This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.
This file or an individual page shall not be considered a certified document.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-1015	1	54

REFERENCE: R-1015

PROJECT: 34360

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *CRAVEN*

PROJECT DESCRIPTION *US 70 (HAVELOCK BYPASS) FROM NORTH OF PINE GROVE TO NORTH OF CARTERET COUNTY LINE*

SITE DESCRIPTION *DUAL BRIDGES ON US 70 BYPASS OVER SOUTHWEST PRONG OF SLOCUM CREEK AT -L- STA. 287+62.5*

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	PROFILES
6-13	CROSS SECTIONS
14-41	BORE LOGS & CORE REPORTS
42	SOIL TEST RESULTS
43-54	CORE PHOTOGRAPHS

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) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (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 THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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

PERSONNEL

LAW ENGINEERING

INVESTIGATED BY *J.K. CRENSHAW*

DRAWN BY *C.P. TURNER*

CHECKED BY *D.N. ARGENBRIGHT*

SUBMITTED BY *D.N. ARGENBRIGHT*

DATE *MARCH 2015*

NORTH CAROLINA LICENSED SEAL 1050 GEOLOGIST D. N. ARGENBRIGHT

DocuSigned by:
Dean N. Argenbright 10/24/2016
F83EDC63E4B74C8...
SIGNATURE DATE

PROJECT REFERENCE NO.	SHEET NO.
R-1015	2 OF 54

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 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 THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

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
MATERIAL PASSING #40 LL PI	— 6 MX			— NP	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 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 0.5 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
	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 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
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	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.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES 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 WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 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 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
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT EXCAVATION
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

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

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [X] CME-45C
- [ ] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [ ] AUTOMATIC [X] MANUAL

CORE SIZE:
- [ ] -B _____ [X] -H 0
- [ ] -N _____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. 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, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD 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 FOOT
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 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, SUCH 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: BM15: RR SPIKE IN TREE AT -BL- STA 210+11, 25LFT LT
N 418342 E 2616967
ELEVATION: 27.08 FEET

NOTES:

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
R-1015	3 OF 54

SITE PLAN

0 100 200

FEET

SKEW = 90°

285 290 295

N

SOUTHWEST PRONG OF SLOCUM CREEK

US 70 BYPASS EBL

TO SR 1756

TO SR 1747

US 70 BYPASS WBL

EB1-A EBL

B1-A EBL

B2-A EBL

B3-A EBL

B4-A EBL

B5-A EBL

B6-A EBL

EB2-A EBL

EB1-B WBL

B1-B WBL

B2-B WBL

B3-B WBL

B4-B WBL

B5-B WBL

B6-B WBL

EB2-B WBL

EB1 BENT LINE

B1 BENT LINE

B2 BENT LINE

B3 BENT LINE

B4 BENT LINE

B5 BENT LINE

B6 BENT LINE

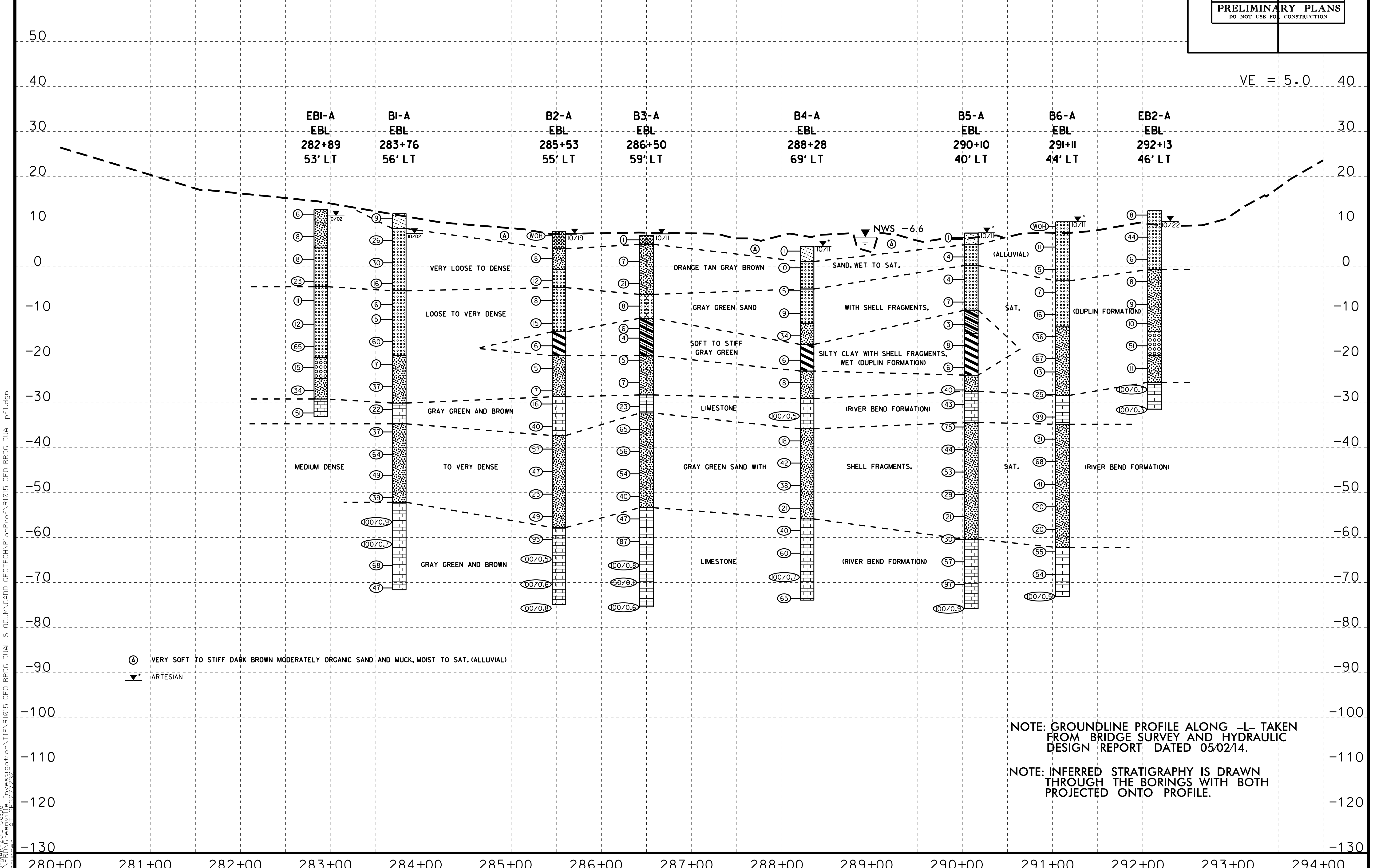
EB2 BENT LINE

PROJECT REFERENCE NO. R-1015
SHEET NO. 4 OF 54
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROFILE THROUGH EASTBOUND LANE BORINGS PROJECTED ONTO –L–


VE = 5.0
EB1-A EBL 282+89 53' LT
B1-A EBL 283+76 56' LT
B2-A EBL 285+53 55' LT
B3-A EBL 286+50 59' LT
B4-A EBL 288+28 69' LT
B5-A EBL 290+10 40' LT
B6-A EBL 291+11 44' LT
EB2-A EBL 292+13 46' LT
NWS = 6.6
(ALLUVIAL)
VERY LOOSE TO DENSE ORANGE TAN GRAY BROWN SAND, WET TO SAT.
LOOSE TO VERY DENSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
SOFT TO STIFF GRAY GREEN SILTY CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)
GRAY GREEN AND BROWN LIMESTONE (RIVER BEND FORMATION)
MEDIUM DENSE TO VERY DENSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
GRAY GREEN AND BROWN LIMESTONE (RIVER BEND FORMATION)
(A) VERY SOFT TO STIFF DARK BROWN MODERATELY ORGANIC SAND AND MUCK, MOIST TO SAT. (ALLUVIAL)
ARTESIAN

NOTE: GROUNDLINE PROFILE ALONG –L– TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED 05/02/14.

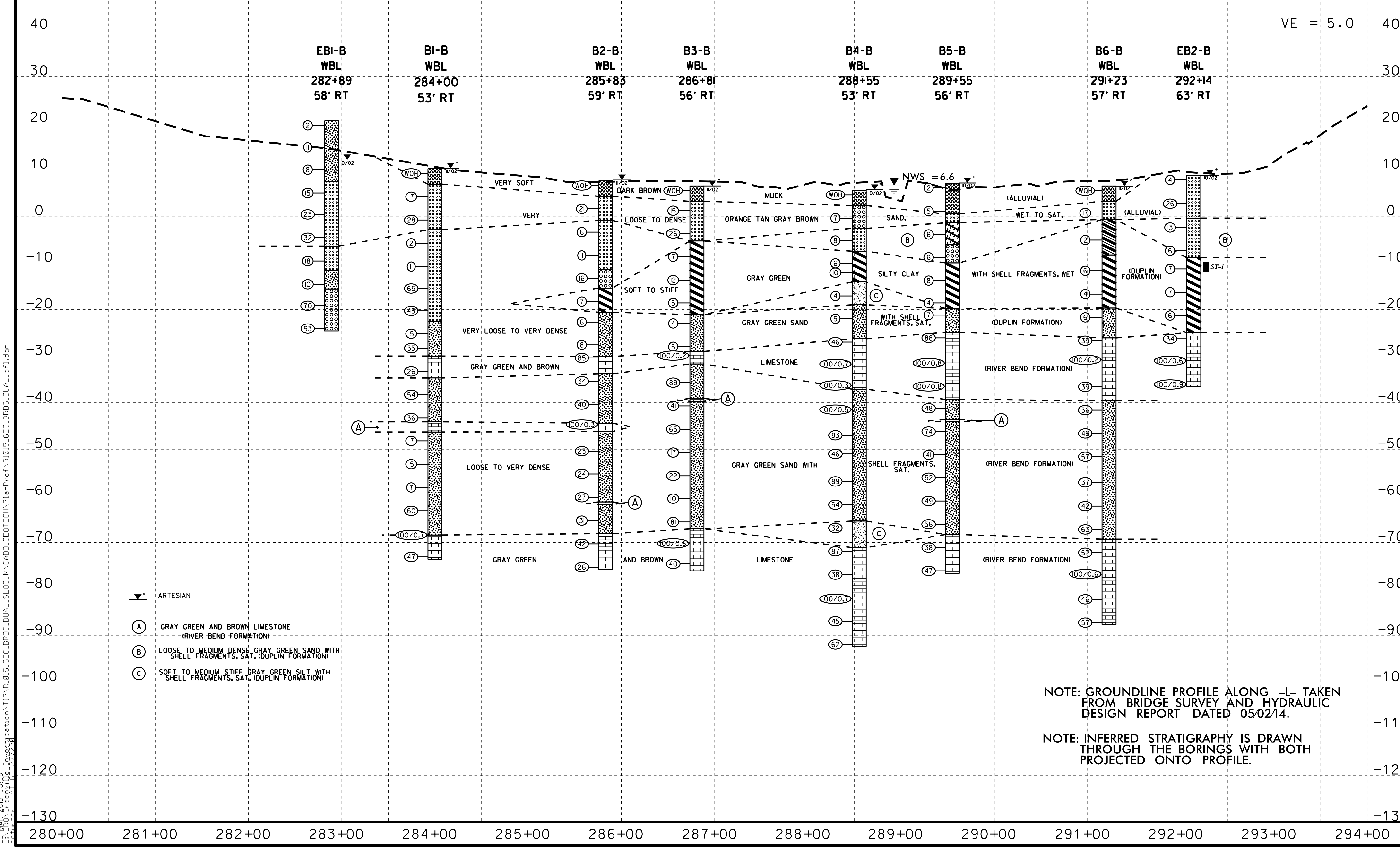
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

PROJECT REFERENCE NO.	SHEET NO.
R-1015	5 OF 54
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROFILE THROUGH WESTBOUND LANE BORINGS PROJECTED ONTO –L–

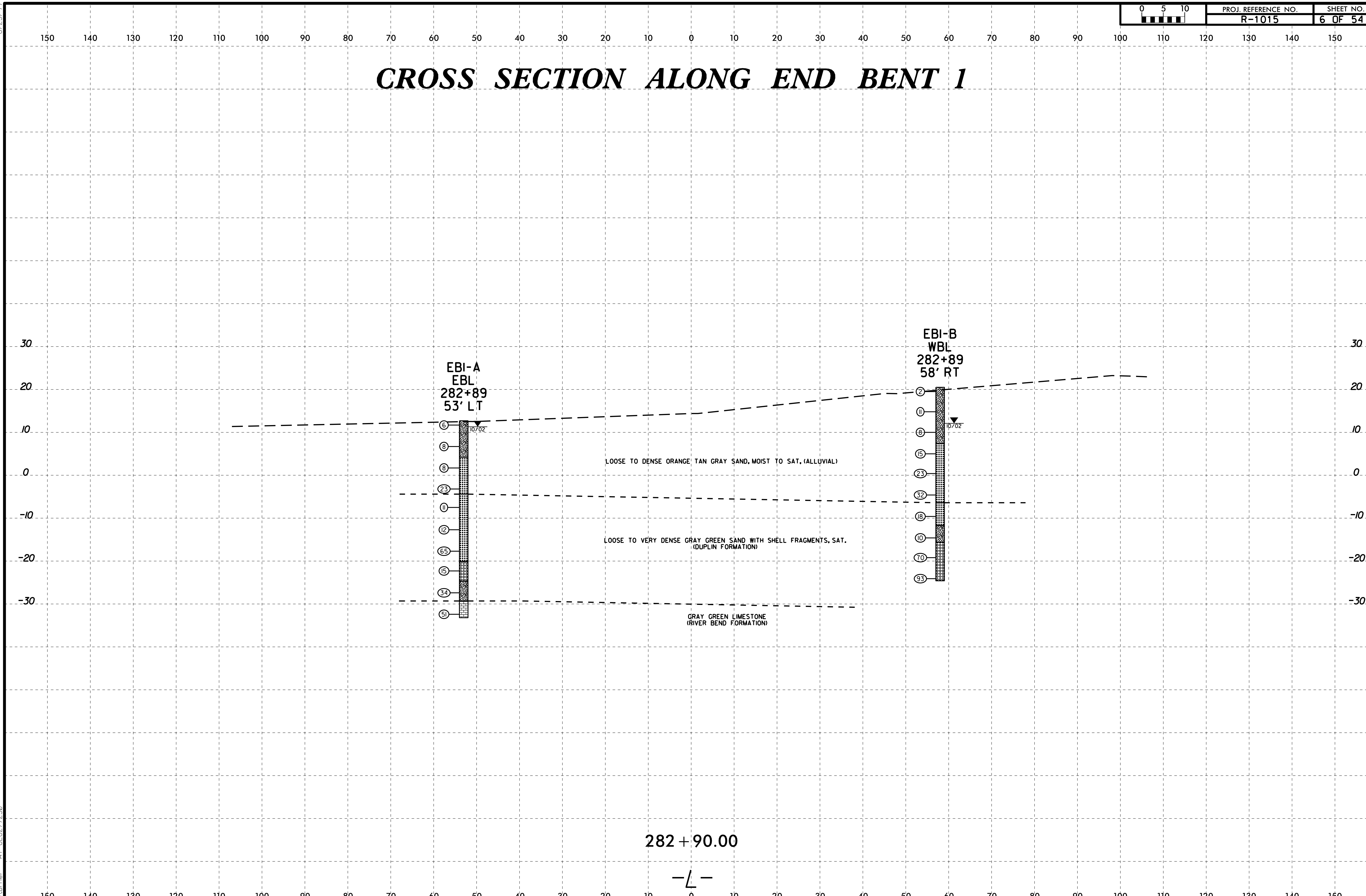


VE = 5.0
EB1-B WBL 282+89 58' RT
B1-B WBL 284+00 53' RT
B2-B WBL 285+83 59' RT
B3-B WBL 286+81 56' RT
B4-B WBL 288+55 53' RT
B5-B WBL 289+55 56' RT
B6-B WBL 291+23 57' RT
EB2-B WBL 292+14 63' RT
NWS = 6.6
VERY SOFT
DARK BROWN
MUCK
VERY
LOOSE TO DENSE
ORANGE TAN GRAY BROWN
SAND.
(ALLUVIAL)
WET TO SAT.
(ALLUVIAL)
SOFT TO STIFF
GRAY GREEN
SILTY CLAY
WITH SHELL FRAGMENTS, WET
(DUPLIN FORMATION)
GRAY GREEN SAND
WITH SHELL FRAGMENTS, SAT.
(DUPLIN FORMATION)
VERY LOOSE TO VERY DENSE
GRAY GREEN AND BROWN
LIMESTONE
(RIVER BEND FORMATION)
LOOSE TO VERY DENSE
GRAY GREEN SAND WITH
SHELL FRAGMENTS, SAT.
(RIVER BEND FORMATION)
GRAY GREEN
AND BROWN
LIMESTONE
(RIVER BEND FORMATION)
ST-1
ARTESIAN
(A) GRAY GREEN AND BROWN LIMESTONE (RIVER BEND FORMATION)
(B) LOOSE TO MEDIUM DENSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
(C) SOFT TO MEDIUM STIFF GRAY GREEN SILT WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
280+00 281+00 282+00 283+00 284+00 285+00 286+00 287+00 288+00 289+00 290+00 291+00 292+00 293+00 294+00
70 60 50 40 30 20 10 0 −10 −20 −30 −40 −50 −60 −70 −80 −90 −100 −110 −120 −130

NOTE: GROUNDLINE PROFILE ALONG –L– TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED 05/02/14.

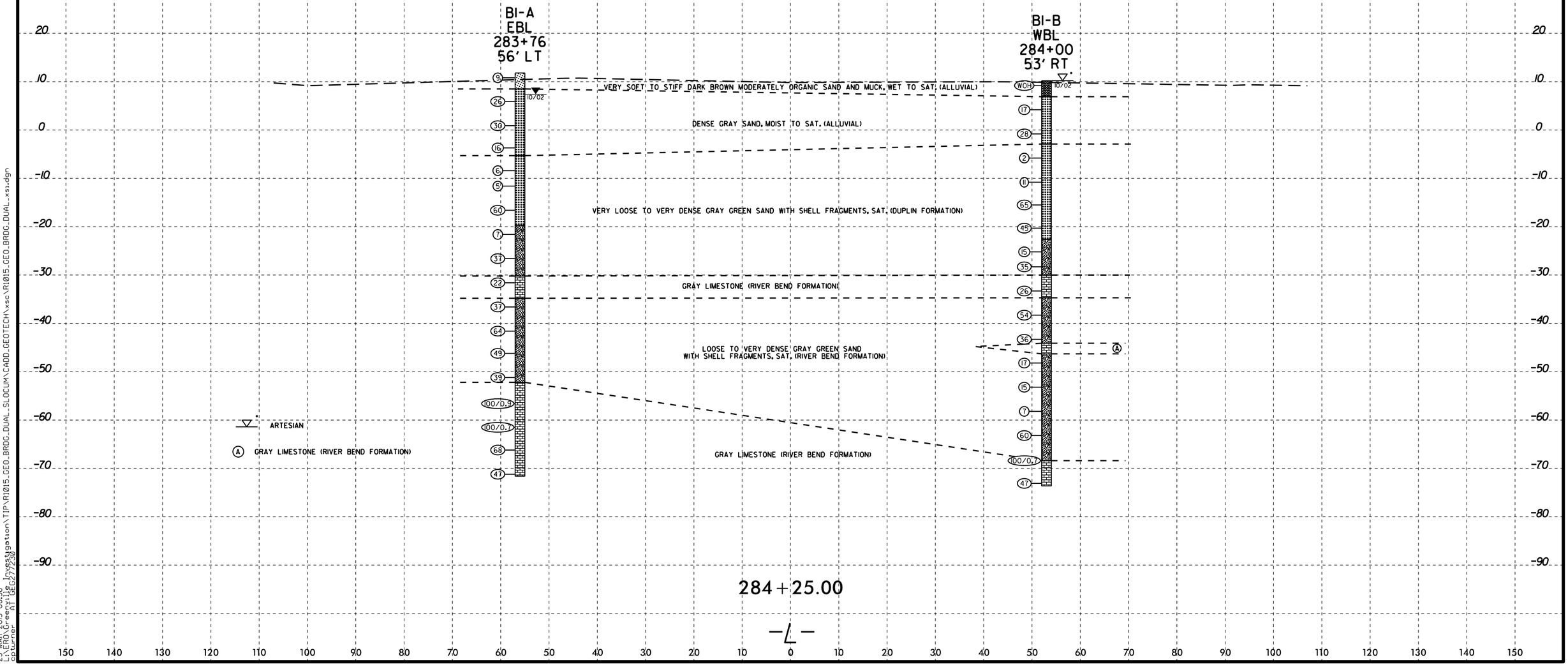
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO PROFILE.

CROSS SECTION ALONG END BENT 1


0 5 10
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
30
20
10
0
-10
-20
-30
EBI-A
EBL
282+89
53' LT
6
8
8
23
11
12
65
15
34
51
10/02
EBI-B
WBL
282+89
58' RT
2
11
8
15
23
32
18
10
70
93
10/02
LOOSE TO DENSE ORANGE TAN GRAY SAND, MOIST TO SAT. (ALLUVIAL)
LOOSE TO VERY DENSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
GRAY GREEN LIMESTONE (RIVER BEND FORMATION)
282+90.00
-L-

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-1015	7 OF 54

CROSS SECTION ALONG BENT 1



23-MAR-2015 08:38
L:\ERO\Greenville Investigation\TIP\R1015_GEO_BRDG_DUAL_SLOCUM\CADD_GEOTECH\xsc\R1015_GEO_BRDG_DUAL_xs1.dgn
cpturner AT GEO27230

CROSS SECTION ALONG BENT 2

B2-A
EBL
285+53
55' LT

B2-B
WBL
285+83
59' RT

VERY SOFT DARK BROWN MUCK, WET TO SAT. (ALLUVIAL)

LOOSE TO MEDIUM DENSE TAN GRAY BROWN SAND, MOIST TO SAT. (ALLUVIAL)

LOOSE TO MEDIUM DENSE GRAY GREEN SAND, MOIST TO SAT. (DUPLIN FORMATION)

MEDIUM STIFF TO STIFF GRAY GREEN SILTY CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)

LOOSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)

GRAY GREEN AND BROWN LIMESTONE (RIVER BEND FORMATION)

MEDIUM DENSE TO VERY DENSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)

GRAY LIMESTONE (RIVER BEND FORMATION)

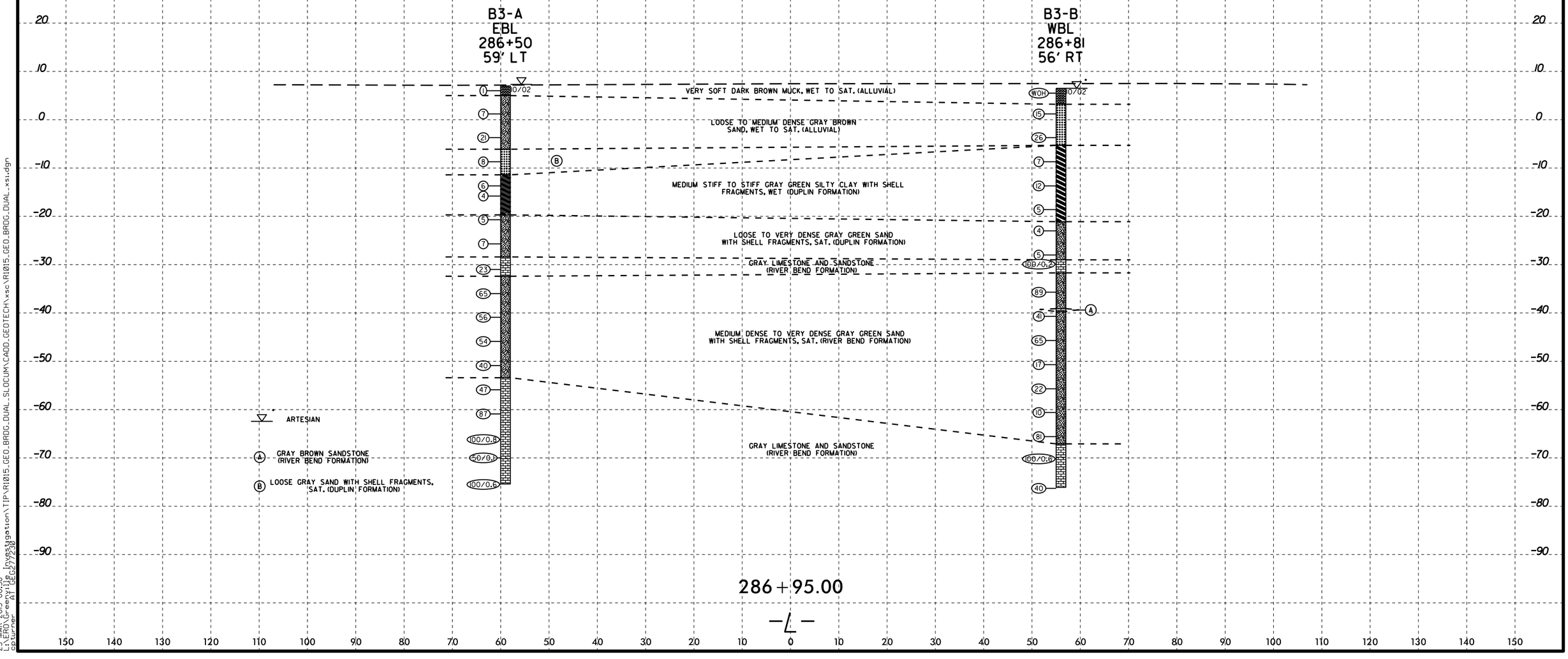
ARTESIAN

(A) GRAY GREEN AND BROWN LIMESTONE (RIVER BEND FORMATION)

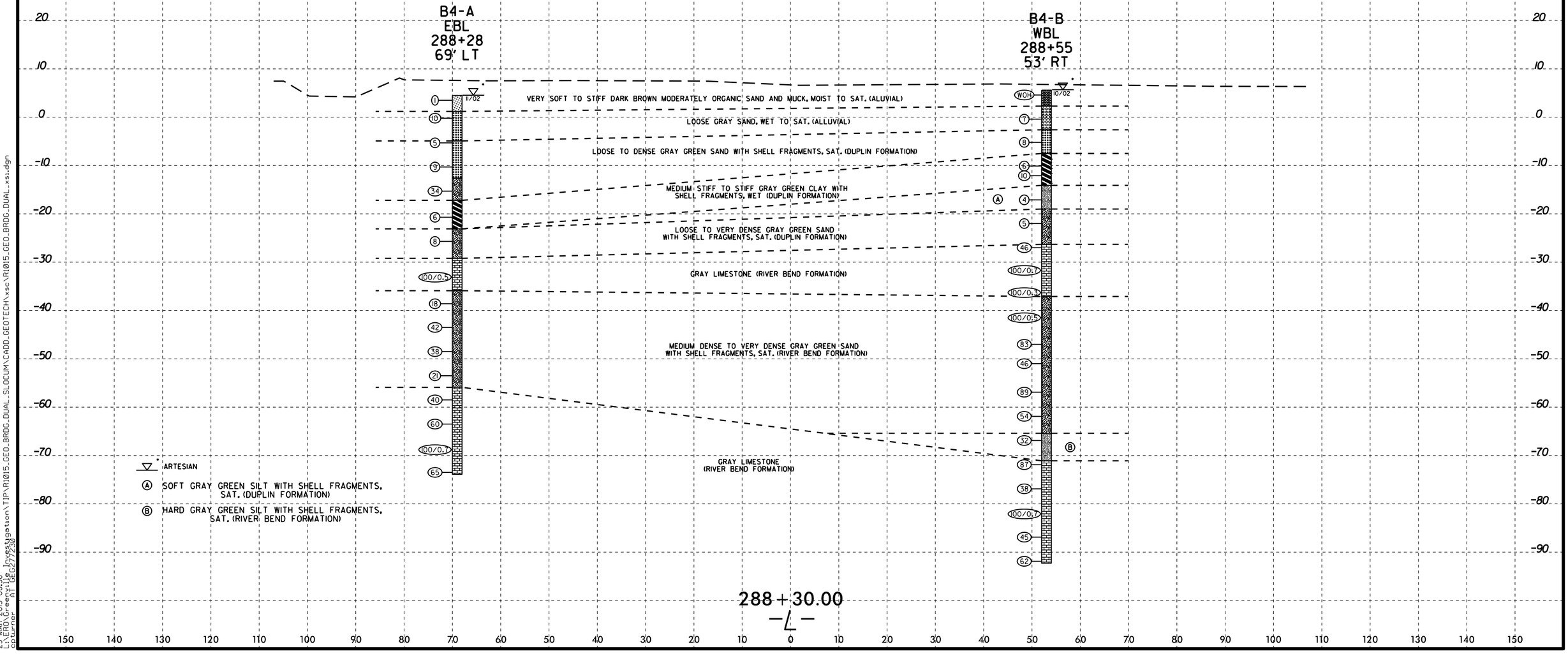
285+60.00

—L—

CROSS SECTION ALONG BENT 3



CROSS SECTION ALONG BENT 4



CROSS SECTION ALONG BENT 5

B5-A
EBL
290+10
40' LT

B5-B
WBL
289+55
56' RT

11/02 (B5-A)

10/02 (B5-B)

LOOSE TAN SAND, MOIST TO SATURATED (ALLUVIAL)

LOOSE GRAY GREEN SAND AND CLAYEY SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)

SOFT TO STIFF GRAY GREEN SILTY CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)

LOOSE TO VERY DENSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)

GRAY GREEN AND BROWN LIMESTONE (RIVER BEND FORMATION)

MEDIUM DENSE TO VERY DENSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)

GRAY GREEN LIMESTONE AND SANDSTONE (RIVER BEND FORMATION)

B5-A: 4, 4, 7, 3, 8, 6, 40, 43, 75, 44, 53, 29, 21, 30, 57, 97, 100/0.9

B5-B: 2, 5, 6, 6, 8, 4, 7, 88, 100/0.8, 100/0.8, 48, B, 74, 41, 52, 49, 56, 38, 47

ARTESIAN

(A) SOFT DARK BROWN MODERATELY ORGANIC SAND AND MUCK, MOIST TO SAT. (ALLUVIAL)

(B) GRAY SANDSTONE (RIVER BEND FORMATION)

289+65.00

—L—

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90

8/23/99

23-MAR-2015 08:38
L:\ERO\Greenville Investigation\TIP\R1015_GEO_BRDG_DUAL_SLOCUM\CADD_GEOTECH\xsc\R1015_GEO_BRDG_DUAL_xs1.dgn
gturner AT GEO27230

CROSS SECTION ALONG BENT 6

B6-A
EBL
291+11
44' LT

B6-B
WBL
291+23
57' RT

VERY LOOSE TO MEDIUM DENSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)

MEDIUM STIFF TO STIFF GRAY GREEN SILTY CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)

LOOSE TO VERY DENSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)

GRAY GREEN LIMESTONE (RIVER BEND FORMATION)

MEDIUM DENSE TO VERY DENSE GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)

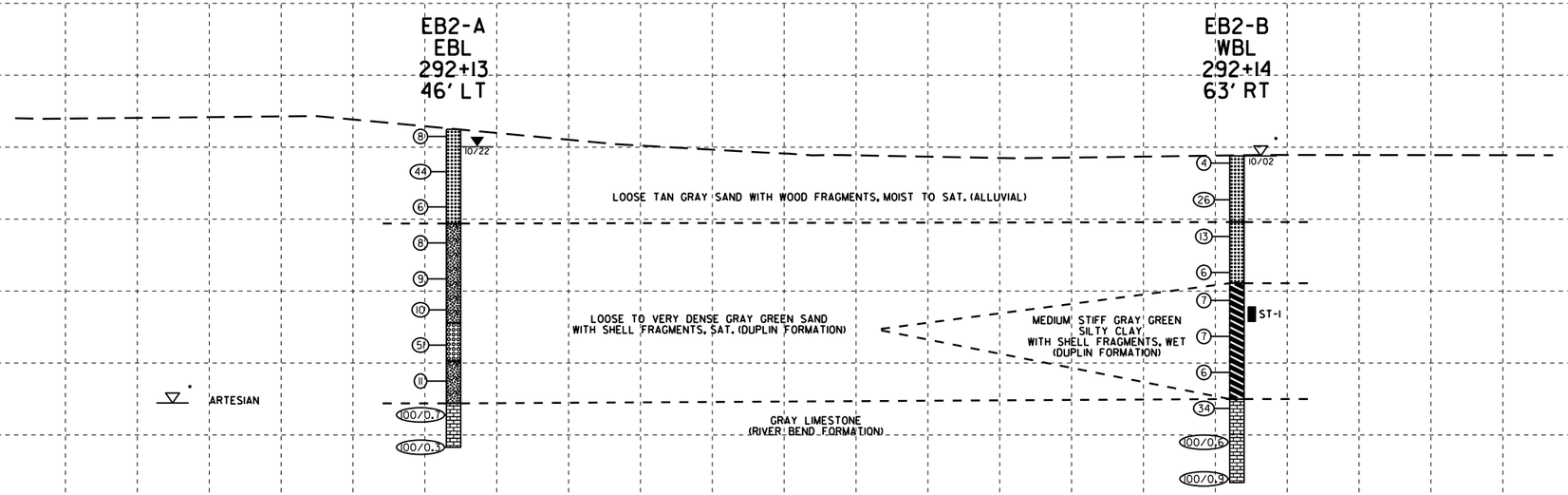
GRAY GREEN LIMESTONE (RIVER BEND FORMATION)

ARTESIAN

(A) VERY SOFT DARK BROWN MUCK, WET TO SAT. (ALLUVIAL)

291+00.00
-L-

CROSS SECTION ALONG END BENT 2



292+35.00

—L—

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. EB1-A EBL	**STATION** 282+89	**OFFSET** 53 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 12.7 ft	**TOTAL DEPTH** 45.9 ft	**NORTHING** 416,611	**EASTING** 2,617,431	**24 HR.** 1.4
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/09/02	**COMP. DATE** 10/09/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
	12.7	0.0	2	2	4	6				12.7 GROUND SURFACE	0.0
										ALLUVIAL DARK GRAY SAND, WET TO SAT.	
10	7.7	5.0	5	3	5	8					
5	2.7	10.0	3	3	5	8	SS-46			4.2	8.5
0	-2.2	14.9	7	11	12	23	SS-47			-4.4	17.1
-5	-6.5	19.2	6	5	6	11				**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	
-10	-11.7	24.4	4	4	8	12					
-15	-16.7	29.4	19	28	37	65					
-20	-21.3	34.0	10	8	7	15	SS-48			-20.1	32.8
-25	-26.4	39.1	17	19	15	34	SS-49			-24.7	37.4
-30	-31.4	44.1	14	21	30	51				-29.3 **COASTAL PLAIN** GREEN LIMESTONE (RIVER BEND FORMATION)	42.0
										-33.2	45.9
										Boring Terminated at Elevation -33.2 ft in Limestone	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. EB1-B WBL	**STATION** 282+89	**OFFSET** 58 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 20.5 ft	**TOTAL DEPTH** 45.1 ft	**NORTHING** 416,627	**EASTING** 2,617,542	**24 HR.** 8.4
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/09/02	**COMP. DATE** 10/09/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
										20.5 GROUND SURFACE	0.0
	20.5	0.0	1	1	1	2				**ALLUVIAL** TAN ORANGE SAND WITH WOOD FRAGMENTS, MOIST TO SAT.	
	15.8	4.7	5	5	6	11	SS-41				
	11.0	9.5	6	5	3	8				7.4	13.1
	6.0	14.5	6	5	10	15	SS-42				
	1.4	19.1	11	12	11	23					
	-3.6	24.1	14	14	18	32				-6.4	26.9
	-8.6	29.1	8	9	9	18	SS-43			**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	
	-13.6	34.1	5	3	7	10	SS-44			-11.7	32.2
	-18.2	38.7	28	35	35	70	SS-45			-15.6	36.1
	-23.1	43.6	27	46	47	93				-24.6 Boring Terminated at Elevation -24.6 ft in Very Dense Sand	45.1

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B1-A EBL	**STATION** 283+76	**OFFSET** 56 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 11.8 ft	**TOTAL DEPTH** 83.4 ft	**NORTHING** 416,698	**EASTING** 2,617,416	**24 HR.** 4.4
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/10/02	**COMP. DATE** 10/10/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
15										
	11.8	0.0								11.8 GROUND SURFACE 0.0
10			3	3	6	9	SS-35			**ALLUVIAL** BROWN MODERATELY ORGANIC SAND, WET TO SAT. (ALLUVIAL)
	6.9	4.9								8.5 3.3
5			4	10	16	26				**ALLUVIAL** GRAY SAND
	1.9	9.9								
0			7	11	19	30				
	-2.7	14.5								
-5			6	7	9	16	SS-36			
	-7.4	19.2								-5.3 17.1
-10			5	3	3	6				**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
	-10.6	22.4								
			2	2	3	5	SS-37			
-15	-15.6	27.4								
			14	30	30	60	SS-38			
-20	-20.6	32.4								
			4	3	4	7	SS-39			
-25	-25.6	37.4								
			23	18	19	37				
-30	-30.6	42.4								
			10	11	11	22				
-35	-35.6	47.4								
			13	13	24	37				
-40	-40.6	52.4								
			56	26	38	64				
-45	-45.2	57.0								
			24	23	26	49				
-50	-50.2	62.0								
			15	17	22	39				
-55	-55.2	67.0								
			30	28	72/0.4	100/0.9				
-60	-60.2	72.0								
			22	70	30/0.2	100/0.7	SS-40			
-65										

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B1-A EBL	**STATION** 283+76	**OFFSET** 56 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 11.8 ft	**TOTAL DEPTH** 83.4 ft	**NORTHING** 416,698	**EASTING** 2,617,416	**24 HR.** 4.4
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/10/02	**COMP. DATE** 10/10/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-65						Match Line				
	-65.2	77.0	33	30	38	68				**COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION) *(continued)*
-70	-70.2	82.0	21	19	28	47				-71.6 83.4
										Boring Terminated at Elevation -71.6 ft in Limestone

NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B1-A EBL	**STATION** 283+76	**OFFSET** 56 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 11.8 ft	**TOTAL DEPTH** 83.4 ft	**NORTHING** 416,698	**EASTING** 2,617,416	**24 HR.** 4.4
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/10/02	**COMP. DATE** 10/10/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 43.9 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) DEPTH (ft)
-8.9											Begin Coring @ 20.7 ft
-10	-8.9	20.7	1.8	0:20/1.0 0:15/0.8	(0.0) 0%						**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION) *(continued)*
	-10.7	22.5		*N=5*			*SS-37*				
	-12.1	23.9	3.5	0:20/1.0 0:17/1.0 0:18/1.0 0:10/0.6	(0.0) 0%						
-15	-15.6	27.4		*N=60*			*SS-38*				
	-17.1	28.9	3.5	0:25/1.0 0:23/1.0 0:25/1.0 0:12/0.6	(0.0) 0%						
-20	-20.6	32.4		*N=7*			*SS-39*				-19.7 31.5
	-22.1	33.9	3.5	0:25/1.0 0:23/1.0 0:27/1.0 0:17/0.6	(0.0) 0%						
-25	-25.6	37.4		*N=37*							
	-27.1	38.9	3.5	0:20/1.0 0:23/1.0 0:21/1.0 0:17/0.6	(0.0) 0%						
-30	-30.6	42.4		*N=22*							-30.2 42.0
	-32.1	43.9	3.5	0:42/1.0 0:41/1.0 0:31/1.0 0:15/0.6	(0.0) 0%						**COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-35	-35.6	47.4		*N=37*							-34.8 46.6
	-37.1	48.9	3.5	0:28/1.0 0:23/1.0 0:25/1.0 0:12/0.6	(0.0) 0%						**COASTAL PLAIN** BROWN GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-40	-40.6	52.4		*N=64*							
	-42.0	53.8	3.2	1:53/1.0 0:34/1.0 0:30/1.0 0:17/0.2	(0.0) 0%						
-45	-45.2	57.0		*N=49*							
	-46.7	58.5	3.5	0:31/1.0 0:32/1.0 0:28/1.0 0:11/0.6	(0.0) 0%						
-50	-50.2	62.0		*N=39*							-52.2 64.0
	-51.7	63.5	3.5	1:37/1.0 1:17/1.0 1:40/1.0 0:42/0.6	(1.6) 46%						**COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-55	-55.2	67.0		*N=100/0.9*							
	-56.6	68.4	3.6	1:29/1.0 1:15/1.0 0:31/1.0 0:15/0.7	(0.9) 25%						
-60	-60.2	72.0		*N=100/0.7*			*SS-40*				
	-61.3	73.1	3.8	2:15/1.0 2:40/1.0 2:19/1.0 2:45/0.9	(2.9) 76%						
-65	-65.1	76.9		*N=68*							
	-66.6	78.4	3.5	2:37/1.0 2:52/1.0 1:43/1.0 2:21/0.6	(2.5) 71%						
-70	-70.1	81.9		*N=47*							-71.6 83.4
											Boring Terminated at Elevation -71.6 ft in Limestone

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B1-B WBL	**STATION** 284+00	**OFFSET** 53 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 10.2 ft	**TOTAL DEPTH** 83.8 ft	**NORTHING** 416,736	**EASTING** 2,617,520	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/13/02	**COMP. DATE** 11/14/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
10	10.2	0.0	WOH	WOH	WOH	0				10.2 GROUND SURFACE 0.0 **ALLUVIAL** DARK BROWN MUCK, MOIST TO SAT.
										6.9 3.3 **ALLUVIAL** LIGHT GRAY SAND, SAT.
5	5.2	5.0	5	8	9	17				
0	0.2	10.0	10	14	14	28				-2.9 13.1 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-5	-4.8	15.0	1	1	1	2				
-10	-9.8	20.0	4	4	7	11				
-15	-14.5	24.7	16	29	36	65				
-20	-19.3	29.5	17	23	22	45				
-25	-24.2	34.4	6	8	7	15				-22.6 32.8
-30	-27.3	37.5	14	16	19	35				-30.0 40.2 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-35	-32.3	42.5	13	15	11	26				
-40	-37.3	47.5	13	20	34	54				-34.7 44.9 **COASTAL PLAIN** GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-45	-42.3	52.5	22	19	17	36				
-50	-47.2	57.4	4	9	8	17				-44.1 54.3 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-55	-52.2	62.4	4	6	9	15				-46.3 56.5 **COASTAL PLAIN** GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-60	-57.2	67.4	12	3	4	7				
-65	-62.2	72.4	9	26	34	60				

