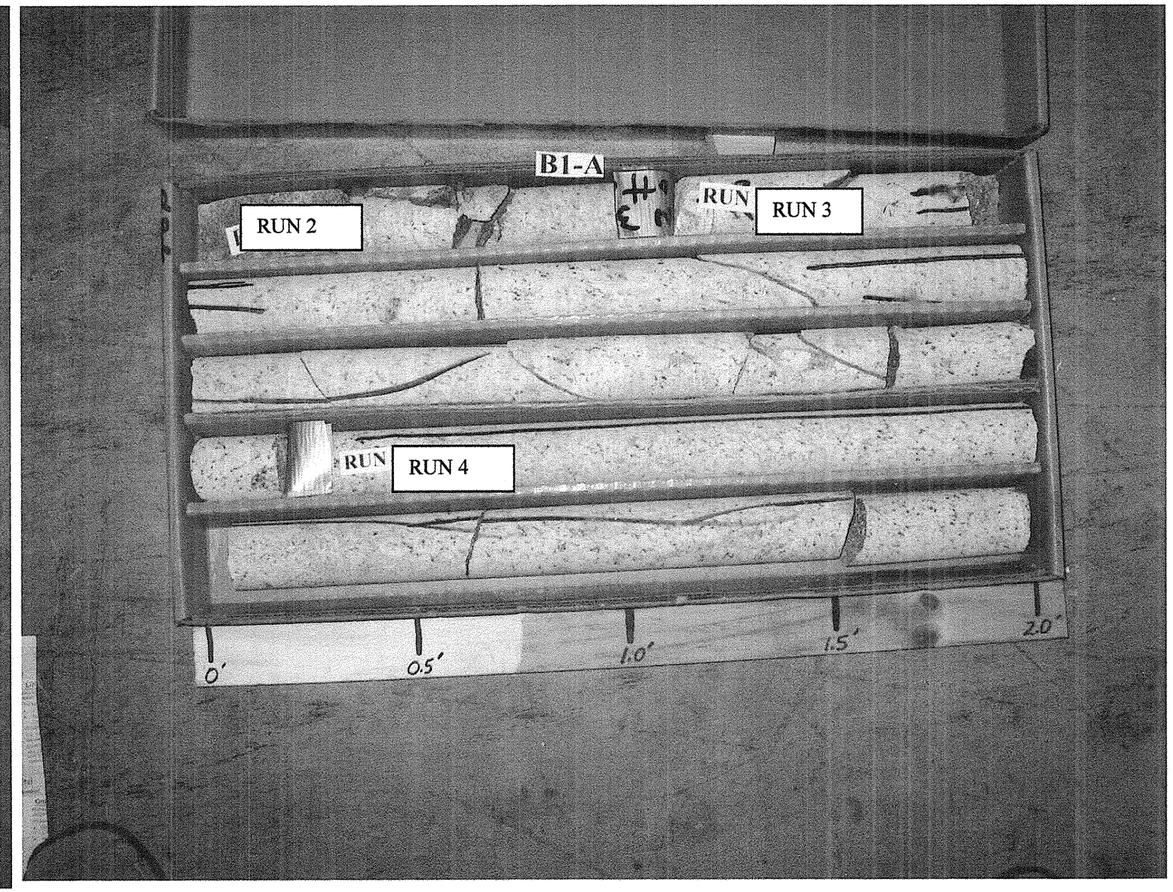
Reported by: C. LITTLE **Date:** 4/23/2007

INSTRUCTIONS

1 Describe the specific site's location, including route number and body of water crossed.
2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
3 Note existing scour protection (e.g. rip rap).
4 Describe extent of existing scour protection.
5 Describe whether or not the scour protection appears to be working.
6 Note obstructions such as dams, fallen trees, debris at bents, etc.
7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
10 Determine the approximate floodplain width from field observation or a topographic map.
11 Describe the material covering the floodplain (e.g. grass, trees, crops).
12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoritical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

