STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3446	1	36
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
33066.1.1	BRSTP-1243 (2)	P.E.	
		CONST.	

ID B-3446

PROJECT: 33066.1.1

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 33066.1.1 I. D. NO. B-3446

F. A. PROJECT BRSTP-1243 (2)

COUNTY DAVIDSON

PROJECT DESCRIPTION BRIDGE NO. 415 OVER NSRR ON SR 1243 (CENTER STREET)

SITE DESCRIPTION

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NCDOT SOIL AND ROCK LEGEND	2
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CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS 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 UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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

For Letting

INVESTIGATED BY ECS, LTD. PERSONNEL J. WHITE

CHECKED BY T. J. ROBERSON T. CALLOWAY

SUBMITTED BY JAMES D. HOSKINS, III, P.E. S. ZIRPOLO

DATE 8/25/05 M. SANDERS

DRAWN BY: T. CALLOWAY

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 PROFESSIONAL SEAL 18493 ENGINEER JAMES D. HOSKINS, III

SEAL

SIGNATURE James D Hoskins III

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ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-3446	33066.1.1	2	36

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 FOOT 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 PLASTIC INDEX	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 (TONS/FT²)
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 0.5 0.5 TO 1 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	2.0	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, VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- 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

EQUIPMENT USED ON SUBJECT PROJECT

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

ADVANCING TOOLS:
- ☐ CLAY BITS
- ☐ 6" CONTINUOUS FLIGHT AUGER
- ☐ 8" HOLLOW AUGERS
- ☐ HARD FACED FINGER BITS
- ☐ TUNG.-CARBIDE INSERTS
- ☐ CASING ☐ W/ ADVANCER
- ☐ TRICONE_____" STEEL TEETH
- ☐ TRICONE_____" TUNG.-CARB.
- ☐ CORE BIT
- ☒ OTHER 2.25" HOLLOW AUGERS

HAMMER TYPE:
- ☒ AUTOMATIC ☐ MANUAL

CORE SIZE:
- ☐ -B_____
- ☐ -N_____
- ☒ -H_Q___

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 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 FOLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.
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 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 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 GEOLOGISTS 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 GEOLOGISTS 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 GEOLOGISTS 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 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 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 4 INCHES 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 OR B.P.F.) 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - 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 (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: CONCRETE MON. STAMPED NCGS/USGS 1898, SW QUAD. OF INTERSECTION OF S. MAIN AND E. CENTER STREET IN LEXINGTON, APPROX. 20 FEET EAST FROM CONFEDERATE SOLDER MEMORIAL. ELEVATION: 808.44 FT.

NOTES:

REVISED 09/15/00

SUBMITTED TO:	State of North Carolina Department of Transportation Geotechnical Engineering Unit 1020 Birch Ridge Drive Raleigh, North Carolina 27610
ATTENTION:	Mr. Njoroge Wainaina, PE State Geotechnical Engineer Geotechnical Engineering Unit
SUBMITTED BY:	Engineering Consulting Services, Ltd. 6909 International Drive, Suite 103 Greensboro, North Carolina 27409 ECS Project No. G-11256
DATE:	August 25, 2005
STATE PROJECT:	33066.1.1 (B-3446)
FA. PROJECT:	BRSTP -1243(2)
COUNTY:	Davidson
DESCRIPTION:	Bridge 415 over NSRR on SR 1243 (Center Street)
SUBJECT:	Report of Structure Subsurface Investigation

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2. Boring Location Diagram
3. Subsurface Profile
4. Subsurface Cross-Sections
5. Subsurface Boring Logs
6. Core Boring Reports
7. Core Photographs
8. AASHTO/ASTM Test Results
9. Site Photographs

Appendix B (Rock Data – Issued Under Separate Cover)

Appendix C (Supportive Documents - Issued Under Separate Cover)

1. Boring Quantity Sheet
2. Boring Logs
3. Survey Notes
4. Checklist
5. Property Owner Contact

STATE PROJECT: 33066.1.1 (B-3446)

FA. PROJECT: BRSTP -1243(2)

COUNTY: Davidson

DESCRIPTION: Bridge 415 over NSRR on SR 1243 (Center Street)

SUBJECT: Report of Structure Subsurface Investigation

Engineering Consulting Services, Ltd. has completed the authorized geotechnical investigation for the above referenced project in Davidson County, North Carolina. The purpose of this exploration was to investigate the subsurface conditions at the proposed bridge bent locations. The work was performed in general accordance with our cost estimate dated July 27, 2005. This report presents the field data and findings of the geotechnical explorations with regard to the proposed bride replacement.

1.0 SITE DESCRIPTION

The project site is located in Davidson County and within the Lexington city limits at the approximate location shown on the Site Location Map (Drawing No. 1) located in Appendix A. The site is located at Bridge 415 over NSRR on SR 1243 (Center Street) between NC 8 and SR 2212. The site topography is relatively level terrain including commercial and residential properties. A cut embankment with steep slopes is located at the railroad crossing. The existing ground cover consists of roadway pavement, sidewalk, and trees bordering the railroad, grassed and landscaped areas.

2.0 PROJECT DESCRIPTION

Information for the proposed structures was obtained from Preliminary General Drawings, dated April 27, 2005. The proposed bridge will be a three span structure, 237 feet in length and 70 feet wide. Skew angles of 105° 57' 52'', 104° 28' 29'', 103° 12' 52'', 102° 01' 21'' and 100° 31' 58'' are proposed for end bent-1, bent-1, railroad crossing, bent-2, and end bent-2, respectively. Existing slopes will be regarded to tie into the ditch at the toe of the slope near the railroad.

The Preliminary General Drawings are in English units with feet (ft) as the primary unit of length. All distances and elevations in this report are feet unless noted otherwise.

3.0 SCOPE OF INVESTIGATION

3.1 FIELD TESTING

The subsurface exploration was conducted on July 27 through August 11, 2005. The exploration consisted of ten (10) soil test borings. The soil test borings were advanced with a CME-55 truck mounted drilling machine utilizing hollow stem auger and rotary drilling techniques and using a 140 pound automatic hammer to perform the standard penetration tests. Water for rotary drilling was obtained from tap water; no drilling mud was added to the water.

Standard Penetration Tests were performed in general accordance with NCDOT guidelines. In conjunction with testing, split-barrel soil samples were recovered for visual classification and laboratory testing.

Six borings were extended below auger refusal and SPT refusal depths to obtain weathered rock and crystalline rock core samples. The core samples were nominally 2.5 inches in diameter and were obtained using HQ size wireline drilling techniques. The core samples were returned to our laboratory for visual classification and testing.

Using existing site features and bench marks established by the NCDOT, the borings were surveyed for elevation and location by personnel from ECS. As-drilled boring locations are shown on the Boring Location Diagram (Drawing No. 2). The majority of the boriong locations were offset from planned locations due to overhead utilities.

3.2 LABORATORY TESTING

Laboratory testing was performed on fourteen (14) representative split-barrel samples to aid in the assessment of AASHTO soil classification and to provide data for evaluation of engineering properties. The laboratory testing consisted of natural moisture content determinations, Atterberg Limits testing, and grain size analysis with hydrometer. Rock core specimens were obtained for unconfined compressive strength testing. As requested, two Shelby tubes were obtained from Bent-1 between elevations 773.4 feet to 770.5 feet (depths from 8 to 12 feet) in B1-A and B1-B. The tubes will be delivered to the NCDOT for their testing. Laboratory tests were performed in general accordance with AASHTO and NCDOT specifications.

3.3 GEOLOGY

The project site is located in the Piedmont Physiographic Province of North Carolina. According to the 1985 Geologic Map of North Carolina, the site is located in an area consisting of Metamorphosed Gabbro and Diorite, Metamorphosed Mafic Rock, Metavolcanic Rock, Metamorphosed Granitic Rock and Granitic Rock of the Charlotte Belt dating from Cambrian to Paleozoic ages. The overlying residual soils are the product of the physical and chemical weathering of the underlying bedrock. Based on the rock core specimens obtained at the site the rock type consisted of tan white to white black Granite. Rock outcrops were not evident within the immediate area of the bridge.

3.4 FOUNDATION MATERIALS

Foundation materials at the end bents and interior bent locations include residual soil, weathered rock, and rock.

Residual soil was encountered at elevations ±784 feet to ±718 feet and consisted of very stiff to stiff fine to coarse sandy clay and silty clay (A-7-5), stiff to medium stiff fine to coarse sandy clayey silty (A-5), stiff fine to coarse sandy silt (A-4), and very loose to very dense silty fine to coarse sand (A-2-4, A-2-5). Weathered rock was encountered from elevations ±731 feet to ±707 feet and consisted of tan white weathered Granite. Crystalline rock was encountered below elevations ±731 feet to ± 706 feet and consisted of a tan, white, and black Granite.

3.5 GROUNDWATER

Groundwater was present in all boring locations at elevations of ±749 feet to ±745 feet. Fluctuation of groundwater levels can occur with seasonal and climatic variations.

4.0 NOTES TO THE DESIGNER

Residual sandy soils and sandy weathered rock were encountered at the interior borings. A weathered rock seam was encountered in boring B1-C at 69.7 to 70.4 feet.

5.0 CLOSURE

The geotechnical investigation is based on the Preliminary General Drawings, dated July 27, 2005 and the data obtained from our field and laboratory testing program. If the proposed location and geometry, or finished grades are changed or are different from those outlined above, it may be necessary to obtain additional data about foundation materials for the structure.

Cross-sections and profiles are generalized interpretations of soil conditions between borings and should not be considered accurate other than at the boring locations. Subsurface conditions between boring locations or elsewhere on the site may vary, and subsurface anomalies may exist which were not detected.

Engineering Consulting Services, Ltd. appreciates this opportunity to be of service to the NCDOT on this project. Should you have any questions concerning this report, please feel free to contact the undersigned.

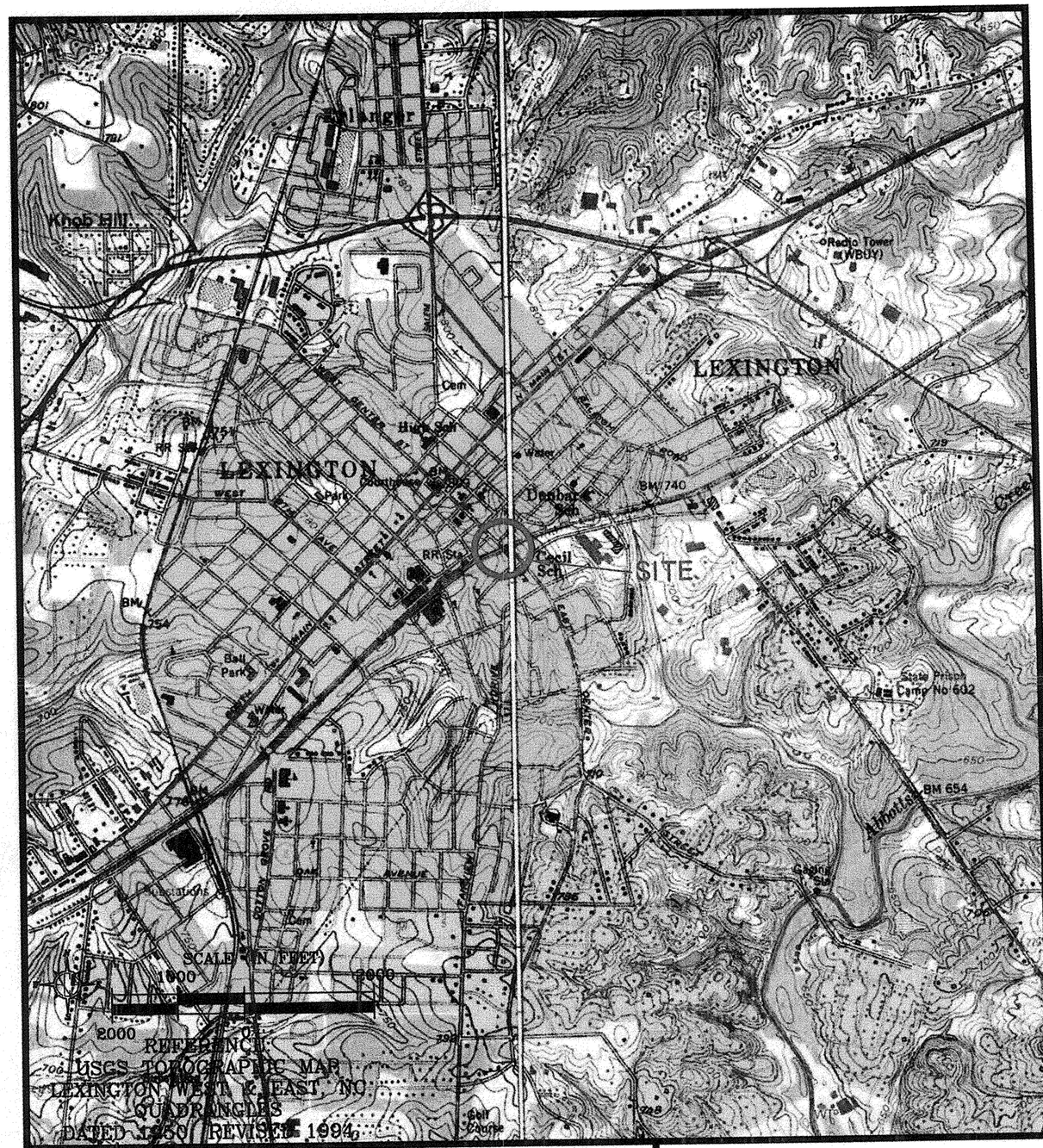
Respectfully submitted,

ENGINEERING CONSULTING SERVICES, LTD.