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B1-B WBL	**STATION** 284+00	**OFFSET** 53 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 10.2 ft	**TOTAL DEPTH** 83.8 ft	**NORTHING** 416,736	**EASTING** 2,617,520	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/13/02	**COMP. DATE** 11/14/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-65						Match Line				
	-67.2	77.4	23	45	55/0.2	100/0.7				**COASTAL PLAIN** GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION) *(continued)*
-70										-68.4 78.6 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
	-72.1	82.3	36	18	29	47				-73.6 83.8 Boring Terminated at Elevation -73.6 ft in Limestone ARTESIAN HEAD ELEVATION = 10.6

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B1-B WBL	**STATION** 284+00	**OFFSET** 53 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 10.2 ft	**TOTAL DEPTH** 83.8 ft	**NORTHING** 416,736	**EASTING** 2,617,520	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/13/02	**COMP. DATE** 11/14/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 33.3 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
-25.7											Begin Coring @ 35.9 ft
	-25.7	35.9	1.6	0:35/1.0 0:13/0.6	(0.0) 0%						GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION) *(continued)*
	-27.3	37.5		*N=35*							
	-28.8	39.0									
-30			3.5	0:21/1.0 1:55/1.0 1:11/1.0 0:10/0.5	(0.5) 14%						-30.0 40.2 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
	-32.3	42.5		*N=26*							
	-33.8	44.0									
-35			3.5	0:25/1.0 0:34/1.0 0:32/1.0 0:12/0.5	(0.0) 0%						-34.7 44.9 **COASTAL PLAIN** GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
	-37.3	47.5		*N=54*							
	-38.8	49.0									
-40			3.5	0:28/1.0 0:22/1.0 1:06/1.0 0:10/0.5	(0.5) 14%						
	-42.3	52.5		*N=36*							
	-43.8	54.0									
-45			3.5	0:41/1.0 0:44/1.0 0:32/1.0 0:15/0.5	(2.3) 66%						-44.1 54.3 **COASTAL PLAIN** -46.3 GRAY LIMESTONE (RIVER BEND FORMATION) 56.5
	-47.3	57.5		*N=17*							**COASTAL PLAIN** GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
	-48.8	59.0									
-50			3.5	0:28/1.0 0:30/1.0 0:27/1.0 0:10/0.5	(0.0) 0%						
	-52.3	62.5		*N=15*							
	-53.8	64.0									
-55			3.5	0:37/1.0 0:22/1.0 0:24/1.0 0:09/0.5	(0.0) 0%						
	-57.3	67.5		*N=7*							
	-58.8	69.0									
-60			3.5	0:22/1.0 0:31/1.0 0:25/1.0 0:15/0.5	(0.0) 0%						
	-62.3	72.5		*N=60*							
	-63.8	74.0									
-65			3.5	0:55/1.0 0:43/1.0 0:42/1.0 0:25/0.5	(0.0) 0%						
	-67.3	77.5		*N=100/0.7*							-68.4 78.6
	-68.4	78.6									**COASTAL PLAIN**
-70			3.7	2:13/1.0 0:22/1.0 1:40/1.0 0:45/0.7	(1.8) 49%						GRAY LIMESTONE (RIVER BEND FORMATION)
	-72.1	82.3		*N=47*							-73.6 83.8
											Boring Terminated at Elevation -73.6 ft in Limestone
											ARTESIAN HEAD ELEVATION = 10.6

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear / B. Banks	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B2-A EBL	**STATION** 285+53	**OFFSET** 55 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.9 ft	**TOTAL DEPTH** 83.9 ft	**NORTHING** 416,871	**EASTING** 2,617,390	**24 HR.** 0.6
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/19/02	**COMP. DATE** 11/19/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
10											
	7.9	0.0	WOH	WOH	WOH	0				7.9 GROUND SURFACE	0.0
5										**ALLUVIAL** DARK BROWN MUCK, WET TO SAT.	
	2.9	5.0	9	5	3	8				4.0	3.9
0										**ALLUVIAL** TAN GRAY SAND WITH WOOD FRAGMENTS, SAT.	
	-2.1	10.0	5	6	6	12				-0.6	8.5
-5											
	-6.5	14.4	3	4	4	8				-4.6	12.5
-10										**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	
	-11.5	19.4	3	7	8	15					
-15											
	-16.5	24.4	2	3	3	6				-14.4	22.3
-20										**COASTAL PLAIN** GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)	
	-21.5	29.4	2	3	2	5				-19.7	27.6
-25										**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	
	-26.5	34.4	4	4	3	7					
-30	-29.4	37.3	12	8	8	16				-28.8	36.7
										COASTAL PLAIN GREEN AND BROWN LIMESTONE (RIVER BEND FORMATION)	
-35	-34.4	42.3	14	17	23	40					
-40	-39.4	47.3	5	26	31	57				-37.4	45.3
										COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	
-45	-44.4	52.3	51	24	23	47					
-50	-49.4	57.3	7	9	14	23					
-55	-54.4	62.3	9	26	23	49					
-60	-59.4	67.3	40	53	40	93				-57.8	65.7
-65	-64.3	72.2	100/0.5			100/0.5				**COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)	
-70	-69.3	77.2									

NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear / B. Banks	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B2-A EBL	**STATION** 285+53	**OFFSET** 55 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.9 ft	**TOTAL DEPTH** 83.9 ft	**NORTHING** 416,871	**EASTING** 2,617,390	**24 HR.** 0.6
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/19/02	**COMP. DATE** 11/19/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70						Match Line				**COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION) *(continued)*
			34	55	45/0.1	100/0.6				
-75	-74.9	82.8	25	75/0.3		100/0.8				-76.0 83.9
										Boring Terminated at Elevation -76.0 ft in Limestone

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear / B. Banks	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B2-A EBL	**STATION** 285+53	**OFFSET** 55 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.9 ft	**TOTAL DEPTH** 83.9 ft	**NORTHING** 416,871	**EASTING** 2,617,390	**24 HR.** 0.6
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/19/02	**COMP. DATE** 11/19/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 34.4 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) / DEPTH (ft)
-27.96											Begin Coring @ 35.9 ft
-30	-28.0 -29.5 -30.9	35.9 37.4 38.8	1.5	0:16/1.0 0:15/0.5 *N=16*	(0.0) 0%						-28.8 / 36.7 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION) *(continued)*
-35	-34.4 -35.9	42.3 43.8	3.5	0:28/1.0 1:04/1.0 0:42/1.0 0:20/0.6 *N=40*	(2.3) 66%						**COASTAL PLAIN** GREEN AND BROWN LIMESTONE (RIVER BEND FORMATION)
-40	-39.4 -40.9	47.3 48.8	3.5	0:31/1.0 0:25/1.0 0:16/1.0 0:10/0.6 *N=57*	(1.5) 44%						-37.4 / 45.3 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-45	-44.4 -45.9	52.3 53.8	3.5	0:36/1.0 0:38/1.0 0:31/1.0 0:12/0.6 *N=47*	(0.0) 0%						
-50	-49.4 -50.9	57.3 58.8	3.5	0:38/1.0 0:34/1.0 0:33/1.0 0:09/0.6 *N=23*	(0.0) 0%						
-55	-54.4 -55.9	62.3 63.8	3.5	0:22/1.0 0:31/1.0 0:21/1.0 0:13/0.6 *N=49*	(0.0) 0%						
-60	-59.4 -60.8	67.3 68.7	3.5	0:31/1.0 0:30/1.0 0:35/1.0 0:12/0.6 *N=93*	(0.0) 0%						-57.8 / 65.7 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-65	-64.3 -64.8	72.2 72.7	3.5 4.5	1:34/1.0 0:25/1.0 1:41/1.0 0:26/0.6 *N=100/0.5* 1:16/1.0 0:46/1.0 1:00/1.0 0:23/1.0 0:35/0.6	(1.2) 35% (1.4) 31%						
-70	-69.3 -70.4	77.2 78.3	3.9	*N=100/0.6* 1:45/1.0 1:58/1.0 0:42/1.0 0:38/1.0	(1.7) 43%						
-75	-74.3	82.2		*N=100/0.8*							-76.0 / 83.9 Boring Terminated at Elevation -76.0 ft in Limestone

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B2-B WBL	**STATION** 285+83	**OFFSET** 59 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.6 ft	**TOTAL DEPTH** 83.4 ft	**NORTHING** 416,918	**EASTING** 2,617,499	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/06/02	**COMP. DATE** 11/07/02	**SURFACE WATER DEPTH** 0.2ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
	7.6	0.0	WOH	WOH	WOH	0				7.6 GROUND SURFACE	0.0
										ALLUVIAL DARK BROWN MUCK, WET TO SAT.	
										4.3	3.3
	2.6	5.0	8	9	12	21				**ALLUVIAL** BROWN GRAY SAND WITH WOOD FRAGMENTS, SAT.	
										-0.9	8.5
	-2.4	10.0	2	2	4	6				**COASTAL PLAIN** GRAY GREEN SAND, SAT. (DUPLIN FORMATION)	
	-7.4	15.0	6	6	5	11					
	-12.3	19.9	11	11	5	16				-11.4	19.0
										COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	
	-17.3	24.9	3	3	4	7				-15.4	23.0
										COASTAL PLAIN GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)	
	-21.7	29.3	3	3	3	6				-20.6	28.2
										COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	
	-26.6	34.2	3	4	4	8					
	-29.4	37.0	7	34	51	85				-30.1	37.7
										COASTAL PLAIN GRAY GREEN LIMESTONE (RIVER BEND FORMATION)	
	-34.4	42.0	14	13	21	34				-33.8	41.4
										COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	
	-39.4	47.0	12	17	23	40					
	-44.4	52.0	100/0.3			100/0.3				-44.4	52.0
										COASTAL PLAIN GRAY GREEN LIMESTONE (RIVER BEND FORMATION)	
	-49.4	57.0	14	9	14	23				-46.2	53.8
										COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	
	-54.3	61.9	8	7	17	24					
	-59.3	66.9	7	9	18	27				-61.3	68.9
										-61.9	69.5
	-64.3	71.9	7	11	20	31				**COASTAL PLAIN** GRAY GREEN LIMESTONE (RIVER BEND FORMATION)	
										COASTAL PLAIN SILTY SAND, SAT. (RIVER BEND FORMATION)	
	-69.3	76.9								-68.1	75.7

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B2-B WBL	**STATION** 285+83	**OFFSET** 59 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.6 ft	**TOTAL DEPTH** 83.4 ft	**NORTHING** 416,918	**EASTING** 2,617,499	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/06/02	**COMP. DATE** 11/07/02	**SURFACE WATER DEPTH** 0.2ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70			5	16	26	Match Line 42				**COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION) *(continued)*
-75	-74.3	81.9	11	12	14	26				-75.8 83.4
										Boring Terminated at Elevation -75.8 ft in Limestone
										ARTESIAN FLOW

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B2-B WBL	**STATION** 285+83	**OFFSET** 59 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.6 ft	**TOTAL DEPTH** 83.4 ft	**NORTHING** 416,918	**EASTING** 2,617,499	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/06/02	**COMP. DATE** 11/07/02	**SURFACE WATER DEPTH** 0.2ft	
CORE SIZE HQ	**TOTAL RUN** 33.8 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft) — DEPTH (ft)
-28.1											Begin Coring @ 35.7 ft
-30	-28.1 -29.4 -30.9	35.7 37.0 38.5	1.3	0:22/1.0 0:08/0.3 *N=85*	(0.0) 0%						-30.1 — **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION) *(continued)* — 37.7
-35	-34.4 -35.9	42.0 43.5	3.5	1:21/1.0 0:23/1.0 2:36/1.0 0:39/0.6 *N=34*	(1.1) 31%						**COASTAL PLAIN** GRAY GREEN LIMESTONE (RIVER BEND FORMATION) — 41.4
-40	-39.4 -40.9	47.0 48.5	3.5	0:34/1.0 1:03/1.0 0:24/1.0 0:29/0.6 *N=40*	(0.8) 23%						**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-45	-44.4 -44.8	52.0 52.4	3.5	0:23/1.0 0:22/1.0 0:26/1.0 0:18/0.6 *N=100/0.3*	(0.0) 0%						-44.4 — 52.0
-50	-49.3 -50.8	56.9 58.4	4.5	0:38/1.0 0:26/1.0 0:19/1.0 0:26/1.0 0:15/0.6 *N=23*	(1.3) 29%						-46.2 — **COASTAL PLAIN** GRAY GREEN LIMESTONE (RIVER BEND FORMATION) — 53.8 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-55	-54.3 -55.8	61.9 63.4	3.5	0:25/1.0 0:25/1.0 0:26/1.0 0:10/0.6 *N=24*	(0.0) 0%						
-60	-59.3 -60.8	66.9 68.4	3.5	0:48/1.0 0:27/1.0 0:27/1.0 0:12/0.6 *N=27*	(0.0) 0%						-61.3 — 68.9 -61.9 — 69.5
-65	-64.3 -65.8	71.9 73.4	3.5	2:56/1.0 2:23/1.0 0:23/1.0 0:10/0.6 *N=31*	(0.6) 17%						**COASTAL PLAIN** GRAY GREEN LIMESTONE (RIVER BEND FORMATION) **COASTAL PLAIN** SILTY SAND, SAT. (RIVER BEND FORMATION)
-70	-69.3 -70.8	76.9 78.4	3.5	0:38/1.0 0:24/1.0 1:05/1.0 0:31/0.6 *N=42*	(1.2) 34%						-68.1 — 75.7 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-75	-74.3	81.9	3.5	0:32/1.0 0:40/1.0 0:43/1.0 0:19/0.6 *N=26*	(1.4) 40%						-75.8 — 83.4 Boring Terminated at Elevation -75.8 ft in Limestone ARTESIAN FLOW

NCDOT CORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B3-A EBL	**STATION** 286+50	**OFFSET** 59 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.0 ft	**TOTAL DEPTH** 82.4 ft	**NORTHING** 416,967	**EASTING** 2,617,373	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/11/02	**COMP. DATE** 10/16/02	**SURFACE WATER DEPTH** 0.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
10											
	7.0	0.0								7.0 GROUND SURFACE	0.0
5			WOH	WOH	1	1	SS-50			**ALLUVIAL**	
										5.0 DARK BROWN MUCK, WET TO SAT.	2.0
	2.2	4.8								**ALLUVIAL**	
0			3	3	4	7	SS-51			GRAY SAND WITH WOOD FRAGMENTS, MOIST TO SAT.	
	-2.7	9.7									
-5			8	13	8	21					
	-7.7	14.7								-6.1	13.1
-10			3	3	5	8				**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	
	-12.7	19.7								-11.4	18.4
			3	3	3	6	SS-52			**COASTAL PLAIN** GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)	
-15	-14.8	21.8	2	2	2	4					
-20	-19.7	26.7	3	2	3	5	SS-53			-19.7	26.7
										COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	
-25	-24.7	31.7	3	3	4	7					
-30	-30.0	37.0	17	12	11	23				-28.4	35.4
										COASTAL PLAIN GRAY CALCITE CEMENTED SANDSTONE WITH SHELL FRAGMENTS (RIVER BEND FORMATION)	
-35	-35.0	42.0	41	32	33	65	SS-54			-32.4	39.4
										COASTAL PLAIN GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	
-40	-39.9	46.9	15	25	31	56					
-45	-44.9	51.9	19	29	25	54					
-50	-49.9	56.9	12	18	22	40					
-55	-54.9	61.9	9	23	24	47				-53.4	60.4
										COASTAL PLAIN GRAY LIMESTONE (RIVER BEND FORMATION)	
-60	-59.9	66.9	38	33	54	87	SS-55				
-65	-64.9	71.9	19	34	66/0.3	100/0.8					
-70	-69.9	76.9				50/0.1					

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B3-A EBL	**STATION** 286+50	**OFFSET** 59 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.0 ft	**TOTAL DEPTH** 82.4 ft	**NORTHING** 416,967	**EASTING** 2,617,373	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/11/02	**COMP. DATE** 10/16/02	**SURFACE WATER DEPTH** 0.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70			50/0.1			Match Line 50/0.1				**COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION) *(continued)*
-75	-74.9	81.9	86	14/0.1		100/0.6				-75.4 82.4 Boring Terminated at Elevation -75.4 ft in Limestone

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B3-A EBL	**STATION** 286+50	**OFFSET** 59 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.0 ft	**TOTAL DEPTH** 82.4 ft	**NORTHING** 416,967	**EASTING** 2,617,373	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/11/02	**COMP. DATE** 10/16/02	**SURFACE WATER DEPTH** 0.3ft	
CORE SIZE HQ	**TOTAL RUN** 44.5 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) DEPTH (ft)
-14.16											Begin Coring @ 21.2 ft
-15	-14.2	21.2	0.6	0:20/0.6	(0.0)						**COASTAL PLAIN**
	-14.8	21.8		N=4	0%						GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN
	-16.2	23.2									FORMATION) *(continued)*
			3.5	0:23/1.0	(0.7)						
				0:30/1.0	21%						
				0:27/1.0							
-20	-19.7	26.7		0:08/0.6							
	-21.2	28.2		N=5			SS-53				
			3.5	0:25/1.0	(0.0)						**COASTAL PLAIN**
				0:21/1.0	0%						GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN
				0:22/1.0							FORMATION)
-25	-24.7	31.7		0:09/0.6							
	-26.2	33.2		N=7							
			3.8	0:30/1.0	(0.0)						
				0:23/1.0	0%						
				0:31/1.0							
-30	-30.0	37.0		0:20/0.8							
	-31.5	38.5		N=23							
			3.5	0:30/1.0	(0.0)						
				0:31/1.0	0%						
				0:28/1.0							
-35	-35.0	42.0		0:15/0.6							
	-36.4	43.4		N=65			SS-54				
			3.5	0:25/1.0	(0.7)						
				0:28/1.0	19%						
				0:21/1.0							
-40	-39.9	46.9		0:15/0.6							
	-41.4	48.4		N=56							
			3.5	0:29/1.0	(1.7)						
				0:27/1.0	50%						
				0:31/1.0							
-45	-44.9	51.9		0:12/0.6							
	-46.4	53.4		N=54							
			3.5	0:20/1.0	(1.1)						
				0:20/1.0	32%						
				0:20/1.0							
-50	-49.9	56.9		0:11/0.6							
	-51.4	58.4		N=40							
			3.5	0:22/1.0	(0.3)						
				0:21/1.0	9%						
				0:24/1.0							
-55	-54.9	61.9		0:15/0.6							
	-56.4	63.4		N=47							
			3.5	1:00/1.0	(0.5)						
				0:54/1.0	15%						
				0:16/1.0							
-60	-59.9	66.9		0:10/0.6							
	-61.4	68.4		N=87			SS-55				
			3.5	0:57/1.0	(1.4)						
				0:45/1.0	39%						
				0:37/1.0							
-65	-64.9	71.9		0:39/0.6							
	-66.2	73.2		N=100/0.8							
			3.7	0:55/1.0	(1.8)						
				1:10/1.0	49%						
				1:15/1.0							
-70	-69.9	76.9		0:45/0.8							
	-69.9	76.9	4.9	1:54/1.0	(1.1)						
				N=50/0.1	23%						
				1:54/1.0							
				1:05/1.0							
				1:10/1.0							
-75	-74.8	81.8		0:45/1.0							
				0:35/1.0							
				N=100/0.6							

-19.7 / 26.7 — **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)

-28.4 / 35.4 — **COASTAL PLAIN** GRAY CALCITE CEMENTED SANDSTONE WITH SHELL FRAGMENTS (RIVER BEND FORMATION)

-32.4 / 39.4 — **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)

-53.4 / 60.4 — **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)

-75.4 / 82.4 — Boring Terminated at Elevation -75.4 ft in Limestone

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B3-B WBL	**STATION** 286+81	**OFFSET** 56 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 6.5 ft	**TOTAL DEPTH** 82.6 ft	**NORTHING** 417,014	**EASTING** 2,617,481	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/04/02	**COMP. DATE** 11/05/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
10										
	6.5	0.0	WOH	WOH	WOH	0				6.5 0.0 GROUND SURFACE
5										**ALLUVIAL** DARK BROWN MUCK, WET TO SAT.
	2.2	4.3	7	8	7	15				3.2 3.3 **ALLUVIAL** LIGHT BROWN SAND WITH WOOD FRAGMENTS, SAT.
0	-2.7	9.2	13	14	12	26				
-5	-7.7	14.2	3	3	4	7				-5.3 11.8 **COASTAL PLAIN** GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)
-10	-12.7	19.2	5	6	6	12				
-15	-17.6	24.1	2	2	3	5				
-20	-22.0	28.5	2	2	2	4				-21.1 27.6 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-25	-27.0	33.5	2	2	3	5				
-30	-29.7	36.2	100/0.2			100/0.2				-29.0 35.5 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-35	-34.7	41.2	43	51	38	89				-31.7 38.2 **COASTAL PLAIN** GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-40	-39.7	46.2	10	19	22	41				-39.1 45.6 **COASTAL PLAIN** GRAY CALCITE CEMENTED SANDSTONE, SAT. (RIVER BEND FORMATION) **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-45	-44.7	51.2	41	36	29	65				39.7 46.2
-50	-49.7	56.2	8	6	11	17				
-55	-54.7	61.2	8	6	16	22				
-60	-59.6	66.1	7	5	5	10				
-65	-64.6	71.1	23	38	43	81				-67.1 73.6
-70	-69.6	76.1								

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B3-B WBL	**STATION** 286+81	**OFFSET** 56 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 6.5 ft	**TOTAL DEPTH** 82.6 ft	**NORTHING** 417,014	**EASTING** 2,617,481	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/04/02	**COMP. DATE** 11/05/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70			85	15/0.1		Match Line 100/0.6				**COASTAL PLAIN** GRAY SANDSTONE (RIVER BEND FORMATION) *(continued)*
-75	-74.6	81.1	31	20	20	40				-76.1 82.6 Boring Terminated at Elevation -76.1 ft in Sandstone ARTESIAN FLOW

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B3-B WBL	**STATION** 286+81	**OFFSET** 56 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 6.5 ft	**TOTAL DEPTH** 82.6 ft	**NORTHING** 417,014	**EASTING** 2,617,481	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/04/02	**COMP. DATE** 11/05/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 35.0 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) DEPTH (ft)
-28.4											Begin Coring @ 34.9 ft
	-28.4	34.9	1.3	1:17/1.0	(0.7)						-29.0 35.5 **COASTAL PLAIN**
-30	-28.7	36.2		*N=100/0.2*	54%						GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN
	-28.9	36.4	4.8	0:25/0.3	(1.8)						FORMATION) *(continued)*
				0:52/1.0							-31.7 38.2 **COASTAL PLAIN**
				0:47/1.0	38%						GRAY LIMESTONE (RIVER BEND FORMATION)
				0:46/1.0							**COASTAL PLAIN**
-35	-34.7	41.2		0:23/1.0							GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND
	-36.2	42.7		0:16/0.9							FORMATION)
				N=89							
			3.5	0:20/1.0	(0.6)						
				0:50/1.0	17%						
				0:33/1.0							-39.1 45.6
-40	-39.7	46.2		4:12/0.6							-39.7 46.2 **COASTAL PLAIN**
	-41.2	47.7		*N=41*							GRAY CALCITE CEMENTED SANDSTONE, SAT. (RIVER BEND
			3.5	0:31/1.0	(0.0)						FORMATION)
				0:43/1.0	0%						**COASTAL PLAIN**
				0:21/1.0							GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND
-45	-44.7	51.2		0:12/0.6							FORMATION)
	-46.2	52.7		*N=65*							
			3.5	0:27/1.0	(0.0)						
				0:29/1.0	0%						
				0:31/1.0							
-50	-49.7	56.2		0:18/0.6							
	-51.1	57.6		*N=17*							
			3.5	0:31/1.0	(0.2)						
				0:34/1.0	6%						
				0:24/1.0							
-55	-54.6	61.1		0:11/0.6							
	-56.1	62.6		*N=22*							
			3.5	1:13/1.0	(0.0)						
				1:13/1.0	0%						
				1:03/1.0							
-60	-59.6	66.1		0:12/0.6							
	-61.1	67.6		*N=10*							
			3.5	0:22/1.0	(0.0)						
				0:33/1.0	0%						
				0:29/1.0							
-65	-64.6	71.1		0:10/0.6							
	-66.1	72.6		*N=81*							
			3.5	0:28/1.0	(2.2)						-67.1 73.6
				4:05/1.0	63%						**COASTAL PLAIN**
				0:31/1.0							GRAY SANDSTONE (RIVER BEND FORMATION)
-70	-69.6	76.1		0:15/0.6							
	-70.2	76.7	4.4	*N=100/0.6*	(1.3)						
				0:45/1.0	30%						
				0:22/1.0							
				0:21/1.0							
				0:58/1.0							
-75	-74.6	81.1		0:15/0.5							
				N=40							-76.1 82.6
											Boring Terminated at Elevation -76.1 ft in Sandstone
											ARTESIAN FLOW

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** B. Banks	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B4-A EBL	**STATION** 288+28	**OFFSET** 69 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 4.5 ft	**TOTAL DEPTH** 78.4 ft	**NORTHING** 417,142	**EASTING** 2,617,337	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/21/02	**COMP. DATE** 11/22/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
5										
	4.5	0.0	1	0	1	1	SS-61			4.5 / 0.0 GROUND SURFACE
0	0.8	3.7	5	4	6	10				**ALLUVIAL** BROWN MODERATELY ORGANIC SAND, SAT. 1.2 / 3.3 **ALLUVIAL** TAN SAND WITH WOOD FRAGMENTS, WET TO SAT.
-5	-4.3	8.8	1	3	2	5				-4.9 / 9.4 **COASTAL PLAIN** GRAY SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-10	-9.3	13.8	4	5	4	9				-12.6 / 17.1
-15	-14.3	18.8	4	13	21	34				-17.2 / 21.7 **COASTAL PLAIN** GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)
-20	-19.7	24.2	2	3	3	6				-23.1 / 27.6 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-25	-24.7	29.2	4	4	4	8				-29.2 / 33.7 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-30	-32.6	37.1	100/0.5			100/0.5				-35.9 / 40.4 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-35	-37.6	42.1	23	9	9	18				
-40	-42.5	47.0	21	18	24	42				
-45	-47.5	52.0	42	20	18	38				
-50	-52.5	57.0	10	12	9	21				
-55	-57.5	62.0	12	18	22	40				-55.9 / 60.4 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-60	-62.5	67.0	23	26	34	60				
-65	-67.5	72.0	18	25	75/0.2	100/0.7				
-70	-72.5	77.0	11	14	51	65				-73.9 / 78.4 Boring Terminated at Elevation -73.9 ft in

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-75						Match Line				Limestone ARTESIAN HEAD ELEVATION =13.1

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** B. Banks
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B4-A EBL	**STATION** 288+28	**OFFSET** 69 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 4.5 ft	**TOTAL DEPTH** 78.4 ft	**NORTHING** 417,142	**EASTING** 2,617,337	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/21/02	**COMP. DATE** 11/22/02	**SURFACE WATER DEPTH** N/A	

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** B. Banks	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B4-A EBL	**STATION** 288+28	**OFFSET** 69 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 4.5 ft	**TOTAL DEPTH** 78.4 ft	**NORTHING** 417,142	**EASTING** 2,617,337	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/21/02	**COMP. DATE** 11/22/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 32.7 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
-29.2											Begin Coring @ 33.7 ft
-30	-29.2	33.7	3.4	1:21/1.0 1:04/1.0 0:25/1.0 0:20/0.5	(1.0) 29%						-29.2 **COASTAL PLAIN** 33.7 GRAY LIMESTONE (RIVER BEND FORMATION)
	-32.6	37.1									
	-33.1	37.6									
			4.5	N=100/0.5							
-35				1:54/1.0 0:32/1.0 4:13/1.0 0:15/1.0 0:21/0.6	(1.1) 24%						-35.9 40.4 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
	-37.6	42.1									
	-39.0	43.5		N=18							
-40			3.5	0:23/1.0 0:26/1.0 0:27/1.0 0:16/0.6	(0.0) 0%						
	-42.5	47.0									
	-44.0	48.5		N=42							
-45			3.5	0:23/1.0 0:17/1.0 0:23/1.0 0:12/0.6	(2.8) 80%						
	-47.5	52.0									
	-49.0	53.5		N=38							
-50			3.5	0:26/1.0 0:18/1.0 0:38/1.0 0:12/0.6	(0.0) 0%						
	-52.5	57.0									
	-54.0	58.5		N=21							
-55			3.5	0:22/1.0 0:23/1.0 0:29/1.0 0:11/0.6	(0.7) 20%						-55.9 60.4 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
	-57.5	62.0									
	-59.0	63.5		N=40							
-60			3.5	0:19/1.0 0:20/1.0 0:20/1.0 0:09/0.6	(1.4) 40%						
	-62.5	67.0									
	-64.0	68.5		N=60							
-65			3.5	0:56/1.0 0:22/1.0 1:10/1.0 0:12/0.6	(2.5) 71%						
	-67.5	72.0									
	-68.6	73.1		N=100/0.7							
-70			3.8	1:36/1.0 0:52/1.0 2:56/1.0 0:59/0.9	(2.0) 53%						
	-72.4	76.9		N=65							
											-73.9 78.4 Boring Terminated at Elevation -73.9 ft in Limestone
											ARTESIAN HEAD ELEVATION =13.1

NCDOT CORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B4-B WBL	**STATION** 288+55	**OFFSET** 53 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 5.6 ft	**TOTAL DEPTH** 97.9 ft	**NORTHING** 417,186	**EASTING** 2,617,453	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/02/02	**COMP. DATE** 10/03/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
10											
5	5.6	0.0	WOH	WOH	WOH	0				5.6 GROUND SURFACE	0.0
										ALLUVIAL DARK BROWN MUCK, WET TO SAT.	
0	0.6	5.0	1	3	4	7	SS-59			2.3 **ALLUVIAL** GRAY BROWN SAND WITH WOOD FRAGMENTS, SAT.	3.3
-5	-4.2	9.8	2	4	4	8	SS-13			-2.6 **COASTAL PLAIN** GRAY BROWN SAND WITH WOOD FRAGMENTS, SAT. (DUPLIN FORMATION)	8.2
-10	-9.1	14.7	3	3	3	6	SS-14			-7.5 **COASTAL PLAIN** GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)	13.1
	-11.1	16.7	5	5	5	10					
-15	-16.1	21.7	2	2	2	4	SS-15			-14.1 **COASTAL PLAIN** GRAY GREEN SILT WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	19.7
-20	-21.0	26.6	3	2	3	5	SS-16			-19.0 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	24.6
-25	-26.0	31.6	12	27	19	46				-26.3 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)	31.9
-30	-31.0	36.6	70	30/0.2		100/0.7					
-35	-36.0	41.6	100/0.3			100/0.3				-37.1 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	42.7
-40	-41.0	46.6	89	11/0.0		100/0.5					
-45	-46.0	51.6	18	28	55	83	SS-17				
-50	-50.0	55.6	9	21	25	46	SS-18				
-55	-55.9	61.5	12	43	46	89					
-60	-60.9	66.5	10	25	29	54	SS-20				
-65	-65.9	71.5	7	10	22	32	SS-21			-65.4 **COASTAL PLAIN** GRAY GREEN SILT WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	71.0
-70											

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B4-B WBL	**STATION** 288+55	**OFFSET** 53 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 5.6 ft	**TOTAL DEPTH** 97.9 ft	**NORTHING** 417,186	**EASTING** 2,617,453	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/02/02	**COMP. DATE** 10/03/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70						Match Line				
	-70.9	76.5	16	45	42	87	SS-22			-71.1 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION) 76.7
-75	-75.9	81.5	38	24	14	38	SS-23			
-80	-80.9	86.5	42	28	72/0.2	100/0.7				
-85	-85.9	91.5	20	20	25	45	SS-24			
-90	-90.9	96.5	20	38	24	62	SS-25			-92.3 Boring Terminated at Elevation -92.3 ft in Limestone 97.9
										ARTESIAN HEAD ELEVATION =12.2

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B4-B WBL	**STATION** 288+55	**OFFSET** 53 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 5.6 ft	**TOTAL DEPTH** 97.9 ft	**NORTHING** 417,186	**EASTING** 2,617,453	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/02/02	**COMP. DATE** 10/03/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 59.8 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
-10.5											Begin Coring @ 16.1 ft
	-10.5	16.1	0.5	0:30/0.5	(0.0)						**COASTAL PLAIN**
	-11.0	16.6		*N=10*	0%						GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN
	-12.5	18.1									FORMATION) *(continued)*
			3.5	0:35/1.0	(0.0)						-14.1 19.7
-15				0:20/1.0	0%						**COASTAL PLAIN**
				0:21/1.0							GRAY GREEN SILT WITH SHELL FRAGMENTS, SAT. (DUPLIN
	-16.0	21.6		0:15/0.6							FORMATION)
	-17.5	23.1		*N=4*			*SS-15*				
			3.5	0:26/1.0	(0.0)						-19.0 24.6
-20				0:28/1.0	0%						**COASTAL PLAIN**
				0:21/1.0							GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN
	-21.0	26.6		0:10/0.6							FORMATION)
	-22.5	28.1		*N=5*			*SS-16*				
			3.5	0:20/1.0	(0.0)						
-25				0:19/1.0	0%						
				0:16/1.0							
	-26.0	31.6		0:10/0.6							-26.3 31.9
	-27.5	33.1		*N=46*							**COASTAL PLAIN**
			3.5	4:17/1.0	(2.0)						GRAY LIMESTONE (RIVER BEND FORMATION)
-30				3:30/1.0	57%						
				2:49/1.0							
	-31.0	36.6		1:50/0.6							
	-31.7	37.3		*N=100/0.7*							
			4.3	2:30/1.0	(2.9)						
-35				2:31/1.0	67%						
				1:59/1.0							
	-36.0	41.6		2:27/1.0							
	-36.3	41.9		1:00/0.4							
			4.7	*N=100/0.3*	(0.6)						-37.1 42.7
				1:20/1.0	13%						**COASTAL PLAIN**
-40				0:58/1.0							GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND
				1:15/1.0							FORMATION)
	-41.0	46.6		0:47/1.0							
	-41.5	47.1		0:45/0.7							
			4.5	*N=100/0.5*	(0.3)						
				0:58/1.0	7%						
-45				1:22/1.0							
				0:51/1.0							
	-46.0	51.6		0:45/1.0							
	-47.5	53.1		0:30/0.5			*SS-17*				
				N=83							
			3.5	0:30/1.0	(0.3)						
-50				0:28/1.0	9%						
				0:31/1.0			*SS-18*				
	-51.0	56.6		*N=46*							
	-52.4	58.0		0:10/0.6							
			3.5	0:23/1.0	(0.0)						
-55				0:18/1.0	0%						
				0:16/1.0							
	-55.9	61.5		0:11/0.6							
	-57.4	63.0		*N=89*							
			3.5	0:28/1.0	(0.0)						
-60				0:25/1.0	0%						
				0:21/1.0							
	-60.9	66.5		0:10/0.6							
	-62.4	68.0		*N=54*			*SS-20*				
			3.5	0:21/1.0	(0.0)						
-65				0:19/1.0	0%						
				0:27/1.0							-65.4 71.0
	-65.9	71.5		0:09/0.6							**COASTAL PLAIN**
	-67.4	73.0		*N=32*			*SS-21*				GRAY GREEN SILT WITH SHELL FRAGMENTS, SAT. (DUPLIN
			3.5	0:25/1.0	(0.0)						FORMATION)
-70				0:37/1.0	0%						
				0:30/1.0							
	-70.9	76.5		0:15/0.6							-71.1 76.7
	-72.4	78.0		*N=87*			*SS-22*				**COASTAL PLAIN**
			3.5	1:00/1.0	(1.5)						GRAY LIMESTONE (RIVER BEND FORMATION)
-75				0:54/1.0	43%						
				0:45/1.0							
	-75.9	81.5		0:20/0.6							
	-77.4	83.0		*N=38*			*SS-23*				
			3.5	0:47/1.0	(1.7)						
-80				1:17/1.0	49%						
				0:50/1.0							
	-80.9	86.5		0:25/0.6							
	-82.0	87.6		*N=100/0.7*							
			3.8	2:01/1.0	(1.3)						
-85				1:45/1.0	34%						
				1:01/1.0							
	-85.8	91.4		0:45/0.9							
	-87.3	92.9		*N=45*			*SS-24*				
			3.5	0:45/1.0	(2.0)						
-90				1:30/1.0	57%						
				3:26/1.0							

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B4-B WBL	**STATION** 288+55	**OFFSET** 53 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 5.6 ft	**TOTAL DEPTH** 97.9 ft	**NORTHING** 417,186	**EASTING** 2,617,453	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/02/02	**COMP. DATE** 10/03/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 59.8 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
-90.5											Begin Coring @ 96.1 ft
	-90.8	96.4		2:12/0.6			*SS-25*				-92.3 97.9
				N=62							Boring Terminated at Elevation -92.3 ft in Limestone

ARTESIAN HEAD ELEVATION =12.2

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** B. Banks
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B5-A EBL	**STATION** 290+10	**OFFSET** 40 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.5 ft	**TOTAL DEPTH** 83.3 ft	**NORTHING** 417,325	**EASTING** 2,617,338	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/22/02	**COMP. DATE** 11/24/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
10										
	7.5	0.0	1	1	0	1				7.5 GROUND SURFACE 0.0
5										**ALLUVIAL** DARK BROWN MODERATELY ORGANIC SAND, MOIST
	3.2	4.3	3	2	2	4				4.9 2.6
0										**ALLUVIAL** TAN SAND, MOIST TO SAT.
	-1.8	9.3	6	2	2	4				0.3 7.2
-5										**COASTAL PLAIN** GRAY SAND, SAT. (DUPLIN FORMATION)
	-6.8	14.3	4	4	3	7				
-10										-9.6 17.1
	-11.8	19.3	1	0	3	3				**COASTAL PLAIN** GRAY GREEN CLAY, WET (DUPLIN FORMATION)
-15										
	-16.4	23.9	7	6	2	8				-14.8 22.3
-20										**COASTAL PLAIN** GRAY GREEN SILTY CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)
	-21.3	28.8	2	2	4	6				
-25										-24.0 31.5
	-26.3	33.8	10	12	28	40				**COASTAL PLAIN** GREEN SAND, SAT. (DUPLIN FORMATION)
-30	-29.5	37.0	53	23	20	43				-27.6 35.1
										COASTAL PLAIN GREEN GRAY LIMESTONE (RIVER BEND FORMATION)
-35	-34.5	42.0	36	41	34	75				-34.5 42.0
										COASTAL PLAIN GRAY GREEN SAND, SAT. (RIVER BEND FORMATION)
-40	-39.5	47.0	5	16	28	44				
-45	-44.5	52.0	8	26	27	53				
-50	-49.5	57.0	8	13	16	29				
-55	-54.4	61.9	7	10	11	21				
-60	-59.4	66.9	8	9	21	30				-60.4 67.9
-65	-64.4	71.9	19	34	23	57				**COASTAL PLAIN SEDIMENTARY ROCK** GRAY CALCITE-CEMENTED SANDSTONE WITH SHELL FRAGMENTS (RIVER BEND FORMATION)
-70	-69.4	76.9								

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** B. Banks
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B5-A EBL	**STATION** 290+10	**OFFSET** 40 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.5 ft	**TOTAL DEPTH** 83.3 ft	**NORTHING** 417,325	**EASTING** 2,617,338	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/22/02	**COMP. DATE** 11/24/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70			21	18	79	Match Line				**COASTAL PLAIN SEDIMENTARY ROCK** GRAY CALCITE-CEMENTED SANDSTONE WITH SHELL FRAGMENTS (RIVER BEND FORMATION) *(continued)*
-75	-74.4	81.9	18	50	50/0.4	97 100/0.9				-75.8 83.3 Boring Terminated at Elevation -75.8 ft in Sandstone ARTESIAN HEAD ELEVATION =15.7

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** B. Banks
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B5-A EBL	**STATION** 290+10	**OFFSET** 40 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.5 ft	**TOTAL DEPTH** 83.3 ft	**NORTHING** 417,325	**EASTING** 2,617,338	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/22/02	**COMP. DATE** 11/24/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 33.2 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
-27.8											Begin Coring @ 35.3 ft
-30	-27.8 -29.5	35.3 37.0	1.7	3:08/1.0 1:26/0.7	(0.9) 54%						**COASTAL PLAIN** GREEN GRAY LIMESTONE (RIVER BEND FORMATION) *(continued)*
	-31.0	38.5		*N=43*							
-35	-34.5	42.0	3.5	1:26/1.0 0:32/1.0 0:52/1.0 0:17/0.6	(2.1) 60%						-34.5 42.0
	-36.0	43.5		*N=75*							**COASTAL PLAIN** GRAY GREEN SAND, SAT. (RIVER BEND FORMATION)
-40	-39.5	47.0	3.5	0:53/1.0 0:25/1.0 0:33/1.0 0:24/0.6	(0.2) 7%						
	-41.0	48.5		*N=44*							
-45	-44.5	52.0	3.5	0:34/1.0 1:23/1.0 0:28/1.0 0:17/1.0	(0.0) 0%						
	-45.9	53.4		*N=53*							
-50	-49.4	56.9	3.5	0:22/1.0 0:50/1.0 0:34/1.0 0:10/0.6	(0.4) 12%						
	-50.9	58.4		*N=29*							
-55	-54.4	61.9	3.5	1:20/1.0 1:08/1.0 1:24/1.0 0:17/0.6	(0.0) 0%						
	-55.9	63.4		*N=21*							
-60	-59.4	66.9	3.5	0:24/1.0 0:15/1.0 0:37/1.0 0:22/0.6	(0.0) 0%						
	-60.9	68.4		*N=30*							-60.4 67.9
-65	-64.4	71.9	3.5	0:20/1.0 0:34/1.0 1:24/1.0 0:29/0.6	(1.4) 41%						**COASTAL PLAIN SEDIMENTARY ROCK** GRAY CALCITE-CEMENTED SANDSTONE WITH SHELL FRAGMENTS (RIVER BEND FORMATION)
	-65.9	73.4		*N=57*							
-70	-69.4	76.9	3.5	0:34/1.0 0:49/1.0 0:38/1.0 0:20/0.6	(1.6) 45%						
	-70.9	78.4		*N=97*							
-75	-74.4	81.9	3.5	0:53/1.0 1:21/1.0 1:03/1.0 0:31/0.6	(1.1) 30%						
				N=100/0.9							-75.8 83.3
											Boring Terminated at Elevation -75.8 ft in Sandstone
											ARTESIAN HEAD ELEVATION =15.7