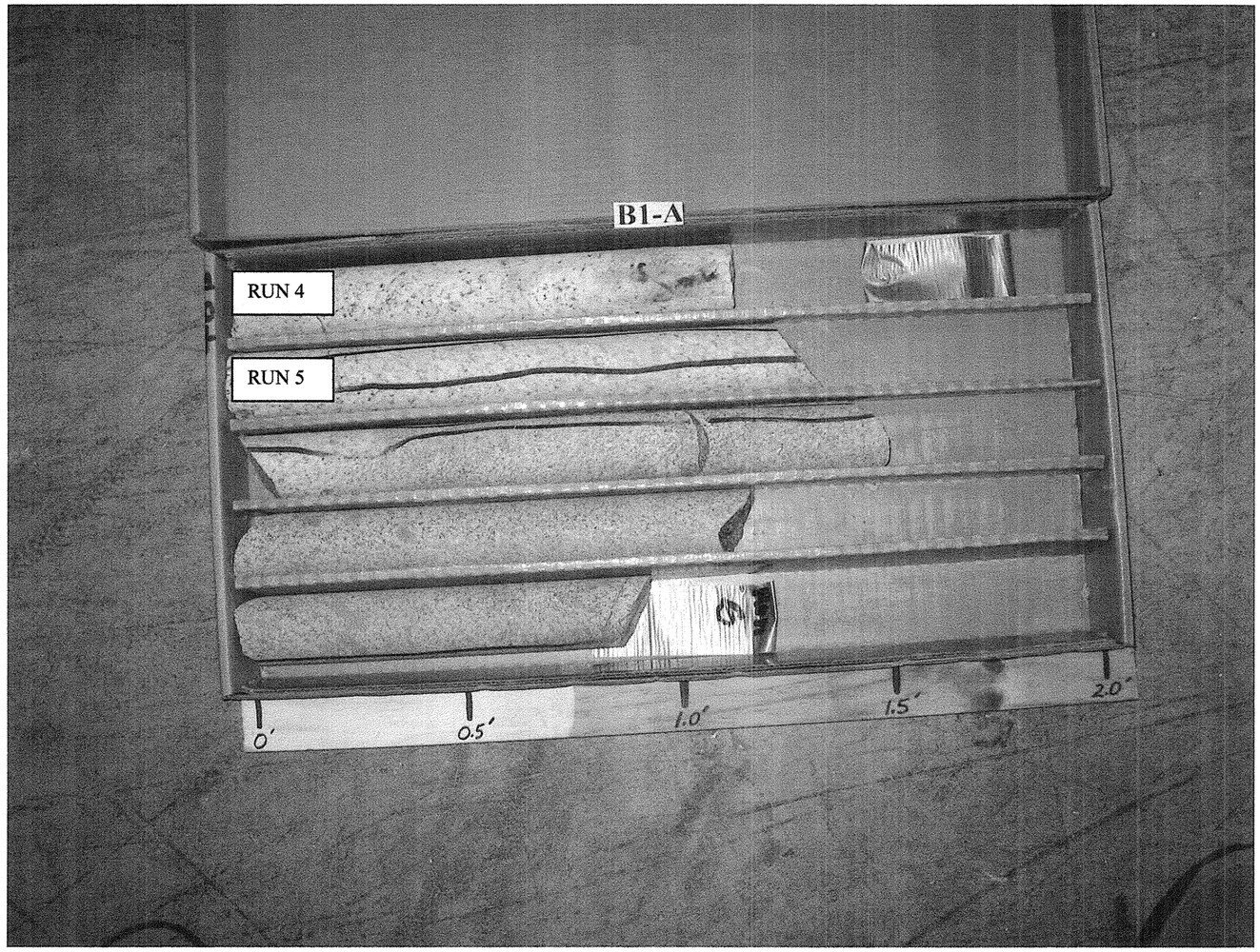
33453.1.1 B-4095
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