Todd J. Roberson
Project Manager

James D. Hoskins, III, P.E.
Chief Engineer
Licensed NC 18493

Attachments



PROJECT NO. 33066.1.1	TIP NO. B-3446
F.A.NO. BRSTP-1243 (2)	
DATE: 8/25/2005	SCALE: 1" = 2000'
DRAWN BY: TAC	CHECKED BY/DATE:
DRAWING NO. 1	

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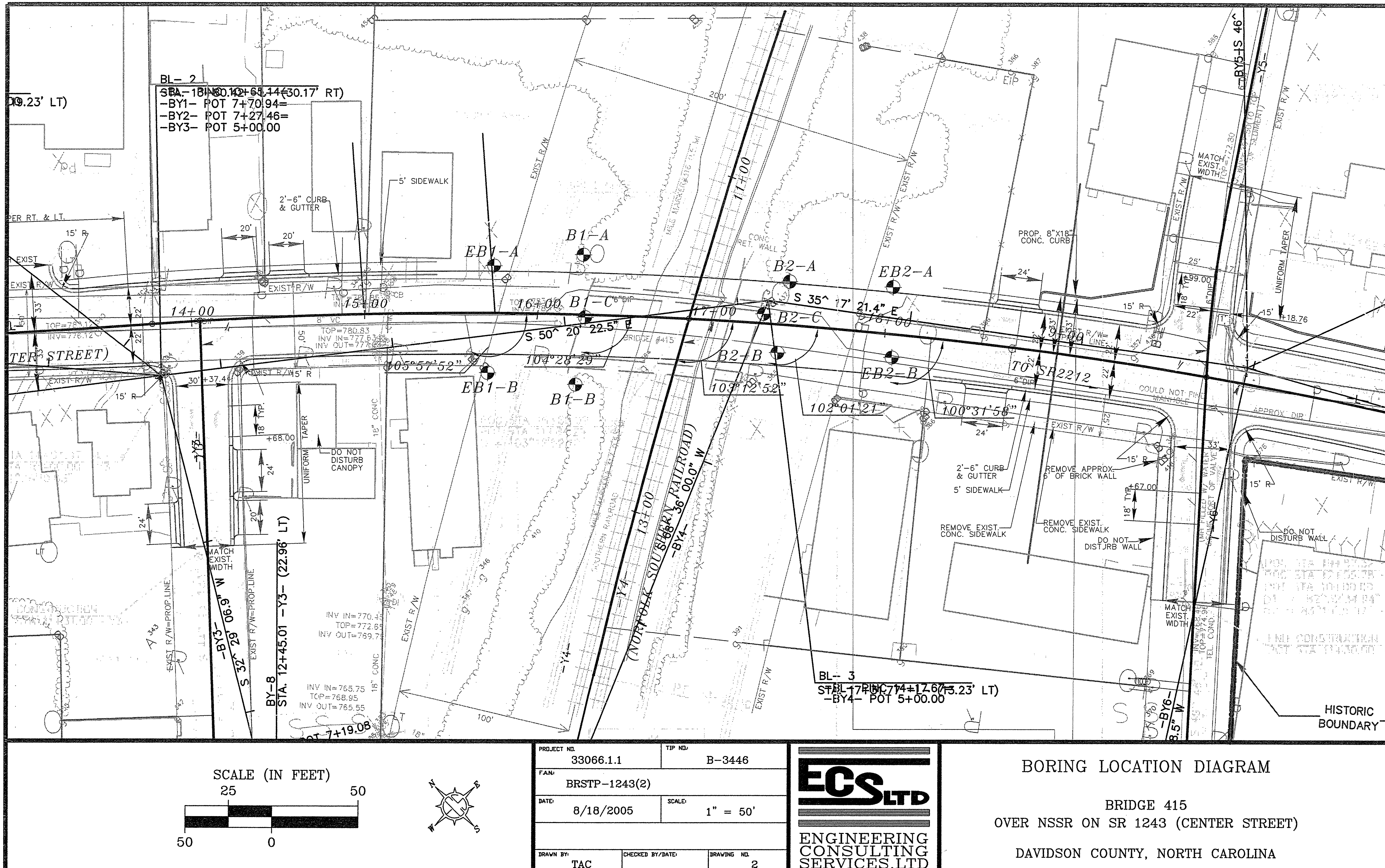
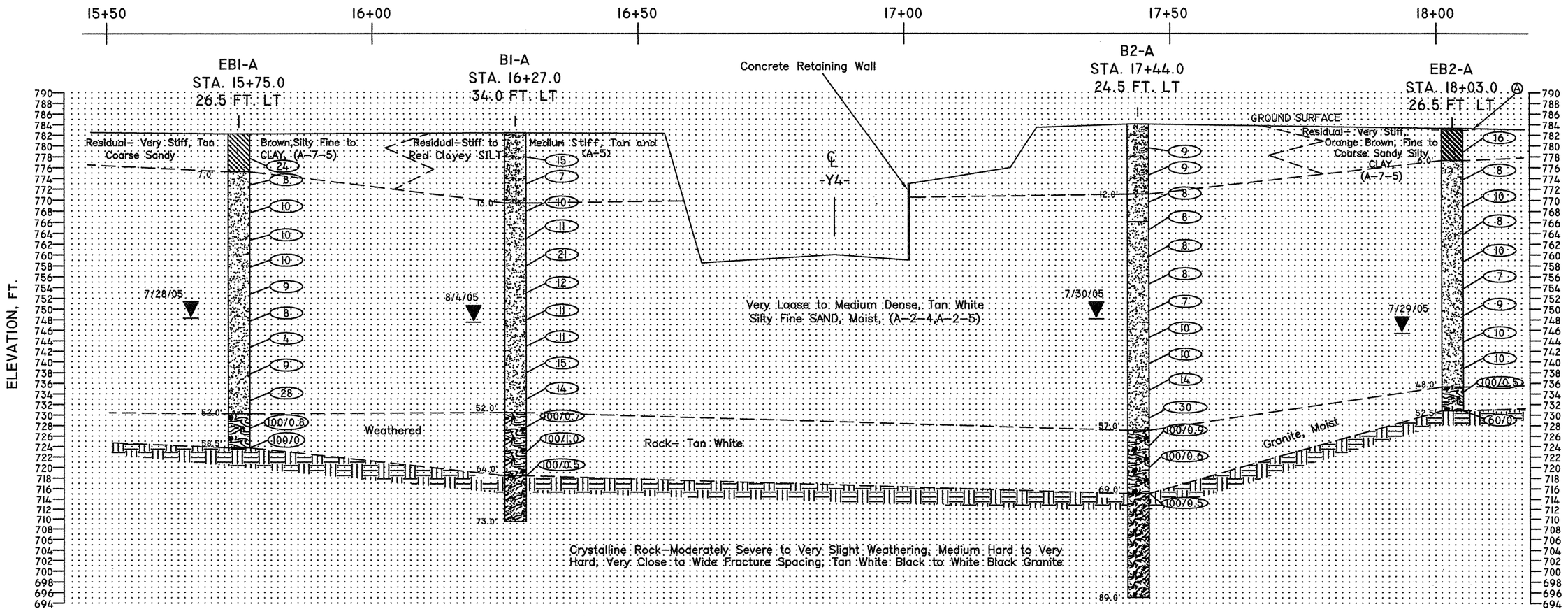
SITE LOCATION MAP

BRIDGE 415 OVER NSRR
ON SR 1243 (CENTER STREET)
STATE PROJECT NO. 33066.1.1
TIP NO. B-3446
DAVIDSON COUNTY, NORTH CAROLINA



BL- 2
-BY1- POT 7+70.94=
-BY2- POT 7+27.46=
-BY3- POT 5+00.00
5' SIDEWALK
2'-6" CURB & GUTTER
EB1-A
B1-A
B2-A
EB2-A
14+00
15+00
16+00
B1-C
17+00
B2-C
18+00
S 35^ 17' 21.4" E
S. 50^ 20' 22.5" E
105°57'52"
104°28'29"
103°12'52"
102°01'21"
100°31'58"
EB1-B
B1-B
B2-B
EB2-B
TO SR 2212
11+00
13+00
(NORFOLK SOUTHERN RAILROAD)
-BY4-
-Y4-
EXIST R/W
PROP. 8"X18" CONC. CURB
MATCH EXIST. WIDTH
UNIFORM TAPER
DO NOT DISTURB CANOPY
REMOVE APPROX. 6' OF BRICK WALL
REMOVE EXIST. CONC. SIDEWALK
DO NOT DISTURB WALL
-BY3- S 32^ 29' 06.9" W
BY-8 STA. 12+45.01 -Y3- (22.96' LT)
BL-- 3
-BY4- POT 5+00.00
HISTORIC BOUNDARY
SCALE (IN FEET)
50 25 0 50
PROJECT NO. 33066.1.1
TIP NO. B-3446
F.A.N. BRSTP-1243(2)
DATE: 8/18/2005
SCALE: 1" = 50'
DRAWN BY: TAC
CHECKED BY/DATE:
DRAWING NO. 2
ECS LTD
ENGINEERING CONSULTING SERVICES, LTD
BORING LOCATION DIAGRAM
BRIDGE 415
OVER NSSR ON SR 1243 (CENTER STREET)
DAVIDSON COUNTY, NORTH CAROLINA

PROFILE ALONG –L– 25.0 FT. LT



Ⓐ Pavement Structure– 1 inch of Asphaltic Concrete over 1 inch of Crushed stone.

SCALE (IN FEET)
10 20
20 0

PROJECT NO. 33066.1.1	TIP NO. B–3446
F.A. NO. BRSTP–1234 (2)	
DATE: 8/25/2005	SCALE: 1" = 20'
DRAWN BY: TAC	CHECKED BY/DATE:
DRAWING NO. 3	

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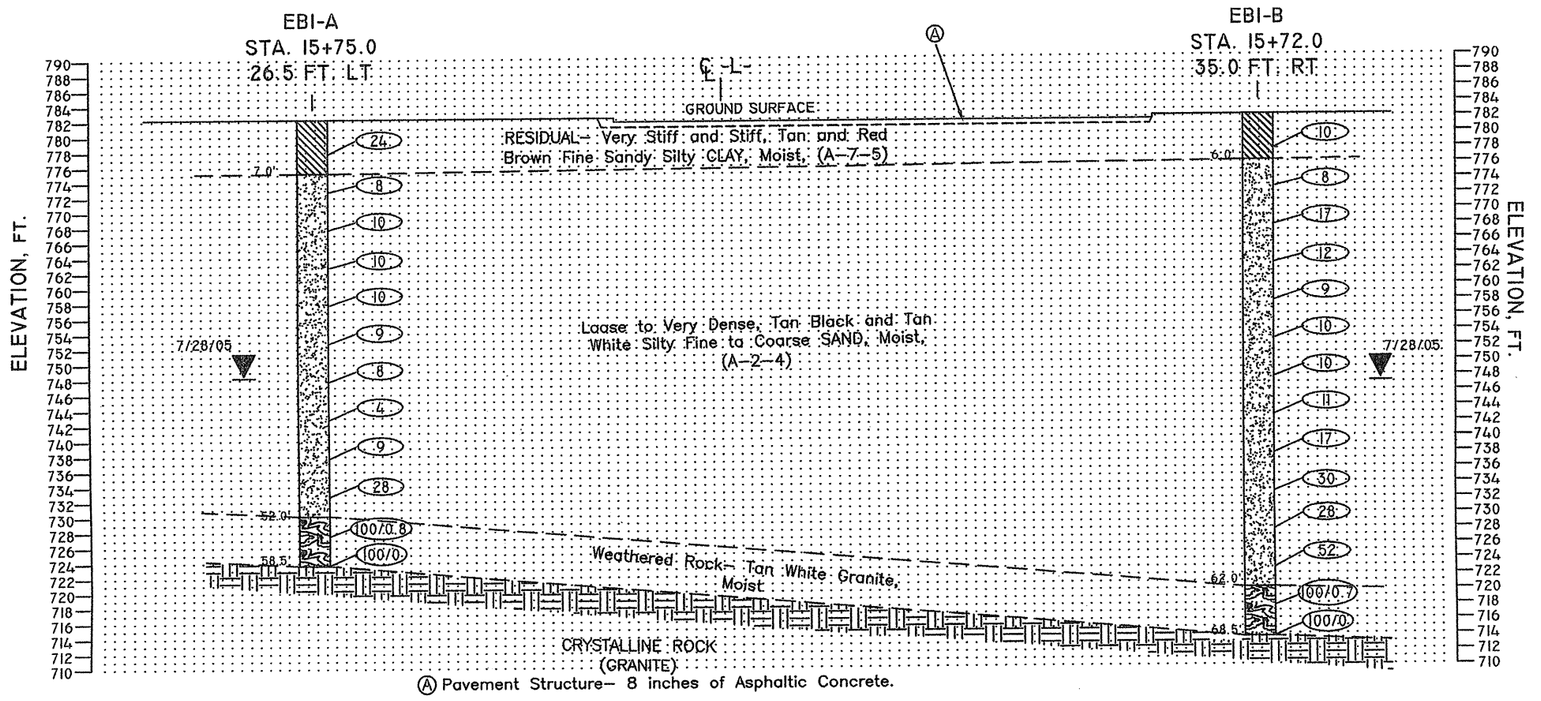
PROFILE ALONG –L– 25.0 FT. LT

BRIDGE 415 OVER NSRR
ON SR 1243 (CENTER STREET)

DAVIDSON COUNTY, NORTH CAROLINA

SECTION THROUGH END BENT–1



Ⓐ Pavement Structure– 8 inches of Asphaltic Concrete.