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B5-B WBL	**STATION** 289+55	**OFFSET** 56 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.1 ft	**TOTAL DEPTH** 83.7 ft	**NORTHING** 417,285	**EASTING** 2,617,441	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/29/02	**COMP. DATE** 10/30/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
10										
	7.1	0.0	1	1	1	2	SS-60			7.1 GROUND SURFACE 0.0 **ALLUVIAL** DARK BROWN MUCK, WET TO SAT.
5										
	2.1	5.0	1	1	4	5				0.5 6.6 **ALLUVIAL** SAND, SAT.
0	-2.9	10.0	4	3	3	6				-1.4 8.5 **COASTAL PLAIN** GRAY CLAYEY SAND WITH WOOD FRAGMENTS, SAT. (DUPLIN FORMATION)
-5	-7.8	14.9	4	3	3	6				-6.0 13.1 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-10	-12.8	19.9	3	4	4	8				-10.0 17.1 **COASTAL PLAIN** GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)
-15	-17.6	24.7	2	2	2	4				
-20	-20.2	27.3	3	3	4	7				-19.8 26.9 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-25	-25.1	32.2	20	36	52	88				-24.9 32.0 **COASTAL PLAIN** GREEN BROWN LIMESTONE (RIVER BEND FORMATION)
-30	-30.2	37.3	12	47	53/0.3	100/0.8				
-35	-35.2	42.3	32	68/0.3		100/0.8				
-40	-40.2	47.3	30	21	27	48				-39.3 46.4 **COASTAL PLAIN** GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-45	-45.2	52.3	31	33	41	74				-43.6 50.7 -44.1 51.2 **COASTAL PLAIN** GRAY CALCITE CEMENTED SANDSTONE (RIVER BEND FORMATION)
-50	-50.2	57.3	12	18	23	41				**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-55	-55.1	62.2	13	23	29	52				
-60	-60.1	67.2	17	22	27	49				
-65	-65.1	72.2	9	27	29	56				
-70										-68.3 75.4

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B5-B WBL	**STATION** 289+55	**OFFSET** 56 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.1 ft	**TOTAL DEPTH** 83.7 ft	**NORTHING** 417,285	**EASTING** 2,617,441	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/29/02	**COMP. DATE** 10/30/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70						Match Line				
	-70.1	77.2	20	19	19	38				**COASTAL PLAIN** GRAY GREEN LIMESTONE (RIVER BEND FORMATION) *(continued)*
-75	-75.1	82.2	18	20	27	47				-76.6 83.7 Boring Terminated at Elevation -76.6 ft in Limestone ARTESIAN HEAD ELEVATION =13.2

NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B5-B WBL	**STATION** 289+55	**OFFSET** 56 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 7.1 ft	**TOTAL DEPTH** 83.7 ft	**NORTHING** 417,285	**EASTING** 2,617,441	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/29/02	**COMP. DATE** 10/30/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 40.5 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) / DEPTH (ft)
-19.1											Begin Coring @ 26.2 ft
-20	-19.1	26.2	1.1	0:31/1.0 0:05/0.1	(0.0) 0%						-19.8 / 26.9 **COASTAL PLAIN** GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION) *(continued)*
	-20.2	27.3		*N=7*							**COASTAL PLAIN**
	-21.7	28.8	3.5	0:15/1.0 0:14/1.0 0:15/1.0 1:28/0.6	(0.3) 9%						GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-25	-25.2	32.3		*N=68*							-24.9 / 32.0
	-26.7	33.8	3.5	1:15/1.0 1:25/1.0 1:56/1.0 1:21/0.6	(1.0) 29%						**COASTAL PLAIN** GREEN BROWN LIMESTONE (RIVER BEND FORMATION)
-30	-30.2	37.3		*N=100/0.8*							
	-31.5	38.6	3.7	1:34/1.0 1:35/1.0 0:46/1.0 0:15/0.6	(1.0) 27%						
-35	-35.2	42.3		*N=100/0.8*							
	-36.0	43.1	4.2	0:25/1.0 0:26/1.0 0:24/1.0 0:31/0.8	(3.2) 76%						
-40	-40.2	47.3		*N=48*							-39.3 / 46.4 **COASTAL PLAIN** GRAY SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
	-41.7	48.8	3.5	0:15/1.0 0:22/1.0 0:26/1.0 3:47/1.0	(0.5) 14%						-43.6 / 50.7
-45	-45.2	52.3		*N=74*							-44.1 / 51.2 **COASTAL PLAIN** GRAY CALCITE CEMENTED SANDSTONE (RIVER BEND FORMATION)
	-46.6	53.7	3.5	0:11/0.3 0:35/1.0 0:31/1.0 0:17/1.0 0:12/0.6	(0.0) 0%						**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)
-50	-50.1	57.2		*N=41*							
	-51.6	58.7	3.5	0:24/1.0 0:26/1.0 0:25/1.0 0:14/0.6	(0.0) 0%						
-55	-55.1	62.2		*N=52*							
	-56.6	63.7	3.5	0:42/1.0 0:21/1.0 0:22/1.0 0:16/0.6	(0.0) 0%						
-60	-60.1	67.2		*N=49*							
	-61.6	68.7	3.5	0:31/1.0 0:29/1.0 0:27/1.0 0:13/0.6	(0.0) 0%						
-65	-65.1	72.2		*N=56*							
	-66.6	73.7	3.5	0:31/1.0 0:49/1.0 1:15/1.0 0:25/0.6	(0.6) 17%						-68.3 / 75.4 **COASTAL PLAIN** GRAY GREEN LIMESTONE (RIVER BEND FORMATION)
-70	-70.1	77.2		*N=38*							
	-71.6	78.7	3.5	1:22/1.0 1:42/1.0 1:31/1.0 0:35/0.6	(0.9) 26%						
-75	-75.1	82.2		*N=47*							-76.6 / 83.7 Boring Terminated at Elevation -76.6 ft in Limestone ARTESIAN HEAD ELEVATION =13.2

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B6-A EBL	**STATION** 291+11	**OFFSET** 44 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 10.0 ft	**TOTAL DEPTH** 83.1 ft	**NORTHING** 417,425	**EASTING** 2,617,319	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/25/02	**COMP. DATE** 11/25/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
10										10.0 GROUND SURFACE	0.0
										ALLUVIAL TAN BROWN SAND, MOIST TO SAT.	
5	5.4	4.6	4	2	9	11					
0	0.4	9.6	2	3	2	5					
-5	-4.6	14.6	3	3	4	7					
-10	-9.6	19.6	7	7	9	16					
-15	-14.5	24.5	15	15	21	36				-13.3	23.3
-20	-19.3	29.3	32	33	34	67				**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)	
-25	-22.3	32.3	4	6	7	13					
-30	-27.3	37.3	7	4	21	25				-28.5	38.5
-35	-32.3	42.3	29	31	68	99				**COASTAL PLAIN** GREEN GRAY LIMESTONE (RIVER BEND FORMATION)	
-40	-37.2	47.2	8	16	15	31				-34.9	44.9
-45	-42.2	52.2	27	37	31	68				**COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND FORMATION)	
-50	-47.2	57.2	16	17	24	41					
-55	-52.2	62.2	13	8	12	20					
-60	-57.2	67.2	5	8	12	20					
-65	-62.2	72.2	13	22	33	55				-62.2	72.2
-70	-67.2	77.2	21	28	26	54				**COASTAL PLAIN** GREEN GRAY LIMESTONE (RIVER BEND FORMATION)	

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B6-A EBL	**STATION** 291+11	**OFFSET** 44 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 10.0 ft	**TOTAL DEPTH** 83.1 ft	**NORTHING** 417,425	**EASTING** 2,617,319	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/25/02	**COMP. DATE** 11/25/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70						Match Line				
	-72.6	82.6	100/0.5			100/0.5				-73.1 83.1
										Boring Terminated at Elevation -73.1 ft in Limestone
										ARTESIAN HEAD ELEVATION =16.3

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B6-A EBL	**STATION** 291+11	**OFFSET** 44 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 10.0 ft	**TOTAL DEPTH** 83.1 ft	**NORTHING** 417,425	**EASTING** 2,617,319	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 11/25/02	**COMP. DATE** 11/25/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 36.5 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
-20.8											Begin Coring @ 30.8 ft
	-20.8	30.8	1.5	0:19/1.0	(0.0)						GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN
	-22.3	32.3		0:10/0.5	0%						FORMATION) *(continued)*
	-23.8	33.8		*N=13*							
-25			3.5	0:21/1.0	(0.0)						
				0:21/1.0	0%						
	-27.3	37.3		0:19/1.0							
	-28.7	38.7		0:12/0.6							
				N=25							-28.5 38.5
-30			3.5	2:29/1.0	(0.3)						**COASTAL PLAIN**
				1:08/1.0	9%						GREEN GRAY LIMESTONE (RIVER BEND FORMATION)
	-32.2	42.2		1:07/1.0							
	-33.7	43.7		0:22/0.6							
				N=99							
-35			3.5	1:03/1.0	(0.4)						-34.9 44.9
				0:26/1.0	11%						**COASTAL PLAIN**
	-37.2	47.2		0:21/1.0							GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (RIVER BEND
	-38.7	48.7		0:18/0.6							FORMATION)
				N=31							
-40			3.5	0:33/1.0	(0.0)						
				1:24/1.0	0%						
	-42.2	52.2		0:48/1.0							
	-43.7	53.7		0:22/0.6							
				N=68							
-45			3.5	0:38/1.0	(0.9)						
				0:30/1.0	26%						
	-47.2	57.2		0:45/1.0							
	-48.7	58.7		0:23/0.6							
				N=41							
-50			3.5	0:30/1.0	(0.7)						
				0:28/1.0	20%						
	-52.2	62.2		0:17/1.0							
	-53.7	63.7		*N=20*							
-55			3.5	0:38/1.0	(0.0)						
				0:27/1.0	0%						
	-57.2	67.2		0:24/1.0							
	-58.7	68.7		0:13/0.6							
				N=20							
-60			3.5	0:19/1.0	(0.0)						
				0:34/1.0	0%						
	-62.2	72.2		0:50/1.0							
	-63.7	73.7		0:16/0.6							-62.2 72.2
				N=55							**COASTAL PLAIN**
-65			3.5	0:40/1.0	(1.6)						GREEN GRAY LIMESTONE (RIVER BEND FORMATION)
				0:34/1.0	46%						
	-67.2	77.2		0:27/1.0							
	-68.6	78.6		0:25/0.6							
				N=54							
-70			3.5	1:13/1.0	(1.7)						
				1:10/1.0	49%						
	-72.1	82.1		0:35/1.0							
				0:37/0.6							-73.1 83.1
				N=100/0.5							Boring Terminated at Elevation -73.1 ft in Limestone
											ARTESIAN HEAD ELEVATION =16.3

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B6-B WBL	**STATION** 291+23	**OFFSET** 57 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 6.5 ft	**TOTAL DEPTH** 94.1 ft	**NORTHING** 417,451	**EASTING** 2,617,417	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 09/17/02	**COMP. DATE** 09/17/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) — DEPTH (ft)
10										
5										6.5 — 0.0 GROUND SURFACE
	1.7	4.8	10	10	7	17	SS-1			**ALLUVIAL** DARK BROWN MUCK, WET TO SAT.
0										3.2 — 3.3
	-4.1	10.6	1	1	1	2	SS-2			**ALLUVIAL** GRAY SAND, WET TO SAT.
-5										-0.7 — 7.2
	-10.7	17.2	1	3	3	6	SS-3			**COASTAL PLAIN** GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)
-10										-8.3 — 14.8
	-15.7	22.2	2	2	2	4				
-15										
	-20.7	27.2	3	2	4	6	SS-4			-19.7 — 26.2 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
-20										
	-25.7	32.2	9	16	23	39				-26.1 — 32.6 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-25										
	-30.6	37.1	100/0.2			100/0.2				
-30										
	-35.6	42.1	15	15	24	39	SS-5			
-35										
	-40.6	47.1	13	16	20	36	SS-6			-39.6 — 46.1 **COASTAL PLAIN** GRAY GREEN SAND, SAT. (RIVER BEND FORMATION)
-40										
	-45.6	52.1	24	23	26	49	SS-7			
-45										
	-50.6	57.1	28	29	28	57				
-50										
	-56.1	62.6	10	12	25	37				
-55										
	-61.2	67.7	11	17	25	42	SS-8			
-60										
	-66.2	72.7	14	26	37	63	SS-9			-69.3 — 75.8
-65										
-70										

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. B6-B WBL	**STATION** 291+23	**OFFSET** 57 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 6.5 ft	**TOTAL DEPTH** 94.1 ft	**NORTHING** 417,451	**EASTING** 2,617,417	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 09/17/02	**COMP. DATE** 09/17/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-70						Match Line				
	-71.2	77.7	39	24	28	52				**COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION) *(continued)*
-75										
	-76.2	82.7	85	15/0.1		100/0.6				
-80										
	-81.2	87.7	29	24	22	46	SS-10			
-85										
	-86.2	92.7	25	29	28	57	SS-11			-87.6 — 94.1 Boring Terminated at Elevation -87.6 ft in Limestone ARTESIAN HEAD ELEVATION = 13.0

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B6-B WBL	**STATION** 291+23	**OFFSET** 57 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 6.5 ft	**TOTAL DEPTH** 94.1 ft	**NORTHING** 417,451	**EASTING** 2,617,417	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 09/17/02	**COMP. DATE** 09/17/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 60.4 ft			

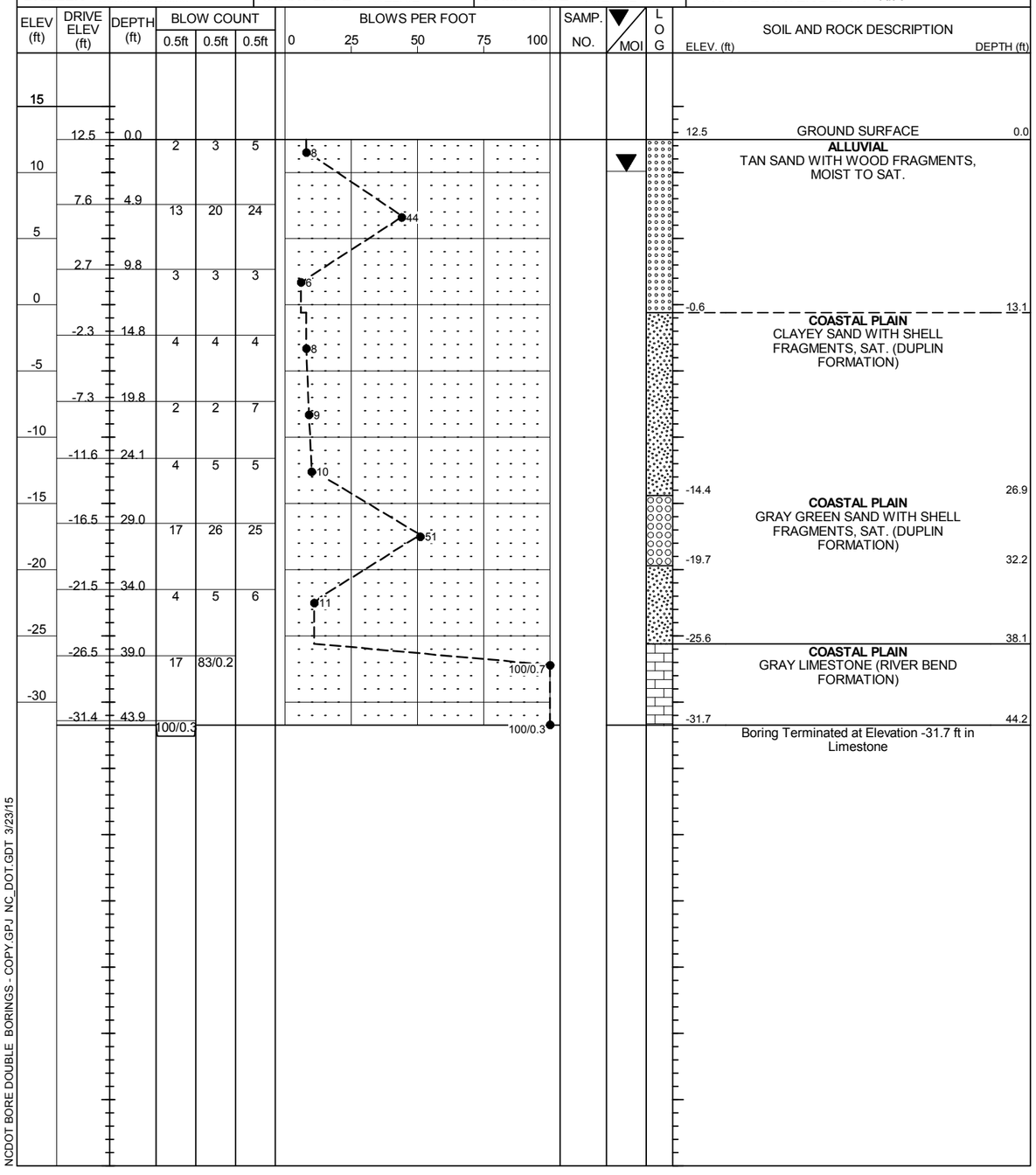
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
-5.7											Begin Coring @ 12.2 ft
	-5.7	12.2	5.0	0:20/1.0 0:22/1.0 0:13/1.0 0:09/1.0 0:25/1.0	(0.0) 0%						**COASTAL PLAIN** GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION) *(continued)* -8.3 / 14.8
-10	-10.7	17.2		*N=6*			*SS-3*				
	-12.2	18.7	3.5	1:30/1.0 1:15/1.0 1:08/1.0 0:31/0.6	(0.0) 0%						
-15	-15.7	22.2		*N=4*							
	-17.2	23.7	3.5	0:36/1.0 0:28/1.0 0:31/1.0 0:15/0.6	(0.0) 0%						
-20	-20.7	27.2		*N=6*			*SS-4*				-19.7 / 26.2 **COASTAL PLAIN** GRAY GREEN SAND WITH SHELL FRAGMENTS, SAT. (DUPLIN FORMATION)
	-22.1	28.6	3.5	0:35/1.0 0:37/1.0 0:29/1.0 0:21/0.6	(0.0) 0%						
-25	-25.6	32.1		*N=39*							-26.1 / 32.6 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
	-27.1	33.6	3.5	2:31/1.0 2:27/1.0 2:20/1.0 0:52/0.6	(2.0) 57%						
-30	-30.6	37.1		*N=100/0.2*							
	-30.9	37.4	4.8	1:56/1.0 1:58/1.0 1:36/1.0 1:35/1.0	(1.3) 27%						
-35	-35.7	42.2		*N=39*			*SS-5*				
	-37.1	43.6	3.5	3:00/0.8 1:13/1.0 1:04/1.0 0:58/1.0	(2.0) 57%						
-40	-40.6	47.1		*N=36*			*SS-6*				-39.6 / 46.1 **COASTAL PLAIN** GRAY GREEN SAND, SAT. (RIVER BEND FORMATION)
	-42.1	48.6	3.5	0:24/0.6 0:30/1.0 0:21/1.0 0:22/1.0 0:15/0.6	(0.0) 0%						
-45	-45.6	52.1		*N=49*			*SS-7*				
	-47.1	53.6	3.5	0:32/1.0 0:42/1.0 0:45/1.0 0:21/0.6	(0.3) 9%						
-50	-50.6	57.1		*N=57*							
	-52.1	58.6	4.0	0:20/1.0 0:21/1.0 0:16/1.0 0:10/0.6	(0.0) 0%						
-55	-56.1	62.6		*N=37*							
	-57.5	64.0	3.7	0:17/1.0 0:15/1.0 0:18/1.0 0:12/0.7	(0.0) 0%						
-60	-61.2	67.7		*N=42*			*SS-8*				
	-62.7	69.2	3.5	0:18/1.0 0:15/1.0 0:16/1.0 0:11/0.6	(0.0) 0%						
-65	-66.2	72.7		*N=63*			*SS-9*				
	-67.7	74.2	3.5	0:24/1.0 0:34/1.0 0:23/1.0 0:12/0.6	(0.0) 0%						-69.3 / 75.8 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-70	-71.2	77.7		*N=52*							
	-72.7	79.2	3.5	1:11/1.0 2:19/1.0 0:45/1.0 0:21/0.6	(0.5) 14%						
-75	-76.2	82.7		*N=100/0.6*							
	-78.7	83.2	4.4	0:31/1.0 0:35/1.0 0:32/1.0 0:25/1.0 0:15/0.5	(0.4) 9%						
-80	-81.1	87.6		*N=46*			*SS-10*				
	-82.6	89.1	3.5	0:45/1.0 0:51/1.0 0:32/1.0	(0.1) 3%						
-85											

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK			**GROUND WTR (ft)**
BORING NO. B6-B WBL	**STATION** 291+23	**OFFSET** 57 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 6.5 ft	**TOTAL DEPTH** 94.1 ft	**NORTHING** 417,451	**EASTING** 2,617,417	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 09/17/02	**COMP. DATE** 09/17/02	**SURFACE WATER DEPTH** N/A	
CORE SIZE HQ	**TOTAL RUN** 60.4 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
-85.7											Begin Coring @ 92.2 ft
	-86.1	92.6		0:25/0.6 *N=57*			*SS-11*				-87.6 / 94.1 Boring Terminated at Elevation -87.6 ft in Limestone ARTESIAN HEAD ELEVATION = 13.0

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. EB2-A EBL	**STATION** 292+13	**OFFSET** 46 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 12.5 ft	**TOTAL DEPTH** 44.2 ft	**NORTHING** 417,525	**EASTING** 2,617,302	**24 HR.** 2.4
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Manual	
DRILLER Contract Driller	**START DATE** 10/22/02	**COMP. DATE** 10/23/02	**SURFACE WATER DEPTH** N/A	



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34360.1.1	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** M. Lear	
SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER SOUTHWEST PRONG OF SLOCUM CREEK				**GROUND WTR (ft)**
BORING NO. EB2-B WBL	**STATION** 292+14	**OFFSET** 63 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 8.8 ft	**TOTAL DEPTH** 45.4 ft	**NORTHING** 417,542	**EASTING** 2,617,409	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CME-45		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Manual
DRILLER Contract Driller	**START DATE** 10/23/02	**COMP. DATE** 10/23/02	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
10										
	8.8	0.0	1	2	2	4				8.8 0.0 GROUND SURFACE
5										**ALLUVIAL** GRAY SAND WITH WOOD FRAGMENTS, MOIST TO SAT.
	3.7	5.1	5	14	12	26				
0										
	-1.4	10.2	16	8	5	13				-0.4 9.2 **COASTAL PLAIN** GRAY GREEN CLAYEY SAND, SAT. (DUPLIN FORMATION)
-5										
	-6.4	15.2	2	2	4	6				
-10	-10.3	19.1	3	3	4	7				-8.9 17.7 **COASTAL PLAIN** GRAY GREEN CLAY WITH SHELL FRAGMENTS, WET (DUPLIN FORMATION)
-15	-15.3	24.1	3	3	4	7				
-20	-20.3	29.1	2	3	3	6				
-25	-25.3	34.1	57	17	17	34				-25.0 33.8 **COASTAL PLAIN** GRAY LIMESTONE (RIVER BEND FORMATION)
-30	-30.4	39.2	87	13/0.1		100/0.6				
-35	-35.2	44.0	12	27	73/0.4	100/0.9				-36.6 45.4 Boring Terminated at Elevation -36.6 ft in Limestone

ARTESIAN HEAD ELEVATION =13.0

Other Samples:
ST-1 (21.0 - 23.0)

NCDOT BORE DOUBLE BORINGS - COPY.GPJ NC_DOT.GDT 3/23/15

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

34360
R-1015
DUAL BRIDGES ON US 70 BYPASS OVER SOUTHWEST PRONG OF SLOCUM CREEK AT -L- STA. 287+62.5

EB1-A EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-46	53 LT	282+89	10.0-11.5	A-3	16	NP	21.4	69.7	0.8	8.1	100	97	9	-	-
SS-47	53 LT	282+89	14.9-16.4	A-3	18	NP	7.2	79.3	8.2	5.3	100	98	15	-	-
SS-48	53 LT	282+89	34.0-35.5	A-1-b	25	NP	40.9	44.9	3.5	10.7	74	50	12	-	-
SS-49	53 LT	282+89	39.1-40.6	A-2-4	22	NP	7.2	79.3	8.2	5.3	100	98	15	-	-

EB1-B WBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-41	58 RT	282+89	4.7-6.2	A-2-4	22	NP	0.9	86.0	1.8	11.3	100	100	13.9	ND	ND
SS-42	58 RT	282+89	14.5-16.0	A-3	21	NP	8.5	85.8	0.4	5.3	100	99	6.6	ND	ND
SS-43	58 RT	282+89	29.1-30.6	A-3	19	NP	28.0	61.9	1.0	9.1	100	96	10	ND	ND
SS-44	58 RT	282+89	34.1-35.6	A-2-4	17	NP	54.9	28	4.4	12.7	95	73	19	ND	ND
SS-45	58 RT	282+89	38.7-40.2	A-1-B	20	NP	79.2	16.5	1.0	3.2	99	50	5	ND	ND

B1-A EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-35	56 LT	283+76	0.0-1.5	A-2-4	38	NP	11.0	71.1	8.2	9.7	100	96	20	22.2	5.0
SS-36	56 LT	283+76	14.5-16.0	A-3	13	NP	41.1	57.4	0.5	1.0	100	96	2	-	-
SS-37	56 LT	283+76	22.4-23.9	A-3	16	NP	22.0	73.8	0	4.2	100	100	4	26.4	-
SS-38	56 LT	283+76	27.4-28.9	A-3	19	NP	64.8	27.0	3.0	5.2	96	64	9	-	-
SS-39	56 LT	283+76	32.4-33.9	A-2-4	29	NP	3.3	76.0	7.2	13.6	95	93	28	33.4	-
SS-40	56 LT	283+76	72.0-73.2	A-1-b	18	NP	72.1	19.2	3.5	5.2	93	39	9	-	-

B3-A EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-50	59 LT	286+50	0.0-1.5	MUCK	-	NP	-	-	-	-	-	-	-	127.1	11.5
SS-51	59 LT	286+50	4.8-6.3	A-2-4	20	NP	5.2	67.8	8.6	18.4	100	100	30	22.9	-
SS-52	59 LT	286+50	19.7-21.2	A-6(2)	36	18	29.8	30.8	14.1	25.3	86	67	37	41.0	-
SS-53	59 LT	286+50	26.7-28.2	A-2-4	24	NP	71.9	13.3	9.2	5.6	83	34	13	39.6	-
SS-54	59 LT	286+50	42.0-43.5	A-2-4	18	NP	6.6	59.4	27.8	6.2	82	78	30	-	-
SS-55	59 LT	286+50	66.9-68.4	A-1-b	15	NP	71.9	13.3	9.2	5.6	83	34	13	-	-

B4-A EBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-61	59 LT	288+28	0.0-1.5	A-2-4	25	NP	17.3	72.0	6.1	4.6	100	95	12	59.1	6.0

B4-B WBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-59	53 RT	288+55	5.0-6.5	A-1-B	18	NP	77.0	20.5	0.0	2.5	100	44	3	ND	ND
SS-13	53 RT	288+55	9.8-11.3	A-3	19	NP	63.7	30.2	0.8	5.3	84.9	53	5.5	ND	ND
SS-14	53 RT	288+55	14.7-16.2	A-7-6(52)	74	51	2	6.4	31.8	59.7	98	96	91	78.6	ND
SS-15	53 RT	288+55	21.7-23.2	A-4	32	10	5.2	56.3	24.3	14.2	89	85	40	52.5	ND
SS-16	53 RT	288+55	26.6-28.1	A-2-4	25	NP	4.4	75.1	8.0	12.5	91	87	26	35.4	ND
SS-17	53 RT	288+55	51.6-53.1	A-2-4	19	NP	5.0	83.4	7.3	4.3	100	99	13	21.0	ND
SS-18	53 RT	288+55	56.6-58.1	A-2-4	23	NP	1.3	84.8	7.2	6.6	97	96	16	36.2	ND
SS-20	53 RT	288+55	66.5-68.0	A-2-4	25	NP	0.6	90.5	2.4	6.5	100	100	11.5	36.4	ND
SS-21	53 RT	288+55	71.5-73.0	A-4	23	NP	1.7	53.4	38.6	6.3	99	98	47	34.3	ND
SS-22	53 RT	288+55	76.5-78.0	A-2-4	18	NP	33.2	46.9	12.1	7.8	73	52	16	ND	ND
SS-23	53 RT	288+55	81.5-83.0	A-1-B	17	NP	74.1	12.2	8.2	5.5	75	29	11	ND	ND
SS-24	53 RT	288+55	91.5-93.0	A-3	24	NP	36.1	59.5	0.2	4.2	100	83	5	ND	ND
SS-25	53 RT	288+55	96.5-98.0	A-1-B	17	NP	65.4	21	7.3	6.3	68	29	10	ND	ND

B5-B WBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-60	56 RT	289+55	0.0-1.5	MUCK	46	NP	17.5	61.9	11.8	8.8	100	96	22	115.9	11.3

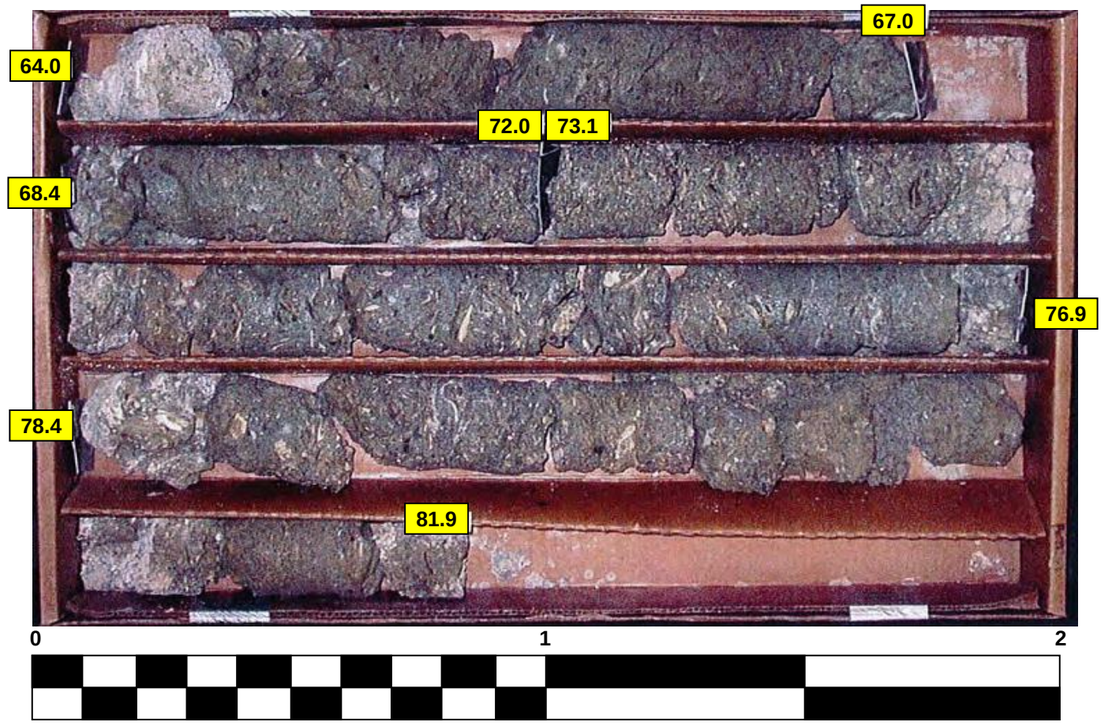
B6-B WBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	57 RT	291+23	4.8-6.3	A-3	22	NP	35.7	61.2	0.9	2.2	100	91	4	ND	ND
SS-2	57 RT	291+23	10.6-12.1	A-6	24	9	3.5	57.8	11.3	27.4	100	99	39	49.7	ND
SS-3	57 RT	291+23	17.2-18.7	A-7-6	46	29	9.1	23.1	26.8	41	98	91	70	66.4	ND
SS-4	57 RT	291+23	27.2-28.7	A-2-4	26	NP	18.5	63	4.1	14.5	86	73	20	29.3	ND
SS-5	57 RT	291+23	42.1-43.6	A-2-4	25	NP	3.8	78.8	9	8.4	99	97	21	28.3	ND
SS-6	57 RT	291+23	47.1-48.6	A-2-4	23	NP	7.8	80.8	5.8	5.5	100	97	14	27.1	ND
SS-7	57 RT	291+23	52.1-53.6	A-2-4	19	NP	3.7	81.2	11	4.1	100	98	17	24.6	ND
SS-8	57 RT	291+23	67.7-69.2	A-2-4	23	NP	0.9	86.5	5.3	7.3	100	99	15	35.6	ND
SS-9	57 RT	291+23	72.7-74.2	A-2-4	24	NP	0.9	89.3	4.6	5.2	100	100	11.6	27.9	ND
SS-10	57 RT	291+23	87.7-89.2	A-1-B	17	NP	68.6	17.1	9.1	5.1	75.9	32.2	12.2	ND	ND
SS-11	57 RT	291+23	92.7-94.2	A-1-B	15	NP	72.1	19.1	3.9	5.0	99	39	11	ND	ND

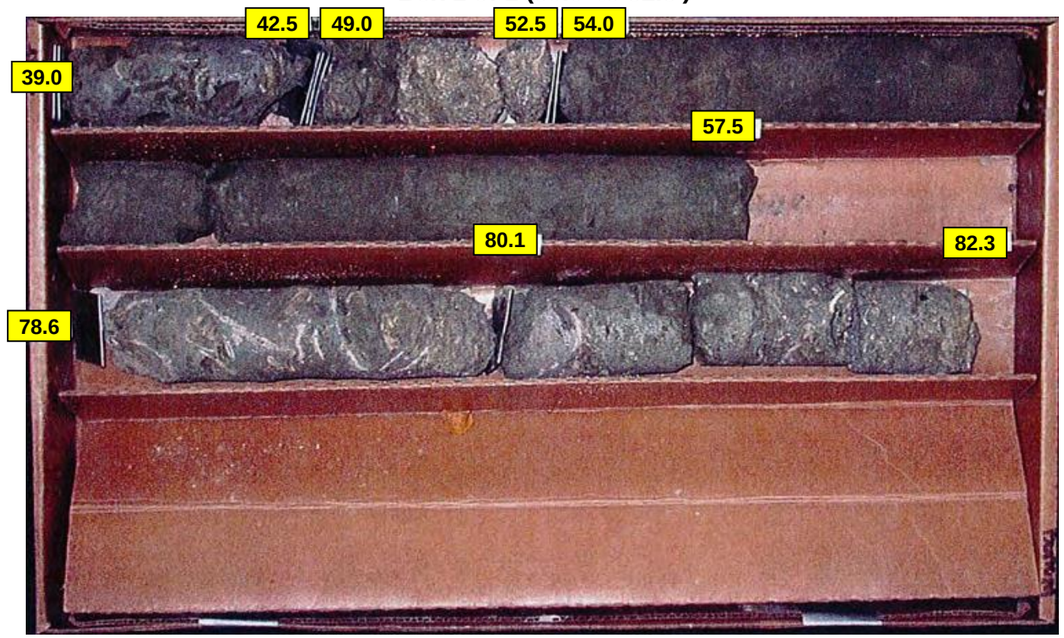
EB2-B WBL SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
ST-1	63 RT	292+14	18.7-20.7	A-7-6(37)	67	41	3.3	16.8	25.2	54.7	99	96	83	79.7	ND

CORE PHOTOGRAPH
B1-A EBL
Box 1 of 1 (64.0' to 81.9')



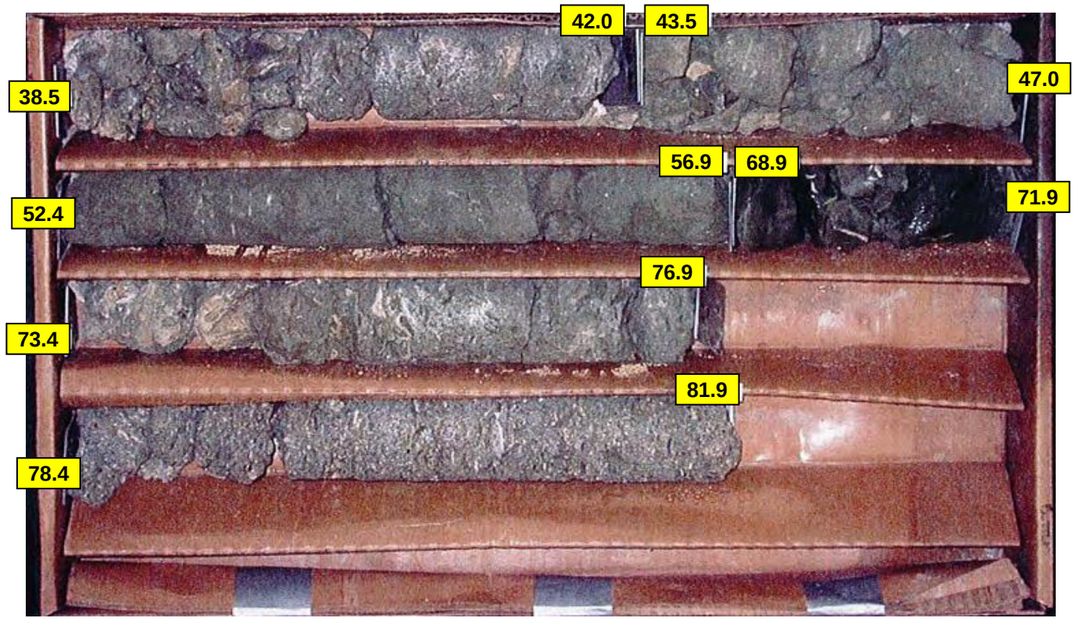
CORE PHOTOGRAPH
B1-B WBL
Box 1 of 1 (39.0' to 82.3')



CORE PHOTOGRAPH
B2-A EBL
Box 1 of 1 (38.8' to 82.2')

FEET

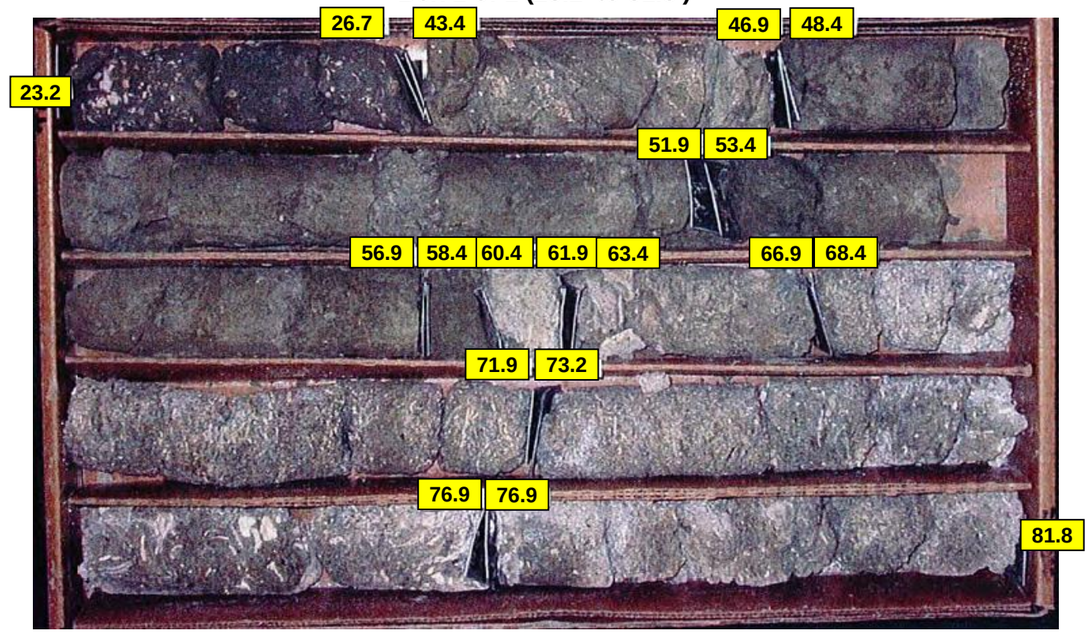
CORE PHOTOGRAPH
B2-B WBL
Box 1 of 1 (38.5' to 81.9')

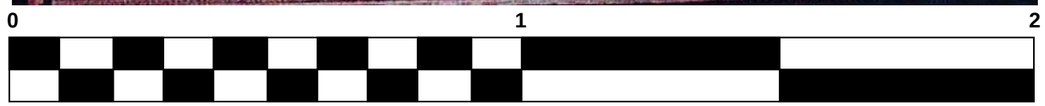


0 1 2

FEET

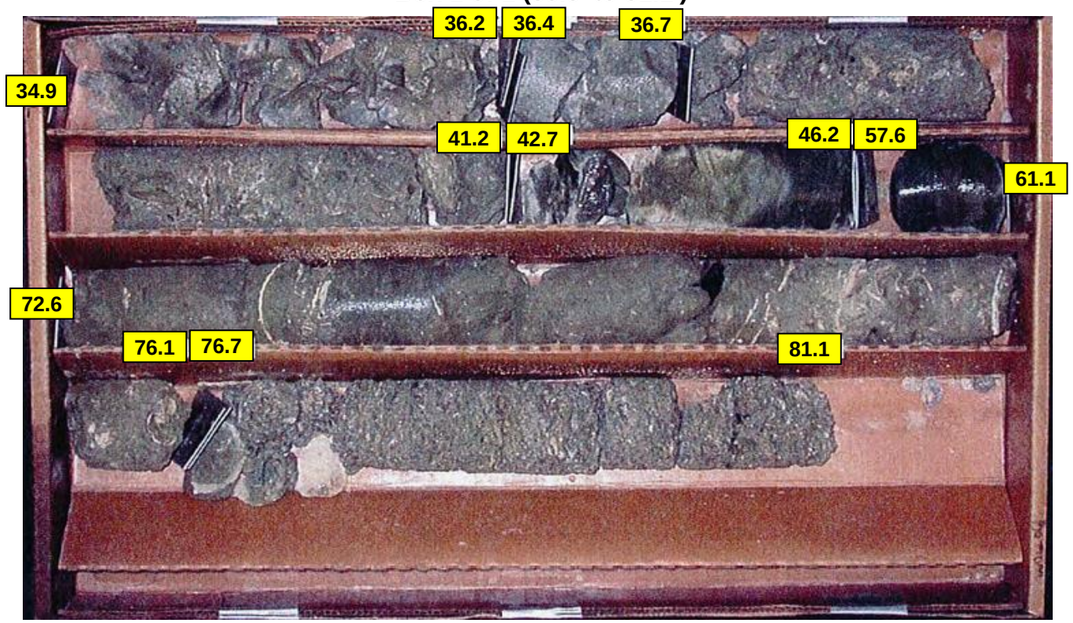
CORE PHOTOGRAPH
B3-A EBL
Box 1 of 1 (23.2' to 81.8')