B1-A



33453.1.1 B-4095
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

B1-A

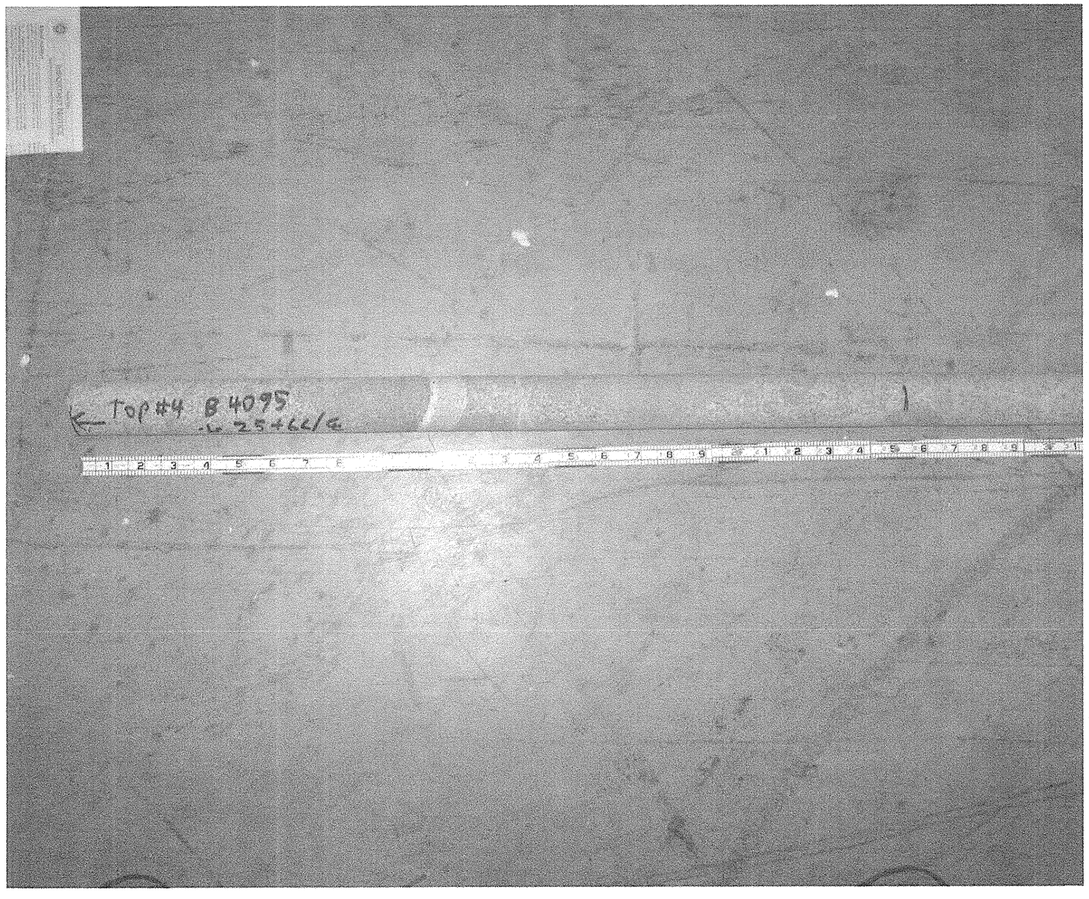


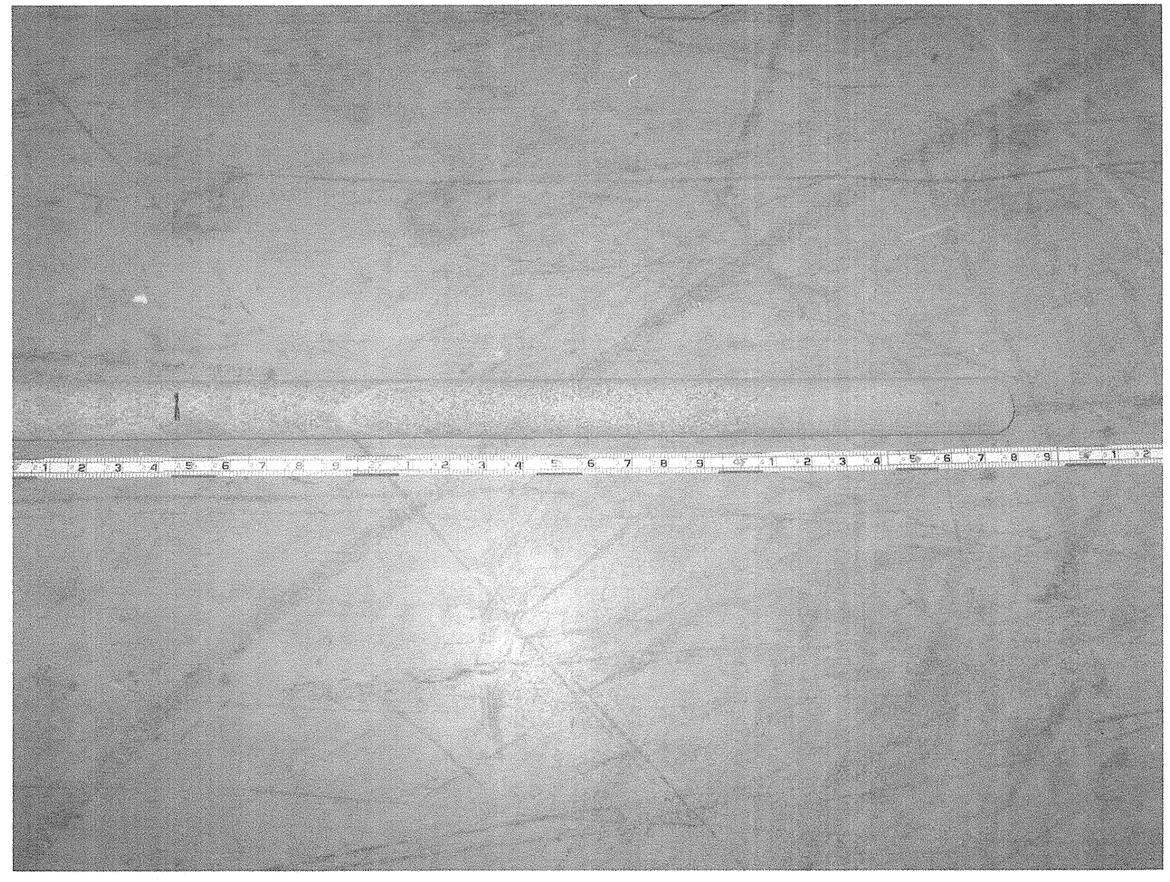
33453.1.1 B-4095
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