VERTICAL SCALE (IN FEET)

10 20 20 0

HORIZONTAL SCALE (IN FEET)

5 10 10 0

PROJECT NO. 33066.1.1	TIP NO. B–3446	
F.A. NO. BRSTP–1234 (2)		
DATE: 8/25/2005	SCALE: V: 1" = 20' H: 1" = 10'	
DRAWN BY: TAC	CHECKED BY/DATE:	DRAWING NO. 4

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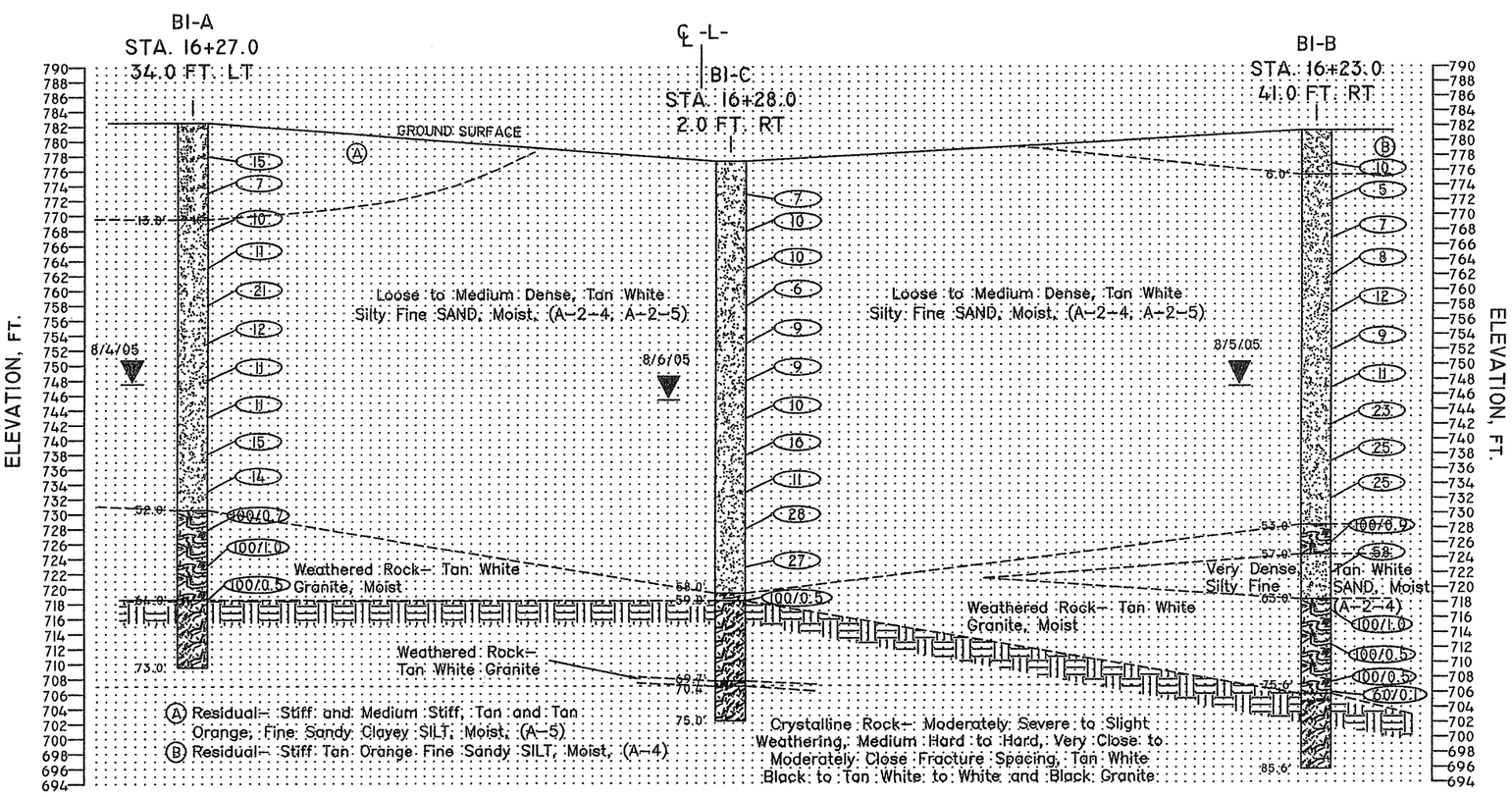
SECTION THROUGH END BENT–1

BRIDGE 415 OVER NSRR
ON SR 1243 (CENTER STREET)

DAVIDSON COUNTY, NORTH CAROLINA

SECTION THROUGH BENT–1



Ⓐ Residual– Stiff and Medium Stiff, Tan and Tan Orange, Fine Sandy Clayey SILT, Moist, (A–5)

Ⓑ Residual– Stiff Tan Orange Fine Sandy SILT, Moist, (A–4)

VERTICAL SCALE (IN FEET)

10 20 20 0

HORIZONTAL SCALE (IN FEET)

5 10 10 0

PROJECT NO. 33066.1.1	TIP NO. B–3446	
F.A. NO. BRSTP–1234(2)		
DATE: 8/25/2005	SCALE: V: 1" = 20' H: 1" = 10'	
DRAWN BY: TAC	CHECKED BY/DATE:	DRAWING NO. 5

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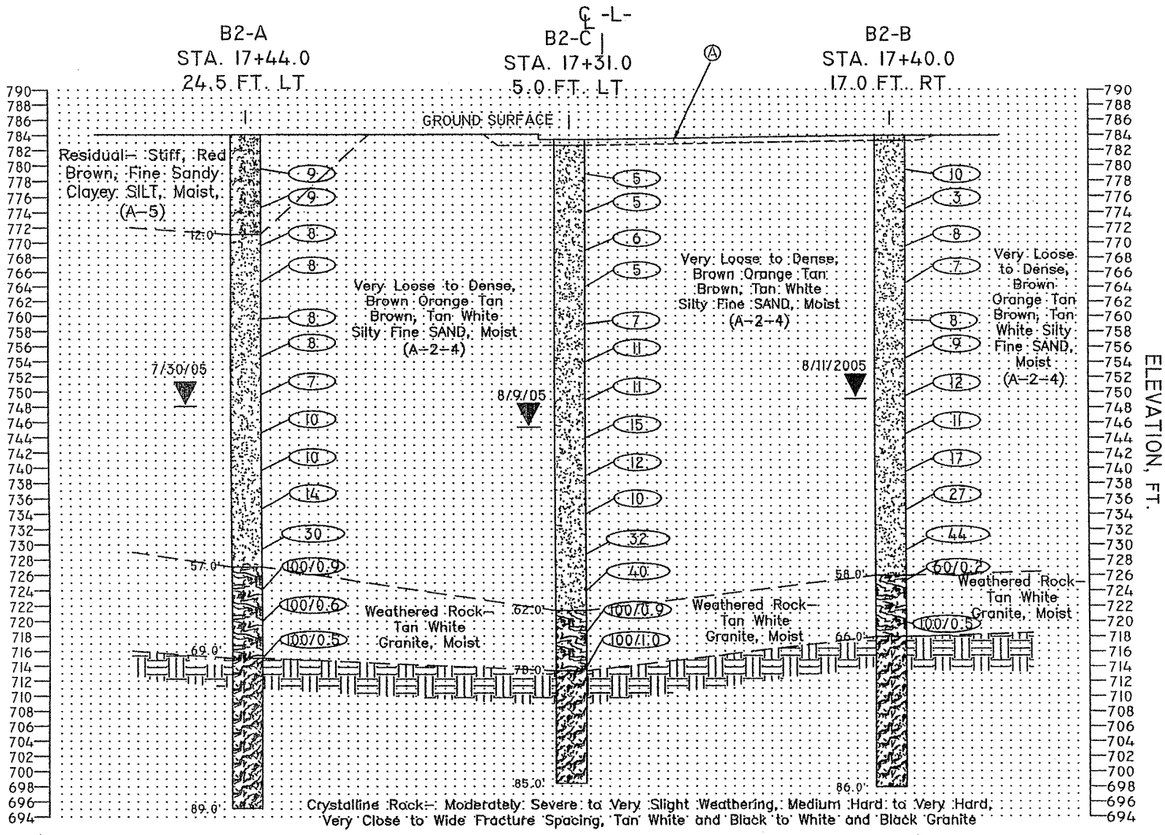
SECTION THROUGH BENT–1

BRIDGE 415 OVER NSRR
ON SR 1243 (CENTER STREET)

DAVIDSON COUNTY, NORTH CAROLINA

SECTION THROUGH BENT-2



Ⓐ Pavement Structure- 4 to 8 inches of Asphaltic Concrete over 6 to 0 inches of Portland Cement Concrete

VERTICAL SCALE (IN FEET)

10 20 20 0

HORIZONTAL SCALE (IN FEET)

5 10 10 0

PROJECT NO. 33066.1.1	TIP NO. B-3446
F.A. NO. BRSTP-1234 (2)	
DATE: 8/25/2005	SCALE: V: 1" = 20' H: 1" = 10'
DRAWN BY: TAC	CHECKED BY/DATE:
DRAWING NO. 6	

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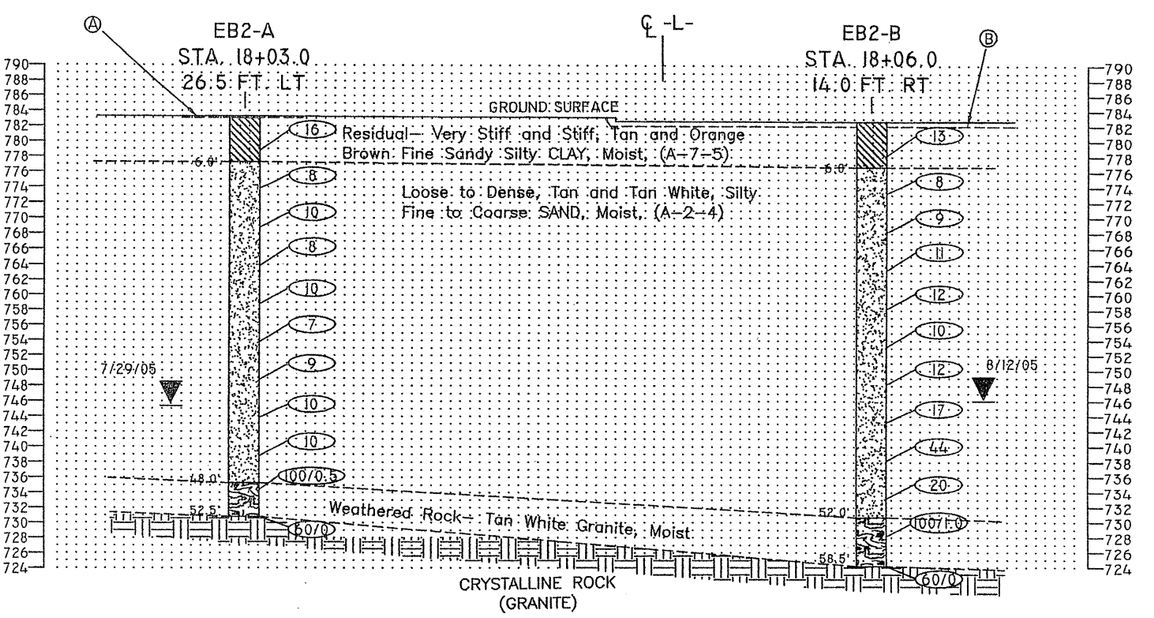
SECTION THROUGH BENT-2

BRIDGE 415 OVER NSRR
ON SR 1243 (CENTER STREET)

DAVIDSON COUNTY, NORTH CAROLINA

SECTION THROUGH END BENT-2



Ⓐ Pavement Structure- 1 inch of Asphaltic Concrete over 1 inch of Crushed Stone.
Ⓑ Pavement Structure- 8 inches of Asphaltic Concrete.