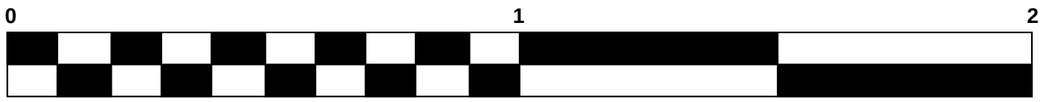




FEET

CORE PHOTOGRAPH
B3-B WBL
Box 1 of 1 (35.5' to 81.1')



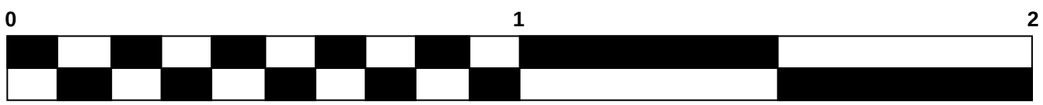


FEET

CORE PHOTOGRAPH
B4-A EBL

Box 1 of 2 (33.7' to 72.0')

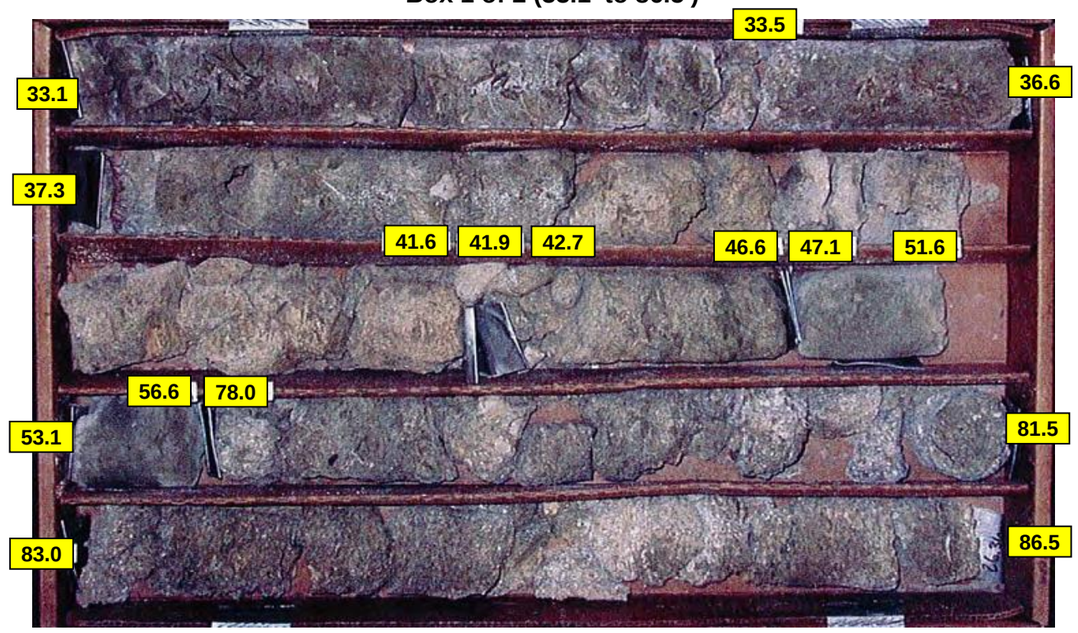
Box 2 of 2 (73.1' to 77.0')



FEET

CORE PHOTOGRAPH
B4-B WBL

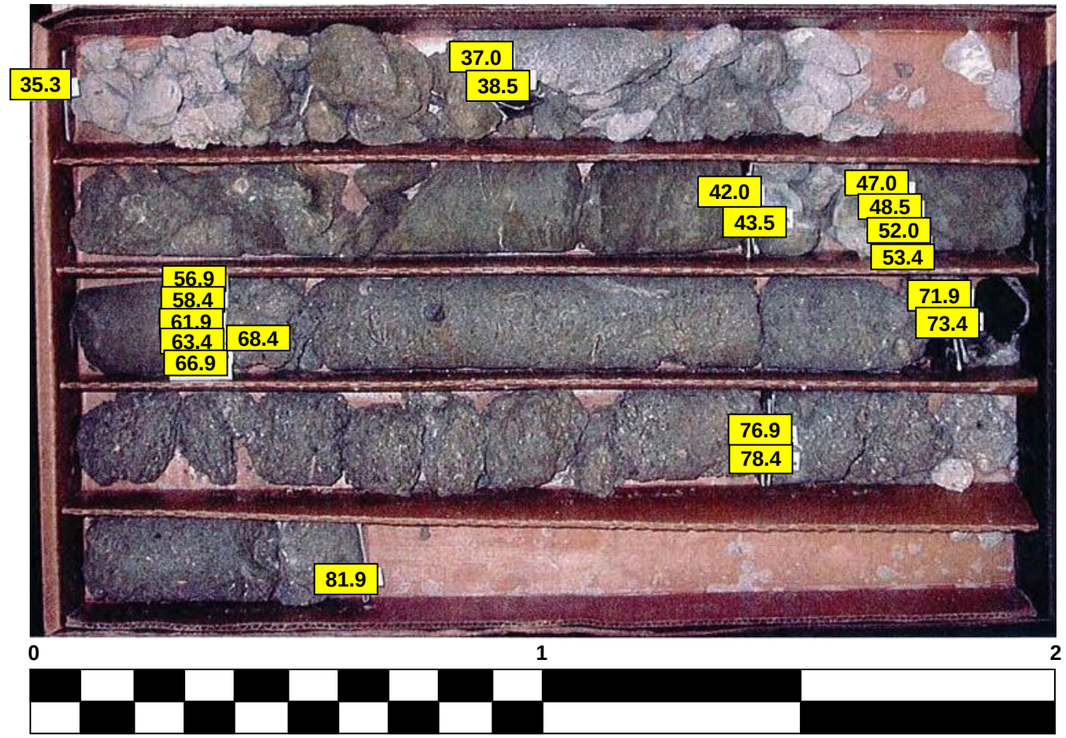
Box 1 of 2 (33.1' to 86.5')



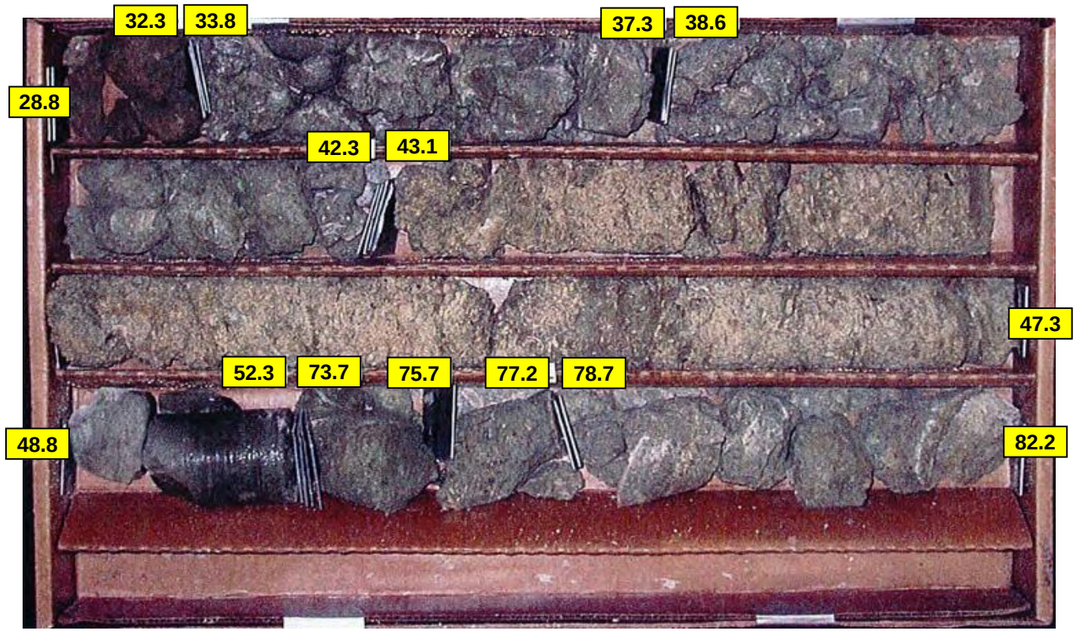
Box 2 of 2 (87.6' to 96.5')

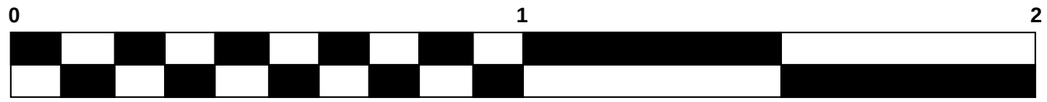
FEET

CORE PHOTOGRAPH
B5-A EBL
Box 1 of 1 35.3' to 81.9')

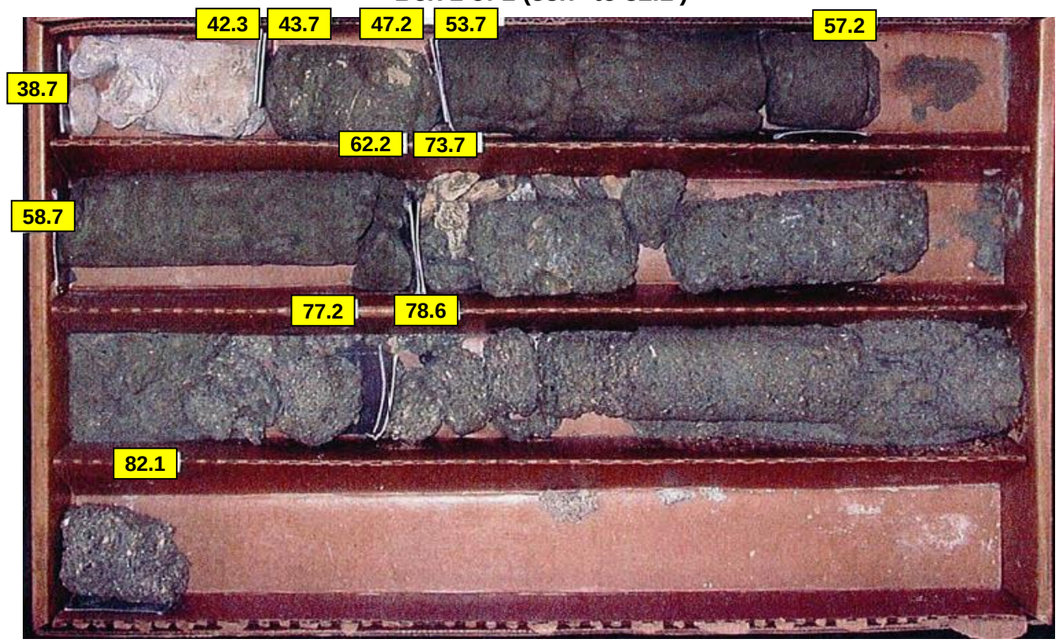


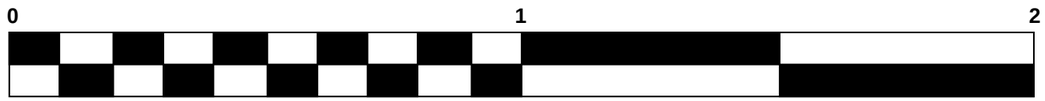
CORE PHOTOGRAPH
B5-B WBL
Box 1 of 1 (28.8' to 82.2')



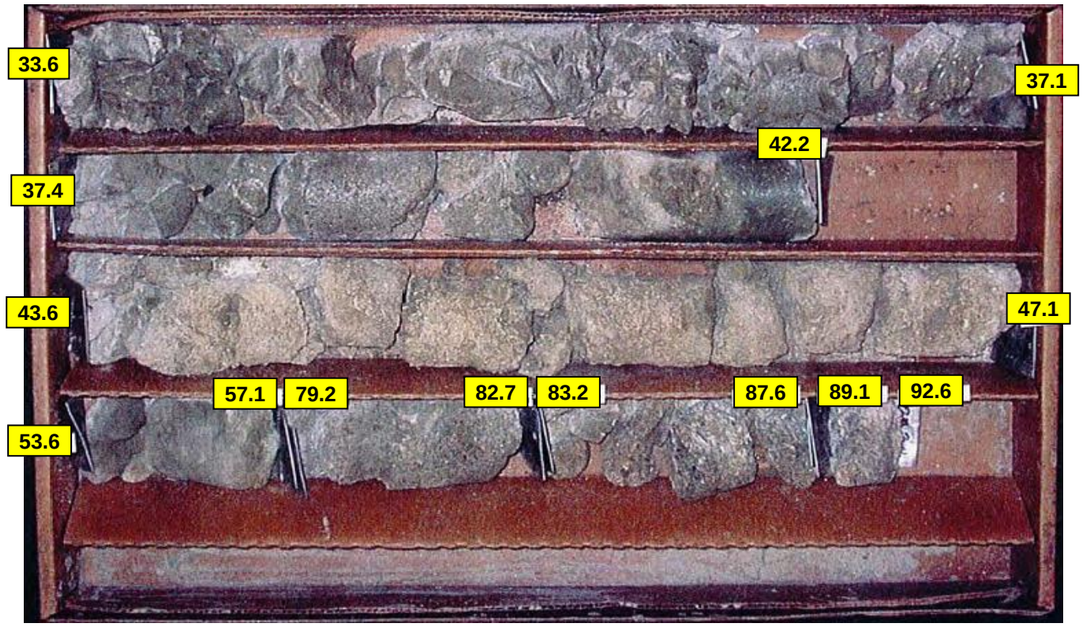


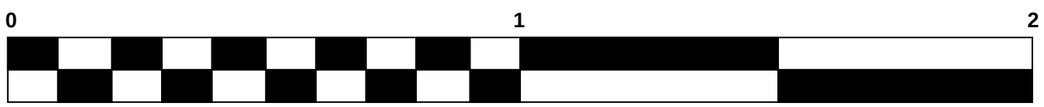
CORE PHOTOGRAPH
B6-A EBL
Box 1 of 1 (38.7' to 82.1')





CORE PHOTOGRAPH
B6-B WBL
Box 1 of 1 (33.6' to 92.7')





STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-1015	1	11

REFERENCE: R-1015

PROJECT: 34360

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY CRAVEN

PROJECT DESCRIPTION US 70 (HAVELOCK BYPASS) FROM SOUTH OF CARTERET /CRAVEN COUNTY LINE TO SOUTH OF SR 1176

SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US 70 HAVELOCK BYPASS) AT STA 44+71.82

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5	CROSS SECTION
6-9	BORE LOGS
10	SOIL TEST RESULTS
11	SITE PHOTOGRAPHS

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) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (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 THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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

PERSONNEL

ES Setnicky

RM Bleifernich

JR Helms

BR Spiro

GW Stalls

INVESTIGATED BY GET SOLUTIONS

DRAWN BY JR Helms; BR Spiro

CHECKED BY GW Stalls

SUBMITTED BY GW Stalls

DATE April, 2016

NORTH CAROLINA PROFESSIONAL SEAL 034336 ENGINEER GERALD W. STALLS, JR.

DocuSigned by:
Gerald W. Stalls, Jr. 7/14/2016
D9E3B27263A8414...
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
R-1015	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 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 THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

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
MATERIAL PASSING #40 LL PI	—		—	NP	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 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	< 4	
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	N/A
	VERY DENSE	> 50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	< 2	< 0.25
	SOFT	2 TO 4	0.25 TO 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	> 30	> 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
	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 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
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	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.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES 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 WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 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 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
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

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

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [X] CME-45C
- [X] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [X] TRICONE 2.88 " STEEL TEETH
- [ ] TRICONE _____ " TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [ ] -N _____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. 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, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD 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 FOOT
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 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, SUCH 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: BM15 RR SPIKE IN TREE -Y4- STATION 41+83.00 97' RIGHT

ELEVATION: 27.08 FEET

NOTES:

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
R-1015	3

SITE PLAN

0 30 60

FEET

-L-

GATE

303

10' SOIL RD

EB1-A

12" RCP

B1-A

US-70 HAVELOCK BYPASS

WOODS

43+00

-Y4- POT STA 44+71.82
-L- POT STA 302+41.24

45+00

47+00

TC

TC

302

-Y4-

B1-B

EB2-B

WOODS

SKEW = 105°35' 46"(TO -L-)

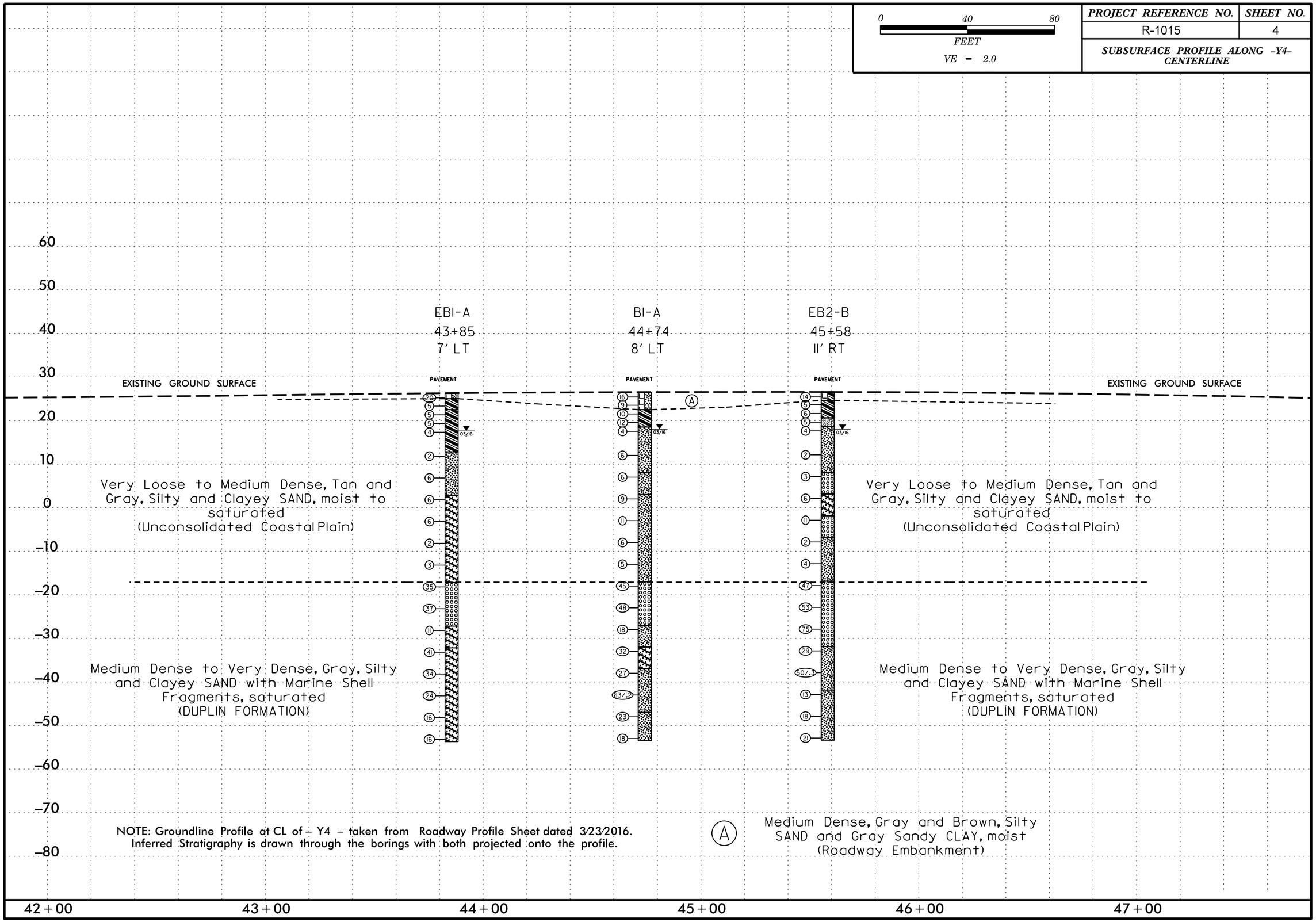
301

US-70 HAVELOCK BYPASS

PROJECT REFERENCE NO.	SHEET NO.
R-1015	4

0 40 80
FEET
VE = 2.0

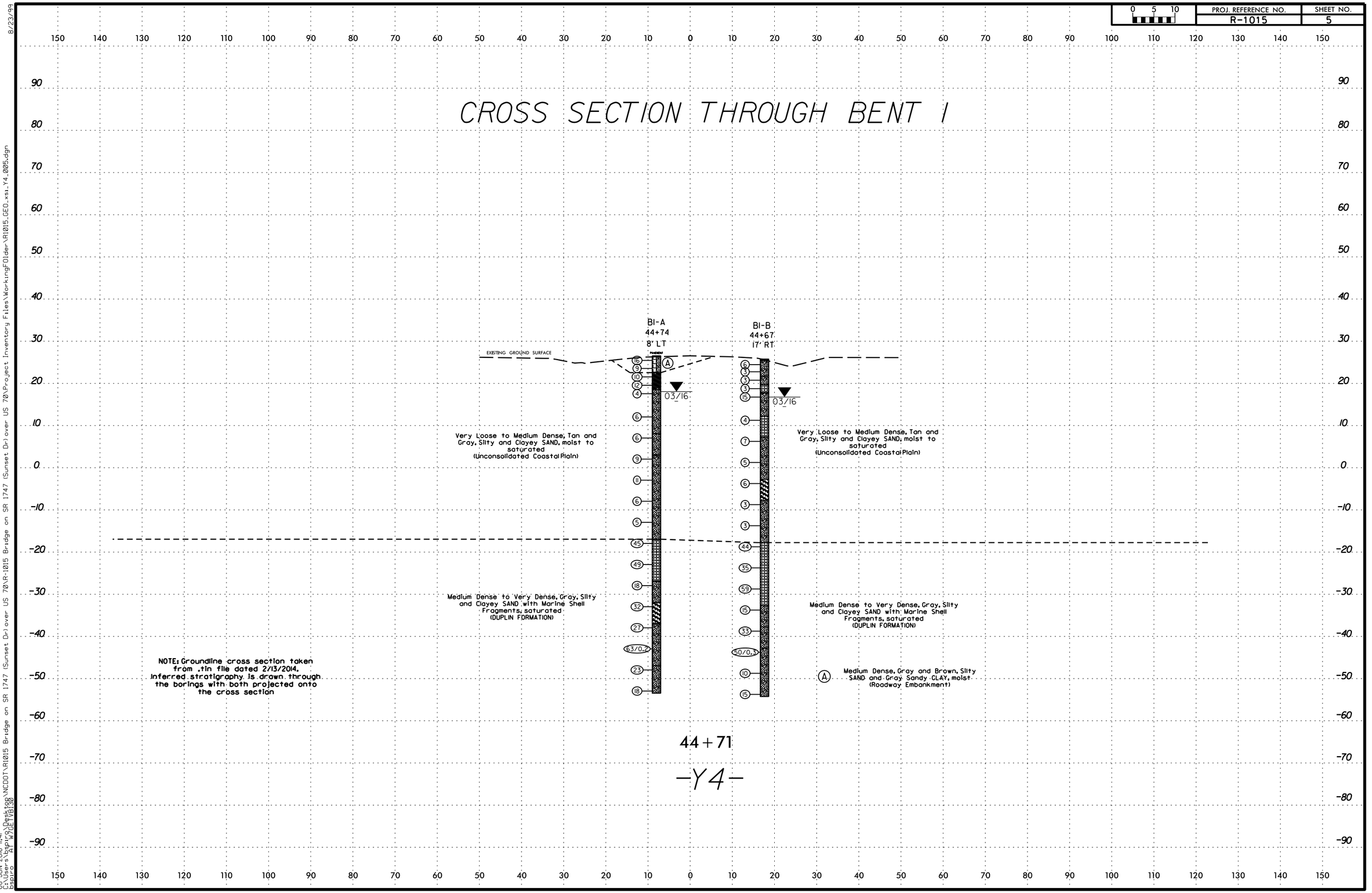
SUBSURFACE PROFILE ALONG –Y4– CENTERLINE



NOTE: Groundline Profile at CL of – Y4 – taken from Roadway Profile Sheet dated 3/23/2016.
Inferred Stratigraphy is drawn through the borings with both projected onto the profile.

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-1015	5

CROSS SECTION THROUGH BENT 1



08-JUN-2016 11:41
C:\Users\bspira\Desktop\NCDOT\R1015 Bridge on SR 1747 (Sunset Dr) over US 70\Project Inventory Files\WorkingFolder\R1015_GEO_xs1_Y4_005.dgn
bspira
8/23/99

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Bliefernich, R.	
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 43+85	**OFFSET** 7 ft LT	**ALIGNMENT** -Y4-	**0 HR.** 8.0
COLLAR ELEV. 26.4 ft	**TOTAL DEPTH** 80.0 ft	**NORTHING** 418,520	**EASTING** 2,617,108	**24 HR.** 8.7
DRILL RIG/HAMMER EFF./DATE GET7255 CME-55 80% 01/04/2016		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Donahue, T.	**START DATE** 03/24/16	**COMP. DATE** 03/24/16	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
30										
25	26.3	0.1	3	12	8	20		M		26.4 / 0.0 PAVEMENT SURFACE 26.3 / 0.1 0.1' of Asphalt Pavement
	24.4	2.0	3	3	2	5		M		25.1 / 1.3 **ROADWAY EMBANKMENT** Non Plastic, Gray-Brown, Silty Fine SAND with a Little Organic Clay
	22.4	4.0	2	2	3	5	SS-2	20% M		22.6 / 3.8 **UNDIVIDED COASTAL PLAIN** Medium Plasticity, Gray-Brown, Clayey Fine to Coarse SAND with trace Silt
20	20.4	6.0	1	2	3	5		M		**UNDIVIDED COASTAL PLAIN** Medium Plasticity, Gray-Brown, Clayey Fine SAND with Silt
	18.4	8.0	1	2	2	4		W		
15	12.9	13.5	1	1	1	2		W		12.9 / 13.5 **UNDIVIDED COASTAL PLAIN** Low Plasticity, Tan, Silty Fine SAND
10	7.9	18.5	4	4	2	6		W		
5	2.9	23.5	3	3	3	6		W		2.9 / 23.5 **UNDIVIDED COASTAL PLAIN** Low Plasticity, Gray, Silty, Clayey Fine SAND
0	-2.1	28.5	WOH	3	3	6		W		
-5	-7.1	33.5	2	1	1	2		W		
-10	-12.1	38.5	1	1	2	3		W		
-15	-17.1	43.5	17	16	19	35		W		-17.1 / 43.5 **COASTAL PLAIN** Non Plastic, Gray, Fine to Coarse SAND with trace Clay, Silt, and Marine Shell Fragments, "Duplin Formation"
-20	-22.1	48.5	14	19	18	37	SS-13	18% W		
-25	-27.1	53.5	5	5	6	11		W		-27.1 / 53.5 **COASTAL PLAIN** Low Plasticity, Gray, Silty, Clayey Fine to Coarse SAND with Few Marine Shell Fragments, "Duplin Formation"
-30	-32.1	58.5	28	27	14	41		W		-32.1 / 58.5 **COASTAL PLAIN** Low Plasticity, Gray, Silty, Clayey, Fine to Coarse SAND with trace Marine Shell Fragments, "Duplin Formation"
-35	-37.1	63.5	16	17	17	34		W		
-40	-42.1	68.5	10	11	13	24		W		
-45	-47.1	73.5	5	8	8	16		W		
-50										

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Bliefernich, R.	
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 43+85	**OFFSET** 7 ft LT	**ALIGNMENT** -Y4-	**0 HR.** 8.0
COLLAR ELEV. 26.4 ft	**TOTAL DEPTH** 80.0 ft	**NORTHING** 418,520	**EASTING** 2,617,108	**24 HR.** 8.7
DRILL RIG/HAMMER EFF./DATE GET7255 CME-55 80% 01/04/2016		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Donahue, T.	**START DATE** 03/24/16	**COMP. DATE** 03/24/16	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-50						Match Line				
	-52.1	78.5	5	7	9	16		W		-53.6 / 80.0 Boring Terminated at Elevation -53.6 ft in Silty SAND (Duplin Formation)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Setnicky, E.	
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 44+74	**OFFSET** 8 ft LT	**ALIGNMENT** -Y4-	**0 HR.** 8.0
COLLAR ELEV. 26.6 ft	**TOTAL DEPTH** 80.0 ft	**NORTHING** 418,556	**EASTING** 2,617,189	**24 HR.** 8.5
DRILL RIG/HAMMER EFF./DATE GET4354 CME-45C 81% 01/06/2016		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Riddick, W.	**START DATE** 03/24/16	**COMP. DATE** 03/24/16	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
30										
	26.5	0.1	5	7	9	16		M		26.6 / 0.0 PAVEMENT SURFACE 0.1' of Asphalt Pavement
25	24.6	2.0	3	4	5	9		M		**ROADWAY EMBANKMENT** Low Plasticity, Gray, Silty Fine SAND with Trace Clay
	22.6	4.0	6	5	5	10		M		22.6 / 4.0 **UNDIVIDED COASTAL PLAIN** Low Plasticity, Tan, Clayey Fine SAND with Silt
20	20.6	6.0	5	6	6	12		M		
	18.6	8.0	1	2	2	4		W		18.6 / 8.0 **UNDIVIDED COASTAL PLAIN** Low Plasticity, Tan, Silty Fine SAND with Trace Clay
15										
	13.1	13.5	2	1	5	6		W		
10										
	8.1	18.5	1	3	3	6	SS-26	23% W		8.1 / 18.5 **UNDIVIDED COASTAL PLAIN** Low Plasticity, Tan, Silty Fine to Medium SAND
5										
	3.1	23.5	6	3	6	9		W		3.1 / 23.5 **UNDIVIDED COASTAL PLAIN** Low Plasticity, Gray, Silty Fine SAND
0										
	-1.9	28.5	3	4	7	11		W		
-5										
	-6.9	33.5	3	3	3	6		W		
-10										
	-11.9	38.5	3	3	2	5	SS-30	23% W		
-15										
	-16.9	43.5	10	20	25	45		W		-16.9 / 43.5 **COASTAL PLAIN** Non Plastic, Dark Gray, Fine to Coarse SAND with Trace Marine Shell Fragments, "Duplin Formation"
-20										
	-21.9	48.5	15	21	28	49		W		
-25										
	-26.9	53.5	9	8	10	18		W		-26.9 / 53.5 **COASTAL PLAIN** Low Plasticity, Dark Gray, Silty Fine to Coarse SAND with Trace Marine Shell Fragments, "Duplin Formation"
-30										
	-31.9	58.5	8	15	17	32	SS-34	19% W		-31.9 / 58.5 **COASTAL PLAIN** Medium Plasticity, Gray, Silty, Clayey Fine to Coarse SAND with Trace Marine Shell Fragments and Fine Gravel, "Duplin Formation"
-35										
	-36.9	63.5	7	8	19	27		W		-36.9 / 63.5 **COASTAL PLAIN** Non Plastic, Dark Gray, Silty Fine to Coarse SAND with Trace Clay and Some Marine Shell Fragments, "Duplin Formation" SPT Refusal Noted At 68.7 Feet with 63 Blows/0.2 Feet
-40										
	-41.9	68.5	63/0.2					W		
-45										
	-46.9	73.5	6	9	14	23		W		-46.9 / 73.5 **COASTAL PLAIN** Non Plastic, Dark Gray, Fine SAND with Silt and Clay, "Duplin Formation"
-50										

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Setnicky, E.	
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 44+74	**OFFSET** 8 ft LT	**ALIGNMENT** -Y4-	**0 HR.** 8.0
COLLAR ELEV. 26.6 ft	**TOTAL DEPTH** 80.0 ft	**NORTHING** 418,556	**EASTING** 2,617,189	**24 HR.** 8.5
DRILL RIG/HAMMER EFF./DATE GET4354 CME-45C 81% 01/06/2016		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Riddick, W.	**START DATE** 03/24/16	**COMP. DATE** 03/24/16	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-50						Match Line				
	-51.9	78.5	5	8	10	18		W		-53.4 / 80.0 **COASTAL PLAIN** Non Plastic, Dark Gray, Fine SAND with Silt and Clay, "Duplin Formation" *(continued)* Boring Terminated at Elevation -53.4 ft in Silty SAND (Duplin Formation)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Bliefernich, R.	
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 44+67	**OFFSET** 17 ft RT	**ALIGNMENT** -Y4-	**0 HR.** 9.5
COLLAR ELEV. 25.8 ft	**TOTAL DEPTH** 80.0 ft	**NORTHING** 418,532	**EASTING** 2,617,193	**24 HR.** 9.0
DRILL RIG/HAMMER EFF./DATE GET7255 CME-55 80% 01/04/2016		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Donahue, T.	**START DATE** 03/24/16	**COMP. DATE** 03/24/16	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
30										
25	25.5	0.3	4	3	3	6		M		GROUND SURFACE 25.8 / 0.0 **UNDIVIDED COASTAL PLAIN** 0.3' of Topsoil 25.5 / 0.3
	23.8	2.0	1	1	2	3		M		**UNDIVIDED COASTAL PLAIN** Low Plasticity, Gray-Tan, Silty Fine SAND with Trace Clay and Trace Gravel and Trace Black Charred Organic Material 21.8 / 4.0
20	21.8	4.0	1	2	1	3	SS-41	18% M		19.8 / 6.0
	19.8	6.0	2	2	1	3		M		**UNDIVIDED COASTAL PLAIN** Low Plasticity, Tan, Silty Fine SAND with Trace Clay 17.8 / 8.0
15	17.8	8.0	4	8	7	15		M		**UNDIVIDED COASTAL PLAIN** Non Plastic, Tan, Fine to Medium SAND with Trace Silt 12.3 / 13.5
	12.3	13.5	2	2	2	4		W		**UNDIVIDED COASTAL PLAIN** Low Plasticity, Gray-Tan, Silty Fine SAND with Trace Clay and Trace Gravel and Trace Black Charred Organic Material 7.3 / 18.5
10	7.3	18.5	3	3	4	7		W		**UNDIVIDED COASTAL PLAIN** Non Plastic, Gray-Tan, Fine to Coarse SAND with Trace Silt
5	2.3	23.5	1	1	4	5		W		**UNDIVIDED COASTAL PLAIN** Non Plastic, Gray, Silty Fine SAND
0	-2.7	28.5	3	3	3	6		W		-2.7 / 28.5 **UNDIVIDED COASTAL PLAIN** Low Plasticity, Gray, Silty Clayey Fine SAND
-5	-7.7	33.5	4	2	1	3		W		-7.7 / 33.5 **UNDIVIDED COASTAL PLAIN** Low Plasticity, Gray, Silty Fine SAND
-10	-12.7	38.5	2	2	1	3		W		
-15	-17.7	43.5	13	19	25	44		W		-17.7 / 43.5 **COASTAL PLAIN** Non Plastic, Gray, Fine to Coarse SAND with Trace Silt and Marine Shell Fragments, "Duplin Formation"
-20	-22.7	48.5	13	17	18	35		W		
-25	-27.7	53.5	18	32	27	59		W		
-30	-32.7	58.5	6	8	7	15	SS-53	22% W		-32.7 / 58.5 **COASTAL PLAIN** Non Plastic, Gray, Silty Fine to Coarse SAND with Few Clay and Trace Marine Shell Fragments, "Duplin Formation"
-35	-37.7	63.5	17	17	16	33		W		-37.7 / 63.5 **COASTAL PLAIN** Non Plastic, Gray, Silty, Fine to Coarse SAND with Trace Clay and Some Marine Shell Fragments, "Duplin Formation"
-40	-42.7	68.5	50/0.3					W		-42.7 / 68.5 **COASTAL PLAIN** Non Plastic, Gray, Fine SAND with Trace Silt and Clay, "Duplin Formation" SPT Refusal Noted At 68.8 Feet with 50 Blows/0.3 Feet
-45	-47.7	73.5	5	5	5	10		W		
-50										

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Bliefernich, R.	
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 44+67	**OFFSET** 17 ft RT	**ALIGNMENT** -Y4-	**0 HR.** 9.5
COLLAR ELEV. 25.8 ft	**TOTAL DEPTH** 80.0 ft	**NORTHING** 418,532	**EASTING** 2,617,193	**24 HR.** 9.0
DRILL RIG/HAMMER EFF./DATE GET7255 CME-55 80% 01/04/2016		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Donahue, T.	**START DATE** 03/24/16	**COMP. DATE** 03/24/16	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-50						Match Line				
	-52.7	78.5	8	7	8	15		W		**COASTAL PLAIN** Non Plastic, Gray, Fine SAND with Trace Silt and Clay, "Duplin Formation" *(continued)* -54.2 / 80.0 Boring Terminated at Elevation -54.2 ft in Silty SAND (Duplin Formation)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Setnicky, E.	
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 45+58	**OFFSET** 11 ft RT	**ALIGNMENT** -Y4-	**0 HR.** 8.0
COLLAR ELEV. 26.7 ft	**TOTAL DEPTH** 80.0 ft	**NORTHING** 418,574	**EASTING** 2,617,274	**24 HR.** 8.7
DRILL RIG/HAMMER EFF./DATE GET4354 CME-45C 81% 01/06/2016		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Riddick, W.	**START DATE** 03/24/16	**COMP. DATE** 03/24/16	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
30										
	26.5	0.2	9	6	8	14		M		PAVEMENT SURFACE 26.7 / 0.0 0.2' of Asphalt Pavement 26.5 / 0.2
25	24.7	2.0	1	2	3	5	SS-59	20% M		**ROADWAY EMBANKMENT** Medium Plasticity, Dark Gray, Sandy Lean CLAY 24.7 / 2.0
	22.7	4.0	1	2	4	6		M		**UNDIVIDED COASTAL PLAIN** Medium Plasticity, Tan, Clayey Fine to Coarse SAND with trace Silt 20.7 / 6.0
20	20.7	6.0	1	2	3	5		M		**UNDIVIDED COASTAL PLAIN** Low Plasticity, Tan, Clayey Fine SAND with Silt 18.7 / 8.0
	18.7	8.0	2	2	2	4		W		**UNDIVIDED COASTAL PLAIN** Non Plastic, Tan, Silty Fine SAND
15										
	13.2	13.5	1	1	1	2		W		
10										
	8.2	18.5	1	2	1	3		W		**UNDIVIDED COASTAL PLAIN** Non Plastic, Red-Tan, Fine to Medium SAND with Silt 8.2 / 18.5
5										
	3.2	23.5	3	3	3	6		W		**UNDIVIDED COASTAL PLAIN** Low Plasticity, Red-Tan, Silty, Clayey Fine SAND 3.2 / 23.5
0										
	-1.8	28.5	3	4	7	11	SS-66	19% W		**UNDIVIDED COASTAL PLAIN** Non Plastic, Tan, Fine SAND with Trace Silt -1.8 / 28.5
-5										
	-6.8	33.5	1	1	1	2		W		**UNDIVIDED COASTAL PLAIN** Low Plasticity, Dark Gray, Silty Fine SAND with Trace Clay -6.8 / 33.5
-10										
	-11.8	38.5	1	2	2	4		W		
-15										
	-16.8	43.5	11	22	25	47		W		**COASTAL PLAIN** Non Plastic, Dark Gray, Fine to Coarse SAND with Some Silt and Trace Marine Shell Fragments, "Duplin Formation" -16.8 / 43.5
-20										
	-21.8	48.5	16	24	29	53		W		
-25										
	-26.8	53.5	11	33	42	75		W		
-30										
	-31.8	58.5	3	13	16	29		W		**COASTAL PLAIN** Non Plastic, Dark Gray, Silty Fine SAND with Trace Medium Gravel and Marine Shell Fragments, "Duplin Formation" -31.8 / 58.5
-35										
	-36.8	63.5	50/0.3					W		SPT Refusal Noted at 63.8 Feet with 50 Blows/0.3 Feet
-40										
	-41.8	68.5	2	5	8	13	SS-74	34% W		**COASTAL PLAIN** Non Plastic, Dark Gray, Fine SAND with Trace Silt and Few Clay and Marine Shell Fragments, "Duplin Formation" -41.8 / 68.5
-45										
	-46.8	73.5	4	7	11	18		W		
-50										

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Setnicky, E.	
SITE DESCRIPTION BRIDGE NO. 0283 ON -Y4- (SR 1747 SUNSET DRIVE) OVER -L- (US HAVELOCK BYPASS) AT STA 44+71.8				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 45+58	**OFFSET** 11 ft RT	**ALIGNMENT** -Y4-	**0 HR.** 8.0
COLLAR ELEV. 26.7 ft	**TOTAL DEPTH** 80.0 ft	**NORTHING** 418,574	**EASTING** 2,617,274	**24 HR.** 8.7
DRILL RIG/HAMMER EFF./DATE GET4354 CME-45C 81% 01/06/2016		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Riddick, W.	**START DATE** 03/24/16	**COMP. DATE** 03/24/16	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-50						Match Line				
	-51.8	78.5	4	9	12	21		W		-53.3 / 80.0 Boring Terminated at Elevation -53.3 ft in Silty SAND (Duplin Formation)

SOIL TEST RESULTS EB1–A

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS–13	7 LT	43 + 85	48.5–50.0	A–1–b	NV	NP	84.0	11.2	0.6	4.2	99	32	5	17.7	–

SOIL TEST RESULTS B1–A

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS–34	8 LT	44 + 74	58.5–60.0	A–2–6(1)	35	19	28.1	37.0	20.2	14.7	75	61	27	19.3	–

SOIL TEST RESULTS B1–B

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS–53	17 RT	44 + 67	58.5–60.0	A–2–4(0)	NV	NP	23.4	54.6	12.2	9.8	86	70	21	22.0	–

SOIL TEST RESULTS EB2–B

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS–59	11 RT	45 + 58	2.0–3.5	A–6(6)	40	22	22.1	34.9	4.8	38.2	100	97	45	20.4	–
SS–74	11 RT	45 + 58	68.5–70.0	A–2–4(0)	NV	NP	1.0	84.4	5.2	9.4	100	100	18	34.5	–