B1-C

33453.1.1 B-4095
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

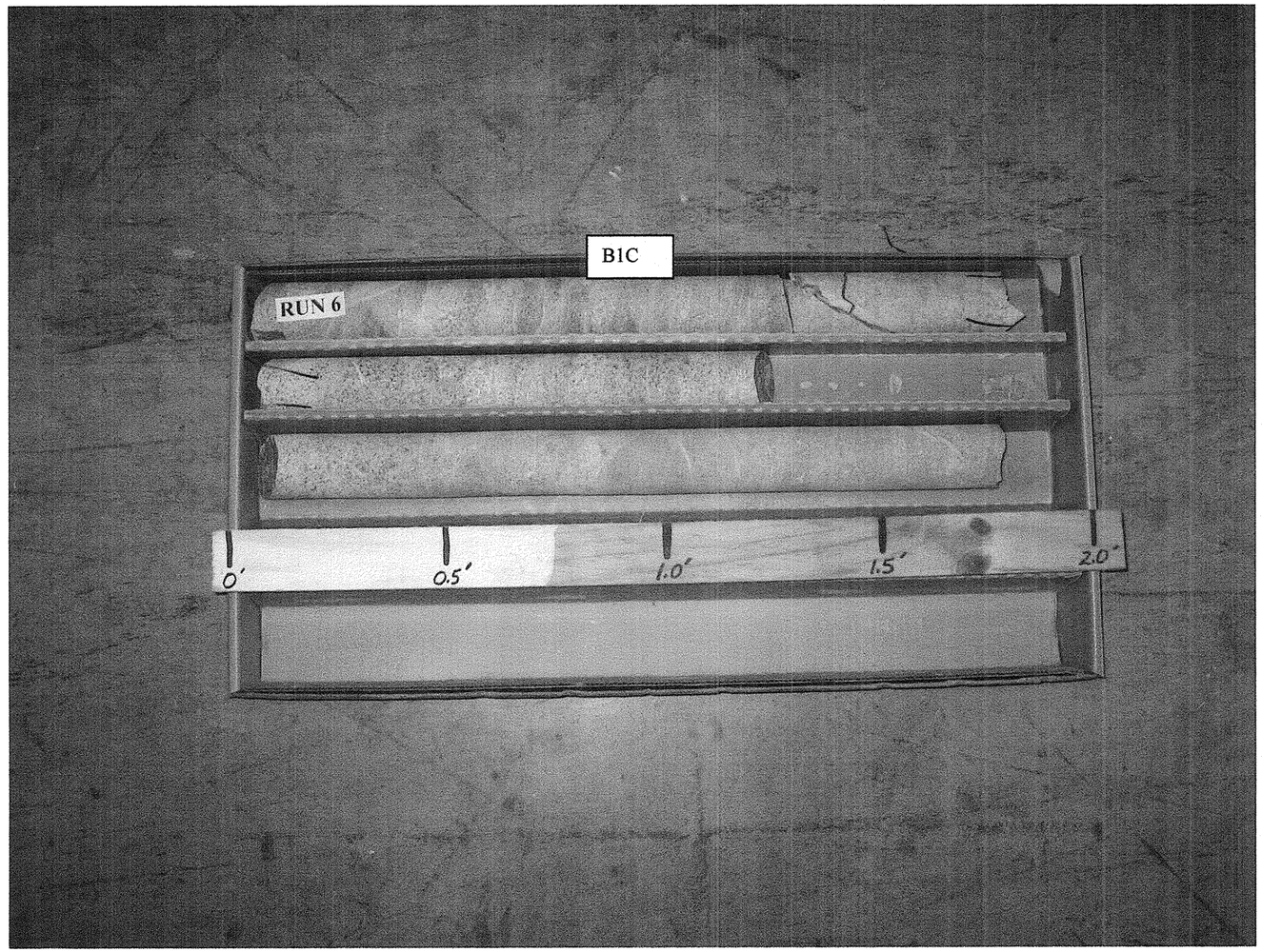