VERTICAL SCALE (IN FEET)

10 20 20 0

HORIZONTAL SCALE (IN FEET)

5 10 10 0

PROJECT NO. 33066.1.1	TIP NO. B-3446
F.A. NO. BRSTP-1234 (2)	
DATE: 8/25/2005	SCALE: V: 1" = 20' H: 1" = 10'
DRAWN BY: TAC	CHECKED BY/DATE:
DRAWING NO. 7	

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SECTION THROUGH END BENT-2

BRIDGE 415 OVER NSRR
ON SR 1243 (CENTER STREET)

DAVIDSON COUNTY, NORTH CAROLINA

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 2

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. EB1-A	BORING LOCATION 15+75.0	OFFSET 26.5 LT	ALIGNMENT -L-	0 HR. 37.4
COLLAR ELEVATION 782.2	NORTHING 756335.3	EASTING 1629393.9	24 HR. 34.0
TOTAL DEPTH 58.5	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 07-27-05	COMPLETION DATE 07-27-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 58.5

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
782.2								782.2' 0.0' RESIDUAL: Very Stiff, Tan, Brown, Silty Fine to Coarse Sandy CLAY, Moist, (A-7-5)
780.0	3.5	7 11 13	1.5	24	SS-1	11.5%		775.2' 7.0' Loose, Tan, White, Silty Fine to Coarse SAND, Moist to Wet, (A-2-4)
775.0	8.5	3 3 5	1.5	8		M		
770.0	13.5	4 4 6	1.5	10	SS-2	M		
765.0	18.5	4 4 6	1.5	10		M		
760.0	23.5	4 4 6	1.5	10		M		
755.0	28.5	3 4 5	1.5	9		M		

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 2

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. EB1-A	BORING LOCATION 15+75.0	OFFSET 26.5 LT	ALIGNMENT -L-	0 HR. 37.4
COLLAR ELEVATION 782.2	NORTHING 756335.3	EASTING 1629393.9	24 HR. 34.0
TOTAL DEPTH 58.5	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 07-27-05	COMPLETION DATE 07-27-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 58.5

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
752.2'								752.2' 30.0' Loose, Tan, White, Silty Fine to Coarse SAND, Moist to Wet, (A-2-4)
750.0	33.5	2 4 4	1.5	8		W		
745.0	38.5	1 1 3	1.5	4		W		
740.0	43.5	2 4 5	1.5	9		M		
735.0	48.5	11 12 16	1.5	28		M		735.2' 47.0' Medium Dense, Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-4)
730.0	53.5	30 37 63/0.3	1.3	100/0.8		M		730.2' 52.0' WEATHERED ROCK- Tan, White, Granite, Moist, (WR)
725.0	58.5	100/0.0	0.0	100/0.8				723.7' 58.5' BORING TERMINATED WITH STANDARD PENETRATION TEST REFUSAL AT ELEVATION 723.7 ON CRYSTALLINE ROCK (GRANITE)
	58.5							

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. EB1-B	BORING LOCATION 15+72.0	OFFSET 35.0 RT	ALIGNMENT -L-	0 HR. 30.0
COLLAR ELEVATION 782.2	NORTHING 756295.7	EASTING 1629346.4	24 HR. 35.0
TOTAL DEPTH 68.5	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 07-27-05	COMPLETION DATE 07-27-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 68.5

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
782.2								782.2' 0.0' RESIDUAL: Stiff, Red, Brown, Silty Fine to Coarse Sandy CLAY, Moist, (A-7-5)
780.0	3.5	3 5 5	1.5	10	SS-3	18.5%		778.2' 6.0' Loose, Tan, Black, Silty Fine to Coarse SAND, Moist, (A-2-4)
775.0	8.5	3 4 4	1.5	8		M		
770.0	13.5	6 7 10	1.5	17		M		770.2' 12.0' Medium Dense, Tan, Black, Silty Fine to Coarse SAND, Moist, (A-2-4)
765.0	18.5	5 6 6	1.5	12		M		
760.0	23.5	4 4 5	1.5	9		M		760.2' 22.0' Loose, Tan, Black, Silty Fine to Coarse SAND, Moist, (A-2-4)
755.0	28.5	4 5 5	1.5	10	SS-4	M		

GROUND WATER ▽

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 3

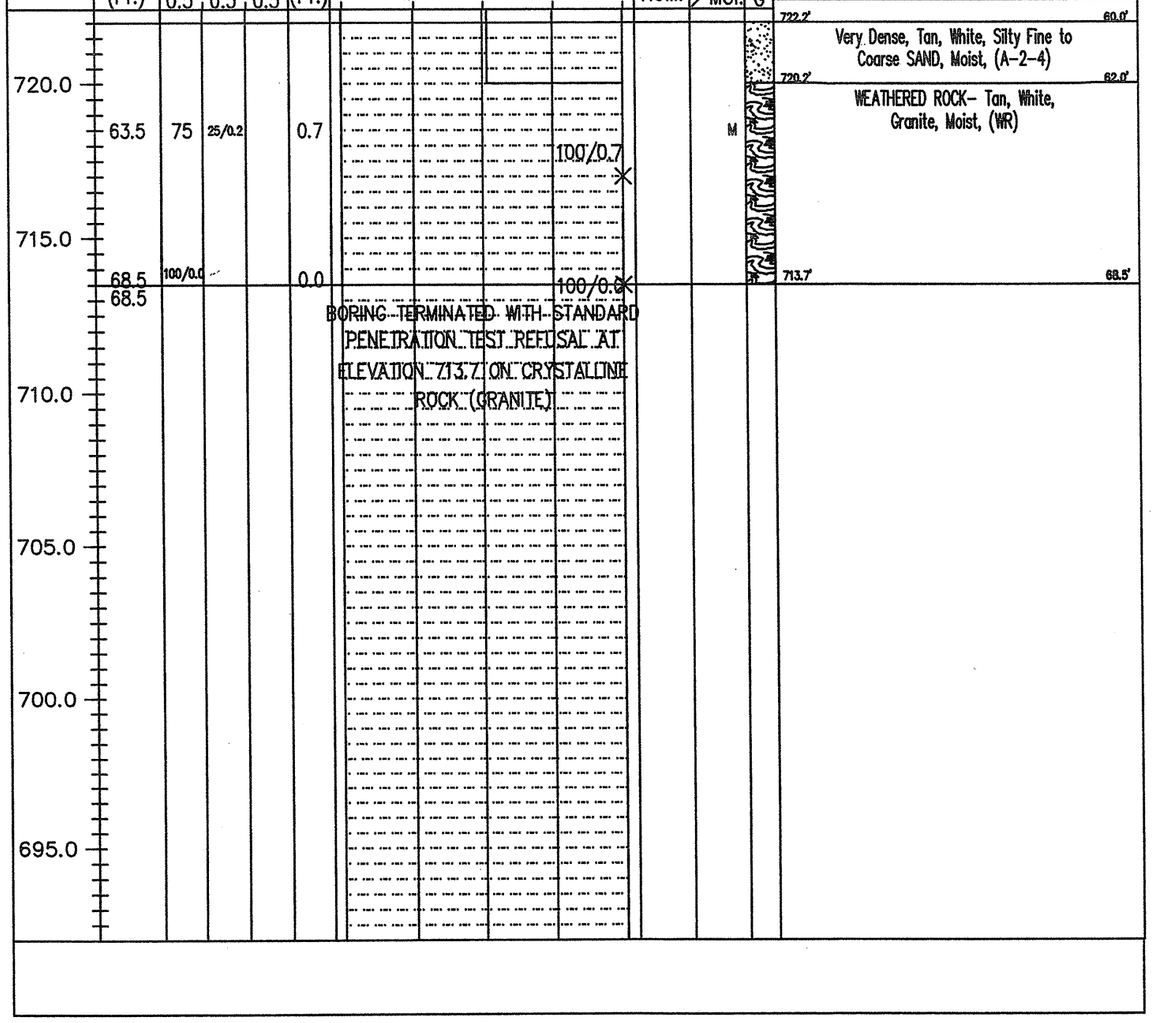
PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. EB1-B	BORING LOCATION 15+72.0	OFFSET 35.0 RT	ALIGNMENT -L-	0 HR. 30.0
COLLAR ELEVATION 782.2	NORTHING 756295.7	EASTING 1629346.4	24 HR. 35.0
TOTAL DEPTH 68.5	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 07-27-05	COMPLETION DATE 07-27-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 68.5

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
752.2' 30.0' Loose, Tan, Black, Silty Fine to Coarse SAND, Wet, (A-2-4)								
750.0	33.5	3 5 5	1.5	10		W		
745.0	38.5	3 5 6	1.5	11		M		745.2' 37.0' Medium Dense, Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-4)
740.0	43.5	6 7 10	1.5	17		M		
735.0	48.5	6 12 18	1.5	30		M		
730.0	53.5	15 12 16	1.5	28		M		
725.0	58.5	8 20 32	1.5	52		M		725.2' 57.0' Very Dense, Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-4)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 3 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. EB1-B	BORING LOCATION 15+72.0	OFFSET 35.0 RT	ALIGNMENT -L-	0 HR. 30.0
COLLAR ELEVATION 782.2	NORTHING 756295.7	EASTING 1629346.4	24 HR. 35.0
TOTAL DEPTH 68.5	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 07-27-05	COMPLETION DATE 07-27-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 68.5



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B1-A	BORING LOCATION 16+27.0	OFFSET 34.0 LT	ALIGNMENT -L-
COLLAR ELEVATION 782.5	NORTHING 756294.9	EASTING 1629426.9	24 HR. 35.0'
TOTAL DEPTH 73.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 08-03-05	COMPLETION DATE 08-03-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 64.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
782.5								782.5' 0.0'
	3.5	5 7 8	1.5	15	SS-5	10.0%		RESIDUAL: Stiff to Medium Stiff, Tan, Fine Sandy Clayey SILT, Moist, (A-5)
780.0								
775.0	8.5	3 3 4	1.5	7	ST-1	M		769.5' 13.0'
770.0	13.5	3 4 6	1.5	10		M		Medium Dense, Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-5)
765.0	18.5	3 5 6	1.5	11	SS-6	M		
760.0	23.5	7 7 14	1.5	21		M		
755.0	28.5	4 6 6	1.5	12		M		

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B1-A	BORING LOCATION 16+27.0	OFFSET 34.0 LT	ALIGNMENT -L-
COLLAR ELEVATION 782.5	NORTHING 756294.9	EASTING 1629426.9	24 HR. 35.0'
TOTAL DEPTH 73.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 08-03-05	COMPLETION DATE 08-03-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 64.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
								752.5' 30.0'
750.0	33.5	4 5 6	1.5	11		M		Medium Dense, Tan, White, Silty Fine SAND, Moist, (A-2-5)
745.0	38.5	4 5 6	1.5	11		M		
740.0	43.5	6 7 8	1.5	15		M		
735.0	48.5	4 6 8	1.5	14		M		
730.0	53.5	17 38 62/0.2	1.2	100/0.7		M		730.5' 52.0' WEATHERED ROCK- Tan, White Granite, Moist, (WR)
725.0	58.5	32 68/0.5	1.0	100/4.0		M		

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 3 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B1-A	BORING LOCATION 16+27.0	OFFSET 34.0 LT	ALIGNMENT -L-	0 HR. 36.4'
COLLAR ELEVATION 782.5	NORTHING 756294.9	EASTING 1629426.9	24 HR. 35.0'
TOTAL DEPTH 73.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 08-03-05	COMPLETION DATE 08-03-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 64.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
								722.5' 60.0' WEATHERED ROCK- Tan, White Granite, Moist, (WR)
720.0	63.5	100/0.5	0.5	100/0.5		D		718.5' 64.0' CRYSTALLINE ROCK-Moderately Severe to Moderate Weathering, Medium Hard to Hard Close Fracture Spacing Tan White and Black Granite, (CR)
715.0					RS-1			714.5' 68.0' CRYSTALLINE ROCK-Moderate Weathering, Moderately Hard, Very Close to Moderately Close Fracture Spacing White and Black Granite, (CR)
710.0	73.0			CORING TERMINATED AT ELEVATION 709.5 IN CRYSTALLINE ROCK (GRANITE)				709.5' 73.0'
705.0								
700.0								
695.0								

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT CORE BORING REPORT

SHEET 1 OF 1

PROJECT NO.: 33066.1.1	ID.: B-3446	COUNTY: Davidson	GEOLOGIST: TJ Roberson
SITE DESCRIPTION: Bridge 415 Over NSRR on SR 1243 (Center Street)			GROUNDWATER (Ft.)
BORING NO. : B1-A	BORING LOCATION: 16+27.0	OFFSET: 34.0 LT	ALIGNMENT: -L-	0 Hr. : 36.4
COLLAR ELEV.: 782.5	NORTHING:756294.9	EASTING:1629426.9	24 Hr.: 35.0
TOTAL DEPTH: 73.0	DRILL MACHINE: CME 55 TM	DRILL METHOD: Rotary	HAMMER TYPE: 140 lb Auto
DATE STARTED: 8-3-05	DATE COMPLETED: 8-3-05	SURFACE WATER DEPTH: N/A	
CORE SIZE: HQ	TOTAL RUN: 9.0	DRILLER: Ameridrill	

ELEV. (Ft.)	DEPTH (Ft.)	RUN (Ft.)	DRILL RATE (Min/Ft.)	RUN REC %	RUN RQD %	SAMP. NO.	STRATA REC %	STRATA RQD %	DESCRIPTION AND REMARKS
									718.5 64.0
718.5	64.0	1	2:25 1:19 2:31 2:42	3.7	1.9		3.7	1.9	Moderately Severe to Moderate Weathering, Medium Hard to Hard Close Fracture Spacing, Tan, White and Black Granite (CR) 4 jts. @ 0-10 deg. 1 jt. @ 10-20 deg. 5 jts @ 30-45 deg.
714.5	68.0	4.0		93	48		93	48	714.5 68.0
714.5		2	1:17 2:01 2:06 2:12 2:19	5.0	3.8	RS-1	5.0	3.9	Moderate Weathering, Moderately Hard, Very Close to Moderately Close Fracture Spacing, White and Black Granite (CR) RS-1 (68.6-69.0 feet) 4 jts. @ 0-10 deg. 2 jts. @ 10-20 deg. 1 jt. @ 20-30 deg. 1 jt @ 30-45 deg. 2 jts. @ 45-60 deg.
709.5	73.0	5.0		100	76		100	76	709.5 73.0
									Coring Terminated at Elevation 709.5 in Crystalline Rock (Granite)

CORE PHOTOGRAPHS

NCDOT PROJECT NO. 33066.1.1 (B-3446)
Bridge 415 over NSRR on SR 1243 (Center Street)
DAVIDSON COUNTY, NORTH CAROLINA
B1-A