PROJECT REFERENCE NO.	SHEET NO.
R-1015	11

SITE PHOTOGRAPHS

VIEW ALONG SR 1747 (SUNSET DRIVE)
FROM EB1-A TO EB2-B

VIEW ALONG SR 1747 (SUNSET DRIVE)
FROM EB2-B TO EB1-A

DATE: 9-15-14

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-1015	1	47

REFERENCE: R-1015

PROJECT: 34360

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *CRAVEN*

PROJECT DESCRIPTION *US 70 (Havelock Bypass) from North of Pine Grove to North of Carteret County Line*

SITE DESCRIPTION *Site No. 8 – Dual Bridges over NCRR between SR 1747 and US 70*

Station 506+32.25 –L– /13+07.59 –RREY3–

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-8	CROSS SECTIONS
9-20	BORE LOGS
21	SOIL TEST RESULTS

APPENDICES

APPENDIX	TITLE	SHEETS
A	CONSOLIDATION & TRIAXIAL SHEAR TEST RESULTS	22-47

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. 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 THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

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

PERSONNEL

P.M. WEAVER

C.R. PASTRANA

Trigon Exploration

INVESTIGATED BY *ESP Associates, INC.*

DRAWN BY *C.R. PASTRANA*

CHECKED BY *P.M. WEAVER*

SUBMITTED BY *ESP Associates, INC.*

DATE *MAY 2018*

ESP ASSOCIATES, INC.
7011 ALBERT PICK RD
SUITE E
GREENSBORO, NC 27409
FIRM # C-0587
WWW.ESPASSOCIATES.COM

NORTH CAROLINA LICENSED SEAL 1500 GEOLOGIST PAUL M. WEAVER

DocuSigned by: Paul Weaver 6/6/2018
01847D3739AD49C...
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
R-1015	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 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 THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

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
MATERIAL PASSING #40 LL PI	— 6 MX			— NP	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 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 0.5 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
	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 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
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	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.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES 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 WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 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 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
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

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

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [X] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [ ] -N _____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. 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, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD 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 FOOT
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 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, SUCH 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: BM-26: RR SPIKE IN TREE STA. 520+57.00 -L- 308' LEFT

ELEVATION: 26.38 FEET

NOTES:

F.I.A.D. = FILLED IMMEDIATELY AFTER DRILLING

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
R-1015	3

SITE PLAN

0 40 80

FEET

-L- LEFT LANE SKEW = 122°52'25"
-L- RIGHT LANE SKEW = 122°52'25"
-RP2C- SKEW = 120°34'25"

505

509

BEGIN APPROACH SLAB
-L- STA. 505+21.32

BEGIN BRIDGE
-L- STA. 505+45.13

-L- STA 506+32.25
RR -EY3- STA 13+07.59

BENT 1

BENT 2

-RP-

EBI-A LL

BI-A LL

B2-A LL

EB2-A LL

BI-B LL

EB2-B LL

EBI-A RL

B2-A RL

B2-B RL

EBI-B RL

BI-B RL

EB2-B RL

ATLANTIC AND EAST CAROLINA RAILROAD

-RP2C-

END APPROACH SLAB
-L- STA. 507+57.44

END BRIDGE
-L- STA. 507+33.63

-RP2C- STA 1+41.52
RR -EY3- STA 13+70.32

BEGIN GRADE
-RP2C- STA 2+75.00

I-95

PROJECT REFERENCE NO.	SHEET NO.
R-1015	4

PROFILE BORINGS PROJECTED ALONG –L–

0 20 40
FEET
VE = 1.0

50
30
10
-10
-30
-50
-70
-90
-110

EB1–A RL
505+36
15' RT
SS-3

B1–B LL
505+94
19' LT
SS-7

–RR–℄

B2–A RL
506+70
19' RT
SS-10

EB2–B LL
507+47
26' LT

Existing Ground

Undivided Coastal Plain: Tan to Gray to Brown, Very Loose to Medium Dense, Silty SAND, Moist to Wet

Undivided Coastal Plain: Greenish Gray to Gray, Soft to Very Stiff, Sandy CLAY, Saturated

Coastal Plain: Greenish Gray, Very Loose to Dense, Silty SAND with Shell Fragments and Clay Seams, Saturated (Duplin Formation)

Coastal Plain Sedimentary Rock: Gray and White, Very Soft to Hard, LIMESTONE (Riverbend Formation)

03/18

BT

505+00 506+00 507+00

(A) Artificial Fill (Engineered): Tan-Brown, Medium Dense, Clayey SAND, Saturated (Railroad Embankment)

(B) Undivided Coastal Plain: Brown to Tan-Brown, Medium Stiff, Sandy CLAY, Trace Roots, Moist

(C) Coastal Plain: Greenish Gray to Brownish Gray, Medium Stiff, Sandy CLAY, Saturated (Duplin Formation)

GROUNDLINE TAKEN FROM TIN FILE PROVIDED BY NCDOT DATED 7/1/2016.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE BRIDGE PROFILE

-L-

PROJECT REFERENCE NO.	SHEET NO.
R-1015	5

SECTION THROUGH END BENT 1

0 20 40
FEET
VE = 1.0

-L- STA. 505+45.12

EB1-A LL
505+86
62' LT
SS-1
SS-2

EB1-A RL
505+36
15' RT
SS-3

EB1-B RL
505+01
72' RT
SS-4

Existing Ground

02/18

03/18

03/18

Undivided Coastal Plain: Tan-Brown to Gray to Brown, Very Loose to Loose, Silty SAND, Moist to Wet

Coastal Plain: Greenish Gray to Gray, Very Loose to Dense, Silty SAND and SAND with Shell Fragments, Saturated (Duplin Formation)

ST-2

Coastal Plain Sedimentary Rock: Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation)

Coastal Plain: Medium Dense, Greenish Gray, Loose to Silty SAND, Saturated (Riverbend Formation)

BT

BT

BT

(B) Undivided Coastal Plain: Brown to Tan-Brown, Medium Stiff, Sandy CLAY, Trace Roots, Moist

(C) Coastal Plain: Greenish Gray, Very Soft to Medium Stiff, SANDY CLAY, Saturated, (Duplin Formation)

GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED 7/11/2016.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE BRIDGE CROSS SECTION

40 20 0 -20 -40 -60 -80 -100

120 100 80 60 40 20 0 20 40 60 80 100 120

PROJECT REFERENCE NO.	SHEET NO.
R-1015	6

SECTION THROUGH BENT 1

0 20 40
FEET
VE = 1.0

-L- STA. 505+81.62

B1-A LL
506+18
57' LT
SS-5
SS-6

B1-B LL
505+94
19' LT
SS-7

B1-B RL
505+76
68' RT
SS-8

Existing Ground

Artificial Fill: Tan-Brown, Very Loose, Silty SAND, Saturated

Undivided Coastal Plain: (15) 03/18 Gray, Loose to Medium (10) 03/18 Dense, Silty SAND, Moist to Wet (1) 03/18

Undivided Coastal Plain: (WOH) Gray to Greenish Gray, Very Soft (2) to Soft, Sandy CLAY, Wet to Saturated (2)

Coastal Plain: Sandy CLAY, (Duplin Formation) (1) Greenish Gray, Very Soft, Saturated (1) (2)

Coastal Plain: (11) Greenish Gray, Very Loose to Dense, (15) Silty SAND with Clay Seams and Shell Fragments, Saturated (12) (22) (Duplin Formation)

(C) (15) (9)

(11) (25) (3)

(28) (16) (28)

(17) (34) (20)

(30) (18) (34)

(41) (13) (43)

(23) (39) (11)

(10) (32) (40)

(56) (26) (18)

(28) (45) (80)

(27) (39) 100/0.3

(21) (40) (19)

(82) (22) (33)

(28)

BT BT BT

Coastal Plain Sedimentary Rock: Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation)

Coastal Plain: Gray and White, Medium Dense to Dense, Silty SAND, Saturated (Riverbend Formation)

(C) Coastal Plain: Brownish Gray to Greenish Gray, Soft to Medium Stiff, Sandy CLAY, Saturated (Duplin Formation)

GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED 7/11/2016.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE BRIDGE CROSS SECTION

40 20 0 -20 -40 -60 -80 -100

120 100 80 60 40 20 0 20 40 60 80 100 120

PROJECT REFERENCE NO.	SHEET NO.
R-1015	7

SECTION THROUGH BENT 2

0 20 40
FEET
VE = 1.0

-L- STA. 506+82.87

B2-A LL
507+36
60' LT
SS-9

B2-A RL
506+70
19' RT
SS-10

B2-B RL
506+37
73' RT
SS-11

Existing Ground

03/18

Undivided Coastal Plain: Gray to Tan to Tan-Brown, Very Loose to Loose, Silty SAND with Undivided Thin (1" to 2") Clay Seams, Coastal Plain: Gray, Soft, Sandy CLAY,

Wet to Saturated

Saturated

Coastal Plain: Greenish Gray, Very Loose to Dense, Silty SAND with Shell Fragments, Saturated (Duplin Formation)

Coastal Plain Sedimentary Rock: Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation)

Coastal Plain: Greenish Shell Fragments, Gray, Very Dense to Dense, Silty SAND with Large Saturated (Riverbend Formation)

BT

GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED 7/11/2016.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE BRIDGE CROSS SECTION

PROJECT REFERENCE NO.	SHEET NO.
R-1015	8

SECTION THROUGH END BENT 2

0 20 40
FEET
VE = 1.0

-L- STA. 507+33.62

EB2-A LL
507+72
62' LT
SS-12
SS-13

EB2-B LL
507+47
26' LT

EB2-B RL
506+87
79' RT

Existing Ground

Alluvial: Brown and Black, Very Loose, Trace Organics, Wet

Silty SAND, Undivided Coastal Plain: Gray to Tan-Brown to Tan, Very Loose to Loose, Silty SAND,

Undivided Coastal Plain: Gray to Greenish Gray, Very Soft to Very Stiff, Sandy CLAY, Saturated

Moist to Saturated

Coastal Plain: Greenish Gray, Loose to Dense, Silty SAND with Shell Fragments, Saturated (Duplin Formation)

Coastal Plain Sedimentary Rock: Gray and White, Very Soft to Hard, LIMESTONE (Riverbend Formation)

03/18

ST-3

BT

GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED 7/11/2016.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE BRIDGE CROSS SECTION

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 505+86	**OFFSET** 62 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 27.1 ft	**TOTAL DEPTH** 100.4 ft	**NORTHING** 437,041	**EASTING** 2,613,597	**24 HR.** 3.8
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 02/27/18	**COMP. DATE** 02/27/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
30											
										27.1	0.0
										GROUND SURFACE **UNDIVIDED COASTAL PLAIN** Brown, Silty SAND, Moist	
25	23.6	3.5	3	3	3	6					
20	18.2	8.9	4	1	2	3					
15	13.2	13.9	WOH	1	0	1	SS-1	52%		15.1	12.0
										COASTAL PLAIN Greenish Gray, Sandy CLAY, Saturated (Duplin Formation)	
10	8.2	18.9	1	1	1	2				10.1	17.0
5	3.2	23.9	4	5	8	13				Greenish Gray to Gray, Silty SAND and SAND with Shell Fragments, Saturated (Duplin Formation) Note: Petroleum odor beginning around 42'	
0	-1.8	28.9	4	5	6	11				5.1	22.0
-5	-6.8	33.9	3	1	3	4				-4.9	32.0
-10	-11.8	38.9	10	14	15	29					
-15	-16.8	43.9	4	5	17	22				-14.9	42.0
-20	-21.8	48.9	7	8	7	15	SS-2				
-25	-26.8	53.9	7	11	13	24				-24.9	52.0
-30	-31.8	58.9	7	2	15	17					
-35	-36.8	63.9	11	11	12	23					
-40	-41.8	68.9	7	11	12	23				-39.9	67.0
-45	-46.8	73.9	15	15	17	32				**COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation)	
-50											

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB1-A LL	**STATION** 505+86	**OFFSET** 62 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 27.1 ft	**TOTAL DEPTH** 100.4 ft	**NORTHING** 437,041	**EASTING** 2,613,597	**24 HR.** 3.8
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 02/27/18	**COMP. DATE** 02/27/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-50						Match Line				
	-52.8	79.9	20	21	16	37				**COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation) *(continued)*
-55	-56.8	83.9	13	7	100/0.4	100/0.4				
-60	-61.8	88.9	27	40	31	71				
-65	-66.8	93.9	11	16	17	33				
-70	-71.8	98.9	21	18	8	26				-73.3 100.4 Boring Terminated at Elevation -73.3 ft in Coastal Plain Sedimentary Rock: LIMESTONE (Riverbend Formaton)

NCDOT BORE DOUBLE R1015_SITE8_GINT.GPJ NC_DOT.GDT 5/21/18

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB1-A RL	**STATION** 505+36	**OFFSET** 15 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 29.1 ft	**TOTAL DEPTH** 95.2 ft	**NORTHING** 436,958	**EASTING** 2,613,636	**24 HR.** 5.3
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 02/27/18	**COMP. DATE** 02/28/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
30										29.1 / 0.0 GROUND SURFACE
	28.1	1.0	2	2	3	5				**UNDIVIDED COASTAL PLAIN** Brown to Tan-Brown, Sandy CLAY, Trace Roots, Moist
25	25.4	3.7	2	2	3	5				26.1 / 3.0 Gray to Brown, Silty SAND, Moist
	22.4	6.7	3	1	2	3				
20										
15	15.4	13.7	WOH	WOH	WOH	0				17.1 / 12.0 **COASTAL PLAIN** Greenish Gray, Silty SAND, Saturated (Duplin Formation)
10	10.4	18.7	WOH	1	4	5				9.4 / 19.7
5	5.4	23.7	1	2	2	4				2.1 / 27.0
0	0.4	28.7	2	2	4	6				-2.9 / 32.0
-5	-4.6	33.7	6	6	10	16				-7.9 / 37.0 Greenish Gray, Sandy CLAY, Saturated (Duplin Formation)
-10	-9.6	38.7	WOH	8	12	20				-10.6 / 39.7 Greenish Gray, Silty SAND, with Shell Fragments, Saturated (Duplin Formation) Note: Petroleum Odor Below 43'
-15	-14.6	43.7	9	11	11	22				
-20	-19.6	48.7	7	8	7	15				
-25	-24.6	53.7	17	16	15	31				
-30	-29.6	58.7	2	5	4	9				
-35	-34.6	63.7	4	9	6	15	SS-3	48%		
-40	-39.6	68.7	4	15	12	27				
-45	-44.6	73.7	16	13	16	29				-42.9 / 72.0 **COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation)
-50	-49.6	78.7								

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB1-A RL	**STATION** 505+36	**OFFSET** 15 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 29.1 ft	**TOTAL DEPTH** 95.2 ft	**NORTHING** 436,958	**EASTING** 2,613,636	**24 HR.** 5.3
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 02/27/18	**COMP. DATE** 02/28/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-50			25	23	28	Match Line 51				**COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation) *(continued)*
-55	-54.6	83.7	10	5	88	93				
-60	-59.6	88.7	7	20	46	66				
-65	-64.6	93.7	15	25	26	51				-66.1 / 95.2 Boring Terminated at Elevation -66.1 ft in Coastal Plain Sedimentary Rock: LIMESTONE (Riverbend Formaton) Other Samples: ST-2 collected at -L- Sta. 505+39, 11' RT (13.0'-15.0')

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 505+01	**OFFSET** 72 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 28.7 ft	**TOTAL DEPTH** 95.0 ft	**NORTHING** 436,899	**EASTING** 2,613,666	**24 HR.** 4.9
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 02/28/18	**COMP. DATE** 03/01/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
30										
										28.7 GROUND SURFACE 0.0
										UNDIVIDED COASTAL PLAIN Tan-Brown to Gray, Silty SAND, Moist to Wet
25	25.2	3.5	4	5	4	9				
20	20.2	8.5	3	1	1	2				
										16.6 12.1
										COASTAL PLAIN Greenish Gray, Silty SAND, Saturated (Duplin Formation)
15	15.2	13.5	WOH	1	0	1				
										11.7 17.0
										Greenish Gray, Sandy CLAY, Saturated (Duplin Formation)
10	10.2	18.5	1	2	2	4				
										6.7 22.0
										Greenish Gray, Silty SAND and SAND with Shell Fragments, Saturated (Duplin Formation) Note: Petroleum odor beginning around 44'
5	5.2	23.5	2	6	5	11				
0	0.2	28.5	3	2	3	5				
-5	-4.8	33.5	4	4	7	11				
-10	-9.8	38.5	5	8	14	22				
-15	-14.8	43.5	7	9	7	16	SS-4			
-20	-19.8	48.5	8	10	13	23				
-25	-24.8	53.5	13	10	10	20				
-30	-29.8	58.5	14	6	9	15				
-35	-34.8	63.5	7	4	11	15				
-40	-39.8	68.5	23	30	35	65				
-45	-44.8	73.5	11	15	16	31				
-50	-49.8	78.5								
										-3.3 32.0
										-28.3 57.0
										-38.3 67.0
										COASTAL PLAIN SEDIMENTARY ROCK Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation)

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB1-B RL	**STATION** 505+01	**OFFSET** 72 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 28.7 ft	**TOTAL DEPTH** 95.0 ft	**NORTHING** 436,899	**EASTING** 2,613,666	**24 HR.** 4.9
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 02/28/18	**COMP. DATE** 03/01/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-50						Match Line				
			52	41	54	95				**COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation) *(continued)*
										-53.4 82.1
-55	-54.8	83.5	9	11	9	20				**COASTAL PLAIN** Greenish Gray, Silty SAND, Saturated (Riverbend Formation)
-60	-59.8	88.5	7	4	6	10				
-65	-64.8	93.5	26	45	41	86				-64.8 93.5
										-66.3 95.0
										COASTAL PLAIN SEDIMENTARY ROCK Gray and White, Hard, LIMESTONE (Riverbend Formation)
										Boring Terminated at Elevation -66.3 ft in Coastal Plain Sedimentary Rock: LIMESTONE (Riverbend Formaton)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. B1-A LL	**STATION** 506+18	**OFFSET** 57 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 23.8 ft	**TOTAL DEPTH** 89.7 ft	**NORTHING** 437,066	**EASTING** 2,613,618	**24 HR.** 2.3
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/06/18	**COMP. DATE** 03/06/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
25										23.8 0.0 GROUND SURFACE
	20.7	3.1	6	7	8	15				**UNDIVIDED COASTAL PLAIN** Gray, Silty SAND, Moist
20	15.6	8.2	WOH	WOH	WOH	0	SS-5	70%		16.8 7.0 Gray, Sandy CLAY, Wet
15	10.6	13.2	1	1	0	1				11.8 12.0 **COASTAL PLAIN** Greenish Gray, Sandy CLAY with Thin (1" to 2") Sand Seams, Saturated (Duplin Formation)
10	5.6	18.2	1	0	1	1				
5	0.6	23.2	4	4	7	11	SS-6	31%		1.8 22.0 Greenish Gray, Clayey SAND and Silty SAND with Shell Fragments, Saturated (Duplin Formation) Note: Petroleum odor beginning around 43'
0	-4.4	28.2	2	4	7	11				
-5	-9.4	33.2	6	12	16	28				
-10	-14.4	38.2	7	8	9	17				
-15	-19.4	43.2	17	18	12	30				
-20	-24.4	48.2	12	19	22	41				
-25	-29.4	53.2	4	11	12	23				
-30	-34.4	58.2	3	4	6	10				
-35	-39.7	63.5	15	14	42	56				-39.2 63.0 **COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation)
-40	-44.4	68.2	32	12	16	28				
-45	-49.4	73.2	13	22	5	27				
-50	-54.4	78.2								
-55										

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. B1-A LL	**STATION** 506+18	**OFFSET** 57 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 23.8 ft	**TOTAL DEPTH** 89.7 ft	**NORTHING** 437,066	**EASTING** 2,613,618	**24 HR.** 2.3
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/06/18	**COMP. DATE** 03/06/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-55			3	7	14	Match Line				**COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation) *(continued)*
	-58.5	82.3	19	40	42	21 82				
-60	-63.4	87.2	13	15	13	28				-65.9 89.7 Boring Terminated at Elevation -65.9 ft in Coastal Plain Sedimentary Rock: LIMESTONE (Riverbend Formaton)
-65										

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. B1-B LL	**STATION** 505+94	**OFFSET** 19 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 24.7 ft	**TOTAL DEPTH** 94.9 ft	**NORTHING** 437,026	**EASTING** 2,613,637	**24 HR.** 1.3
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/02/18	**COMP. DATE** 03/02/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
25										24.7 / 0.0 GROUND SURFACE
										UNDIVIDED COASTAL PLAIN Gray, Silty SAND, Wet
20	21.2	3.5	1	5	5	10				
	16.3	8.4	1	1	1	2				17.7 / 7.0 Greenish Gray, Sandy CLAY, Saturated
15										
10	11.3	13.4	1	0	2	2				8.7 / 16.0 **COASTAL PLAIN** Greenish Gray, Silty SAND, with Clay Seams and Trace Shell Fragments, Saturated (Duplin Formation)
5	6.3	18.4	2	1	1	2				
0	1.3	23.4	7	6	9	15				
-5	-3.7	28.4	4	4	8	12				
-10	-8.7	33.4	1	4	11	15				
-15	-13.7	38.4	10	13	12	25				
-20	-18.7	43.4	10	8	8	16				
-25	-23.7	48.4	11	18	16	34				
-30	-28.7	53.4	9	9	9	18				
-35	-33.7	58.4	4	4	9	13	SS-7			
-40	-38.7	63.4	16	15	24	39				
-45	-43.7	68.4	15	15	17	32				
-50	-48.7	73.4	17	9	17	26				
-55	-53.7	78.4	6	10	35	45				
										-7.3 / 32.0 Brownish Gray, Sandy CLAY, Saturated (Duplin Formation)
										-9.8 / 34.5 Greenish Gray, Silty SAND, with Shell Fragments, Saturated (Duplin Formation) -12.3 / 37.0 Note: Petroleum odor beginning around 44'
										-27.3 / 52.0
										-37.3 / 62.0 **COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Medium Hard, LIMESTONE (Riverbend Formation)

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. B1-B LL	**STATION** 505+94	**OFFSET** 19 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 24.7 ft	**TOTAL DEPTH** 94.9 ft	**NORTHING** 437,026	**EASTING** 2,613,637	**24 HR.** 1.3
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/02/18	**COMP. DATE** 03/02/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-55						Match Line				**COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Medium Hard, LIMESTONE (Riverbend Formation) *(continued)*
-60	-58.7	83.4	3	23	16	39				
-65	-63.7	88.4	18	21	19	40				
-70	-68.7	93.4	10	10	12	22				-70.2 / 94.9 Boring Terminated at Elevation -70.2 ft in Coastal Plain Sedimentary Rock: LIMESTONE (Riverbend Formaton)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. B1-B RL	**STATION** 505+76	**OFFSET** 68 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 20.3 ft	**TOTAL DEPTH** 84.5 ft	**NORTHING** 436,965	**EASTING** 2,613,702	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/07/18	**COMP. DATE** 03/07/18	**SURFACE WATER DEPTH** 0.7ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
25											
20										20.3 GROUND SURFACE	0.0
	17.1	3.2	WOH	WOH	1	1				**ARTIFICIAL FILL (ENGINEERED)** Tan-Brown, Silty SAND, Saturated (Railroad Embankment)	
15										16.7	3.6
	12.3	8.0	WOH	1	1	2				**UNDIVIDED COASTAL PLAIN** Gray, Sandy CLAY, Saturated	
10										13.3	7.0
	7.3	13.0	2	2	1	3	SS-8	36%		**COASTAL PLAIN** Greenish Gray, Silty SAND, Saturated (Duplin Formation)	
5											
	2.3	18.0	6	9	13	22					
0											
	-2.7	23.0	3	4	5	9					
-5											
	-7.7	28.0	3	2	1	3				-6.7 Greenish Gray, Sandy CLAY, Saturated (Duplin Formation)	27.0
-10											
	-12.7	33.0	15	14	14	28				-11.7 Greenish Gray, Silty SAND and Clayey SAND with Shell Fragments (Duplin Formation) Note: Petroleum odor beginning around 41'	32.0
-15											
	-17.7	38.0	6	9	11	20					
-20											
	-22.7	43.0	16	16	18	34					
-25											
	-27.7	48.0	14	22	21	43					
-30											
	-32.7	53.0	5	5	6	11					
-35											
	-37.7	58.0	8	10	30	40					
-40										-41.7	62.0
	-42.7	63.0	8	10	8	18					
-45											
	-47.7	68.0	16	23	57	80				-46.7 **COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation)	67.0
-50											
	-51.7	72.0	100/0.3			100/0.3					
-55											

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. B1-B RL	**STATION** 505+76	**OFFSET** 68 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 20.3 ft	**TOTAL DEPTH** 84.5 ft	**NORTHING** 436,965	**EASTING** 2,613,702	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/07/18	**COMP. DATE** 03/07/18	**SURFACE WATER DEPTH** 0.7ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-55						Match Line				
	-57.7	78.0	7	9	10	19				-56.7 77.0 **COASTAL PLAIN** Gray and White, Silty SAND, Saturated (Riverbend Formation)
-60										-61.7 82.0
	-62.7	83.0	14	16	17	33				-64.2 84.5 Boring Terminated at Elevation -64.2 ft in Coastal Plain Soil: Silty SAND (Riverbend Formation)

NCDOT BORE DOUBLE R1015_SITE8_GINT.GPJ NC_DOT.GDT 5/21/18

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70			**GROUND WTR (ft)**
BORING NO. B2-A LL	**STATION** 507+36	**OFFSET** 60 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 20.4 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 437,168	**EASTING** 2,613,677	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Toothman, R.	**START DATE** 03/09/18	**COMP. DATE** 03/09/18	**SURFACE WATER DEPTH** 0.0ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
25										
20										20.4 GROUND SURFACE 0.0
	16.9	3.5	5	2	4	6				**UNDIVIDED COASTAL PLAIN** Gray, Silty SAND with Thin (1" to 2") Clay Seams, Saturated
15										
	11.7	8.7	WOH	1	1	2				
10										8.4 12.0
	6.7	13.7	4	7	9	16				**COASTAL PLAIN** Greenish Gray, Silty SAND with Shell Fragments, Saturated (Duplin Formation)
5										
	1.7	18.7	4	7	9	16				
0										
	-3.3	23.7	3	4	8	12				
-5										
	-8.3	28.7	4	3	7	10				
-10										
	-13.3	33.7	11	13	12	25				
-15										
	-18.3	38.7	6	7	10	17				
-20										
	-23.3	43.7	6	13	26	39				
-25										
	-28.3	48.7	5	5	5	10	SS-9	34%		
-30										
	-33.3	53.7	5	7	11	18				
-35										
	-38.3	58.7	6	9	22	31				
-40										
	-43.3	63.7	10	13	13	26				
-45										
	-48.3	68.7	31	52	48/0.2	100/0.7				
-50										
	-53.3	73.7	57	47	48	95				
-55										

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70			**GROUND WTR (ft)**
BORING NO. B2-A LL	**STATION** 507+36	**OFFSET** 60 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 20.4 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 437,168	**EASTING** 2,613,677	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Toothman, R.	**START DATE** 03/09/18	**COMP. DATE** 03/09/18	**SURFACE WATER DEPTH** 0.0ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-55						Match Line				
	-58.3	78.7	33	17	36	53				-56.6 77.0 **COASTAL PLAIN** Greenish Gray, Silty SAND with Large Shell Fragments, Saturated (Riverbend Formation)
-60										-61.6 82.0
	-63.3	83.7	22	16	21	37				-64.8 85.2 Boring Terminated at Elevation -64.8 ft in Coastal Plain Soil: Silty SAND (Riverbend Formation)

-11.6 32.0 **COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Hard LIMESTONE (Riverbend Formation)

-26.6 47.0

-41.6 62.0

-47.8 68.2

NCDOT BORE DOUBLE R1015_SITE8_GINT.GPJ NC_DOT.GDT 5/21/18

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. B2-A RL	**STATION** 506+70	**OFFSET** 19 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 21.5 ft	**TOTAL DEPTH** 90.4 ft	**NORTHING** 437,070	**EASTING** 2,613,710	**24 HR.** 0.7
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/13/18	**COMP. DATE** 03/13/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
25												
20											21.5	0.0
	18.0	3.5	3	2	1	3				**UNDIVIDED COASTAL PLAIN** Tan to Gray, Silty SAND, Wet		
15											14.5	7.0
	12.6	8.9	1	1	2	3				Gray, Sandy CLAY with Thin (1" to 2") Sand Seams, Saturated		
10											9.5	12.0
	7.6	13.9	1	0	3	3				**COASTAL PLAIN** Greenish Gray, Silty SAND with Shell Fragments, Saturated (Duplin Formation)		
5												
	2.6	18.9	16	12	13	25	SS-10					
0												
	-2.4	23.9	3	5	7	12					-5.5	27.0
-5												
	-7.4	28.9	4	6	9	15						
-10											-10.5	32.0
	-12.4	33.9	9	16	17	33						
-15												
	-17.4	38.9	4	5	6	11						
-20												
	-22.4	43.9	16	12	11	23						
-25												
	-27.4	48.9	13	17	8	25					-28.4	49.9
-30												
	-32.4	53.9	4	4	6	10						
-35												
	-37.4	58.9	3	1	37	38						
-40											-40.1	61.6
	-42.4	63.9	11	15	11	26				**COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation) Note: Slight petroleum odor beginning around 63'		
-45												
	-47.4	68.9	23	17	19	36						
-50												
	-52.4	73.9	5	25	75/0.4	100/0.9						
-55												

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. B2-A RL	**STATION** 506+70	**OFFSET** 19 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 21.5 ft	**TOTAL DEPTH** 90.4 ft	**NORTHING** 437,070	**EASTING** 2,613,710	**24 HR.** 0.7
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/13/18	**COMP. DATE** 03/13/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-55						Match Line				
	-57.4	78.9	14	12	11	23				
-60										
	-62.4	83.9	7	7	7	14				
-65										
	-67.4	88.9	26	34	26	60				
										COASTAL PLAIN SEDIMENTARY ROCK Gray and White, Soft to Hard, LIMESTONE (Riverbend Formation) Note: Slight petroleum odor beginning around 63' *(continued)*
										-68.9 90.4 Boring Terminated at Elevation -68.9 ft in Coastal Plain Sedimentary Rock: LIMESTONE (Riverbend Formaton)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. B2-B RL	**STATION** 506+37	**OFFSET** 73 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 22.1 ft	**TOTAL DEPTH** 85.6 ft	**NORTHING** 437,014	**EASTING** 2,613,738	**24 HR.** 0.9
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/14/18	**COMP. DATE** 03/15/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
25											
										22.1	0.0
										UNDIVIDED COASTAL PLAIN Tan-Brown to Gray, Silty SAND, Wet	
20	18.6	3.5	4	4	1	5					
	13.0	9.1	WOH	1	1	2				15.1	7.0
15										Gray, Sandy CLAY, Saturated	
	8.0	14.1	1	2	2	4				10.1	12.0
10										**COASTAL PLAIN** Greenish Gray, Silty SAND with Shell Fragments, Saturated (Duplin Formation)	
	3.0	19.1	11	15	12	27					
5											
	-2.0	24.1	3	2	7	9	SS-11				
0											
	-7.0	29.1	4	7	9	16					
-5											
	-12.0	34.1	11	19	26	45					
-10											
	-17.0	39.1	5	7	19	26					
-15											
	-22.0	44.1	12	13	13	26					
-20											
	-27.0	49.1	14	7	27	34					
-25											
	-32.0	54.1	4	7	15	22					
-30											
	-37.0	59.1	5	8	22	30					
-35											
	-42.0	64.1	12	10	15	25					
-40											
	-47.0	69.1	17	15	16	31					
-45											
	-52.0	74.1	11	38	8	46					
-50											
										0.1	22.0
										-9.9	32.0
										-28.0	50.1
										-39.9	62.0
										COASTAL PLAIN SEDIMENTARY ROCK Gray and White, Soft to Medium Hard LIMESTONE (Riverbend Formation)	
-55											

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. B2-B RL	**STATION** 506+37	**OFFSET** 73 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 22.1 ft	**TOTAL DEPTH** 85.6 ft	**NORTHING** 437,014	**EASTING** 2,613,738	**24 HR.** 0.9
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/14/18	**COMP. DATE** 03/15/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-55						Match Line				
	-57.0	79.1	8	12	44	56				**COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Medium Hard LIMESTONE (Riverbend Formation) *(continued)*
-60	-62.0	84.1	26	18	27	45				-63.5 85.6
										Boring Terminated at Elevation -63.5 ft in Coastal Plain Sedimentary Rock: LIMESTONE (Riverbend Formaton)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 507+72	**OFFSET** 62 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 19.6 ft	**TOTAL DEPTH** 80.4 ft	**NORTHING** 437,200	**EASTING** 2,613,694	**24 HR.** 3.1
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/08/18	**COMP. DATE** 03/08/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
20										19.6 GROUND SURFACE	0.0
	16.1	3.5	3	2	1	3				**ALLUVIAL** Brown and Black, Silty SAND, Trace Organics, Wet	
15							SS-12	25%		15.7	3.9
	10.7	8.9	WOH	WOH	1	1				**UNDIVIDED COASTAL PLAIN** Gray, Silty SAND, Wet	
10										12.6 Gray, Sandy CLAY, Saturated	7.0
	5.7	13.9	2	4	6	10				7.6	12.0
5										**COASTAL PLAIN** Greenish Gray, Silty SAND with Shell Fragments, Saturated (Duplin Formation) Note: Petroleum odor beginning around 37'	
	0.7	18.9	5	4	9	13					
0											
	-4.3	23.9	3	5	3	8					
-5											
	-9.3	28.9	4	7	11	18					
-10											
	-14.3	33.9	12	11	11	22					
-15											
	-19.3	38.9	7	9	9	18					
-20											
	-24.3	43.9	11	16	22	38					
-25											
	-29.3	48.9	23	19	16	35					
-30											
	-34.3	53.9	4	5	8	13	SS-13	40%			
-35											
	-39.3	58.9	8	12	13	25					
-40											
	-44.3	63.9	10	23	11	34					
-45											
	-49.3	68.9	30	25	20	45					
-50											
	-54.3	73.9	63	15	10	25					
-55											
	-59.3	78.9									
-60										-42.4 Gray and White, Soft to Moderately Hard, LIMESTONE (Riverbend Formation)	62.0

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB2-A LL	**STATION** 507+72	**OFFSET** 62 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 19.6 ft	**TOTAL DEPTH** 80.4 ft	**NORTHING** 437,200	**EASTING** 2,613,694	**24 HR.** 3.1
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/08/18	**COMP. DATE** 03/08/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-60			7	34	33	Match Line 67				-60.8 Boring Terminated at Elevation -60.8 ft in Coastal Plain Sedimentary Rock: LIMESTONE (Riverbend Formaton) 80.4

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB2-B LL	**STATION** 507+47	**OFFSET** 26 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 20.6 ft	**TOTAL DEPTH** 80.3 ft	**NORTHING** 437,159	**EASTING** 2,613,712	**24 HR.** 2.4
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/08/18	**COMP. DATE** 03/08/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
										20.6	0.0
										GROUND SURFACE	
										UNDIVIDED COASTAL PLAIN Tan to Gray, Silty SAND, Wet	
	17.1	3.5	3	1	1	2					
										12.1	8.5
	11.8	8.8	WOH	1	1	2				Gray, Sandy CLAY, Saturated	
	6.8	13.8	5	10	10	20					
										3.6	17.0
	1.8	18.8	12	10	4	14				**COASTAL PLAIN** Greenish Gray, Silty SAND with Shell Fragments, Saturated (Duplin Formation)	
	-3.2	23.8	6	7	7	14				-1.4	22.0
	-8.2	28.8	4	8	13	21					
	-13.2	33.8	9	16	12	28					
	-18.2	38.8	8	11	12	23					
	-23.2	43.8	12	17	14	31					
	-28.2	48.8	19	13	12	25					
	-33.2	53.8	3	5	10	15					
	-38.2	58.8	6	11	46	57				-37.7	58.3
	-43.2	63.8	8	4	10	14				**COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Very Soft to Hard, LIMESTONE (Riverbend Formation)	
	-48.2	68.8	11	11	19	30					
	-53.2	73.8	82	13	100/0.3	100/0.3					

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB2-B LL	**STATION** 507+47	**OFFSET** 26 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 20.6 ft	**TOTAL DEPTH** 80.3 ft	**NORTHING** 437,159	**EASTING** 2,613,712	**24 HR.** 2.4
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/08/18	**COMP. DATE** 03/08/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-55						Match Line				**COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Very Soft to Hard, LIMESTONE (Riverbend Formation) *(continued)*
	-58.2	78.8	11	57	23	80				-59.7 80.3 Boring Terminated at Elevation -59.7 ft in Coastal Plain Sedimentary Rock: LIMESTONE (Riverbend Formaton)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 506+87	**OFFSET** 79 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 22.6 ft	**TOTAL DEPTH** 75.0 ft	**NORTHING** 437,053	**EASTING** 2,613,770	**24 HR.** 1.3
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/14/18	**COMP. DATE** 03/14/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
25										
	21.6	1.0	3	4	3	7				22.6 / 0.0 GROUND SURFACE
20	19.1	3.5	3	2	3	5				**UNDIVIDED COASTAL PLAIN** Tan-Brown to Gray, Silty SAND, Moist to Saturated
	16.6	6.0	WOH	WOH	1	1				
15	14.1	8.5	WOH	1	1	2				
	9.1	13.5	1	1	2	3				10.6 / 12.0 Greenish Gray, Sandy CLAY, Saturated (Duplin Formation)
10	4.1	18.5	11	14	13	27				5.6 / 17.0 **COASTAL PLAIN** Greenish Gray, Silty SAND with Shell Fragments, Saturated (Duplin Formation) Note: Petroleum odor beginning around 43'
5	-0.9	23.5	3	4	8	12				0.6 / 22.0
0	-5.9	28.5	2	3	4	7				
-5	-10.9	33.5	9	14	23	37				-9.4 / 32.0
-10	-15.9	38.5	5	4	5	9				
-15	-20.9	43.5	8	11	23	34				
-20	-25.9	48.5	19	22	19	41				-29.4 / 52.0
-25	-30.9	53.5	4	6	9	15				
-30	-35.9	58.5	9	5	11	16				
-35	-40.9	63.5	8	9	17	26				-39.4 / 62.0 **COASTAL PLAIN SEDIMENTARY ROCK** Gray and White, Soft to Medium Hard, LIMESTONE (Riverbend Formation)
-40	-45.9	68.5	28	25	31	56				
-45	-50.9	73.5	38	25	19	44				-52.4 / 75.0 Boring Terminated at Elevation -52.4 ft in Coastal Plain Sedimentary Rock:
-50										

WBS 34360.1.2	**TIP** R-1015	**COUNTY** CRAVEN	**GEOLOGIST** Pastrana, C.R.	
SITE DESCRIPTION Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70				**GROUND WTR (ft)**
BORING NO. EB2-B RL	**STATION** 506+87	**OFFSET** 79 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 22.6 ft	**TOTAL DEPTH** 75.0 ft	**NORTHING** 437,053	**EASTING** 2,613,770	**24 HR.** 1.3
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/19/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Toothman, R.	**START DATE** 03/14/18	**COMP. DATE** 03/14/18	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
-55						Match Line				LIMESTONE (Riverbend Formaton) Other Samples: ST-3 collected at -L- Sta. 506+89, 75' RT (7.0'-9.0')

SOILS LABORATORY TESTS RESULTS

WBS NO.: 34360.1.2

TIP NO.: R-1015

COUNTY: Craven

SITE DESCRIPTION: Site #8 - Dual Bridges on US 70 Bypass over NCRR Between SR 1747 and US 70

BORING NO.	SAMPLE NO.	Boring Location	DEPTH INTERVAL (ft.)	AASHTO CLASS	N	L.L	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
								CSE. SAND	F. SAND	SILT	CLAY	10	40	200		
EB1-A LL	SS-1	-L- 505+86, 62' LT	13.9-15.4	A-6 (4)	1	26	13	19	27	19	35	100	99	56	51.9	-
EB1-A LL	SS-2	-L- 505+86, 62' LT	48.9-50.4	A-1-b (1)	15	NP	NP	64	29	3	4	85	45	8	-	-
	ST-2	-L- 505+39, 11' RT	13.0-15.0	A-3 (1)	N/A	NP	NP	10	82	1	7	100	95	9	33.6	-
EB1-A RL	SS-3	-L- 505+36, 15' RT	63.7-65.2	A-2-4 (0)	15	28	5	1	70	20	9	99	99	33	47.9	-
EB1-B RL	SS-4	-L- 505+01, 72' RT	43.5-45.0	A-1-b (1)	16	NP	NP	81	12	2	5	94	30	8	-	-
B1-A LL	SS-5	-L- 506+18, 57' LT	8.2-9.7	A-6 (7)	0	32	17	0	44	17	39	100	100	59	69.7	-
B1-A LL	SS-6	-L- 506+18, 57' LT	23.2-24.7	A-2-4 (0)	11	NP	NP	14	69	6	11	100	92	20	31.3	-
B1-B LL	SS-7	-L- 505+94, 19' LT	58.4-59.9	A-2-4 (0)	13	NP	NP	5	79	11	5	99	98	19	-	-
B1-B RL	SS-8	-L- 505+76, 68' RT	13.0-14.5	A-2-4 (0)	3	18	5	55	21	8	16	100	86	25	36.0	-
B2-A LL	SS-9	-L- 507+36, 60' LT	48.7-50.2	A-2-4 (0)	10	NP	NP	6	74	11	9	97	94	23	33.7	-
B2-A RL	SS-10	-L- 506+70, 19' RT	18.9-20.4	A-3 (1)	25	NP	NP	39	55	3	3	100	75	8	-	-
B2-B RL	SS-11	-L- 506+37, 73' RT	24.1-25.6	A-2-4 (0)	9	NP	NP	2	81	7	10	100	100	21	-	-
EB2-A LL	SS-12	-L- 507+72, 62' LT	3.5-5.0	A-2-4 (0)	3	NP	NP	18	70	2	10	100	94	13	24.9	-
EB2-A LL	SS-13	-L- 507+72, 62' LT	53.9-55.4	A-2-4 (0)	13	NP	NP	1	90	3	6	100	100	11	40.1	-
	ST-3	-L- 506+89, 75' RT	7.0-9.0	A-2-4 (0)	N/A	18	3	1	90	2	7	100	100	9	29.0	-

Signed:

NCDOT Certification No. 129-04-0411

PROJECT REFERENCE NO.	SHEET NO.
R–1015	22

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX A
CONSOLIDATION & TRIAXIAL SHEAR TEST RESULTS

REFERENCE: R–1015

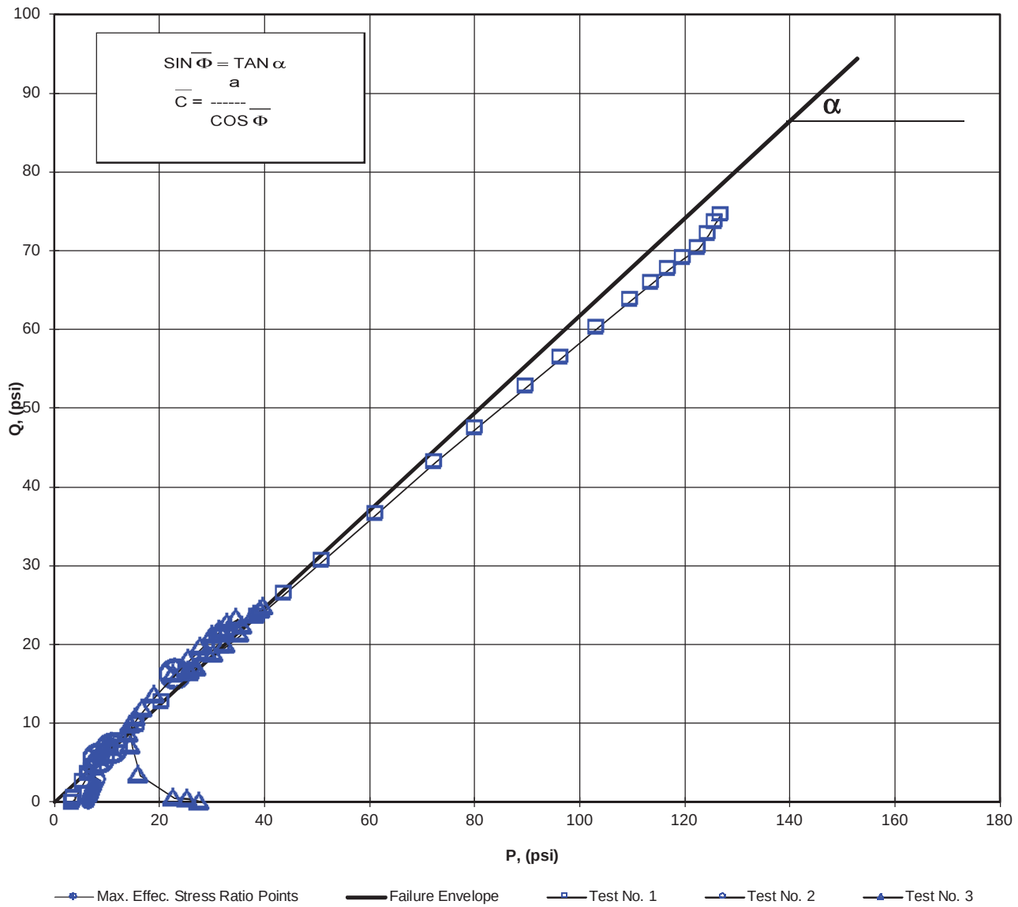
PROJECT: 34360

ESP
ESP ASSOCIATES, INC.
7011 ALBERT PICK RD
SUITE E
GREENSBORO, NC 27409
FIRM # C-0587
WWW.ESPASSOCIATES.COM

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA 505+39 11'RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	13.0-15.0
Project No.:	R-2018-075-001	Sample No.:	ST-2
Lab ID:	R-2018-075-001-003		

Consolidated Undrained Triaxial Test with Pore Pressure



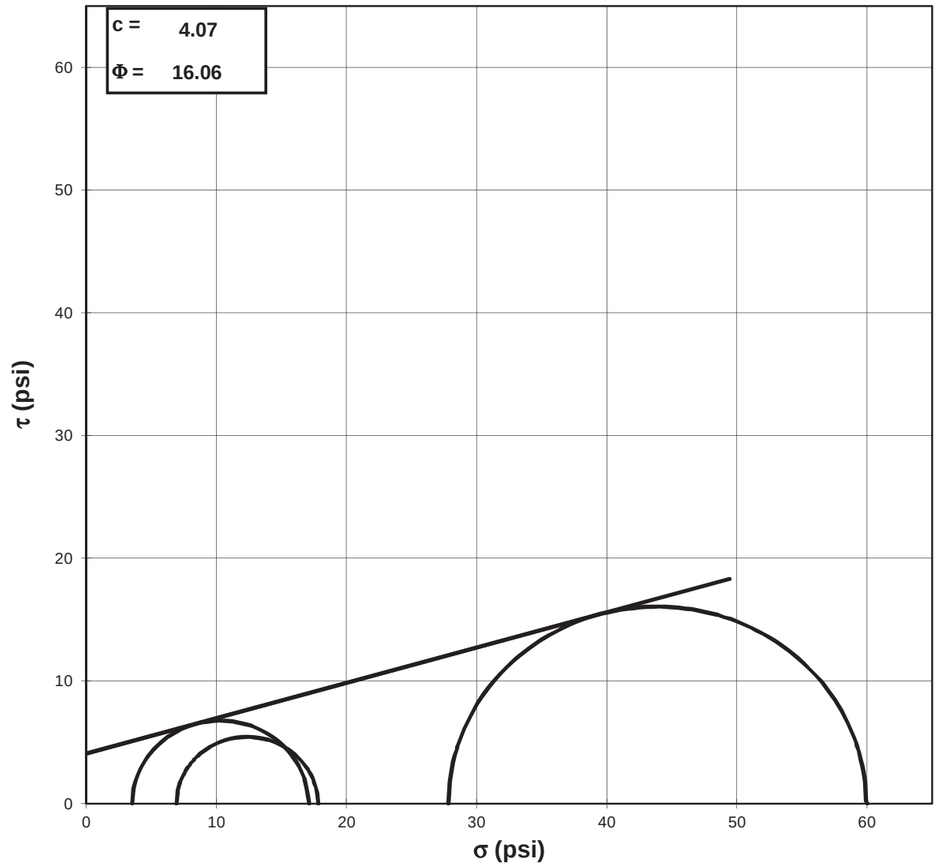
a	=	**0.00**	$\overline{C}$	=	**0.00**
α	=	**31.7**	$\overline{\Phi}$	=	**38.11**

Tested By: 129-04-0411 Date: 3/28/18 Approved By: MPS Date: 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

MOHR TOTAL STRENGTH ENVELOPE
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA 505+39 11'RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	13.0-15.0
Project No.:	R-2018-075-001	Sample No.:	ST-2
Lab ID:	R-2018-075-001-003		
Visual Description:	TAN SAND (UNDISTURBED)		



Failure Based on Maximum Effective Principal Stress Ratio NOTE: GRAPH NOT TO SCALE

Tested By: 129-04-0411 *Date:* 3/28/18 *Approved By:* MPS *Date:* 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA 505+39 11'RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	13.0-15.0
Project No.:	R-2018-075-001	Sample No.:	ST-2
Lab ID:	R-2018-075-001-003		

Visual Description: TAN SAND (UNDISTURBED)

Stage No.	1
Test No.	1

PRESSURES (psi)

Cell Pressure (psi)	53.5
Back Pressure (psi)	50.0
Eff. Conf. Pressure (psi)	3.5
Pore Pressure Response (%)	100

MAXIMUM OBLIQUITY POINTS

$\overline{P}$	=	10.96
Q	=	6.76

INITIAL SAMPLE DIMENSIONS (in)

Length 1:	5.761	Diameter 1:	2.797
Length 2:	5.830	Diameter 2:	2.784
Length 3:	5.861	Diameter 3:	2.808
Length 4:	5.970	Diameter 4:	2.748
Avg. Length:	5.856	*Avg. Diam.:*	2.784

VOLUME CHANGE

Initial Burette Reading (ml)	24.0
Final Burette Reading (ml)	21.6
Final Change (ml)	2.4
Initial Dial Reading (mil)	160
Dial Reading After Saturation (mil)	160
Dial Reading After Consolidation (mil)	165

LOAD (LB)	DEFORMATION (IN)	PORE PRESSURE (PSI)
5.5	0.000	50.0
11.2	0.001	50.0
12.4	0.003	50.0
36.5	0.008	50.4
49.7	0.014	50.5
60.8	0.019	50.3
72.9	0.028	49.8
88.1	0.037	49.3
100.4	0.048	48.7
125.3	0.068	47.4
162.1	0.097	45.6
207.1	0.132	43.4
252.8	0.166	41.0
301.8	0.206	38.2
340.6	0.235	36.1
394.8	0.276	32.9
475.7	0.331	28.6
565.7	0.389	24.1
627.1	0.432	20.7
702.7	0.489	16.3
757.7	0.533	13.2
815.1	0.576	10.2
869.9	0.619	7.4
904.6	0.648	5.6
933.1	0.677	4.0
957.0	0.706	2.5
981.5	0.735	1.2
1013.7	0.778	1.0
1042.8	0.821	1.0
1066.3	0.865	1.0
1074.9	0.910	1.0

Tested By: 129-04-0411 Date: 3/28/18 Input Checked By: GEM Date: 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA 505+39 11'RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	13.0-15.0
Project No.:	R-2018-075-001	Sample No.:	ST-2
Lab ID:	R-2018-075-001-003		

Visual Description: TAN SAND (UNDISTURBED)

Effective Confining Pressure (psi)	3.5	*Stage No.*	1
		Test No	1

INITIAL DIMENSIONS

Initial Sample Length (in)	5.86
Initial Sample Diameter (in)	2.78
Initial Sample Area (in^2)	6.09
Initial Sample Volume (in^3)	35.65

VOLUME CHANGE

Volume After Consolidation (in^3)	35.50
Length After Consolidation (in)	5.85
Area After Consolidation (in^2)	6.069

Strain (%)	Deviation Stress	ΔU	$\overline{\sigma_1}$	$\overline{\sigma_3}$	Effective Principle Stress Ratio	$\overline{A}$	$\overline{P}$	Q
0.02	0.93	0.04	4.44	3.5	1.265	0.04	3.98	0.47
0.04	1.13	0.01	4.66	3.5	1.320	0.01	4.10	0.56
0.14	5.09	0.46	8.18	3.1	2.648	0.09	5.63	2.55
0.23	7.26	0.50	10.30	3.0	3.386	0.07	6.67	3.63
0.33	9.08	0.30	12.32	3.2	3.799	0.03	7.78	4.54
0.47	11.04	-0.18	14.77	3.7	3.960	-0.02	9.25	5.52
0.62	13.52	-0.65	17.72	4.2	4.224	-0.05	10.96	6.76
0.82	15.50	-1.31	20.35	4.9	4.194	-0.08	12.60	7.75
1.16	19.50	-2.58	25.63	6.1	4.182	-0.13	15.88	9.75
1.66	25.37	-4.40	33.32	7.9	4.192	-0.17	20.63	12.69
2.26	32.47	-6.61	42.63	10.2	4.196	-0.20	26.39	16.24
2.84	39.59	-8.95	52.08	12.5	4.169	-0.23	32.29	19.79
3.52	47.09	-11.73	62.37	15.3	4.083	-0.25	38.83	23.55
4.02	52.99	-13.92	70.45	17.5	4.034	-0.26	43.96	26.49
4.71	61.13	-17.03	81.70	20.6	3.971	-0.28	51.14	30.56
5.65	73.10	-21.36	98.00	24.9	3.935	-0.29	61.45	36.55
6.65	86.17	-25.91	115.63	29.5	3.925	-0.30	72.54	43.08
7.38	94.86	-29.29	127.70	32.8	3.889	-0.31	80.27	47.43
8.35	105.29	-33.68	142.51	37.2	3.828	-0.32	89.87	52.64
9.11	112.65	-36.77	152.97	40.3	3.794	-0.33	96.64	56.33
9.84	120.28	-39.76	163.59	43.3	3.777	-0.33	103.45	60.14
10.59	127.36	-42.59	173.50	46.1	3.760	-0.33	109.82	63.68
11.08	131.74	-44.38	179.67	47.9	3.749	-0.34	113.80	65.87
11.57	135.16	-45.97	184.68	49.5	3.730	-0.34	117.09	67.58
12.06	137.88	-47.47	188.89	51.0	3.703	-0.34	119.96	68.94
12.56	140.62	-48.83	192.99	52.4	3.685	-0.35	122.68	70.31
13.29	144.05	-48.98	196.58	52.5	3.743	-0.34	124.55	72.03
14.03	146.95	-48.98	199.47	52.5	3.798	-0.33	126.00	73.47
14.79	148.94	-48.98	201.47	52.5	3.836	-0.33	127.00	74.47
15.55	148.81	-48.98	201.33	52.5	3.833	-0.33	126.93	74.40

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA 505+39 11'RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	13.0-15.0
Project No.:	R-2018-075-001	Sample No.:	ST-2
Lab ID:	R-2018-075-001-003		

Visual Description: TAN SAND (UNDISTURBED)

Stage No.	1
Test No.	3

PRESSURES (psi)

Cell Pressure (psi)	77.8
Back Pressure (psi)	50.0
Eff. Conf. Pressure (psi)	27.8
Pore Pressure Response (%)	100

MAXIMUM OBLIQUITY POINTS

$\overline{P}$	=	22.86
Q	=	16.05

INITIAL SAMPLE DIMENSIONS (in)

Length 1:	5.851	Diameter 1:	2.912
Length 2:	5.929	Diameter 2:	2.870
Length 3:	5.846	Diameter 3:	2.899
Length 4:	5.991	Diameter 4:	2.874
Avg. Length:	5.904	*Avg. Diam.:*	2.889

VOLUME CHANGE

Initial Burette Reading (ml)	24.0
Final Burette Reading (ml)	0.0
Final Change (ml)	24.0
Initial Dial Reading (mil)	118
Dial Reading After Saturation (mil)	116
Dial Reading After Consolidation (mil)	145

LOAD (LB)	DEFORMATION (IN)	PORE PRESSURE (PSI)
12.8	0.000	50.0
17.1	0.001	52.5
18.2	0.003	55.4
54.7	0.008	64.9
102.0	0.013	70.1
120.6	0.019	71.9
135.6	0.028	72.6
147.2	0.037	72.7
162.0	0.048	72.4
184.8	0.069	71.9
219.8	0.098	71.0
247.1	0.134	70.1
267.8	0.169	69.3
288.5	0.211	68.5
299.5	0.240	67.9
313.1	0.281	67.2
324.6	0.337	66.1
299.8	0.396	66.1
269.3	0.440	67.2
242.0	0.500	68.5
243.7	0.544	68.3
251.0	0.588	67.8
252.5	0.633	67.4
278.7	0.662	65.9
297.7	0.692	64.9
318.4	0.722	63.6
335.8	0.751	64.1
357.8	0.795	63.2
370.7	0.839	62.7
378.5	0.869	62.5
384.1	0.899	60.3

Tested By: 129-04-0411 Date: 3/28/18 Input Checked By: GEM Date: 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA 505+39 11'RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	13.0-15.0
Project No.:	R-2018-075-001	Sample No.:	ST-2
Lab ID:	R-2018-075-001-003		

Visual Description: TAN SAND (UNDISTURBED)

Effective Confining Pressure (psi)	27.8	*Stage No.*	1
		Test No	3

INITIAL DIMENSIONS

Initial Sample Length (in)	5.90
Initial Sample Diameter (in)	2.89
Initial Sample Area (in^2)	6.55
Initial Sample Volume (in^3)	38.70

VOLUME CHANGE

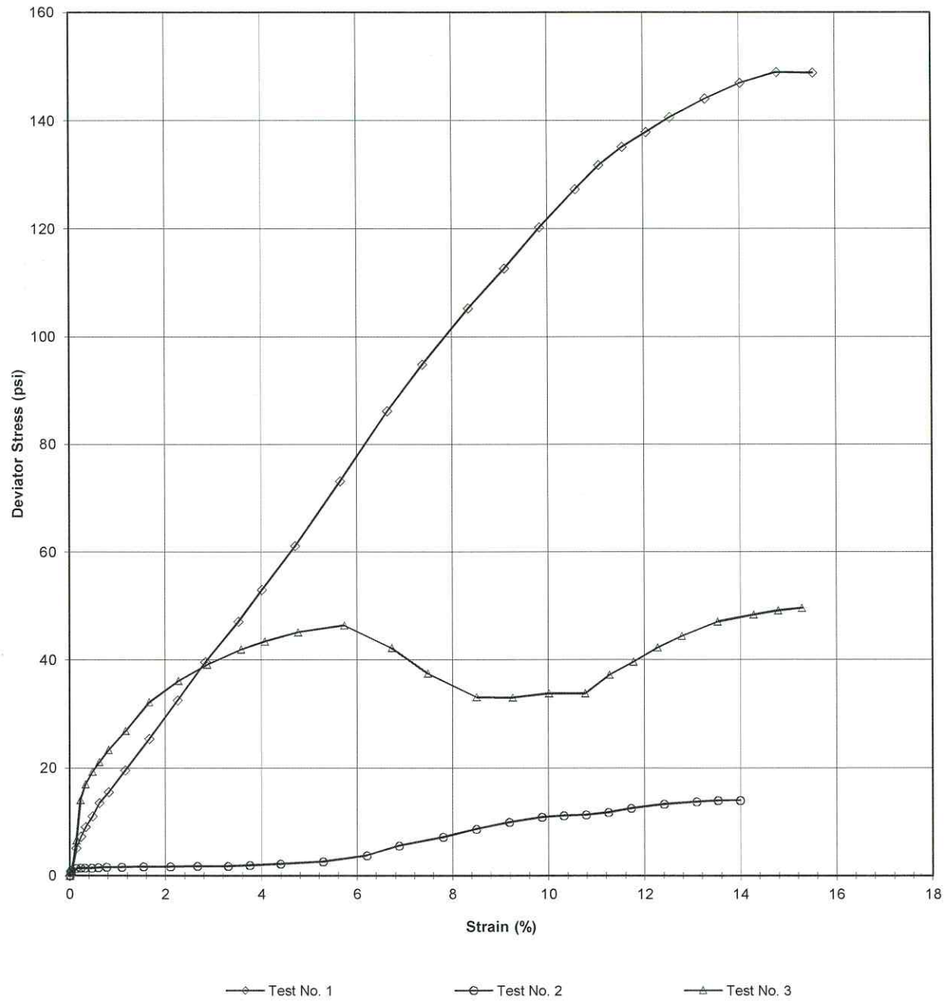
Volume After Consolidation (in^3)	37.27
Length After Consolidation (in)	5.88
Area After Consolidation (in^2)	6.342

Strain (%)	Deviation Stress	ΔU	$\overline{\sigma_1}$	$\overline{\sigma_3}$	Effective Principle Stress Ratio	$\overline{A}$	$\overline{P}$	Q
0.02	0.67	2.52	26.00	25.3	1.027	3.74	25.66	0.34
0.05	0.85	5.41	23.28	22.4	1.038	6.39	22.86	0.42
0.14	6.61	14.91	19.54	12.9	1.511	2.26	16.24	3.30
0.22	14.04	20.06	21.82	7.8	2.804	1.43	14.80	7.02
0.33	16.94	21.86	22.92	6.0	3.830	1.29	14.45	8.47
0.48	19.27	22.60	24.52	5.2	4.675	1.17	14.88	9.64
0.62	21.06	22.66	26.24	5.2	5.062	1.08	15.71	10.53
0.81	23.34	22.43	28.75	5.4	5.313	0.96	17.08	11.67
1.17	26.80	21.88	32.76	6.0	5.497	0.82	19.36	13.40
1.67	32.10	21.03	38.91	6.8	5.712	0.66	22.86	16.05
2.28	36.11	20.07	43.88	7.8	5.643	0.56	25.83	18.05
2.87	39.06	19.31	47.60	8.5	5.575	0.49	28.07	19.53
3.58	41.92	18.53	51.23	9.3	5.501	0.44	30.27	20.96
4.08	43.36	17.94	53.27	9.9	5.378	0.41	31.59	21.68
4.77	45.10	17.24	55.70	10.6	5.254	0.38	33.15	22.55
5.74	46.35	16.12	58.08	11.7	4.952	0.35	34.90	23.17
6.73	42.21	16.14	53.91	11.7	4.607	0.38	32.81	21.10
7.49	37.42	17.24	48.02	10.6	4.529	0.46	29.31	18.71
8.51	33.07	18.52	42.39	9.3	4.547	0.56	25.85	16.53
9.26	33.04	18.33	42.56	9.5	4.471	0.55	26.04	16.52
10.01	33.80	17.78	43.87	10.1	4.359	0.53	26.97	16.90
10.77	33.73	17.42	44.15	10.4	4.236	0.52	27.29	16.87
11.27	37.21	15.86	49.20	12.0	4.104	0.43	30.59	18.61
11.78	39.64	14.86	52.62	13.0	4.053	0.37	32.80	19.82
12.28	42.27	13.59	56.52	14.3	3.966	0.32	35.39	21.14
12.78	44.43	14.09	58.18	13.8	4.231	0.32	35.97	22.21
13.53	47.04	13.18	61.71	14.7	4.208	0.28	38.19	23.52
14.28	48.38	12.67	63.55	15.2	4.189	0.26	39.36	24.19
14.79	49.14	12.47	64.52	15.4	4.195	0.25	39.95	24.57
15.29	49.59	10.25	67.18	17.6	3.819	0.21	42.39	24.80

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA 505+39 11'RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	13.0-15.0
Project No.:	R-2018-075-001	Sample No.:	ST-2
Lab ID:	R-2018-075-001-003		
Visual Description:	TAN SAND (UNDISTURBED)		



Tested By: 129-04-0411 Date: 3/28/18 Approved By: MPS Date: 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates		
Client Reference:	R-1015 Site B CS34.324.00		
Project No.:	R-2018-075-001		
Lab ID:	R-2018-075-001-003	Specific Gravity (Measured)	2.66
Visual Description:	TAN SAND (UNDISTURBED)		

SAMPLE CONDITION SUMMARY

Boring No.:	-L- STA 505+39 11'RT	-L- STA 505+39 11'RT
Depth (ft):	13.0-15.0	13.0-15.0
Sample No.:	ST-2	ST-2
Test No.	T1	T3
Deformation Rate (in/min)	0.002	0.002
Back Pressure (psi)	50.0	50.0
Consolidation Time (days)	1	1
Moisture Content (%) (INITIAL)	33.6	33.6
Total Unit Weight (pcf)	130.9	126.5
Dry Unit Weight (pcf)	98.0	94.7
Moisture Content (%) (FINAL)	23.7	24.4
Initial State Void Ratio,e	0.694	0.752
Void Ratio at Shear, e	0.687	0.688

Tested By: 129-04-0411 Date: 3/28/18 Input Checked By: GEM Date: 5/11/18

DCN: CT-S28 DATE: 4/12/13 REVISION: 3

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA 505+39 1
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	13.0-15.0
Project No.:	R-2018-075-001	Sample No.:	ST-2
Lab ID:	R-2018-075-001-003		

TEST 1 INITIAL

N/A

TEST 1 FINAL

TEST 2 INITIAL

N/A

TEST 2 FINAL

TEST 3 INITIAL

N/A

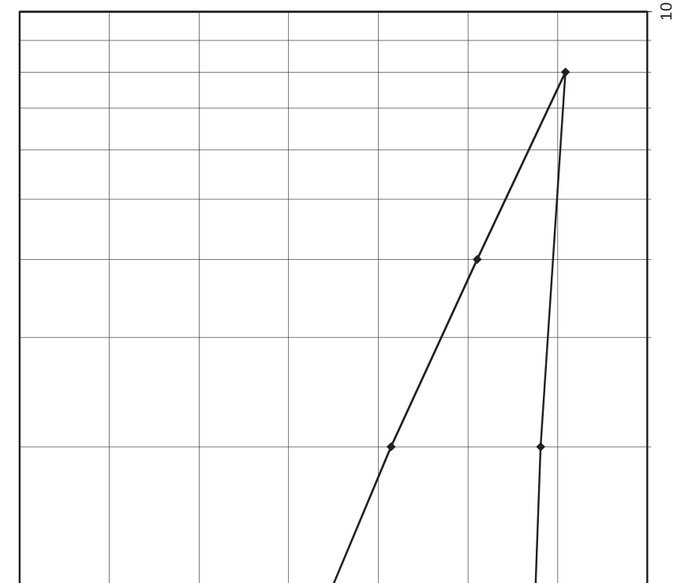
TEST 3 FINAL

Tested By 129-04-0411 *Date* 3/28/18 *Approved By* MPS *Date* 5/11/18

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By 129-04-0411 *Date* 3/28/18 *Approved By* MPS *Date* 5/11/18

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE B\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]FINAL PLOT

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED
Consolidometer No. R487
1 Division = 0.0001 (in.)

Sample Properties	**Initial**	**Final**
Water Content		
Tare Number	SS-1	SS-8
Wt. Tare & WS (g)	395.74	226.77
Wt. Tare & DS (g)	316.52	200.61
Wt. Water (g)	79.22	26.16
Wt. Tare (g)	100.16	99.81
Wt. DS (g)	216.36	100.80
Water Content (%)	36.61	25.95
Sample Parameters		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.0000	0.8418
Sample Volume (cc)	80.44	67.72
Wt. Wet Sample + Ring (g)	251.20	239.75
Wt. of Ring (g)	104.45	104.45
Wt. of Wet Sample (g)	146.75	135.30
Wet Density (pcf)	113.84	124.67
Wet Density (g/cc)	1.82	2.00
Water Content (%)	36.61	25.95
Wt. of Dry Sample (g)	107.42	107.42
Dry Density (pcf)	83.33	98.98
Dry Density (g/cc)	1.34	1.59
Void Ratio	0.9919	0.6769
Saturation (%)	98.19	101.99
Specific Gravity	2.66	*Measured*

Test Data Summary

Applied Pressure (tsf)	Final Dial Reading (div)	Machine Deflection (div)	Corrected Reading (div)	Height of Sample (mm)	Volume (cc)	Dry Density (g/cc)	Void Ratio
Seating	0	0	0	25.400	80.440	1.33539	**0.99192**
0.125	442.4	3.6	438.9	24.285	76.910	1.39669	**0.90450**
0.25	617.3	9.0	608.4	23.855	75.546	1.42190	**0.87074**
0.5	855.6	21.0	834.6	23.280	73.726	1.45700	**0.82567**
1	1070.2	40.0	1030.2	22.783	72.153	1.48877	**0.78671**
2	1309.5	59.6	1249.9	22.225	70.386	1.52615	**0.74295**
4	1575.7	85.0	1490.7	21.614	68.448	1.56934	**0.69498**
8	1861.3	123.4	1737.9	20.986	66.460	1.61629	**0.64574**
2	1783.5	114.6	1668.9	21.161	67.015	1.60290	**0.65949**
0.5	1714.3	84.0	1630.3	21.259	67.326	1.59550	**0.66719**
0.25	1682.4	78.9	1603.5	21.327	67.542	1.59041	**0.67253**
0.125	1660.6	78.9	1581.7	21.383	67.717	1.58629	**0.67687**

Tested By *129-04-0411* *Date* *3/28/18* *Input Checked By* *GEM* *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 6

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]FINAL PLOT

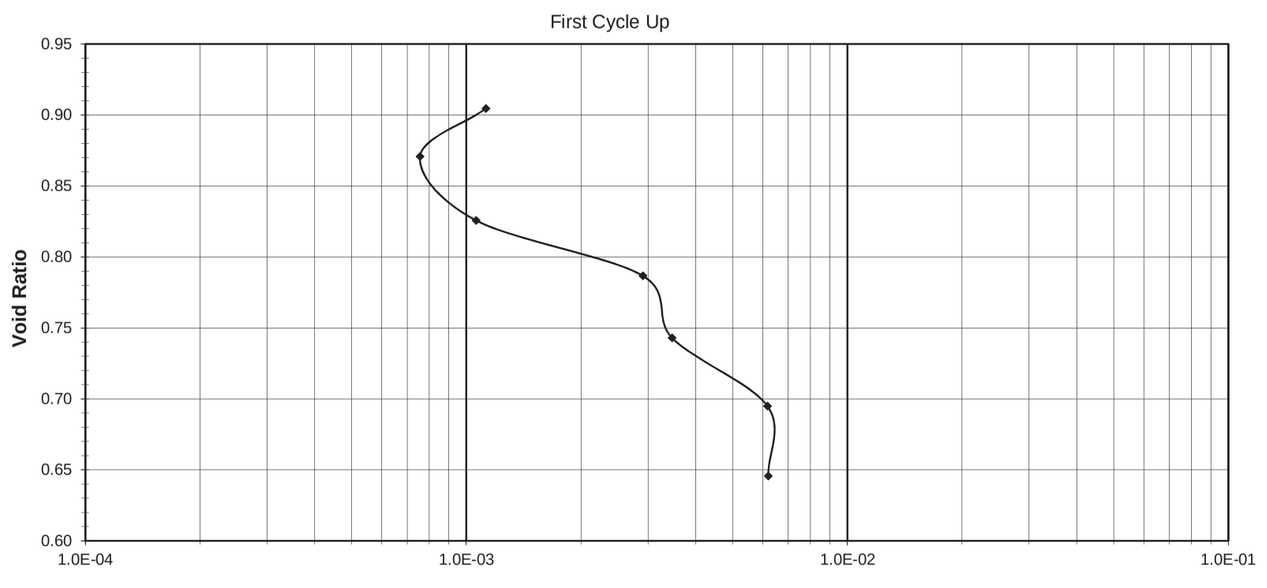
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By *129-04-0411* *Date* *3/28/18* *Input Checked By* *GEM* *Date* *5/11/18*

DCN: CT-24E Date: 5/3/12 Revision: 6

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]FINAL PLOT

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

SHEET 28

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED
Consolidometer No. R487
1 Division = 0.0001 (in.)

Sample Properties	**Initial**	**Final**
Water Content		
Tare Number	SS-1	SS-8
Wt. Tare & WS (g)	395.74	226.77
Wt. Tare & DS (g)	316.52	200.61
Wt. Water (g)	79.22	26.16
Wt. Tare (g)	100.16	99.81
Wt. DS (g)	216.36	100.80
Water Content (%)	36.61	25.95
Sample Parameters		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.000	0.842
Sample Volume (cc)	80.44	67.72
Wt. Wet Sample + Ring (g)	251.20	239.75
Wt. of Ring (g)	104.45	104.45
Wt. of Wet Sample (g)	146.75	135.30
Wet Density (pcf)	113.84	124.67
Wet Density (g/cc)	1.82	2.00
Water Content (%)	36.61	25.95
Wt. of Dry Sample (g)	107.42	107.42
Dry Density (pcf)	83.33	98.98
Dry Density (g/cc)	1.34	1.59
Void Ratio	0.9919	0.6769
Saturation (%)	98.19	101.99
Specific Gravity	*2.66*	*Measured*

C_v Test Data Summary

Load Increment (tsf)	Dial Reading @ t_{50} (div)	Machine Deflection (div)	Corrected Dial Reading @ t_{50} (div)	Sample Height @ t_{50} (cm)	Time t_{50} (min.)	C_v (cm^2/sec)
0 - 0.125	223.3	3.6	219.7	2.484	**4.50**	**0.00113**
0.125 - 0.25	525.4	9.0	516.4	2.409	**6.30**	**0.00076**
0.25 - 0.5	740.1	21.0	719.1	2.357	**4.30**	**0.00106**
0.5 - 1	968.8	40.0	928.8	2.304	**1.50**	**0.00291**
1 - 2	1196.4	59.6	1136.8	2.251	**1.20**	**0.00347**
2 - 4	1450.0	85.0	1365.0	2.193	**0.64**	**0.00617**
4 - 8	1741.4	123.4	1618.0	2.129	**0.60**	**0.00620**
8 - 2	NA	114.6	NA	NA	**NA**	**NA**
2 - 0.5	NA	84.0	NA	NA	**NA**	**NA**
0.5 - 0.25	NA	78.9	NA	NA	**NA**	**NA**
0.25 - 0.125	NA	78.9	NA	NA	**NA**	**NA**

Tested By 129-04-0411 *Date* 3/28/18 *Input Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 6

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE B\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]FINAL PLOT

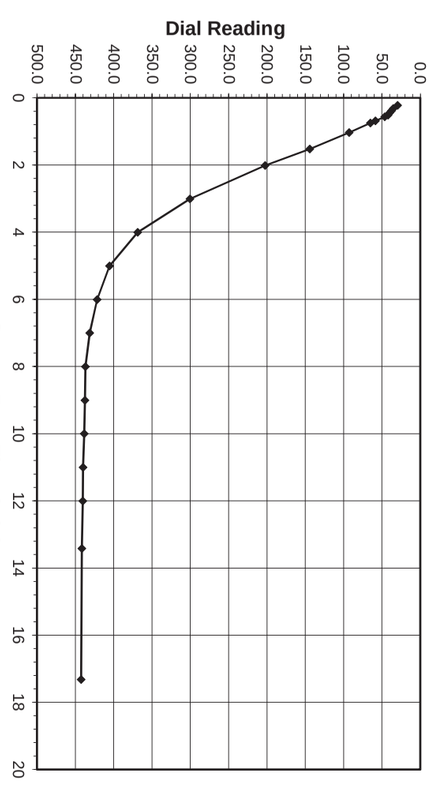
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

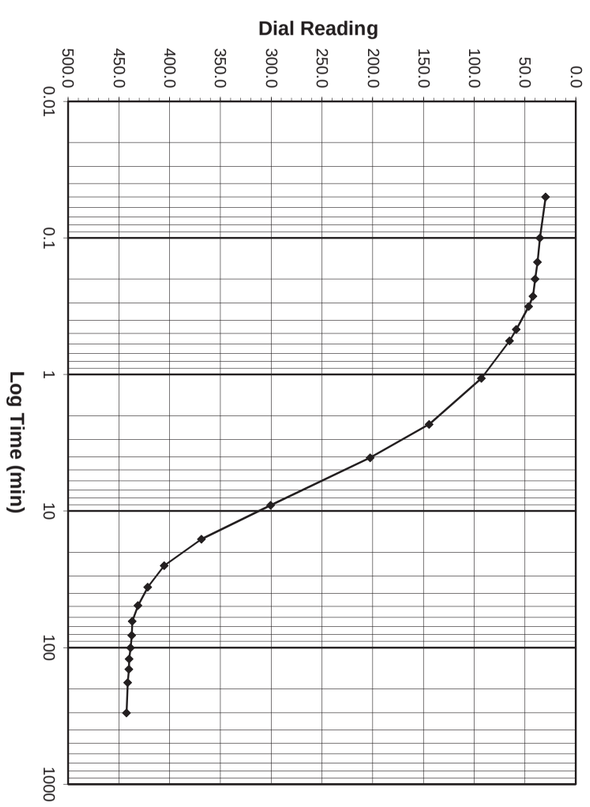
ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load (tsf) 0.0-0.125
Final Reading (div) 442.4
Consolidometer No. **R487**
1 Division (in) 0.0001
Start Date 3/28/18
Start Time 9:12:44

Elapsed Time (min)	Dial Reading (div)
Initial	**0.0**
0.05	29.6
0.10	35.2
0.15	37.6
0.20	39.9
0.27	42.1
0.32	46.4
0.47	58.4
0.57	65.2
1.07	92.9
2.32	144.2
4.07	202.4
9.07	300.4
16.07	368.6
25.07	405.2
36.07	421.5
49.07	431.2
64.08	436.9
81.08	437.3
100.08	438.3
121.08	440.0
144.08	440.1
180.08	441.4
300.08	442.4

Tested By 129-04-0411 *Date* 3/28/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE B\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 1

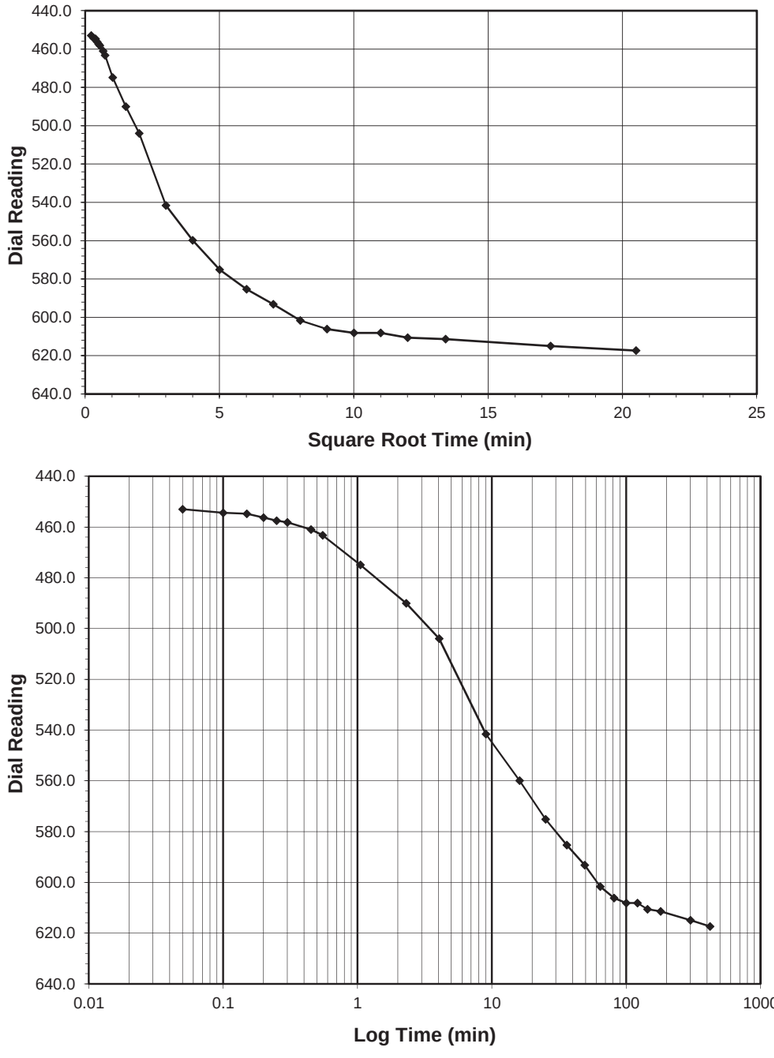
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**0.125-0.25**
Final Reading	**(div)**	**617.3**
Consolidometer No.		**R487**
1 Division	(in)	0.0001
Start Date		3/28/18
Start Time		16:13:12

Elapsed Time (min)	Dial Reading (div)
Initial	**442.4**
0.05	453.0
0.10	454.4
0.15	454.7
0.20	456.3
0.25	457.4
0.30	458.2
0.45	461.0
0.55	463.2
1.05	474.9
2.30	490.0
4.05	504.0
9.05	541.6
16.05	559.9
25.07	575.1
36.07	585.3
49.07	593.2
64.07	601.6
81.07	606.1
100.08	608.2
121.08	608.2
144.08	610.6
180.08	611.4
300.08	614.9
420.47	617.3

Tested By 129-04-0411 *Date* 3/28/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 2

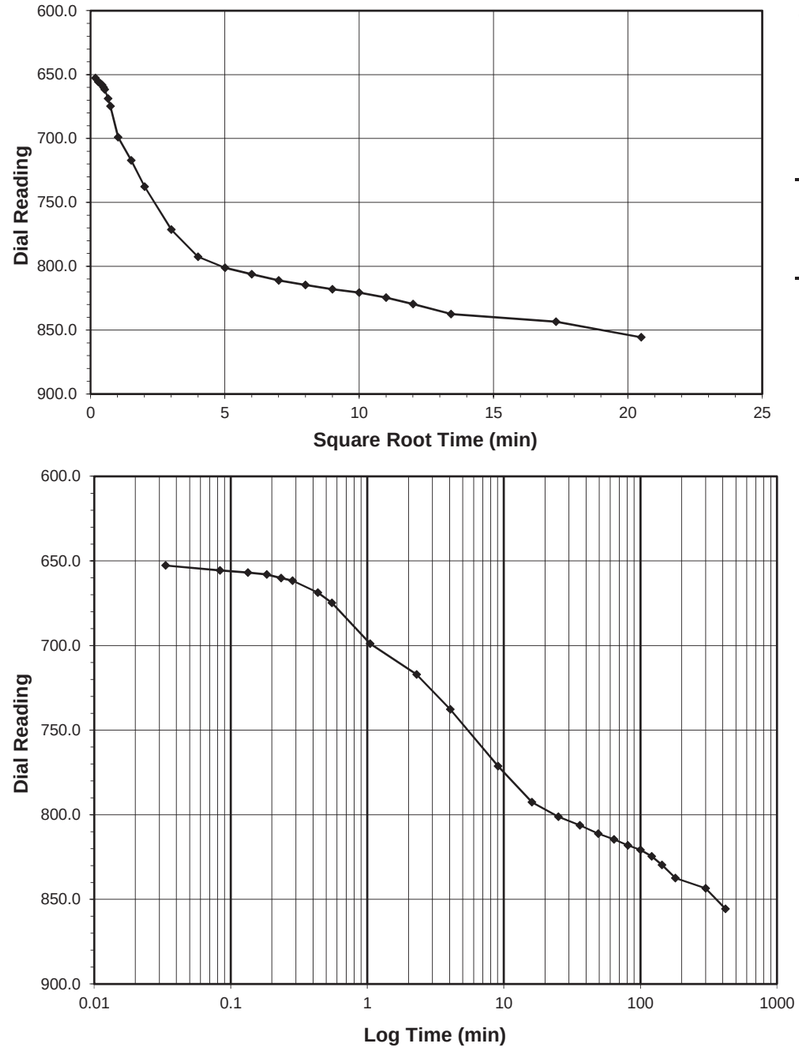
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**0.25-0.5**
Final Reading	**(div)**	**855.6**
Consolidometer No.		**R487**
1 Division	(in)	0.0001
Start Date		3/28/18
Start Time		23:13:40

Elapsed Time (min)	Dial Reading (div)
Initial	**617.3**
0.03	652.6
0.08	655.6
0.13	656.8
0.18	658.0
0.23	660.0
0.28	661.6
0.43	668.7
0.55	674.8
1.05	698.9
2.30	717.0
4.05	737.7
9.05	771.3
16.05	792.5
25.05	801.2
36.05	806.2
49.05	811.1
64.05	814.6
81.05	818.0
100.05	820.7
121.05	824.5
144.05	829.6
180.05	837.3
300.05	843.4
420.32	855.6