B1-C, RUN 4. ONE PIECE





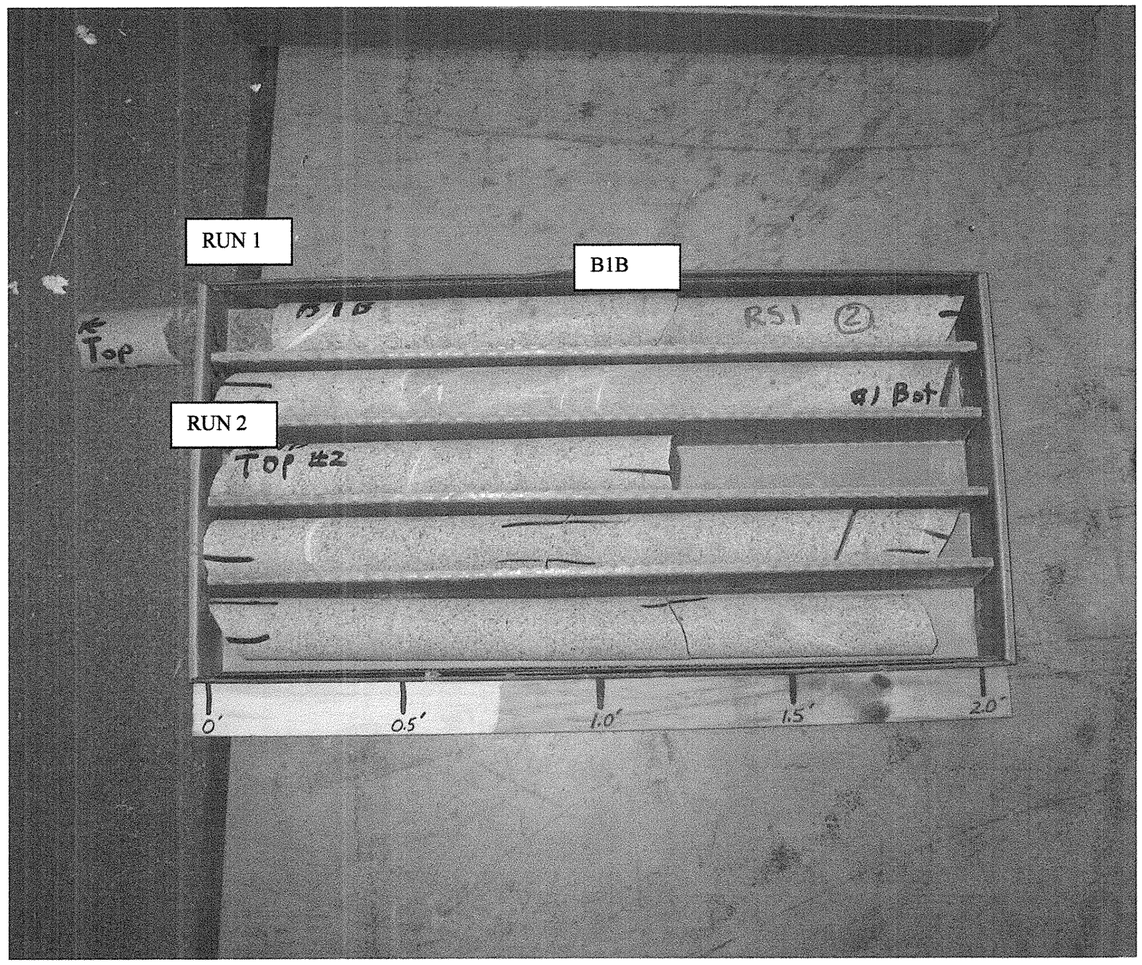
33453.1.1 B-4095
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