Box 1 of 1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B1-C	BORING LOCATION 16+28.0	OFFSET 2.0 RT	ALIGNMENT -L-	0 HR. 35.0
COLLAR ELEVATION 777.3	NORTHING 756276.7	EASTING 1629408.4	24 HR. 32.0
TOTAL DEPTH 75.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 08-05-05	COMPLETION DATE 08-05-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 59.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5'	0.5'	0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
777.3										777.3' 0.0' RESIDUAL: Loose, Tan White, Silty Fine to Coarse SAND, Moist, (A-2-5)
775.0	3.5	3	3	4	1.5	7		M		
770.0	8.5	3	4	6	1.5	10	SS-8	M		
765.0	13.5	3	4	6	1.5	10		M		
760.0	18.5	2	2	4	1.5	6		M		
755.0	23.5	3	4	5	1.5	9		M		
750.0	28.5	4	4	5	1.5	9		M		

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

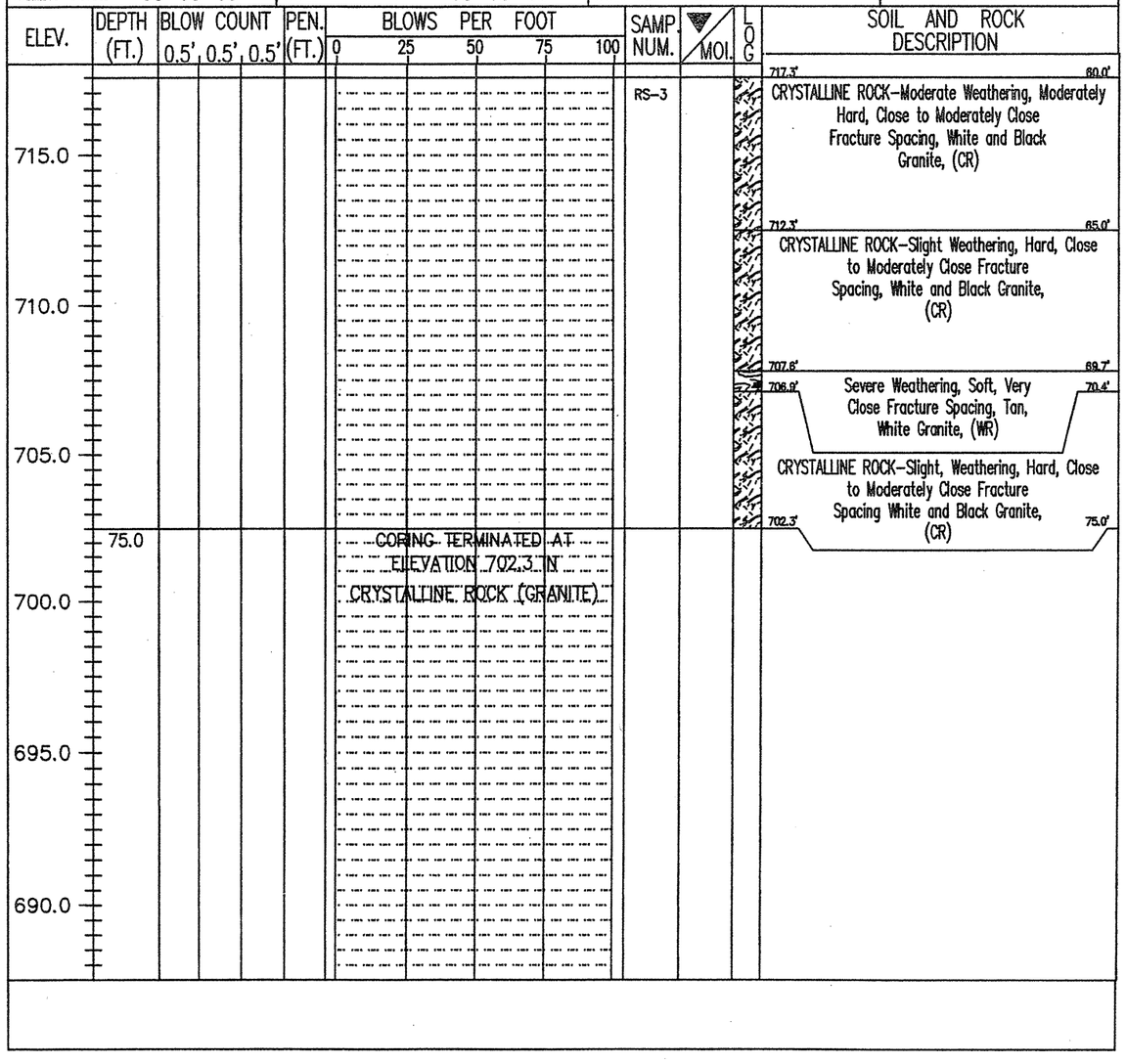
PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B1-C	BORING LOCATION 16+28.0	OFFSET 2.0 RT	ALIGNMENT -L-	0 HR. 35.0
COLLAR ELEVATION 777.3	NORTHING 756276.7	EASTING 1629408.4	24 HR. 32.0
TOTAL DEPTH 75.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 08-05-05	COMPLETION DATE 08-05-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 59.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5'	0.5'	0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
										747.3' 30.0' RESIDUAL: Loose, Tan, White, Silty Fine SAND, Moist, (A-2-5)
745.0	33.5	2	4	6	1.5	10		M		740.3' 37.0' Medium Dense, Tan, White, Silty Fine SAND, Moist, (A-2-4)
740.0	38.5	5	7	9	1.5	16		M		
735.0	43.5	4	5	6	1.5	11		M		
730.0	48.5	7	11	17	1.5	28		M		
725.0	53.5	3	9	18	1.5	27		M		
720.0	58.5	100/0.5			0.5	100/0.5		M		719.3' 58.0' WEATHERED ROCK- Tan, White, Granite, Moist, (WR) 718.3' 59.0' CRYSTALLINE ROCK- Moderate Weathering, Moderately Hard, Close to Moderately Close Fracture Spacing, White and Black Granite (CR)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 3 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B1-C	BORING LOCATION 16+28.0	OFFSET 2.0 RT	ALIGNMENT -L-	0 HR. 35.0
COLLAR ELEVATION 777.3	NORTHING 756276.7	EASTING 1629408.4	24 HR. 32.0
TOTAL DEPTH 75.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 08-05-05	COMPLETION DATE 08-05-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 59.0



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT CORE BORING REPORT

SHEET 1 OF 1

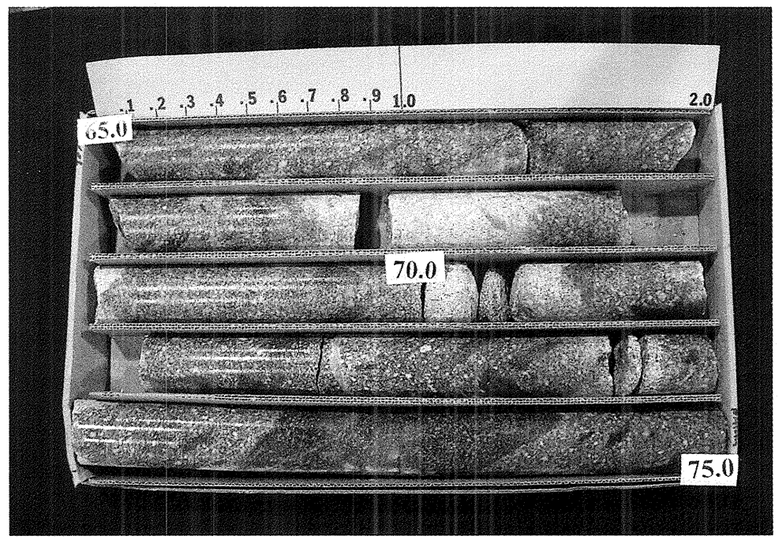
PROJECT NO.: 33066.1.1	ID.: B-3446	COUNTY: Davidson	GEOLOGIST: TJ Roberson
SITE DESCRIPTION: Bridge 415 Over NSRR on SR 1243 (Center Street)			GROUNDWATER (Ft.)
BORING NO.: B1-C	BORING LOCATION: 16+28.0	OFFSET: 41.0 LT	ALIGNMENT: -L-	0 Hr.: 35.0
COLLAR ELEV.: 777.3	NORTHING: 756276.7	EASTING: 1629408.4	24 Hr.: 32.0
TOTAL DEPTH: 75.0	DRILL MACHINE: CME 55 TM	DRILL METHOD: Rotary	HAMMER TYPE: 140 lb Auto
DATE STARTED: 8-5-05	DATE COMPLETED: 8-5-05	SURFACE WATER DEPTH: N/A	
CORE SIZE: HQ	TOTAL RUN: 16.0	DRILLER: Ameridrill	

ELEV. (Ft.)	DEPTH (Ft.)	RUN (Ft.)	DRILL RATE (Min/Ft.)	RUN REC %	RUN RQD %	SAMP. NO.	STRATA REC %	STRATA RQD %	DESCRIPTION AND REMARKS
718.3	59.0	1	2:13	1.0	1.0	RS-3	5.9	4.4	718.3 59.0 Moderate Weathering, Moderately Hard, Close to Moderately Close Fracture Spacing, White and Black Granite (CR) RS-3 (60.3-60.7 feet)
717.3	60.0	1.0		100	100				
717.3	60.0	2	2:01 2:51 2:45 2:53 3:02	4.9	3.4				1 jt. @ 0-10 deg. 4 jts. @ 10-20 deg. 2 jts. @ 20-30 deg. 1 jt. @ 50-60 deg. 1 jt. @ 60-70 deg. 1 jt. @ 70-80 deg.
712.3	65.0	5.0		98	68		98	73	712.3 65.0
712.3	65.0	3	3:10 2:58 2:51 3:11 3:17	4.7	4.7		4.7	4.7	Slight Weathering Hard, Close to Moderately Close Fracture Spacing White and Black Granite (CR) 2jts. @ 0-10 deg. 1 jt. @ 10-20 deg.
707.3	70.0	5.0		94	94		100	100	707.6 69.7
							0.0	0.0	707.6 69.7 Severe Weathering, Soft, Very Close Fracture spacing Tan, White Granite (WR)
707.3	70.0	4	3:04 3:12 3:21 3:17 3:24	4.6	4.4		0.0	0.0	706.9 4 jts. @ 0-10 deg. 70.4
702.3	75.0	5.0		92	88		4.6	4.4	706.9 70.4 Slight Weathering, Hard Close to Moderately Close Fracture Spacing White and Black Granite (CR) 3 jts. @ 0-10 deg.
							100	96	702.3 75.0
									Coring Terminated at Elevation 702.3 in Crystalline Rock (Granite)

CORE PHOTOGRAPHS

NCDOT PROJECT NO. 33066.1.1 (B-3446)
Bridge 415 over NSRR on SR 1243 (Center Street)
DAVIDSON COUNTY, NORTH CAROLINA
B1-C

Box 1 of 2



Box 2 of 2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B1-B	BORING LOCATION 16+23.0	OFFSET 41.0 RT	ALIGNMENT -L-	0 HR. 40.0'
COLLAR ELEVATION 781.4	NORTHING 756254.1	EASTING 1629376.2	24 HR. 34.2'
TOTAL DEPTH 85.6	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTAR	HAMMER TYPE 140lb. AUTO
START DATE 08-04-05	COMPLETION DATE 08-04-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 75.6

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
781.4								781.4' 0.0' RESIDUAL: Stiff, Tan, Orange, Fine to Coarse Sandy SILT, Moist, (A-4)
	3.5	4 5 5	1.5	10	SS-7	10.2%		775.4' 6.0' Loose, Tan, White, Silty Fine SAND, Moist, (A-2-4)
775.0								
	8.5	2 2 3	1.5	5	ST-2	M		
770.0								
	13.5	3 3 4	1.5	7		M		
765.0								
	18.5	4 4 4	1.5	8		M		
760.0								
	23.5	4 5 7	1.5	12		M		759.4' 22.0' Medium Dense, Tan, White, Silty Fine SAND, Moist, (A-2-4)
755.0								
	28.5	3 4 5	1.5	9		M		753.4' 28.0' Loose, Tan' White, Silty Fine SAND, Moist, (A-2-4)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B1-B	BORING LOCATION 16+23.0	OFFSET 41.0 RT	ALIGNMENT -L-	0 HR. 40.0'
COLLAR ELEVATION 781.4	NORTHING 756254.1	EASTING 1629376.2	24 HR. 34.2'
TOTAL DEPTH 85.6	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTAR	HAMMER TYPE 140lb. AUTO
START DATE 08-04-05	COMPLETION DATE 08-04-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 75.6

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
								751.4' 30.0' Loose, Tan, White, Silty Fine SAND, Moist, (A-2-4)
750.0	33.5	3 4 7	1.5	11		M		749.4' 32.0' Medium Dense, Tan, Black, Silty Fine SAND, Moist, (A-2-4)
745.0	38.5	5 9 14	1.5	23		M		
740.0	43.5	8 11 14	1.5	25		M		
735.0	48.5	7 8 17	1.5	25		M		
730.0	53.5	50 50/0.4	0.9	100/0.9		M		728.4' 53.0' WEATHERED ROCK-Tan, White Granite, Moist, (WR)
725.0	58.5	16 26 32	1.5	58		M		724.4' 57.0' Very Dense, Tan, White, Silty Fine SAND, Moist, (A-2-4)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 3 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B1-B	BORING LOCATION 16+23.0	OFFSET 41.0 RT	ALIGNMENT -L-	0 HR. 40.0'
COLLAR ELEVATION 781.4	NORTHING 756254.1	EASTING 1629376.2	24 HR. 34.2'
TOTAL DEPTH 85.6	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTAR	HAMMER TYPE 140lb. AUTO
START DATE 08-04-05	COMPLETION DATE 08-04-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 75.6