Tested By 129-04-0411 *Date* 3/28/18 *Checked By* GEM *Date* 5/11/18

page 1 of 1

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 3

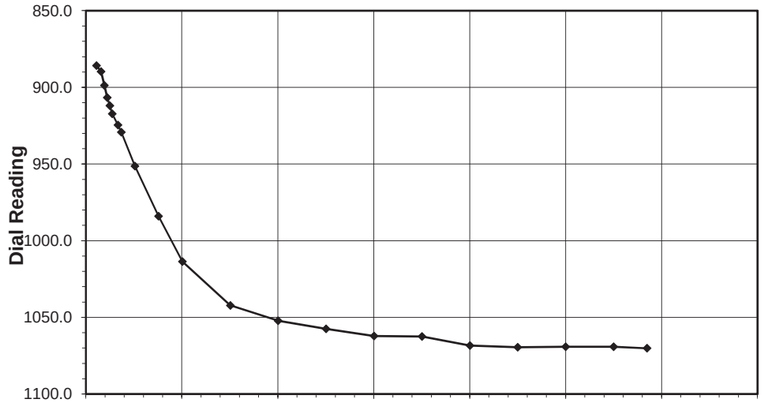
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

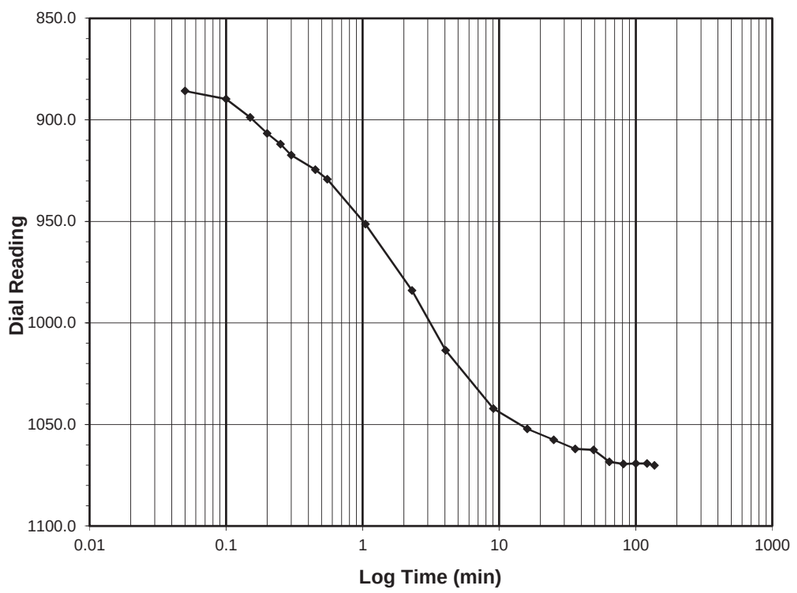
ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**0.5-1.0**
Final Reading	**(div)**	**1070.2**
Consolidometer No.		**R487**
1 Division	(in)	0.0001
Start Date		3/29/18
Start Time		6:14:00

Elapsed Time (min)	Dial Reading (div)
Initial	**855.6**
0.05	885.8
0.10	889.7
0.15	898.8
0.20	906.7
0.25	912.0
0.30	917.3
0.45	924.5
0.55	929.2
1.05	951.4
2.30	984.0
4.05	1013.5
9.07	1042.2
16.07	1052.2
25.07	1057.5
36.07	1062.1
49.07	1062.5
64.07	1068.4
81.07	1069.4
100.07	1069.2
121.07	1069.2
136.82	1070.2

Tested By *129-04-0411* *Date* *3/29/18* *Checked By* *GEM* *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 4

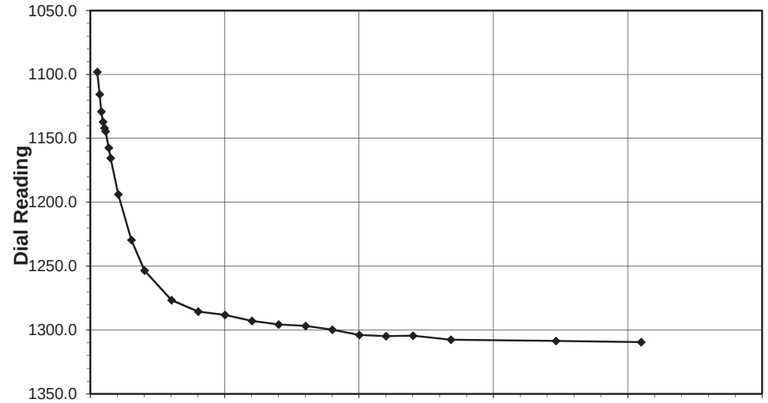
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

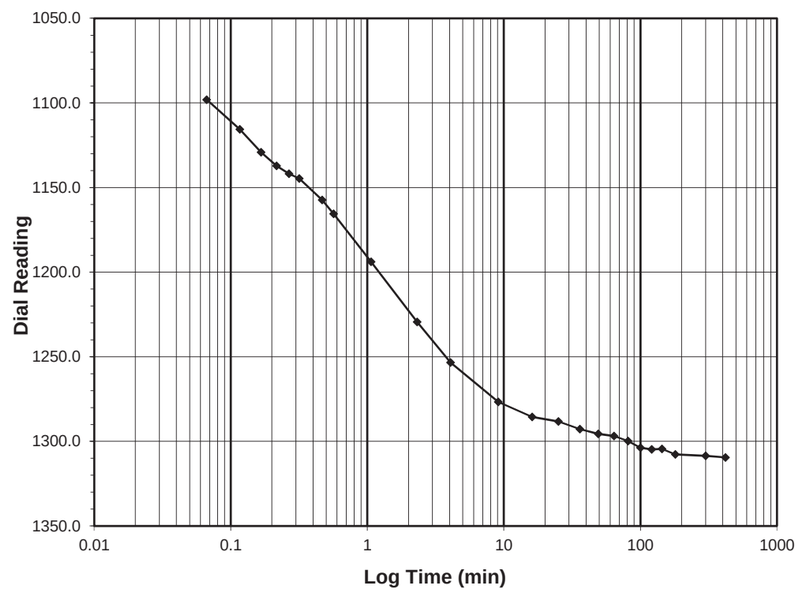
ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**(tsf)**	**1.0-2.0**
Final Reading	**(div)**	**1309.5**
Consolidometer No.		**R487**
1 Division	(in)	0.0001
Start Date		3/29/18
Start Time		8:30:50

Elapsed Time (min)	Dial Reading (div)
Initial	**1070.2**
0.07	1098.0
0.12	1115.6
0.17	1129.1
0.22	1137.1
0.27	1141.8
0.32	1144.6
0.47	1157.3
0.57	1165.5
1.07	1193.8
2.32	1229.4
4.07	1253.4
9.08	1276.7
16.08	1285.5
25.08	1288.2
36.08	1292.8
49.08	1295.6
64.08	1296.8
81.08	1299.8
100.08	1303.8
121.08	1304.7
144.08	1304.4
180.08	1307.6
300.08	1308.5
420.23	1309.5

Tested By *129-04-0411* *Date* *3/29/18* *Checked By* *GEM* *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 5

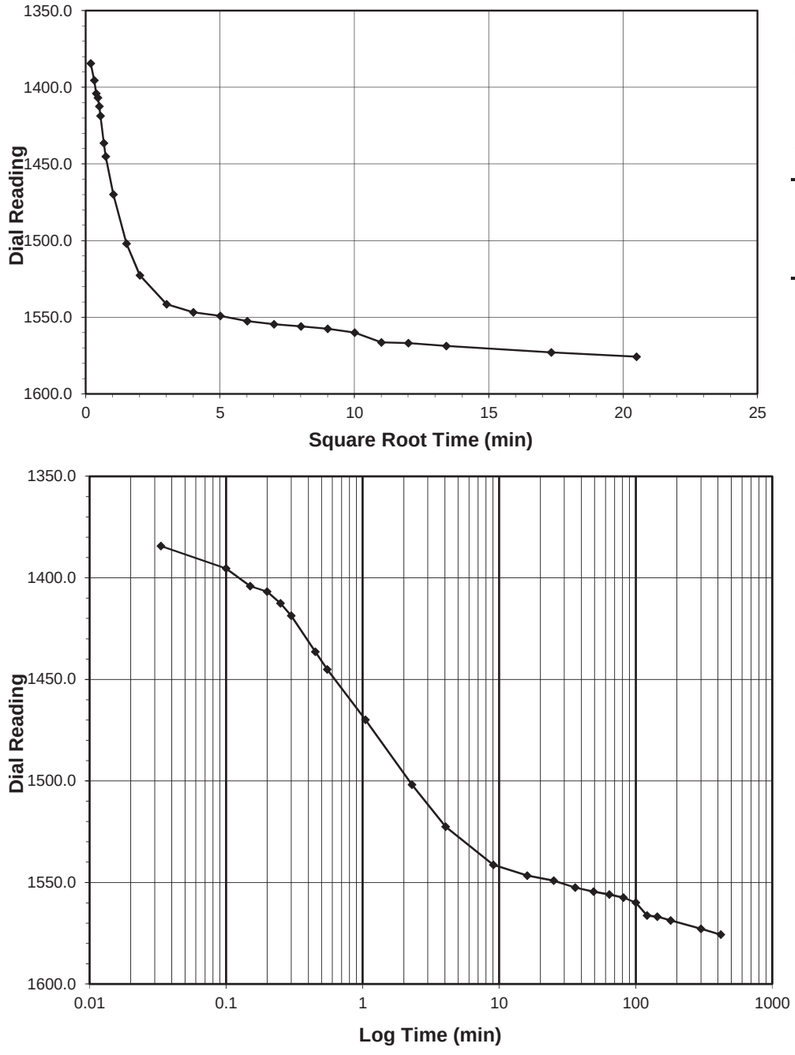
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**2.0-4.0**
Final Reading	**(div)**	**1575.7**
Consolidometer No.		**R487**
1 Division	(in)	0.0001
Start Date		3/29/18
Start Time		15:31:03

Elapsed Time (min)	Dial Reading (div)
Initial	**1309.5**
0.03	1384.3
0.10	1395.4
0.15	1404.1
0.20	1406.8
0.25	1412.5
0.30	1418.6
0.45	1436.4
0.55	1445.1
1.05	1469.9
2.30	1501.9
4.05	1522.6
9.05	1541.4
16.05	1546.7
25.05	1549.1
36.07	1552.5
49.07	1554.6
64.07	1555.9
81.07	1557.5
100.07	1559.9
121.07	1566.3
144.07	1566.9
180.07	1568.7
300.07	1572.9
420.27	1575.7

Tested By 129-04-0411 *Date* 3/29/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

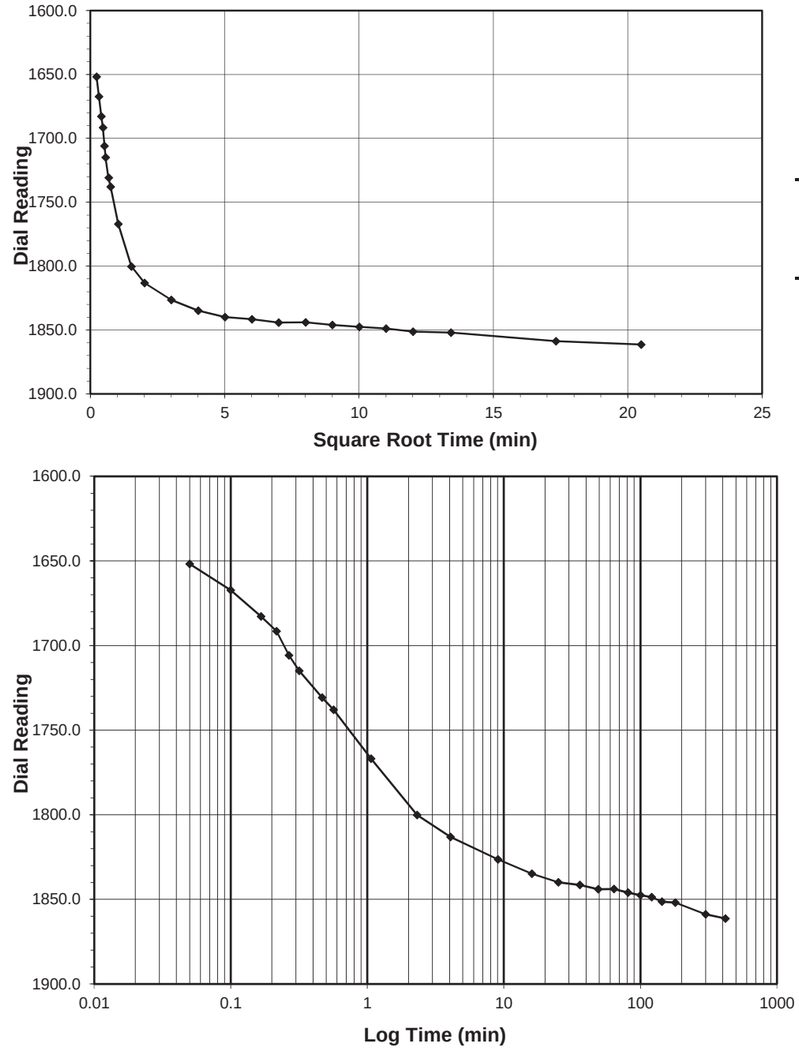
Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 6

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**4.0-8.0**
Final Reading	**(div)**	**1861.3**
Consolidometer No.		**R487**
1 Division	(in)	0.0001
Start Date		3/29/18
Start Time		22:31:20

Elapsed Time (min)	Dial Reading (div)
Initial	**1575.7**
0.05	1651.8
0.10	1667.3
0.17	1682.7
0.22	1691.6
0.27	1705.8
0.32	1714.9
0.47	1730.8
0.57	1737.9
1.07	1766.9
2.32	1800.2
4.07	1813.1
9.07	1826.3
16.07	1834.8
25.07	1839.9
36.07	1841.5
49.07	1844.1
64.07	1843.9
81.07	1846.0
100.08	1847.5
121.08	1848.7
144.08	1851.3
180.08	1852.0
300.08	1858.8
420.28	1861.3

Tested By 129-04-0411 *Date* 3/29/18 *Checked By* GEM *Date* 5/11/18

page 1 of 1

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 7

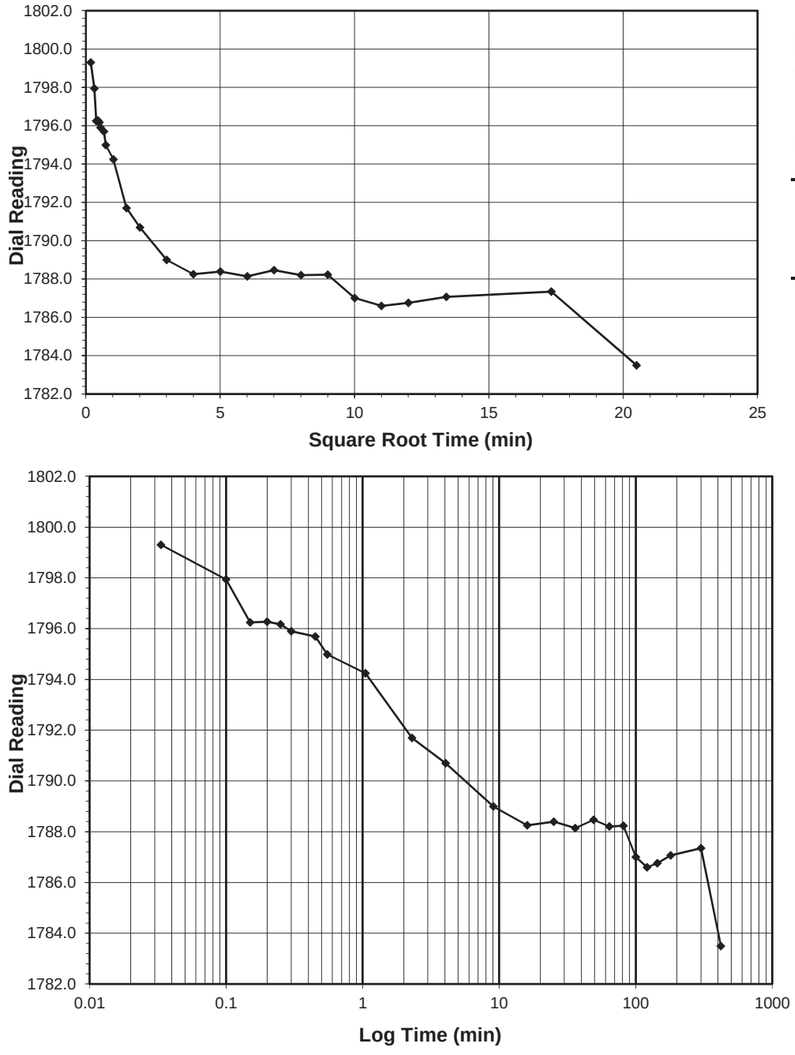
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**8.0-2.0**
Final Reading	**(div)**	**1783.5**
Consolidometer No.		**R487**
1 Division	(in)	0.0001
Start Date		3/30/18
Start Time		5:31:37

Elapsed Time (min)	Dial Reading (div)
Initial	**1861.3**
0.03	1799.3
0.10	1797.9
0.15	1796.2
0.20	1796.3
0.25	1796.2
0.30	1795.9
0.45	1795.7
0.55	1795.0
1.05	1794.2
2.30	1791.7
4.05	1790.7
9.05	1789.0
16.05	1788.2
25.05	1788.4
36.07	1788.1
49.07	1788.5
64.07	1788.2
81.07	1788.2
100.07	1787.0
121.07	1786.6
144.07	1786.8
180.07	1787.1
300.07	1787.3
420.27	1783.5

Tested By 129-04-0411 *Date* 3/30/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

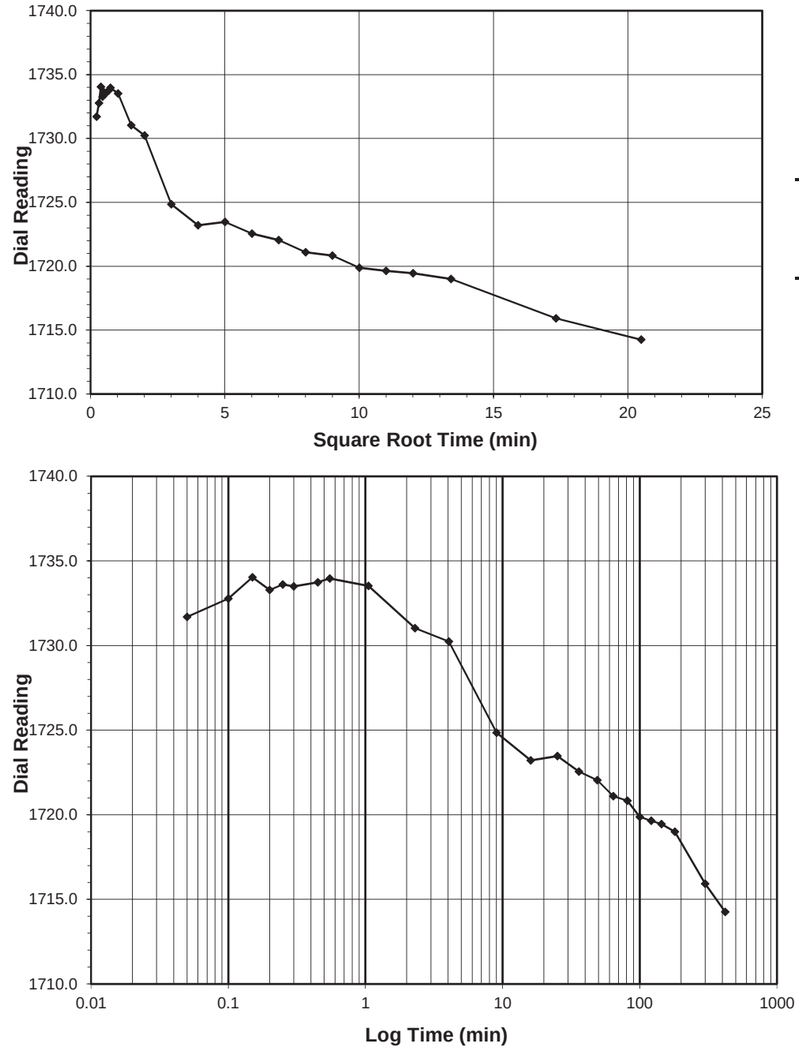
Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 8

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**2.0-0.5**
Final Reading	**(div)**	**1714.3**
Consolidometer No.		**R487**
1 Division	(in)	0.0001
Start Date		3/30/18
Start Time		12:31:54

Elapsed Time (min)	Dial Reading (div)
Initial	**1783.5**
0.05	1731.7
0.10	1732.8
0.15	1734.0
0.20	1733.3
0.25	1733.6
0.30	1733.5
0.45	1733.7
0.55	1734.0
1.05	1733.5
2.30	1731.0
4.05	1730.2
9.05	1724.8
16.05	1723.2
25.07	1723.5
36.07	1722.6
49.07	1722.1
64.07	1721.1
81.07	1720.8
100.07	1719.9
121.07	1719.6
144.07	1719.4
180.08	1719.0
300.08	1715.9
420.10	1714.3

Tested By 129-04-0411 *Date* 3/30/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 9

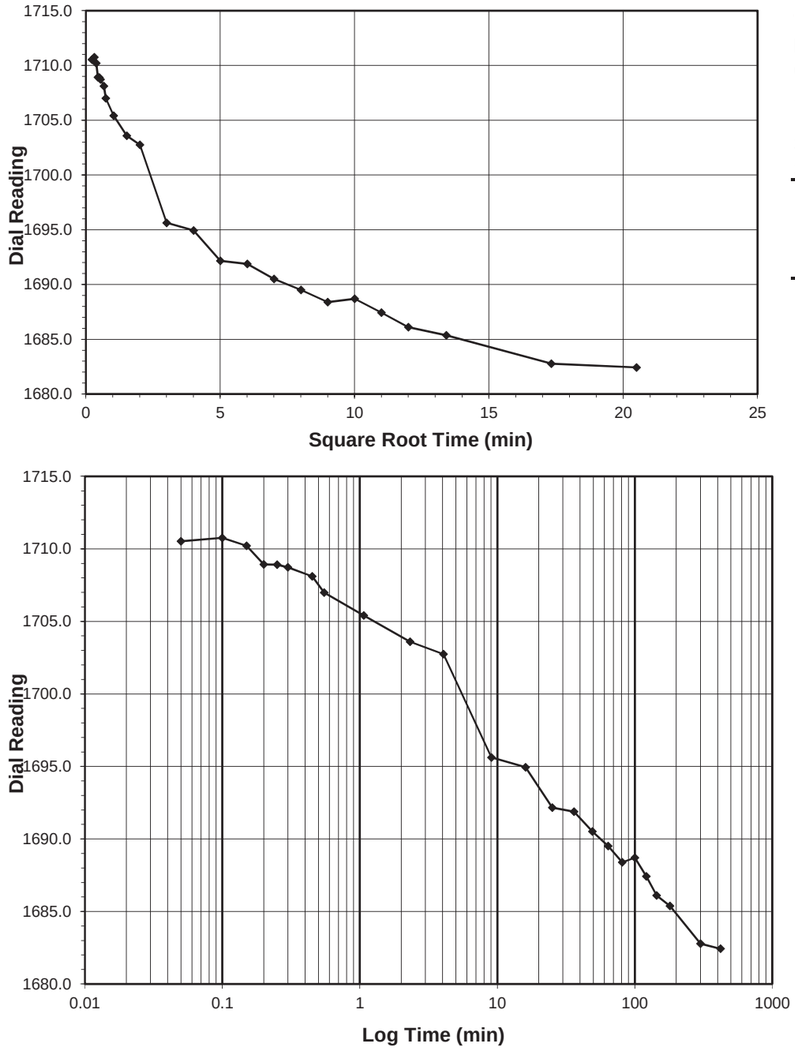
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**0.5-0.25**
Final Reading	**(div)**	**1682.4**
Consolidometer No.		**R487**
1 Division	(in)	0.0001
Start Date		3/30/18
Start Time		19:32:00

Elapsed Time (min)	Dial Reading (div)
Initial	**1714.3**
0.05	1710.5
0.10	1710.8
0.15	1710.2
0.20	1708.9
0.25	1708.9
0.30	1708.7
0.45	1708.1
0.55	1707.0
1.07	1705.4
2.32	1703.6
4.07	1702.7
9.07	1695.6
16.07	1694.9
25.07	1692.2
36.07	1691.9
49.07	1690.5
64.07	1689.5
81.07	1688.4
100.07	1688.7
121.07	1687.4
144.07	1686.1
180.07	1685.4
300.08	1682.8
420.28	1682.4

Tested By 129-04-0411 *Date* 3/30/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 10

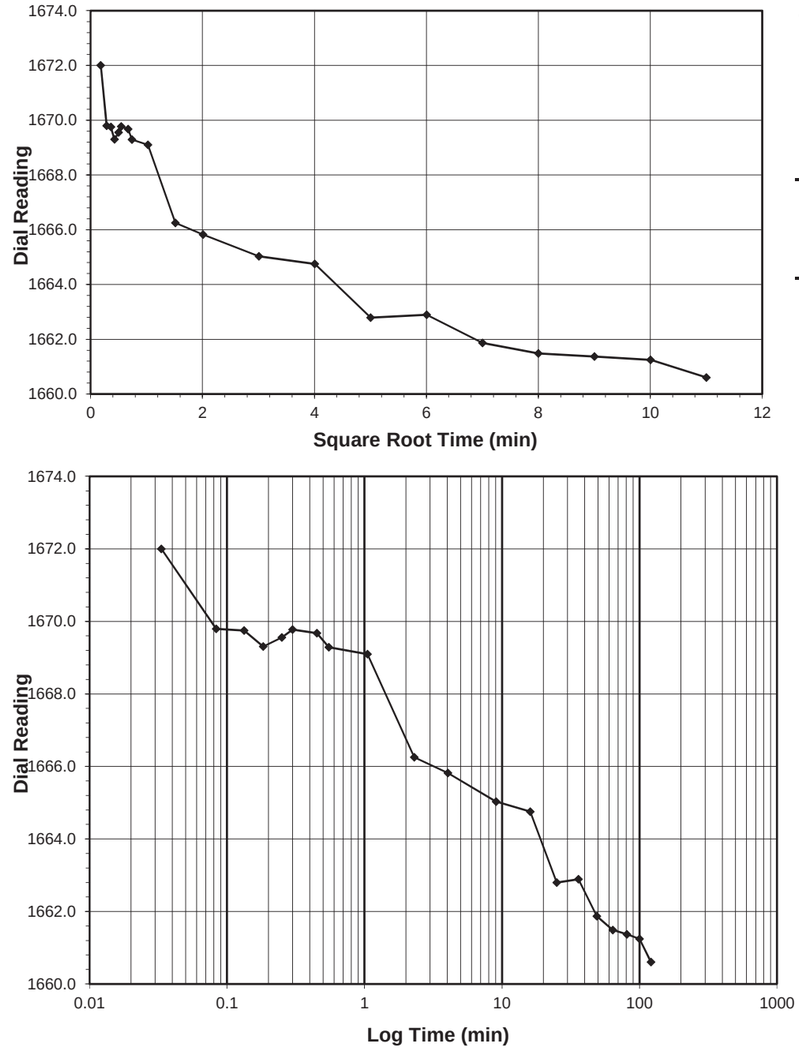
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA 505+39 11'RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	13.0-15.0
Project No.	R-2018-075-001	Sample No.	ST-2
Lab ID	R-2018-075-001-003	Visual Description	TAN SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**0.25-0.125**
Final Reading	**(div)**	**1660.6**
Consolidometer No.		**R487**
1 Division	(in)	0.0001
Start Date		3/31/18
Start Time		2:32:17

Elapsed Time (min)	Dial Reading (div)
Initial	**1682.4**
0.03	1672.0
0.08	1669.8
0.13	1669.8
0.18	1669.3
0.25	1669.6
0.30	1669.8
0.45	1669.7
0.55	1669.3
1.05	1669.1
2.30	1666.3
4.05	1665.8
9.05	1665.0
16.05	1664.8
25.05	1662.8
36.05	1662.9
49.05	1661.9
64.05	1661.5
81.07	1661.4
100.07	1661.2
121.07	1660.6

Tested By 129-04-0411 *Date* 3/31/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

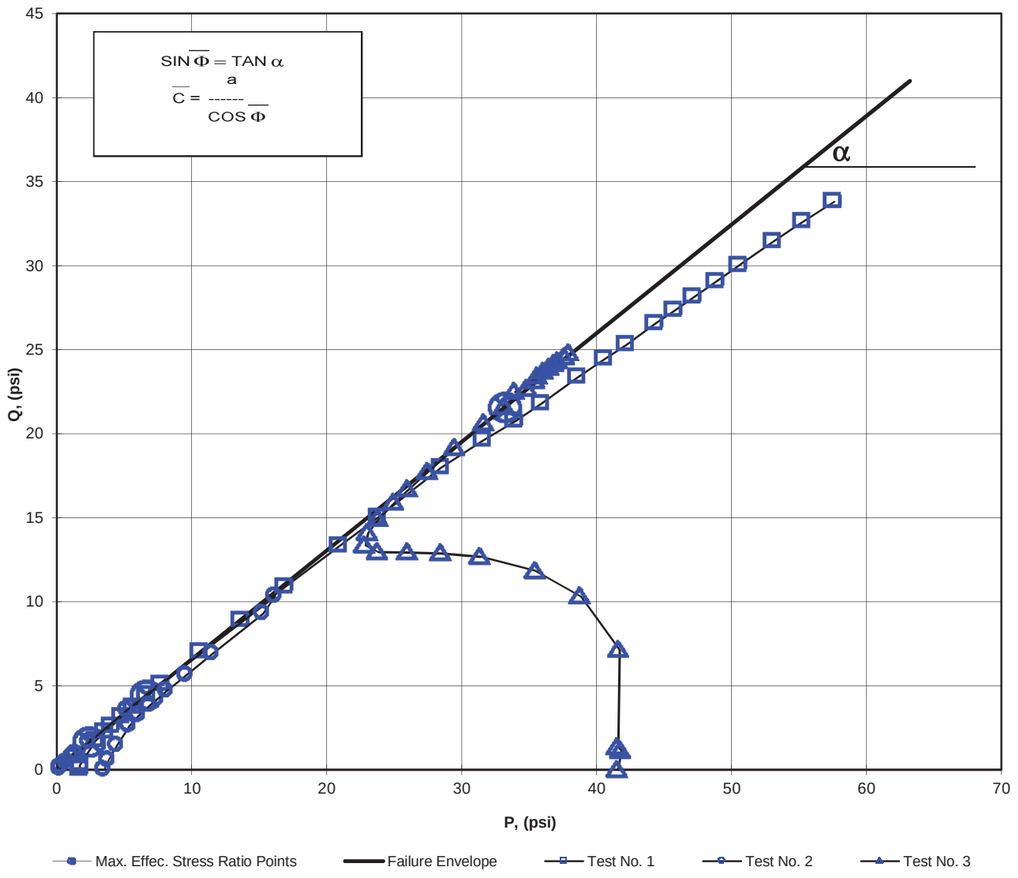
Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-003 GEOJAC-16TSF1 Cv.xlsm]STEP 11

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA. 506+89, 75' RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	7.0-9.0
Project No.:	R-2018-075-001	Sample No.:	ST-3
Lab ID:	R-2018-075-001-015		

Consolidated Undrained Triaxial Test with Pore Pressure



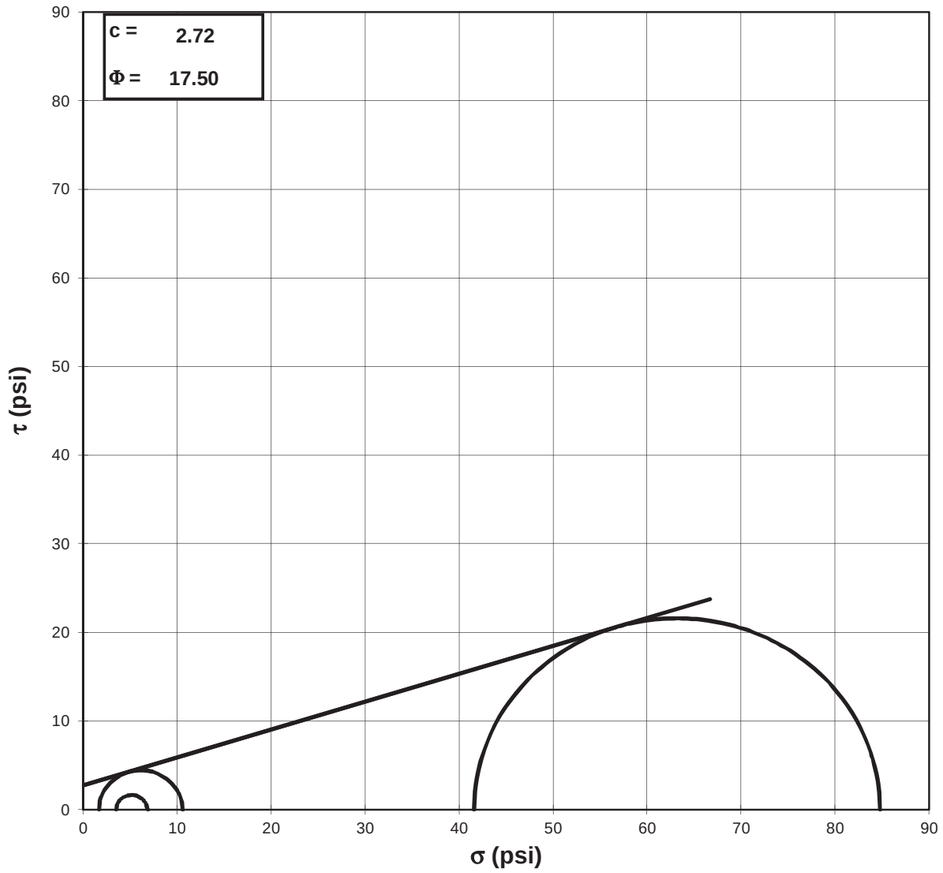
a	=	**0.12**	$\overline{C}$	=	**0.16**
α	=	**32.9**	$\overline{\Phi}$	=	**40.26**

Tested By: 129-04-0411 Date: 3/29/18 Approved By: MPS Date: 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

MOHR TOTAL STRENGTH ENVELOPE
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA. 506+89, 75' RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	7.0-9.0
Project No.:	R-2018-075-001	Sample No.:	ST-3
Lab ID:	R-2018-075-001-015		
Visual Description:	ORANGE SAND (UNDISTURBED)		



Failure Based on Maximum Effective Principal Stress Ratio

NOTE: GRAPH NOT TO SCALE

Tested By: 129-04-0411 *Date:* 3/29/18 *Approved By:* MPS *Date:* 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA. 506+89, 75' RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	7.0-9.0
Project No.:	R-2018-075-001	Sample No.:	ST-3
Lab ID:	R-2018-075-001-015		

Visual Description: ORANGE SAND (UNDISTURBED)

Stage No.	1
Test No.	1

PRESSURES (psi)

Cell Pressure (psi)	51.7
Back Pressure (psi)	50.0
Eff. Conf. Pressure (psi)	1.7
Pore Pressure Response (%)	95

MAXIMUM OBLIQUITY POINTS

$\overline{P}$	=	6.67
Q	=	4.43

INITIAL SAMPLE DIMENSIONS (in)

Length 1:	6.251	Diameter 1:	2.800
Length 2:	6.263	Diameter 2:	2.799
Length 3:	6.244	Diameter 3:	2.787
Length 4:	6.231	Diameter 4:	2.814
Avg. Length:	6.247	*Avg. Diam.:*	2.800

VOLUME CHANGE

Initial Burette Reading (ml)	24.0
Final Burette Reading (ml)	22.4
Final Change (ml)	1.6
Initial Dial Reading (mil)	112
Dial Reading After Saturation (mil)	112
Dial Reading After Consolidation (mil)	125

LOAD (LB)	DEFORMATION (IN)	PORE PRESSURE (PSI)
9.4	0.000	50.0
12.4	0.001	50.2
13.1	0.002	50.3
30.7	0.008	50.6
36.9	0.013	50.4
41.3	0.019	50.2
48.4	0.027	50.0
55.4	0.035	49.7
64.4	0.046	49.5
72.8	0.066	49.1
97.0	0.097	48.1
121.0	0.133	46.9
147.1	0.170	45.6
178.8	0.210	44.1
201.9	0.240	42.9
241.1	0.281	41.2
264.4	0.338	39.7
282.1	0.397	38.5
297.9	0.441	37.6
321.9	0.500	36.5
339.1	0.546	35.5
353.3	0.590	34.8
373.3	0.633	33.9
385.8	0.662	33.2
398.6	0.692	32.6
414.1	0.723	31.9
429.7	0.753	31.1
453.3	0.797	30.0
473.1	0.840	29.0
494.2	0.885	27.9
517.2	0.930	26.7

Tested By: 129-04-0411 Date: 3/29/18 Input Checked By: GEM Date: 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA. 506+89, 75' RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	7.0-9.0
Project No.:	R-2018-075-001	Sample No.:	ST-3
Lab ID:	R-2018-075-001-015		

Visual Description: ORANGE SAND (UNDISTURBED)

Effective Confining Pressure (psi)	1.7	*Stage No.*	1
		Test No	1

INITIAL DIMENSIONS

Initial Sample Length (in)	6.25
Initial Sample Diameter (in)	2.80
Initial Sample Area (in^2)	6.16
Initial Sample Volume (in^3)	38.47

VOLUME CHANGE

Volume After Consolidation (in^3)	38.37
Length After Consolidation (in)	6.23
Area After Consolidation (in^2)	6.155

Strain (%)	Deviation Stress	ΔU	$\overline{\sigma_1}$	$\overline{\sigma_3}$	Effective Principle Stress Ratio	$\overline{A}$	$\overline{P}$	Q
0.01	0.48	0.22	1.97	1.5	1.327	0.47	1.73	0.24
0.03	0.61	0.26	2.04	1.4	1.422	0.46	1.74	0.30
0.12	3.46	0.57	4.59	1.1	4.061	0.17	2.86	1.73
0.21	4.45	0.37	5.78	1.3	4.349	0.09	3.56	2.23
0.30	5.17	0.23	6.64	1.5	4.512	0.05	4.05	2.58
0.43	6.31	0.02	7.99	1.7	4.750	0.00	4.84	3.15
0.57	7.44	-0.27	9.40	2.0	4.779	-0.04	5.68	3.72
0.75	8.87	-0.54	11.11	2.2	4.962	-0.06	6.67	4.43
1.07	10.19	-0.94	12.83	2.6	4.857	-0.10	7.73	5.09
1.55	14.02	-1.89	17.61	3.6	4.899	-0.14	10.60	7.01
2.14	17.74	-3.10	22.54	4.8	4.695	-0.18	13.67	8.87
2.72	21.77	-4.35	27.82	6.1	4.597	-0.21	16.94	10.88
3.38	26.58	-5.92	34.20	7.6	4.489	-0.23	20.91	13.29
3.84	30.07	-7.08	38.85	8.8	4.426	-0.25	23.81	15.04
4.51	35.94	-8.82	46.47	10.5	4.415	-0.26	28.50	17.97
5.42	39.18	-10.32	51.20	12.0	4.261	-0.28	31.61	19.59
6.37	41.48	-11.53	54.71	13.2	4.135	-0.29	33.97	20.74
7.07	43.55	-12.44	57.70	14.1	4.079	-0.30	35.92	21.78
8.03	46.70	-13.55	61.95	15.2	4.062	-0.31	38.60	23.35
8.76	48.87	-14.46	65.03	16.2	4.025	-0.31	40.59	24.44
9.47	50.58	-15.24	67.52	16.9	3.985	-0.32	42.23	25.29
10.15	53.12	-16.12	70.94	17.8	3.982	-0.32	44.38	26.56
10.62	54.66	-16.75	73.11	18.5	3.962	-0.32	45.78	27.33
11.10	56.22	-17.40	75.32	19.1	3.943	-0.33	47.21	28.11
11.59	58.13	-18.14	77.97	19.8	3.930	-0.33	48.90	29.06
12.08	60.03	-18.89	80.63	20.6	3.915	-0.33	50.61	30.02
12.78	62.91	-19.95	84.56	21.7	3.905	-0.33	53.11	31.45
13.48	65.19	-21.02	87.91	22.7	3.869	-0.34	55.32	32.59
14.19	67.58	-22.12	91.40	23.8	3.837	-0.34	57.61	33.79
14.92	70.19	-23.27	95.16	25.0	3.811	-0.35	60.07	35.09

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA. 506+89, 75' RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	7.0-9.0
Project No.:	R-2018-075-001	Sample No.:	ST-3
Lab ID:	R-2018-075-001-015		

Visual Description: ORANGE SAND (UNDISTURBED)

Stage No.	1
Test No.	2

PRESSURES (psi)

Cell Pressure (psi)	53.5
Back Pressure (psi)	50.0
Eff. Conf. Pressure (psi)	3.5
Pore Pressure Response (%)	99

MAXIMUM OBLIQUITY POINTS

$\overline{P}$	=	2.42
Q	=	1.65

INITIAL SAMPLE DIMENSIONS (in)

Length 1:	6.122	Diameter 1:	2.822
Length 2:	6.124	Diameter 2:	2.840
Length 3:	6.129	Diameter 3:	2.813
Length 4:	6.128	Diameter 4:	2.801
Avg. Length:	6.126	*Avg. Diam.:*	2.819

VOLUME CHANGE

Initial Burette Reading (ml)	24.0
Final Burette Reading (ml)	20.9
Final Change (ml)	3.1
Initial Dial Reading (mil)	210
Dial Reading After Saturation (mil)	214
Dial Reading After Consolidation (mil)	220

LOAD (LB)	DEFORMATION (IN)	PORE PRESSURE (PSI)
16.2	0.000	50.0
23.4	0.001	50.2
34.1	0.002	50.5
48.8	0.008	50.7
56.6	0.013	50.6
63.9	0.019	50.5
74.8	0.027	50.0
86.5	0.035	49.6
102.6	0.046	48.9
132.8	0.066	47.5
146.4	0.097	47.7
61.2	0.133	51.9
37.3	0.170	52.7
28.7	0.210	53.0
25.8	0.240	53.1
22.0	0.281	53.2
18.5	0.338	53.4
18.2	0.397	53.4
17.4	0.441	53.3
17.0	0.500	53.3
17.4	0.546	53.3
17.5	0.590	53.3
17.6	0.633	53.3
17.3	0.662	53.3
17.5	0.692	53.3
17.6	0.723	53.3
18.1	0.753	53.3
17.9	0.797	53.3
17.7	0.840	53.3
18.1	0.870	53.3
18.1	0.900	53.3