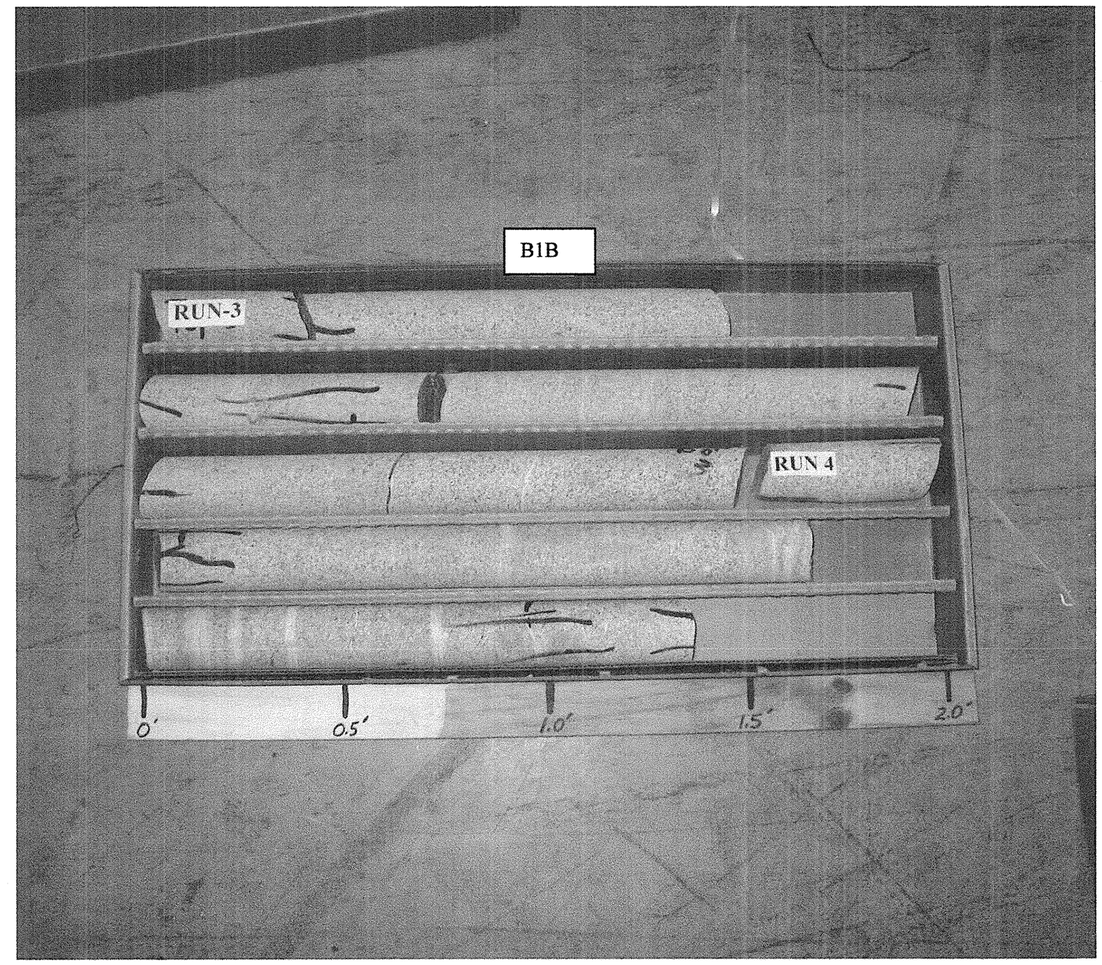
B1-C



33453.1.1 B-4095
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