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
720.0								721.4' 60.0' Very Dense, Tan, White, Silty Fine SAND, Moist, (A-2-4)
	63.5	32 (68/0.5)	1.0	100/1.0		M		718.4' 63.0' WEATHERED ROCK- Tan, White, Granite, Moist to Dry, (WR)
715.0	68.5	100/0.5	0.5	100/0.5		D		
710.0	73.5	100/0.5	0.5	100/0.5		D		707.4' 74.0' Severe Weathering, Soft, Very Close Fracture Spacing, Tan, White Granite, (WR)
705.0	75.5	60/0.1	0.1	60/0.1	RS-2			705.8' 75.6' CRYSTALLINE ROCK- Moderately Severe Weathering, Medium to Moderately Hard, Very Close to Moderately Close Fracture Spacing Tan, White Granite, (CR)
700.0								700.8' 80.6' CRYSTALLINE ROCK-Moderate Weathering, Moderately Hard to Hard, Close to Moderately Close Fracture Spacing, Tan, White Granite, (CR)
695.0	85.6			CORING TERMINATED AT ELEVATION 695.8 IN CRYSTALLINE ROCK (GRANITE)				695.8 85.6'

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT CORE BORING REPORT

SHEET 1 OF 1

PROJECT NO.: 33066.1.1	ID.: B-3446	COUNTY: Davidson	GEOLOGIST: TJ Roberson
SITE DESCRIPTION: Bridge 415 Over NSRR on SR 1243 (Center Street)			GROUNDWATER (Ft.)
BORING NO. : B1-B	BORING LOCATION: 16+23.0	OFFSET: 41.0 LT	ALIGNMENT: -L-	0 Hr. : 40.0
COLLAR ELEV.: 781.4	NORTHING: 756254.1	EASTING:1629376.2	24 Hr.: 34.2
TOTAL DEPTH: 85.6	DRILL MACHINE: CME 55 TM	DRILL METHOD: Rotary	HAMMER TYPE: 140 lb auto
DATE STARTED: 8-4-05	DATE COMPLETED: 8-4-05	SURFACE WATER DEPTH: N/A	
CORE SIZE: HQ	TOTAL RUN: 11.5	DRILLER: Ameridrill	

ELEV. (Ft.)	DEPTH (Ft.)	RUN (Ft.)	DRILL RATE (Min/Ft.)	RUN REC %	RUN RQD %	SAMP. NO.	STRATA REC %	STRATA RQD %	DESCRIPTION AND REMARKS
707.4	74.0	1	0:42	0.0	0.0		0.0	0.0	707.4 74.0 Severe Weathering. Soft, Very Close Fracture Spacing, Tan, White Granite (WR) No Recovery
			0.5/0:27						
705.9	75.5	1.5		0	0		0	0	705.9 75.5
705.9 705.8	75.5 75.6	NA							705.9 (SPT– 60/0.1) 75.5 705.8 75.6
705.8	75.6	2	0:57	2.2	1.4	RS-2	2.2	1.4	705.8 75.6 Moderately Severe Weathering, Medium to Moderately Hard, Very Close to Moderately Close Fracture Spacing, Tan, White Granite (CR) RS-2 (76.6-77.0 feet) 7 jts. @ 0-10 deg. 1 jt @ 10-20 deg. 1 jt. @ 30-40 deg.
			1:05						
			1:19						
			1:12						
700.8	80.6	5.0	1:15	44	28		44	28	700.8 80.6
700.8	80.6	3	1:51	4.7	4.4		4.7	4.4	Moderate Weathering, Moderately Hard to Hard, Close to Moderately Close Fracture Spacing, Tan, White Granite (CR) 1 jt. @ 0-10 deg.
			2:02						
			2:11						
			2:16						
695.8	85.6	5.0	2:28	94	88		94	88	695.8 85.6
									Coring Terminated at Elevation 695.8 in Crystalline Rock (Granite)

CORE PHOTOGRAPHS

NCDOT PROJECT NO. 33066.1.1 (B-3446)
Bridge 415 over NSRR on SR 1243 (Center Street)
DAVIDSON COUNTY, NORTH CAROLINA
B1-B

Box 1 of 1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B2-A	BORING LOCATION 17+44.0	OFFSET 24.5 LT	ALIGNMENT -L-	0 HR. 40.0
COLLAR ELEVATION 784.1	NORTHING 756205.0	EASTING 1629503.9	24 HR. 36.0
TOTAL DEPTH 89.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTAR	HAMMER TYPE 140lb. AUTO
START DATE 07-28-05	COMPLETION DATE 07-28-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 69.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
784.1								784.1' 0.0' RESIDUAL: Stiff, Red, Brown, Fine to Coarse Sandy Clayey SILT, Moist, (A-5)
780.0	3.5	3 4 5	1.5	9		M		
775.0	8.5	2 4 5	1.5	9	SS-9	21.7%		
772.1	12.0							Loose, Tan, Brown, Silty Fine SAND, Moist, (A-2-4)
770.0	13.5	2 4 4	1.5	8		M		
767.1	17.0							Loose, Tan, White, , Silty Fine SAND, Moist, (A-2-4)
765.0	18.5	3 4 4	1.5	8		M		
760.0	23.5	3 4 4	1.5	8		M		
755.0	28.5	2 3 5	1.5	8		W		

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B2-A	BORING LOCATION 17+44.0	OFFSET 24.5 LT	ALIGNMENT -L-	0 HR. 40.0
COLLAR ELEVATION 784.1	NORTHING 756205.0	EASTING 1629503.9	24 HR. 36.0
TOTAL DEPTH 89.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTAR	HAMMER TYPE 140lb. AUTO
START DATE 07-28-05	COMPLETION DATE 07-28-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 69.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
754.1								754.1' 30.0' Loose, Tan, White, Silty Fine SAND, Moist, (A-2-4)
750.0	33.5	2 3 4	1.5	7		W		
745.0	38.5	3 4 6	1.5	10		M		
740.0	43.5	2 4 6	1.5	10		M		
737.1	47.0							Medium Dense, Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-4)
735.0	48.5	4 5 9	1.5	14	SS-10	M		
730.0	53.5	6 11 19	1.5	30		M		
727.1	57.0							WEATHERED ROCK- Tan, White, Granite, Moist (WR)
725.0	58.5	19 45 55/0.4	1.4	100/0.9		M		

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 3 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B2-A	BORING LOCATION 17+44.0	OFFSET 24.5 LT	ALIGNMENT -L-	0 HR. 40.0
COLLAR ELEVATION 784.1	NORTHING 756205.0	EASTING 1629503.9	24 HR. 36.0
TOTAL DEPTH 89.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTARY	HAMMER TYPE 140lb. AUTO
START DATE 07-28-05	COMPLETION DATE 07-28-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 69.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
								724.1' 69.0' WEATHERED ROCK- Tan, White, Granite, Moist, (WR)
720.0	63.5	70 30/0.1	0.6	100/0.6		D		
715.0	68.5	100/0.5	0.5	100/0.5		D		715.1' 69.0' CRYSTALLINE ROCK- Moderately Severe Weathering, Medium Hard, Very Close to Close Fracture Spacing Tan White and Black Granite, (CR)
710.0								713.0' 71.1' CRYSTALLINE ROCK-Moderate to Slight Weathering, Hard, Close to Moderately Close Fracture Spacing White and Black Granite, (CR)
705.0					RS-4			710.1' 74.0' CRYSTALLINE ROCK-Slight to Very Slight Weathering, Hard to Very Hard, Moderately Close to Wide Fracture Spacing White and Black Granite, (CR)
700.0								
695.0	89.0			CORING TERMINATED AT ELEVATION 695.1 IN CRYSTALLINE ROCK (GRANITE)				695.1' 89.0'

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT CORE BORING REPORT

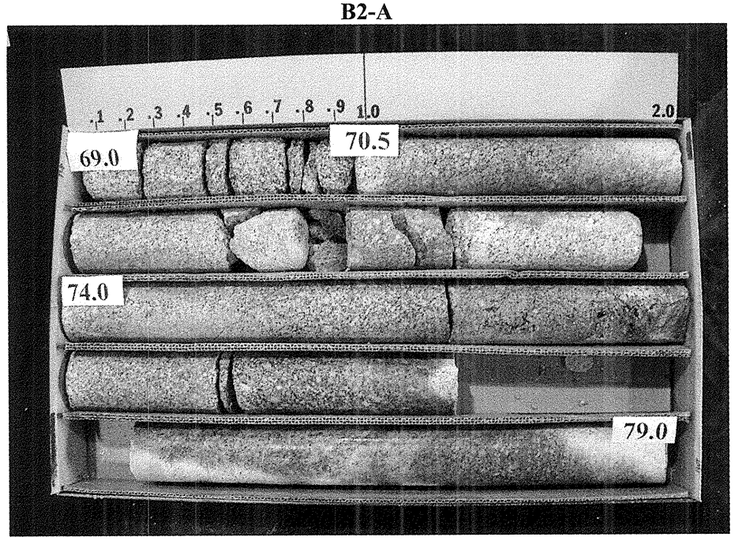
SHEET 1 OF 1

PROJECT NO.: 33066.1.1	ID.: B-3446	COUNTY: Davidson	GEOLOGIST: TJ Roberson
SITE DESCRIPTION: Bridge 415 Over NSRR on SR 1243 (Center Street)			GROUNDWATER (Ft.)
BORING NO.: B2-A	BORING LOCATION: 17+44.0	OFFSET: 24.5 LT	ALIGNMENT: -L-	0 Hr.: 40.0
COLLAR ELEV.: 784.1	NORTHING: 756205.0	EASTING: 1629503.9	24 Hr.: 36.0
TOTAL DEPTH: 89.0	DRILL MACHINE: CME 55 TM	DRILL METHOD: Rotary	HAMMER TYPE: 140 lb Auto
DATE STARTED: 7-28-05	DATE COMPLETED: 7-29-05	SURFACE WATER DEPTH: N/A	
CORE SIZE: HQ	TOTAL RUN: 20.0	DRILLER: Ameridrill	

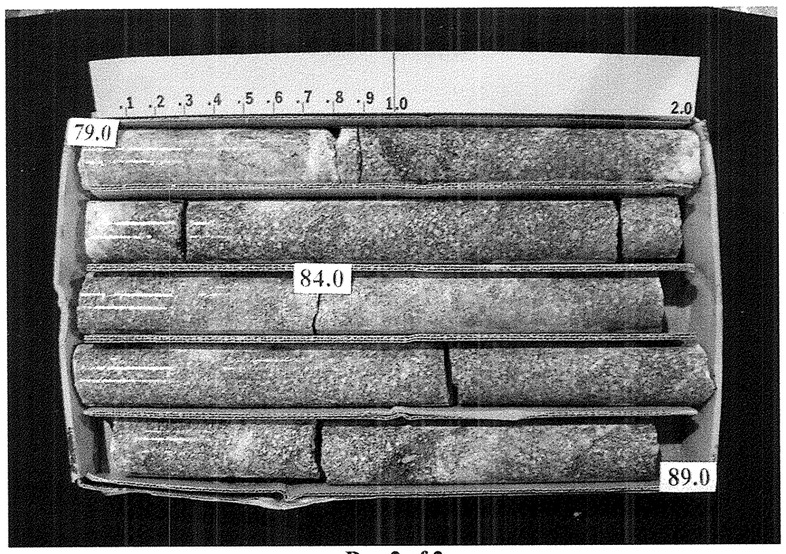
ELEV. (Ft.)	DEPTH (Ft.)	RUN (Ft.)	DRILL RATE (Min/Ft.)	RUN REC %	RUN RQD %	SAMP. NO.	STRATA REC %	STRATA RQD %	DESCRIPTION AND REMARKS
									715.1 69.0
715.1	69.0	1	1:12	0.95	0.0		0.95	0.0	Moderately Severe Weathering, Medium Hard, Very Close to Close Fracture Spacing, Tan, White and Black Granite (CR)
			:36 /0.5						
									7 jts. @ 0-10 deg.
713.6	70.5	1.5		63	0		45	0	713.0 71.1
713.6	70.5	2	1:27	2.9	2.2		2.9	2.2	713.0 71.1
			1:31						Moderate to Slight Weathering, Hard to Very Hard, Moderately Close to Wide Fracture Spacing, White and Black Granite (CR)
			1:52						
			1:01/0.5						4 jts @ 0-10deg. 2 jts. @ 30-40 deg.
710.1	74.0	3.5		83	63		100	76	710.1 74.0
710.1	74.0	3	2:42	5.0	4.9	RS-4	14.9	14.7	Slight to Very Slight Weathering, Hard to Very Hard, Moderately Close to Wide Fracture Spacing, White and Black Granite (CR)
			2:51						
			2:58						RS-4 (77.0-77.7 feet)
			3:11						
705.1	79.0	5.0	3:16	100	98				
705.1	79.0	4	4:34	4.9	4.9				12 jts. @ 0-10 deg.
			4:12						
			4:15						
			4:26						
700.1	84.0	5.0	4:30	98	98				
700.1	84.0	5	4:24	5.0	5.0				
			4:34						
			4:28						
			4:32						
695.1	89.0	5.0	4:42	100	100		99	98	695.1 89.0
									Coring Terminated at Elevation 695.1 in Crystalline Rock (Granite)

CORE PHOTOGRAPHS

NCDOT PROJECT NO. 33066.1.1 (B-3446)
Bridge 415 over NSRR on SR 1243 (Center Street)
DAVIDSON COUNTY, NORTH CAROLINA
B2-A