B1-B





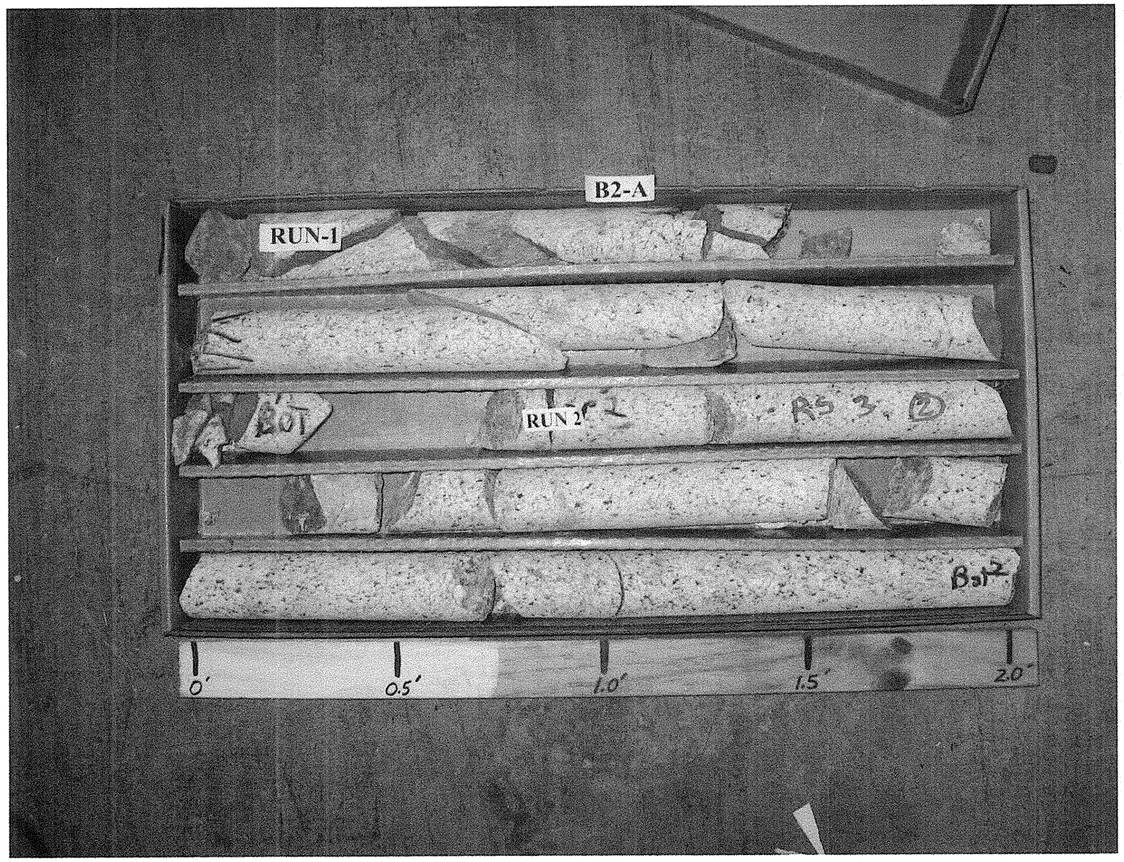
33453.1.1 B-4095
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

B1-B

33453.1.1 B-4095

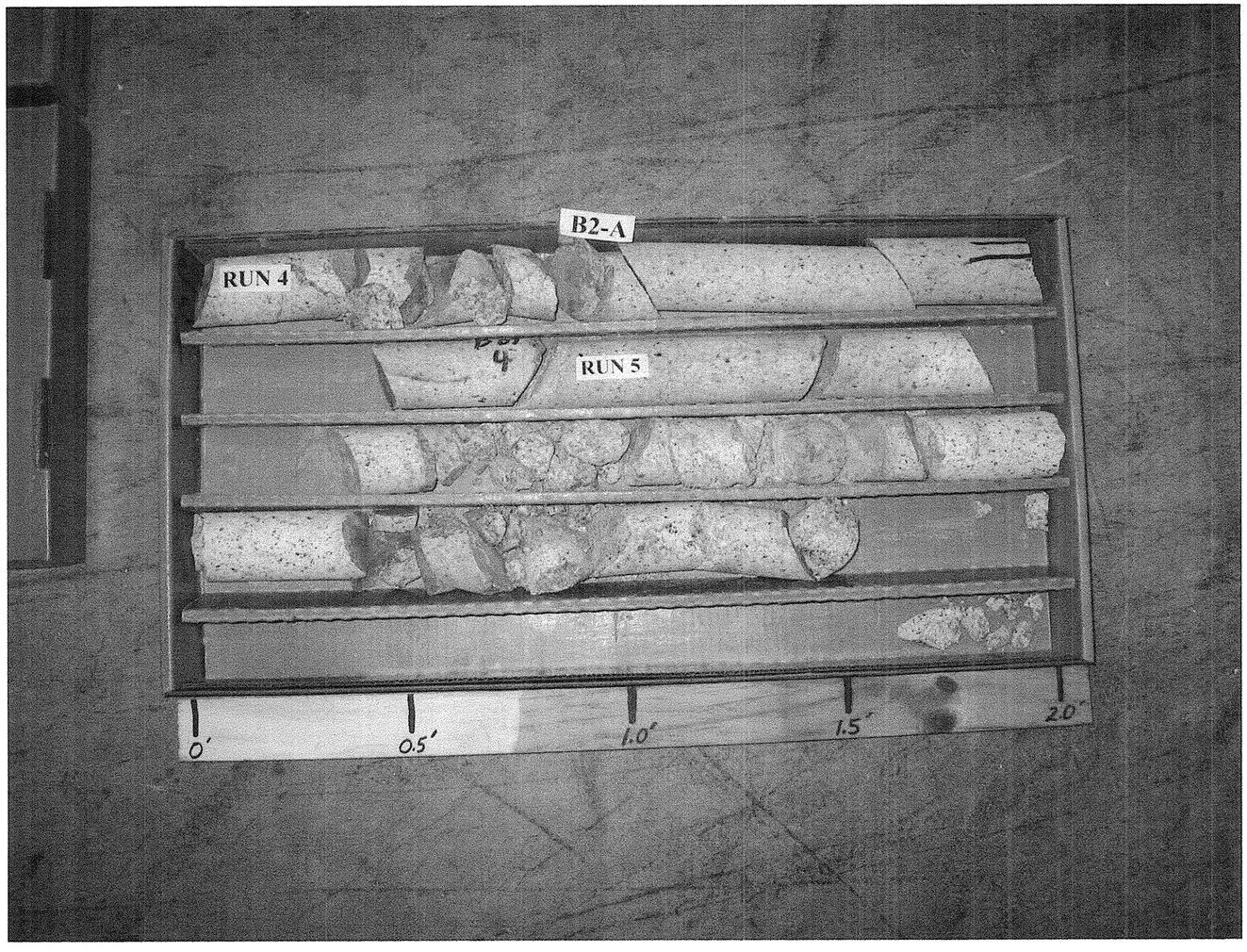
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

B2-A



33453.1.1 B-4095
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

B2-A



33453.1.1 B-4095
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

B2-B

33453.1.1 B-4095
BRIDGES NO. 128 & 130 ON US 29/70 & I-85 BUSINESS LOOP OVER ABBOTT'S CREEK

B2-B