Box 1 of 2



Box 2 of 2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B2-C	BORING LOCATION 17+31.0	OFFSET 5.0 LT	ALIGNMENT -L-	0 HR. 42.2
COLLAR ELEVATION 783.4	NORTHING 756203.3	EASTING 1629480.1	24 HR. 38.1
TOTAL DEPTH 85.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTAR	HAMMER TYPE 140lb. AUTO
START DATE 08-08-05	COMPLETION DATE 08-08-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 70.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
783.4								783.4' 0.0' PAVEMENT STRUCTURE- 4 inches of Asphaltic Concrete over 6 inches of Portland Cement Concrete 782.6' 0.8' RESIDUAL: Loose, Tan, White, Silty Fine SAND, Moist, (A-2-4)
780.0	3.5	1 2 3	1.5	5		W		
775.0	8.5	1 2 3	1.5	5		M		
770.0	13.5	2 3 3	1.5	6		M		
765.0	18.5	2 2 3	1.5	5		M		
760.0	23.5	2 3 4	1.5	7		M		
755.0	28.5	5 5 6	1.5	11	SS-11	M		756.4' 27.0' Medium Dense, Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-4)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B2-C	BORING LOCATION 17+31.0	OFFSET 5.0 LT	ALIGNMENT -L-	0 HR. 42.2
COLLAR ELEVATION 783.4	NORTHING 756203.3	EASTING 1629480.1	24 HR. 38.1
TOTAL DEPTH 85.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTAR	HAMMER TYPE 140lb. AUTO
START DATE 08-08-05	COMPLETION DATE 08-08-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 70.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
								753.4' 30.0' Medium Dense, Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-4)
750.0	33.5	3 5 6	1.5	11		M		
745.0	38.5	5 6 9	1.5	15		M		
740.0	43.5	4 5 7	1.5	12		M		
735.0	48.5	4 4 6	1.5	10		M		
730.0	53.5	4 11 21	1.5	32		M		
725.0	58.5	15 19 21	1.5	40		M		731.4' 52.0' Dense, Tan, White, Silty Fine SAND, Moist, (A-2-4)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 3 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B2-C	BORING LOCATION 17+31.0	OFFSET 5.0 LT	ALIGNMENT -L-	0 HR. 42.2
COLLAR ELEVATION 783.4	NORTHING 756203.3	EASTING 1629480.1	24 HR. 38.1
TOTAL DEPTH 85.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTARY	HAMMER TYPE 140lb. AUTO
START DATE 08-08-05	COMPLETION DATE 08-08-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 70.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
								723.4' 60.0' Dense, Tan, White, Silty Fine SAND, Moist, (A-2-4)
								721.4' 62.0' WEATHERED ROCK- Tan, White, Granite, Moist, (WR)
720.0	63.5	15 45 55/0.4	1.4	100/0.9		M		
715.0	68.5	24 76/0.5	1.0	100/1.0		M		713.4' 70.0' CRYSTALLINE ROCK- Moderately Severe Weathering, Moderately Hard to Hard, Very Close to Close Fracture Spacing White and Black Granite, (CR)
710.0					RS-6			708.4' 75.0' CRYSTALLINE ROCK-Slight to Very Slight Weathering, Hard to Very Hard, Moderately Close to Wide Fracture Spacing White and Black Granite, (CR)
705.0								
700.0								698.4' 85.0'
695.0	85.0	CORING TERMINATED AT ELEVATION 698.4 IN CRYSTALLINE ROCK (GRANITE)						

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT CORE BORING REPORT

SHEET 1 OF 1

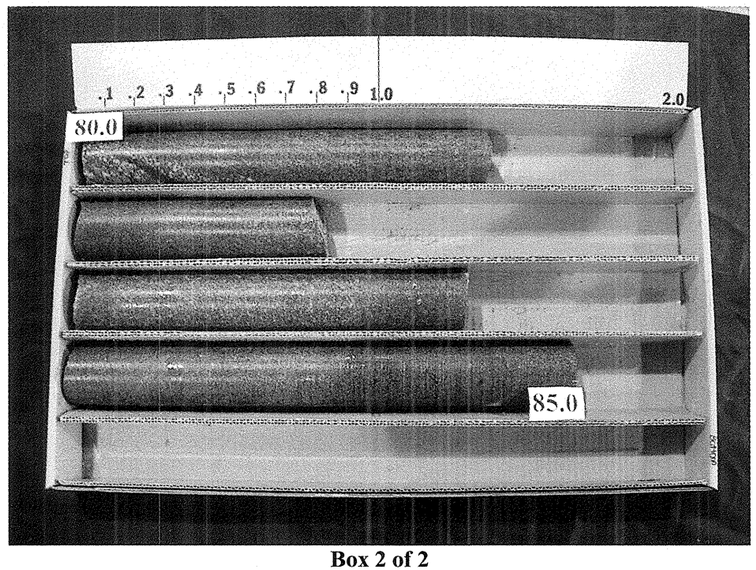
PROJECT NO.: 33066.1.1	ID.: B-3446	COUNTY: Davidson	GEOLOGIST: TJ Roberson
SITE DESCRIPTION: Bridge 415 Over NSRR on SR 1243 (Center Street)			GROUNDWATER (Ft.)
BORING NO. : B2-C	BORING LOCATION: 17+31.0	OFFSET: 5.0 LT	ALIGNMENT: -L-	0 Hr. : 42.2
COLLAR ELEV.: 783.4	NORTHING: 756203.3	EASTING: 1629480.1	24 Hr.: 38.1
TOTAL DEPTH: 85.0	DRILL MACHINE: CME 55 TM	DRILL METHOD: Rotary	HAMMER TYPE: 140 lb Auto
DATE STARTED: 8-8-05	DATE COMPLETED: 8-8-05	SURFACE WATER DEPTH: N/A	
CORE SIZE: HQ	TOTAL RUN: 15.0	DRILLER: Ameridrill	

ELEV. (Ft.)	DEPTH (Ft.)	RUN (Ft.)	DRILL RATE (Min/Ft.)	RUN REC %	RUN RQD %	SAMP. NO.	STRATA REC %	STRATA RQD %	DESCRIPTION AND REMARKS
									713.4 70.0
713.4	70.0	1	1:36	2.8	0.7		2.8	0.7	Moderately Severe Weathering, Moderately Hard to Hard, Very Close to Close Fracture Spacing, White and Black Granite (CR)
			1:32						
			1:19						13 jts. @ 0-10 deg.
			1:25						3 jjts. @ 10-20 deg.
708.4	75.0	5.0	1:41	56	14		56	14	2 jts. @ 30-40 deg. 708.4 75.0
708.4	75.0	2	1:58	4.7	4.6	RS-6	9.7	9.6	Slight to Very Slight Weathering, Hard to Very Hard, Moderately Close to Wide Fracture Spacing, White and Black Granite (CR)
			2:05						
			2:13						RS-6 (76.3-76.7 feet)
			2:17						
703.4	80.0	5.0	2:21	94	92				7 jts. @ 0-10 deg.
703.4	80.0	3	2:18	5.0	5.0				1 jt. @ 10-20 deg.
			2:25						2 jts. @ 40-50 deg.
			2:29						
			3:01						
698.4	85.0	5.0	2:57	100	100		97	96	698.4 85.0
									Coring Terminated at Elevation 698.4 in Crystalline Rock (Granite)

CORE PHOTOGRAPHS

NCDOT PROJECT NO. 33066.1.1 (B-3446)
Bridge 415 over NSRR on SR 1243 (Center Street)
DAVIDSON COUNTY, NORTH CAROLINA
B2-C

Box 1 of 2



Box 2 of 2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B2-B	BORING LOCATION 17+40.0	OFFSET 17.0 RT	ALIGNMENT -L-	0 HR. 37.0
COLLAR ELEVATION 784.0	NORTHING 756182.0	EASTING 1629469.1	24 HR. 34.8
TOTAL DEPTH 86.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTAR	HAMMER TYPE 140lb. AUTO
START DATE 08-10-05	COMPLETION DATE 08-10-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 66.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
783.9								784.0' 0.0' 783.3' 0.7' PAVEMENT STRUCTURE- 8 inches of Asphaltic Concrete
780.0	3.5	1 2 8	1.5	10		M		RESIDUAL: Very Loose and Loose, Brown, Orange and Tan, Silty Fine SAND, Moist, (A-2-4)
775.0	8.5	2 1 2	1.5	3		M		
770.0	13.5	2 4 4	1.5	8		M		
765.0	18.5	2 3 4	1.5	7		M		
760.0	23.5	3 4 4	1.5	8		M		
755.0	28.5	4 4 5	1.5	9		M		

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B2-B	BORING LOCATION 17+40.0	OFFSET 17.0 RT	ALIGNMENT -L-	0 HR. 37.0
COLLAR ELEVATION 784.0	NORTHING 756182.0	EASTING 1629469.1	24 HR. 34.8
TOTAL DEPTH 86.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTAR	HAMMER TYPE 140lb. AUTO
START DATE 08-10-05	COMPLETION DATE 08-10-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 66.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
750.0	33.5	4 5 7	1.5	12		M		753.9' 30.0' RESIDUAL: Very Loose and Loose,Brown, Orange and Tan, Silty Fine SAND, Moist, (A-2-4) 750.9' 33.0' Medium Dense, Tan, White, Silty Fine SAND, Moist, (A-2-4)
745.0	38.5	3 4 7	1.5	11		M		
740.0	43.5	5 8 9	1.5	17		M		
735.0	48.5	10 12 15	1.5	27		M		
730.0	53.5	11 20 24	1.5	44		M		731.9' 52.0' Dense, Tan, White, Silty Fine SAND, Moist, (A-2-4)
725.0	58.5	60/0.2	0.2	60/0.2		M		725.9' 58.0' WEATHERED ROCK- Tan, White, Granite, Moist, (WR)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 3 OF 3

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. B2-B	BORING LOCATION 17+40.0	OFFSET 17.0 RT	ALIGNMENT -L-	0 HR. 37.0
COLLAR ELEVATION 784.0	NORTHING 756182.0	EASTING 1629469.1	24 HR. 34.8
TOTAL DEPTH 86.0	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH/ROTAR	HAMMER TYPE 140lb. AUTO
START DATE 08-10-05	COMPLETION DATE 08-10-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 66.0

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
								723.9' 60.0'
720.0	63.5	100/0.5	0.5	100/0.5		D		WEATHERED ROCK- Tan, White, Granite, Moist, (WR)
					RS-5			717.9' 66.0' CRYSTALLINE ROCK- Moderate to Moderately Severe Weathering, Moderately Hard to Medium Hard, Moderately Close to Very Close Fracture Spacing Tan, White and Black Granite, (CR)
715.0								711.5' 72.4'
								CRYSTALLINE ROCK-Moderate to Slight, Weathering, Moderately Hard, Close to Moderately Close Fracture Spacing, Tan White and Black to White and Black Granite, (CR)
710.0								707.9' 76.0'
								CRYSTALLINE ROCK-Slight to Very Slight Weathering, Hard, Moderately Close to Wide Fracture Spacing, White and Black Granite, (CR)
705.0								
700.0								697.9' 86.0'
	86.0			CORING TERMINATED AT ELEVATION 697.9 IN CRYSTALLINE ROCK (GRANITE)				
695.0								

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT CORE BORING REPORT

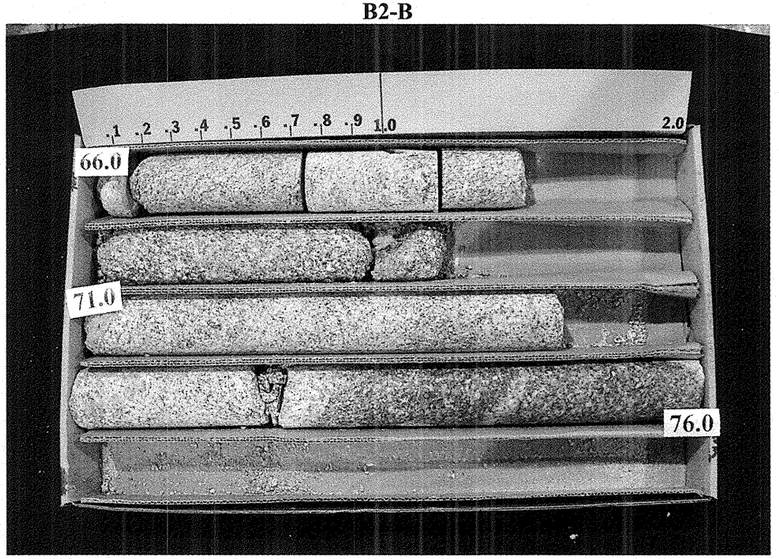
SHEET 1 OF 1

PROJECT NO.: 33066.1.1	ID.: B-3446	COUNTY: Davidson	GEOLOGIST: TJ Roberson
SITE DESCRIPTION: Bridge 415 Over NSRR on SR 1243 (Center Street)			GROUNDWATER (Ft.)
BORING NO. : B2-B	BORING LOCATION: 17+40.0	OFFSET: 17.0 RT	ALIGNMENT: -L-	0 Hr. : 37.0
COLLAR ELEV.: 784.0	NORTHING: 756182.0	EASTING: 1629469.1	24 Hr.: 34.8
TOTAL DEPTH: 86.0	DRILL MACHINE: CME 55 TM	DRILL METHOD: Rotary	HAMMER TYPE: 140 lb Auto
DATE STARTED: 8-10-05	DATE COMPLETED: 8-10-05	SURFACE WATER DEPTH: N/A	
CORE SIZE: HQ	TOTAL RUN: 20.0	DRILLER: Ameridrill	

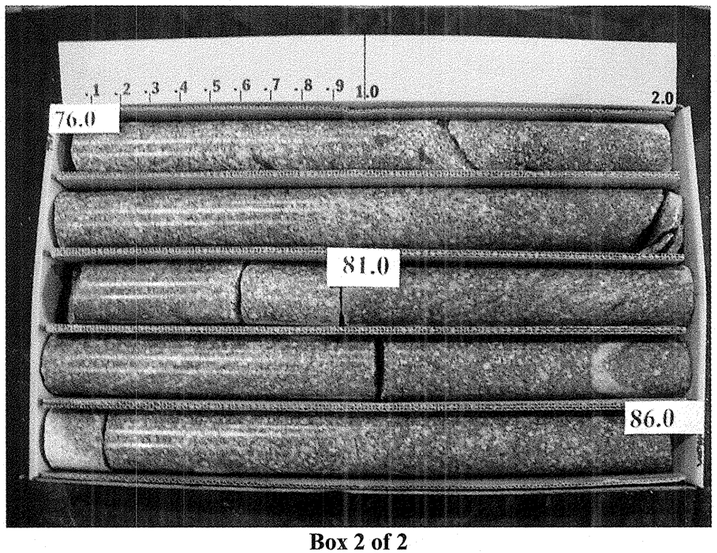
ELEV. (Ft.)	DEPTH (Ft.)	RUN (Ft.)	DRILL RATE (Min/Ft.)	RUN REC %	RUN RQD %	SAMP. NO.	STRATA REC %	STRATA RQD %	DESCRIPTION AND REMARKS
									717.9 66.0
717.9	66.0	1	1:36 1:42 2:21 2:19 2:25	2.6	2.2	RS-5	2.6	2.2	Moderate to Moderately Severe Weathering, Moderately Hard to Medium Hard, Moderately Close to Very Close Fracture Spacing, Tan, White and Black Granite (CR) RS-5 (66.5-66.9) feet 4 jts. @ 0-10 deg.
712.9	71.0	5.0		52	44				
712.9	71.0	2	1:02 0:55 1:13 1:17 1:22	3.6	3.5		41	34	711.5 72.4
							3.6	3.5	711.6 Moderate to Slight Weathering, Moderately Hard, Close to Moderately Close Fracture Spacing, Tan, White and Black to White and Black Granite (CR) 2 jts. @ 0-10 deg.
707.9	76.0	5.0		72	70		100	97	707.9 76.0
707.9	76.0	3	2:27 2:05 2:19 3:05 4:12	5.0	5.0		10.0	10.0	Slight to Very Slight Weathering, Hard, Moderately Close to Wide Fracture Spacing, White and Black Granite (CR) 4 jts. @ 0-10 deg. 1 jt. @ 20-30 deg. 1 jt. @ 40-50 deg.
702.9	81.0	5.0		100	100				
702.9	81.0	4	2:59 3:02 3:10 3:19 4:17	5.0	5.0				
697.9	86.0	5.0		100	100		100	100	697.9 86.0
									Coring Terminated at Elevation 697.9 in Crystalline Rock (Granite)

CORE PHOTOGRAPHS

NCDOT PROJECT NO. 33066.1.1 (B-3446)
Bridge 415 over NSRR on SR 1243 (Center Street)
DAVIDSON COUNTY, NORTH CAROLINA
B2-B



Box 1 of 2



Box 2 of 2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 2

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. EB2-A	BORING LOCATION 18+03.0	OFFSET 26.5 LT	ALIGNMENT -L-	0 HR. DRY
COLLAR ELEVATION 783.1	NORTHING 756159.6	EASTING 1629542.3	24 HR. 38.0
TOTAL DEPTH 52.5	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 07-28-05	COMPLETION DATE 07-28-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 52.5

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
783.1								783.1' 0.0' PAVEMENT STRUCTURE- 1 inch of Asphaltic Concrete over 1 inch of Crushed Stone 782.9' 0.2'
780.0	3.5	4 7 9	1.5	16	SS-12	19.3%		RESIDUAL: Very Stiff, Orange, Brown, Fine to Coarse Sandy Silty CLAY, Moist, (A-7-5)
								777.1' 6.0' Loose, Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-4)
775.0	8.5	3 3 5	1.5	8		M		
770.0	13.5	4 5 5	1.5	10		M		
765.0	18.5	4 4 4	1.5	8		M		
760.0	23.5	3 4 6	1.5	10		M		
755.0	28.5	3 3 4	1.5	7		W		

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 2

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. EB2-A	BORING LOCATION 18+03.0	OFFSET 26.5 LT	ALIGNMENT -L-	0 HR. DRY
COLLAR ELEVATION 783.1	NORTHING 756159.6	EASTING 1629542.3	24 HR. 38.0
TOTAL DEPTH 52.5	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 07-28-05	COMPLETION DATE 07-28-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 52.5

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
753.1'								753.1' 30.0' Loose, Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-4)
750.0	33.5	3 4 5	1.5	9		W		
745.0	38.5	3 4 6	1.5	10		M		
740.0	43.5	2 4 6	1.5	10		M		
735.0	48.5	100/0.5	0.5	100/0.5		M		735.1' 48.0' WEATHERED ROCK- Tan, White, Granite, Moist, (WR)
730.0	52.5	60/0.0	0.0	60/0.0				730.6' 52.5' BORING TERMINATED WITH STANDARD PENETRATION TEST REFUSAL AT ELEVATION 730.6 ON CRYSTALLINE ROCK (GRANITE)
725.0								

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 2

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. EB2-B	BORING LOCATION 18+06.0	OFFSET 14.0 RT	ALIGNMENT -L-	0 HR. 39.0
COLLAR ELEVATION 782.7	NORTHING 756132.3	EASTING 1629512.1	24 HR. 36.7
TOTAL DEPTH 58.5	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 08-11-05	COMPLETION DATE 08-11-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 58.5

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
782.7								782.7' 0.0' PAVEMENT STRUCTURE- 8 inches of Asphaltic Concrete 782.0' 0.7'
								RESIDUAL: Stiff, Tan, Brown, Fine to Coarse Sandy Silty CLAY, Dry, (A-7-5)
780.0	3.5	4 7 6	1.5	15	SS-13	6.4%		778.7' 6.0' Loose to Medium Dense, Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-4)
775.0	8.5	3 4 4	1.5	8		M		
770.0	13.5	3 4 5	1.5	9		M		
765.0	18.5	3 5 6	1.5	11	SS-14	M		
760.0	23.5	3 5 7	1.5	12		M		
755.0	28.5	3 4 6	1.5	10		M		

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

SHEET 2 OF 2

PROJECT NO. 33066.1.1	ID. B-3446	COUNTY DAVIDSON	GEOLOGIST TJ ROBERSON
SITE DESCRIPTION BRIDGE 415 OVER NSRR ON SR 1243 (CENTER STREET)			GROUND WATER
BORING NO. EB2-B	BORING LOCATION 18+06.0	OFFSET 14.0 RT	ALIGNMENT -L-	0 HR. 39.0
COLLAR ELEVATION 782.7	NORTHING 756132.3	EASTING 1629512.1	24 HR. 36.7
TOTAL DEPTH 58.5	DRILL MACHINE CME 55 TM	DRILL METHOD HSA 2.25 INCH	HAMMER TYPE 140lb. AUTO
START DATE 08-11-05	COMPLETION DATE 08-11-05	SURFACE WATER DEPTH NA	DEPTH TO ROCK 58.5

ELEV.	DEPTH (FT.)	BLOW COUNT 0.5', 0.5', 0.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMP. NUM.	MOI.	LOG	SOIL AND ROCK DESCRIPTION
750.0	33.5	3 5 7	1.5	12		M		752.7' 30.0' RESIDUAL: Medium Dense, Tan, Brown to Tan, White, Silty Fine to Coarse SAND, Moist, (A-2-4)
745.0	38.5	4 5 12	1.5	17		M		
740.0	43.5	16 18 26	1.5	44		M		740.7' 42.0' Dense Tan, White, Silty Fine SAND, Moist, (A-2-4)
735.0	48.5	3 8 12	1.5	20		M		734.7' 48.0' Medium Dense Tan, White, Silty Fine SAND, Moist, (A-2-4)
730.0	53.5	41 59/0.5	1.0	100/1.0		M		730.7' 52.0' WEATHERED ROCK- Tan, White, Granite, Moist, (WR)
725.0	58.5	60/0.0	0.0	60/0.0		D		724.2' 58.5'
	58.5							BORING TERMINATED WITH STANDARD PENETRATION TEST REFUSAL AT 724.2 ON CRYSTALLINE ROCK (GRANITE)

SUMMARY OF LABORATORY TEST DATA FOR NCDOT

Project No. 33066.1.1 (B-3446)
Bridge 415 over NSRR on SR 1243 (Center Street)
Davidson County, North Carolina

Boring No.	Sample Depth (ft)	Sample No.	Natural Moisture Content %	AASHTO Class	N Value	Atterberg Limits			Gradation Results							
						L.L.	P.L.	P.I.	Pass #10 Sieve %	Pass #40 Sieve %	Pass #200 Sieve %	Pass #270 Sieve %	Coarse Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)
EB1-A	3.5-5	SS-1	11.5	A-7-5 (4)	24	41	30	11	98	77	52	49	28	22	10	40
EB1-A	13.5-15	SS-2	NA	A-2-4 (0)	10	37	35	2	96	68	34	31	39	29	18	14
EB1-B	3.5-5	SS-3	18.5	A-7-5 (7)	10	52	35	17	95	71	51	49	32	17	7	44
EB1-B	28.5-30	SS-4	NA	A-2-4 (0)	10	NP	NP	NP	90	58	28	25	46	27	14	13
B1-A	3.5-5	SS-5	10.0	A-5 (0)	15	44	39	5	96	88	40	37	33	28	12	27
B1-A	18.5-20	SS-6	NA	A-2-5 (0)	11	43	42	1	94	67	33	29	40	30	15	15
B1-C	8.5-10	SS-8	NA	A-2-5 (0)	10	41	36	5	94	67	32	27	39	32	27	2
B1-B	3.5-5	SS-7	10.2	A-4 (0)	10	40	32	8	93	69	39	36	34	27	24	15
B2-A	8.5-10	SS-9	21.7	A-5 (2)	9	51	47	4	99	91	52	50	23	26	24	27
B2-A	48.5-50	SS-10	NA	A-2-4 (0)	14	NP	NP	NP	98	93	33	24	23	52	8	17
B2-C	28.5-30	SS-11	NA	A-2-4 (0)	11	NP	NP	NP	96	74	29	25	39	35	24	2
EB2-A	3.5-5	SS-12	19.3	A-7-5 (10)	16	64	48	16	97	82	58	57	25	17	17	41
EB2-B	3.5-5	SS-13	6.4	A-7-5 (7)	13	50	37	13	97	79	56	54	26	19	28	27
EB2-B	18.5-20	SS-14	NA	A-2-4 (0)	11	NP	NP	NP	95	73	33	30	36	33	29	2

ECS LTD
ENGINEERING CONSULTING SERVICES, LTD
Greensboro, NC

SITE PHOTOGRAPHS

NCDOT PROJECT NO. 33066.1.1 (B-3446)
Bridge 415 over NSRR on SR 1243 (Center Street)
DAVIDSON COUNTY, NORTH CAROLINA

VIEW LOOKING NORTHEAST ALONG END BENT – 1

VIEW LOOKING NORTHEAST ALONG BENT - 2

VIEW LOOKING NORTHEAST ALONG BENT - 1

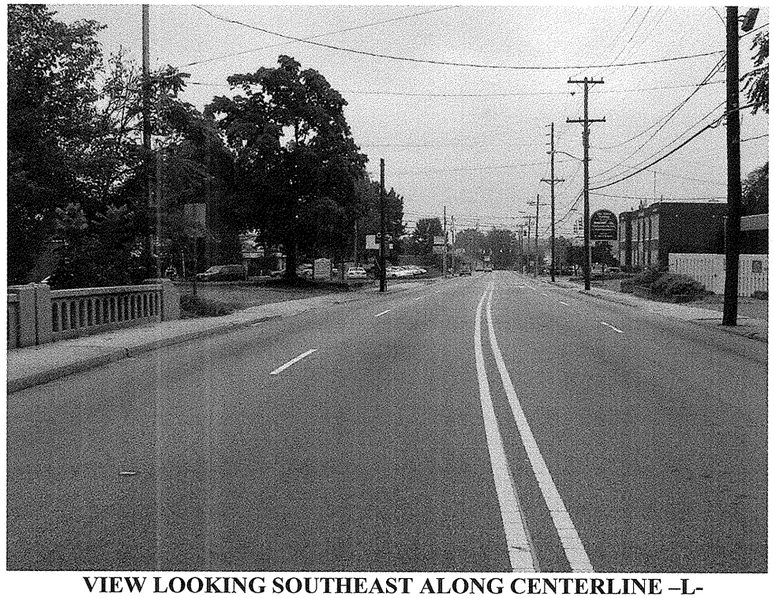
VIEW LOOKING NORTHEAST ALONG END BENT - 2

SITE PHOTOGRAPHS

NCDOT PROJECT NO. 33066.1.1 (B-3446)
Bridge 415 over NSRR on SR 1243 (Center Street)
DAVIDSON COUNTY, NORTH CAROLINA

VIEW LOOKING NORTHWEST ALONG CENTERLINE –L-

VIEW LOOKING NORTHEAST ALONG NSRR



VIEW LOOKING SOUTHEAST ALONG CENTERLINE –L-

VIEW LOOKING SOUTHWEST ALONG NSRR