Tested By: 129-04-0411 Date: 3/29/18 Input Checked By: GEM Date: 5/11/18

DCN: CT-S28 DATE: 4/12/13 REVISION: 3
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA. 506+89, 75' RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	7.0-9.0
Project No.:	R-2018-075-001	Sample No.:	ST-3
Lab ID:	R-2018-075-001-015		

Visual Description: ORANGE SAND (UNDISTURBED)

Effective Confining Pressure (psi)	3.5	*Stage No.*	1
		Test No	2

INITIAL DIMENSIONS

Initial Sample Length (in)	6.13
Initial Sample Diameter (in)	2.82
Initial Sample Area (in^2)	6.24
Initial Sample Volume (in^3)	38.23

VOLUME CHANGE

Volume After Consolidation (in^3)	37.97
Length After Consolidation (in)	6.12
Area After Consolidation (in^2)	6.208

Strain (%)	Deviation Stress	ΔU	$\overline{\sigma_1}$	$\overline{\sigma_3}$	Effective Principle Stress Ratio	$\overline{A}$	$\overline{P}$	Q
0.01	1.16	0.24	4.43	3.3	1.355	0.21	3.85	0.58
0.03	2.88	0.48	5.90	3.0	1.951	0.17	4.47	1.44
0.12	5.24	0.73	8.03	2.8	2.880	0.14	5.41	2.62
0.21	6.49	0.65	9.35	2.9	3.263	0.10	6.11	3.24
0.31	7.66	0.45	10.73	3.1	3.504	0.06	6.89	3.83
0.44	9.39	0.04	12.86	3.5	3.707	0.00	8.16	4.70
0.58	11.25	-0.45	15.21	4.0	3.843	-0.04	9.58	5.63
0.76	13.80	-1.15	18.46	4.7	3.964	-0.08	11.56	6.90
1.09	18.57	-2.51	24.60	6.0	4.084	-0.14	15.31	9.29
1.58	20.63	-2.35	26.49	5.9	4.523	-0.11	16.17	10.32
2.18	7.09	1.86	8.75	1.7	5.289	0.26	5.20	3.55
2.77	3.31	2.75	4.07	0.8	5.337	0.84	2.42	1.65
3.44	1.94	3.04	2.41	0.5	5.087	1.59	1.44	0.97
3.92	1.49	3.12	1.89	0.4	4.764	2.11	1.14	0.75
4.60	0.88	3.25	1.14	0.3	4.363	3.72	0.70	0.44
5.53	0.35	3.37	0.50	0.1	3.435	9.62	0.32	0.18
6.50	0.29	3.41	0.39	0.1	4.003	11.78	0.24	0.15
7.21	0.17	3.30	0.38	0.2	1.837	19.09	0.30	0.09
8.18	0.12	3.31	0.33	0.2	1.592	27.29	0.27	0.06
8.93	0.17	3.31	0.38	0.2	1.855	19.24	0.29	0.09
9.65	0.18	3.31	0.38	0.2	1.906	18.54	0.29	0.09
10.35	0.20	3.32	0.39	0.2	1.998	17.17	0.29	0.10
10.83	0.15	3.32	0.34	0.2	1.785	22.09	0.27	0.08
11.32	0.19	3.32	0.37	0.2	1.979	18.10	0.28	0.09
11.81	0.20	3.32	0.38	0.2	2.042	17.20	0.29	0.10
12.31	0.26	3.32	0.45	0.2	2.410	12.69	0.32	0.13
13.03	0.23	3.33	0.41	0.2	2.314	14.45	0.29	0.12
13.74	0.21	3.33	0.40	0.2	2.144	15.84	0.29	0.11
14.22	0.26	3.33	0.44	0.2	2.369	13.15	0.31	0.13
14.72	0.26	3.33	0.44	0.2	2.453	12.91	0.31	0.13

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297

geotechnics — geotechnical & geosynthetic testing

Client:	ESP Associates	Boring No.:	-L- STA. 506+89, 75' RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	7.0-9.0
Project No.:	R-2018-075-001	Sample No.:	ST-3
Lab ID:	R-2018-075-001-015		

Visual Description: ORANGE SAND (UNDISTURBED)

Stage No.	1
Test No.	3

PRESSURES (psi)

Cell Pressure (psi)	91.6
Back Pressure (psi)	50.0
Eff. Conf. Pressure (psi)	41.6
Pore Pressure Response (%)	99

MAXIMUM OBLIQUITY POINTS

$\overline{P}$	=	33.22
Q	=	21.59

INITIAL SAMPLE DIMENSIONS (in)

Length 1:	5.991	Diameter 1:	2.772
Length 2:	5.987	Diameter 2:	2.773
Length 3:	6.013	Diameter 3:	2.787
Length 4:	5.942	Diameter 4:	2.821
Avg. Length:	5.983	*Avg. Diam.:*	2.788

VOLUME CHANGE

Initial Burette Reading (ml)	48.0
Final Burette Reading (ml)	10.8
Final Change (ml)	37.2
Initial Dial Reading (mil)	50
Dial Reading After Saturation (mil)	338
Dial Reading After Consolidation (mil)	335

LOAD (LB)	DEFORMATION (IN)	PORE PRESSURE (PSI)
13.2	0.000	50.0
24.9	0.001	50.9
26.8	0.003	51.3
85.7	0.009	57.0
118.3	0.015	63.1
133.8	0.021	67.9
142.7	0.029	72.9
145.1	0.039	76.0
146.0	0.051	78.5
146.8	0.072	80.8
151.6	0.102	82.1
160.1	0.138	82.6
169.6	0.175	82.6
181.1	0.216	82.4
190.4	0.246	82.2
203.2	0.288	81.8
220.7	0.345	81.2
238.8	0.406	80.5
251.8	0.450	80.0
266.5	0.510	79.4
274.0	0.555	79.2
268.5	0.600	80.1
281.4	0.645	79.3
286.3	0.675	79.1
290.7	0.705	78.9
294.8	0.735	78.8
298.4	0.765	78.7
304.2	0.811	78.5
309.7	0.856	78.3

Tested By: 129-04-0411 Date: 3/29/18 Input Checked By: GEM Date: 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST WITH PORE PRESSURE READINGS

AASHTO T-297

geotechnics — geotechnical & geosynthetic testing

Client:	ESP Associates	Boring No.:	-L- STA. 506+89, 75' RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	7.0-9.0
Project No.:	R-2018-075-001	Sample No.:	ST-3
Lab ID:	R-2018-075-001-015		

Visual Description: ORANGE SAND (UNDISTURBED)

Effective Confining Pressure (psi)	41.6	*Stage No.*	1
		Test No	3

INITIAL DIMENSIONS

Initial Sample Length (in)	5.98
Initial Sample Diameter (in)	2.79
Initial Sample Area (in^2)	6.11
Initial Sample Volume (in^3)	36.53

VOLUME CHANGE

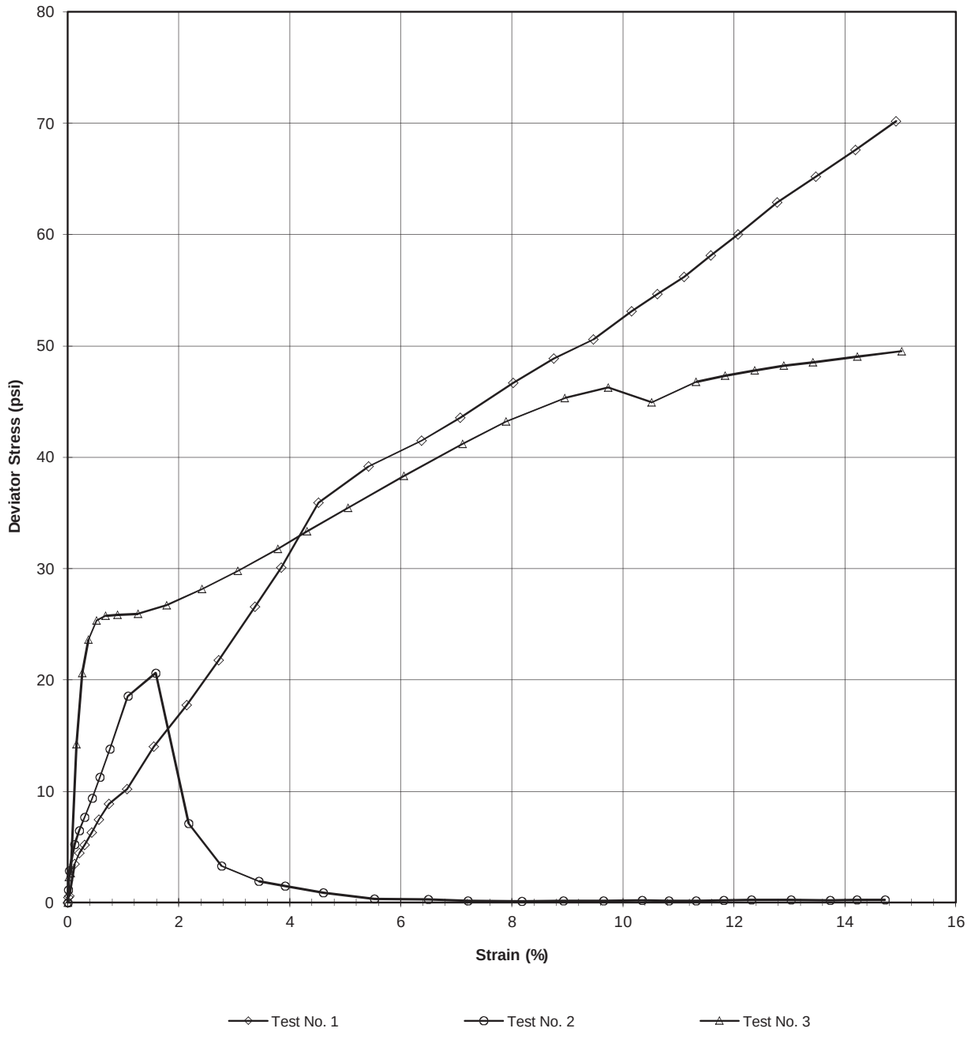
Volume After Consolidation (in^3)	28.99
Length After Consolidation (in)	5.70
Area After Consolidation (in^2)	5.087

Strain (%)	Deviation Stress	ΔU	$\overline{\sigma_1}$	$\overline{\sigma_3}$	Effective Principle Stress Ratio	$\overline{A}$	$\overline{P}$	Q
0.02	2.30	0.89	43.01	40.7	1.056	0.39	41.86	1.15
0.06	2.66	1.32	42.94	40.3	1.066	0.50	41.61	1.33
0.15	14.23	7.01	48.82	34.6	1.411	0.50	41.71	7.12
0.26	20.60	13.06	49.15	28.5	1.722	0.64	38.84	10.30
0.37	23.62	17.88	47.34	23.7	1.996	0.76	35.53	11.81
0.51	25.33	22.85	44.07	18.7	2.351	0.91	31.41	12.66
0.68	25.75	25.97	41.38	15.6	2.647	1.02	28.51	12.87
0.90	25.86	28.49	38.97	13.1	2.973	1.11	26.04	12.93
1.26	25.93	30.76	36.77	10.8	3.393	1.20	23.80	12.97
1.79	26.72	32.09	36.24	9.5	3.810	1.21	22.87	13.36
2.42	28.18	32.60	37.18	9.0	4.130	1.17	23.09	14.09
3.06	29.80	32.64	38.76	9.0	4.328	1.11	23.86	14.90
3.79	31.76	32.44	40.92	9.2	4.467	1.03	25.04	15.88
4.31	33.33	32.20	42.73	9.4	4.548	0.98	26.06	16.67
5.05	35.45	31.80	45.25	9.8	4.619	0.91	27.52	17.73
6.06	38.31	31.19	48.71	10.4	4.680	0.82	29.56	19.15
7.12	41.19	30.49	52.30	11.1	4.707	0.75	31.71	20.60
7.89	43.19	29.97	54.82	11.6	4.714	0.70	33.22	21.59
8.95	45.33	29.37	57.56	12.2	4.707	0.65	34.89	22.66
9.74	46.27	29.25	58.62	12.4	4.746	0.64	35.49	23.13
10.52	44.91	30.08	56.43	11.5	4.900	0.68	33.97	22.45
11.32	46.75	29.30	59.05	12.3	4.802	0.63	35.67	23.38
11.85	47.32	29.12	59.80	12.5	4.793	0.62	36.14	23.66
12.37	47.80	28.95	60.45	12.7	4.778	0.61	36.55	23.90
12.90	48.21	28.81	61.00	12.8	4.771	0.60	36.89	24.11
13.43	48.54	28.67	61.47	12.9	4.754	0.60	37.20	24.27
14.23	49.06	28.46	62.20	13.1	4.733	0.59	37.67	24.53
15.02	49.53	28.35	62.78	13.3	4.737	0.58	38.02	24.76

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA. 506+89, 75' RT
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	7.0-9.0
Project No.:	R-2018-075-001	Sample No.:	ST-3
Lab ID:	R-2018-075-001-015		
Visual Description:	ORANGE SAND (UNDISTURBED)		



Tested By: 129-04-0411 Date: 3/29/18 Approved By: MPS Date: 5/11/18

page 9 of 11

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates		
Client Reference:	R-1015 Site B CS34.324.00		
Project No.:	R-2018-075-001		
Lab ID:	R-2018-075-001-015	Specific Gravity (Measured)	2.66
Visual Description:	ORANGE SAND (UNDISTURBED)		

SAMPLE CONDITION SUMMARY

Boring No.:	-L- STA. 506+89, 75' RT	-L- STA. 506+89, 75' RT	-L- STA. 506+89, 75' RT
Depth (ft):	7.0-9.0	7.0-9.0	7.0-9.0
Sample No.:	ST-3	ST-3	ST-3
Test No.	T1	T2	T3
Deformation Rate (in/min)	0.002	0.002	0.002
Back Pressure (psi)	50.0	50.0	50.0
Consolidation Time (days)	1	1	1
Moisture Content (%) (INITIAL)	29.1	29.1	29.1
Total Unit Weight (pcf)	116.7	120.6	123.5
Dry Unit Weight (pcf)	90.4	93.4	95.6
Moisture Content (%) (FINAL)	27.5	29.7	26.1
Initial State Void Ratio,e	0.838	0.778	0.736
Void Ratio at Shear, e	0.833	0.766	0.378

Tested By: 129-04-0411 Date: 3/29/18 Input Checked By: GEM Date: 5/11/18

DCN: CT-S28 DATE: 4/12/13 REVISION: 3

CONSOLIDATED UNDRAINED TRIAXIAL TEST
WITH PORE PRESSURE READINGS
AASHTO T-297

Client:	ESP Associates	Boring No.:	-L- STA. 506+89, 7
Client Reference:	R-1015 Site B CS34.324.00	Depth (ft):	7.0-9.0
Project No.:	R-2018-075-001	Sample No.:	ST-3
Lab ID:	R-2018-075-001-015		

TEST 1 INITIAL

N/A

TEST 1 FINAL

TEST 2 INITIAL

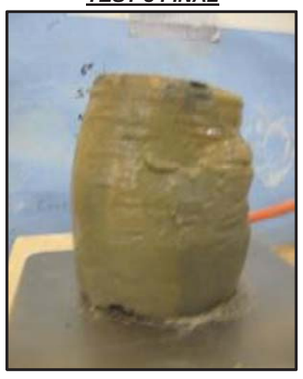
N/A

TEST 2 FINAL

TEST 3 INITIAL

N/A

TEST 3 FINAL



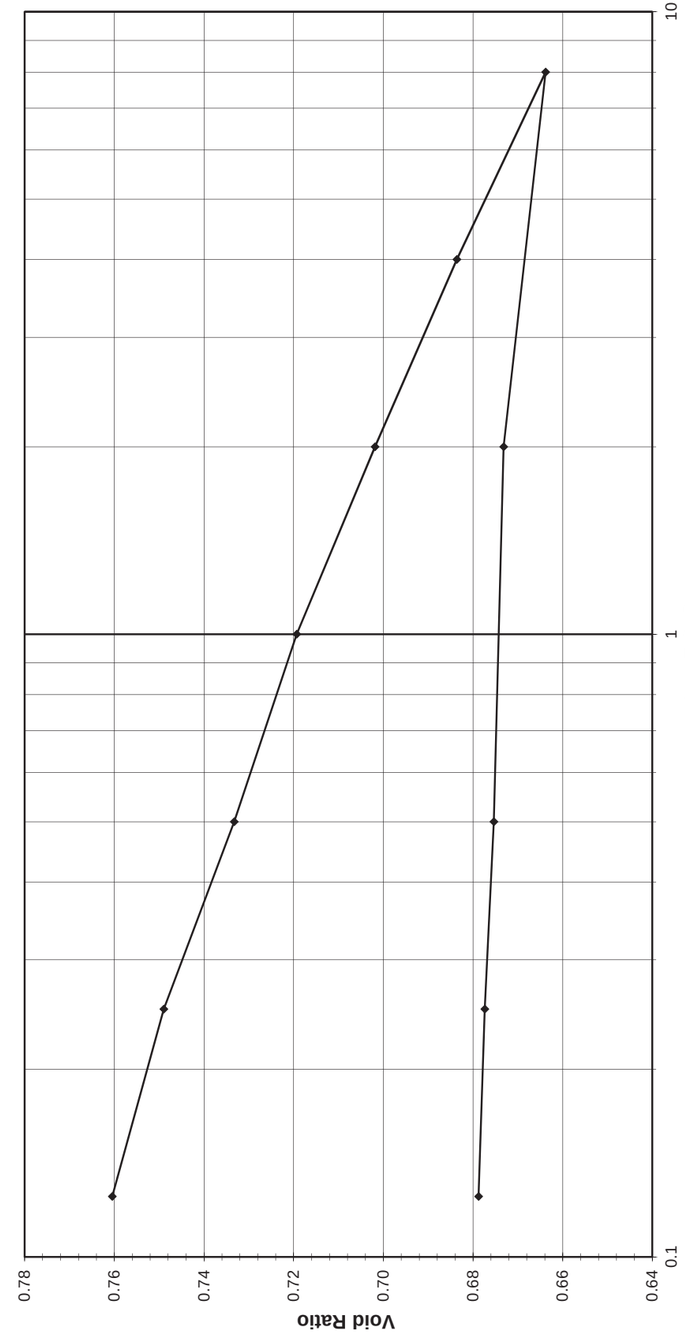
Tested By 129-04-0411 *Date* 3/29/18 *Approved By* MPS *Date* 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION
AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By 129-04-0411 *Date* 3/28/18 *Approved By* MPS *Date* 5/11/18

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED
Consolidometer No. R491
1 Division = 0.0001 (in.)

Sample Properties	Initial	Final
Water Content		
Tare Number	SS-0	SS-5
Wt. Tare & WS (g)	229.19	247.60
Wt. Tare & DS (g)	200.17	218.30
Wt. Water (g)	29.02	29.30
Wt. Tare (g)	100.59	99.98
Wt. DS (g)	99.58	118.32
Water Content (%)	29.14	24.76
Sample Parameters		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.0000	0.9461
Sample Volume (cc)	80.44	76.10
Wt. Wet Sample + Ring (g)	370.01	364.73
Wt. of Ring (g)	214.28	214.28
Wt. of Wet Sample (g)	155.73	150.45
Wet Density (pcf)	120.81	123.36
Wet Density (g/cc)	1.94	1.98
Water Content (%)	29.14	24.76
Wt. of Dry Sample (g)	120.59	120.59
Dry Density (pcf)	93.54	98.87
Dry Density (g/cc)	1.50	1.58
Void Ratio	0.7744	0.6788
Saturation (%)	100.10	97.05
Specific Gravity	2.66	*Measured*

Test Data Summary

Applied Pressure (tsf)	Final Dial Reading (div)	Machine Deflection (div)	Corrected Reading (div)	Height of Sample (mm)	Volume (cc)	Dry Density (g/cc)	Void Ratio
Seating	0	0	0	25.400	80.440	1.49911	**0.77439**
0.125	81.9	3.6	78.4	25.201	79.809	1.51095	**0.76049**
0.25	152.2	9.0	143.3	25.036	79.287	1.52090	**0.74897**
0.5	252.8	21.0	231.8	24.811	78.575	1.53467	**0.73327**
1	350.3	40.0	310.3	24.612	77.944	1.54712	**0.71933**
2	468.4	59.6	408.8	24.362	77.151	1.56300	**0.70185**
4	596.5	85.0	511.5	24.101	76.325	1.57992	**0.68363**
8	746.4	123.4	623.0	23.817	75.428	1.59871	**0.66384**
2	684.9	114.6	570.3	23.951	75.852	1.58978	**0.67319**
0.5	642.0	84.0	558.0	23.983	75.951	1.58770	**0.67538**
0.25	625.5	78.9	546.6	24.012	76.043	1.58578	**0.67741**
0.125	617.9	78.9	539.0	24.031	76.104	1.58451	**0.67876**

Tested By 129-04-0411 *Date* 3/28/18 *Input Checked By* GEM *Date* 5/11/18

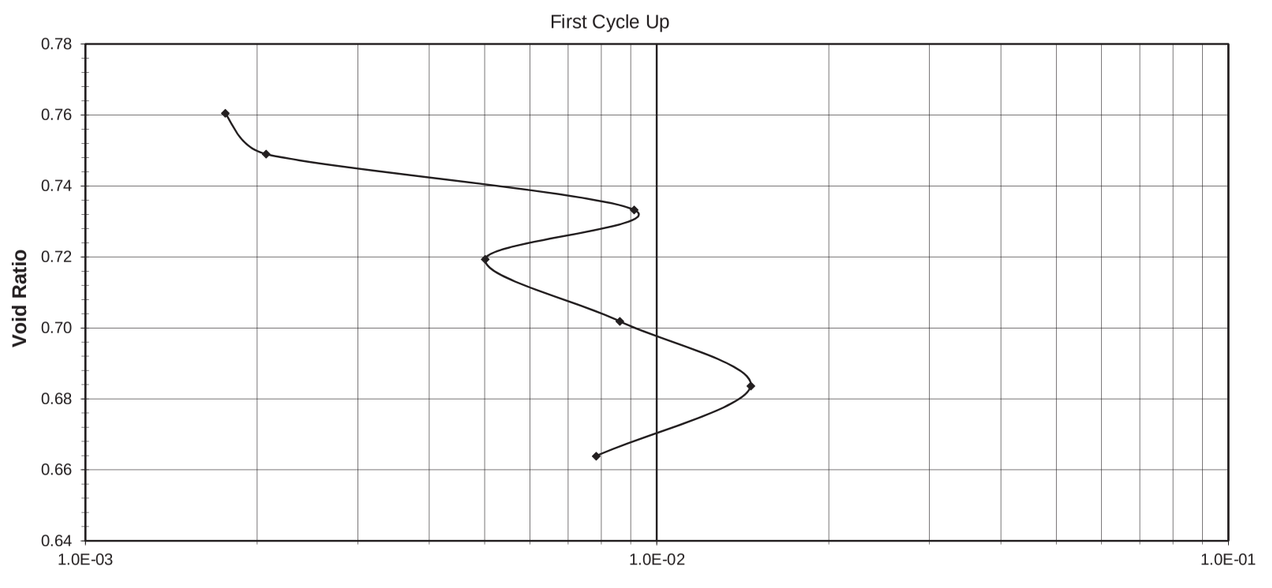
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Tested By 129-04-0411 *Date* 3/28/18 *Input Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 6

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]FINAL PLOT

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Reference	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED
Consolidometer No. R491
1 Division = 0.0001 (in.)

Sample Properties	**Initial**	**Final**
Water Content		
Tare Number	SS-0	SS-5
Wt. Tare & WS (g)	229.19	247.60
Wt. Tare & DS (g)	200.17	218.30
Wt. Water (g)	29.02	29.30
Wt. Tare (g)	100.59	99.98
Wt. DS (g)	99.58	118.32
Water Content (%)	29.14	24.76
Sample Parameters		
Sample Diameter (in)	2.5	2.5
Sample Height (in)	1.000	0.946
Sample Volume (cc)	80.44	76.10
Wt. Wet Sample + Ring (g)	370.01	364.73
Wt. of Ring (g)	214.28	214.28
Wt. of Wet Sample (g)	155.73	150.45
Wet Density (pcf)	120.81	123.36
Wet Density (g/cc)	1.94	1.98
Water Content (%)	29.14	24.76
Wt. of Dry Sample (g)	120.59	120.59
Dry Density (pcf)	93.54	98.87
Dry Density (g/cc)	1.50	1.58
Void Ratio	0.7744	0.6788
Saturation (%)	100.10	97.05
Specific Gravity	*2.66*	*Measured*

C_v Test Data Summary

Load Increment (tsf)	Dial Reading @ t_{50} (div)	Machine Deflection (div)	Corrected Dial Reading @ t_{50} (div)	Sample Height @ t_{50} (cm)	Time t_{50} (min.)	C_v (cm^2/sec)
0 - 0.125	27.2	3.6	23.6	2.534	**3.00**	**0.00176**
0.125 - 0.25	120.6	9.0	111.6	2.512	**2.50**	**0.00207**
0.25 - 0.5	197.7	21.0	176.7	2.495	**0.56**	**0.00913**
0.5 - 1	314.3	40.0	274.3	2.470	**1.00**	**0.00501**
1 - 2	430.7	59.6	371.1	2.446	**0.57**	**0.00861**
2 - 4	547.9	85.0	462.9	2.422	**0.33**	**0.01460**
4 - 8	705.2	123.4	581.8	2.392	**0.60**	**0.00783**
8 - 2	NA	114.6	NA	NA	**NA**	**NA**
2 - 0.5	NA	84.0	NA	NA	**NA**	**NA**
0.5 - 0.25	NA	78.9	NA	NA	**NA**	**NA**
0.25 - 0.125	NA	78.9	NA	NA	**NA**	**NA**

Tested By 129-04-0411 *Date* 3/28/18 *Input Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 6

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]FINAL PLOT

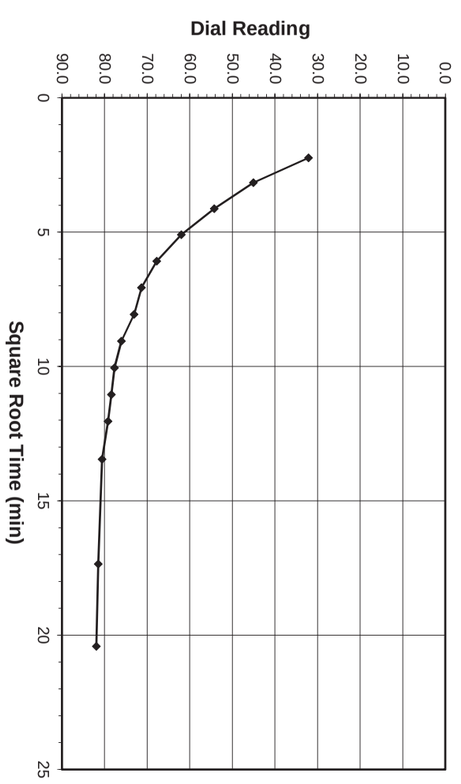
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

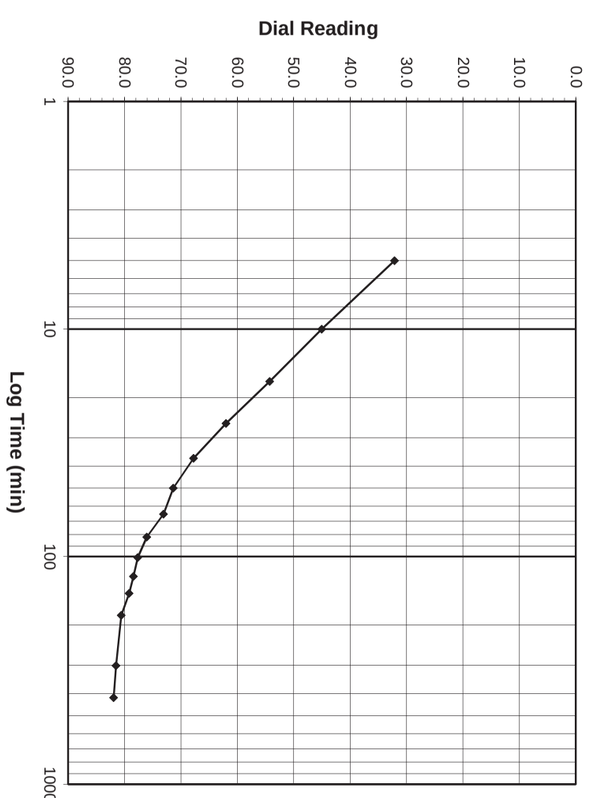
ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED





Test Load	**0.0-0.125**
Final Reading (div)	**81.9**
Consolidometer No.	**R491**
1 Division (in)	0.0001
Start Date	3/28/18
Start Time	9:21:08

Elapsed Time (min)	Dial Reading (div)
Initial	**0.0**
5.00	32.1
10.00	45.0
17.00	54.2
26.00	62.0
37.00	67.7
50.00	71.4
65.00	73.1
82.00	76.1
101.00	77.7
122.00	78.4
145.00	79.2
181.00	80.6
301.00	81.5
416.82	81.9

Tested By 129-04-0411 *Date* 3/28/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 1

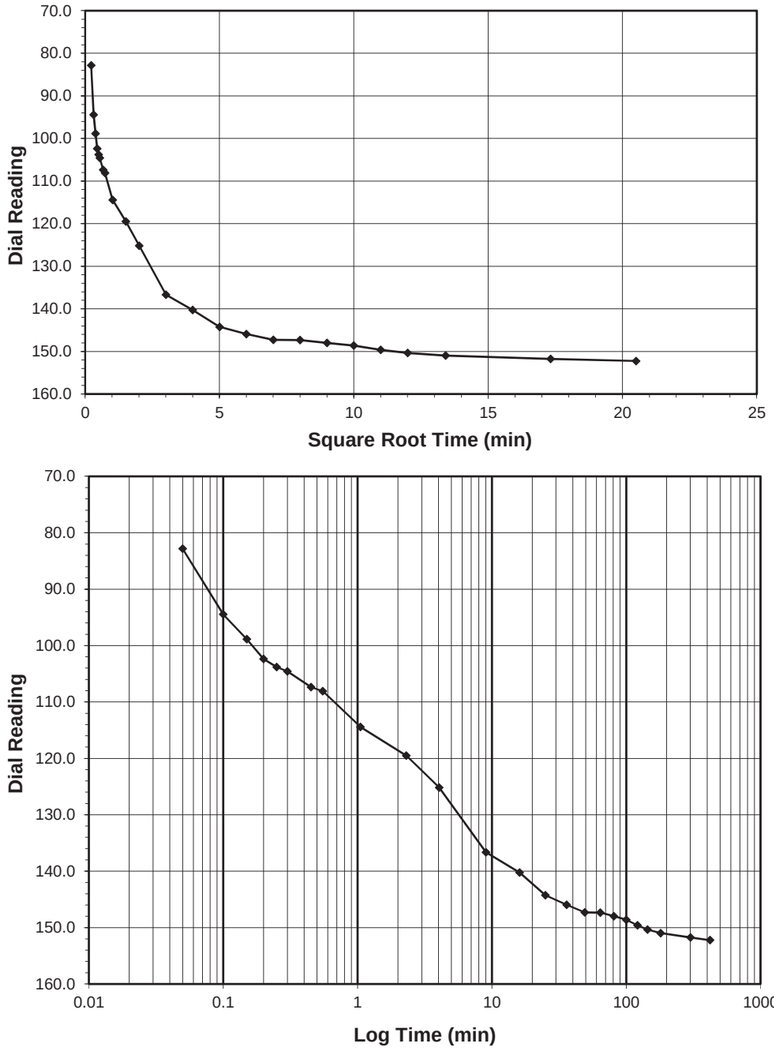
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**0.125-0.25**
Final Reading	**(div)**	**152.2**
Consolidometer No.		**R491**
1 Division	(in)	0.0001
Start Date		3/28/18
Start Time		16:13:00

Elapsed Time (min)	Dial Reading (div)
Initial	**81.9**
0.05	82.8
0.10	94.4
0.15	98.8
0.20	102.4
0.25	103.8
0.30	104.6
0.45	107.4
0.55	108.1
1.05	114.4
2.30	119.5
4.05	125.2
9.05	136.7
16.05	140.2
25.05	144.3
36.05	145.9
49.05	147.3
64.05	147.4
81.05	148.0
100.05	148.6
121.05	149.6
144.05	150.4
180.05	151.0
300.05	151.8
420.43	152.2

Tested By 129-04-0411 *Date* 3/28/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 2

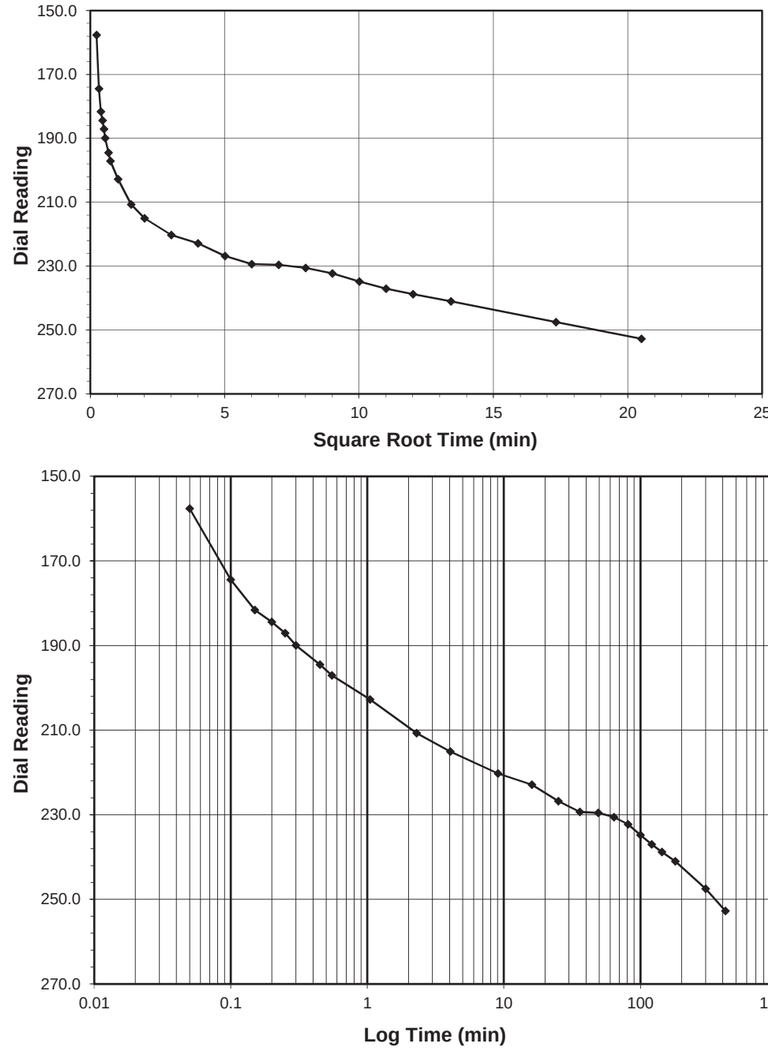
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**0.25-0.5**
Final Reading	**(div)**	**252.8**
Consolidometer No.		**R491**
1 Division	(in)	0.0001
Start Date		3/28/18
Start Time		23:13:26

Elapsed Time (min)	Dial Reading (div)
Initial	**152.2**
0.05	157.6
0.10	174.4
0.15	181.6
0.20	184.4
0.25	187.1
0.30	189.9
0.45	194.5
0.55	197.1
1.05	202.8
2.30	210.7
4.05	215.0
9.05	220.2
16.05	222.9
25.05	226.8
36.05	229.3
49.07	229.6
64.07	230.5
81.07	232.3
100.07	234.8
121.07	237.0
144.07	238.8
180.07	241.0
300.07	247.5
420.35	252.8

Tested By 129-04-0411 *Date* 3/28/18 *Checked By* GEM *Date* 5/11/18

page 1 of 1

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 3

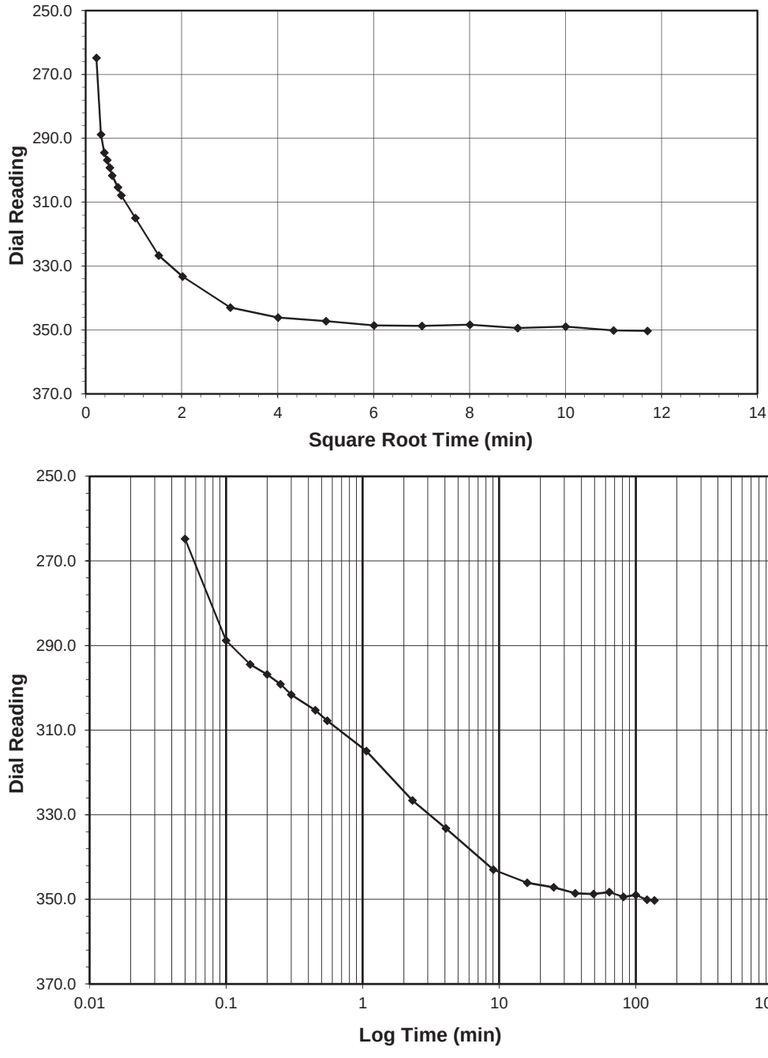
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**0.5-1.0**
Final Reading	**(div)**	**350.3**
Consolidometer No.		**R491**
1 Division	(in)	0.0001
Start Date		3/29/18
Start Time		6:13:47

Elapsed Time (min)	Dial Reading (div)
Initial	**252.8**
0.05	264.8
0.10	288.8
0.15	294.5
0.20	296.8
0.25	299.2
0.30	301.6
0.45	305.3
0.55	307.8
1.07	314.9
2.32	326.6
4.07	333.2
9.07	343.0
16.07	346.1
25.07	347.2
36.07	348.6
49.07	348.7
64.07	348.3
81.07	349.4
100.07	349.0
121.07	350.1
137.10	350.3

Tested By 129-04-0411 *Date* 3/29/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 4

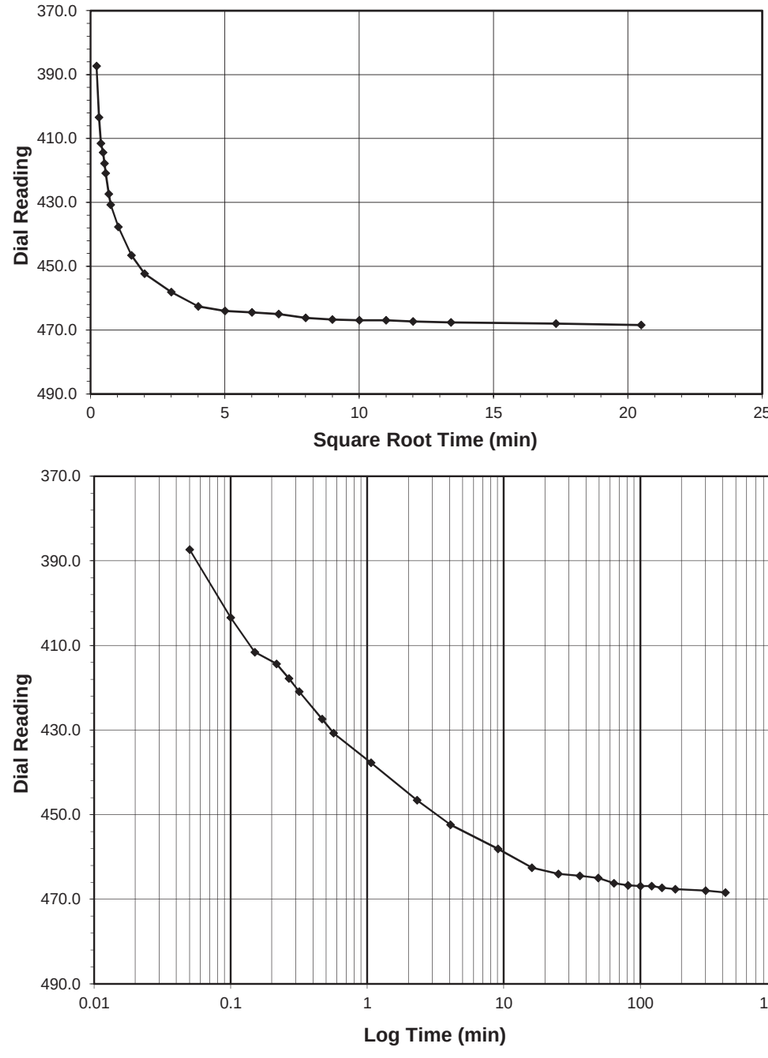
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**1.0-2.0**
Final Reading	**(div)**	**468.4**
Consolidometer No.		**R491**
1 Division	(in)	0.0001
Start Date		3/29/18
Start Time		8:30:53

Elapsed Time (min)	Dial Reading (div)
Initial	**350.3**
0.05	387.4
0.10	403.4
0.15	411.6
0.22	414.4
0.27	417.8
0.32	420.9
0.47	427.4
0.57	430.7
1.07	437.7
2.32	446.6
4.07	452.3
9.07	458.1
16.07	462.6
25.07	464.0
36.07	464.5
49.07	465.0
64.07	466.2
81.07	466.7
100.07	466.9
121.07	466.9
144.07	467.3
180.08	467.6
300.08	467.9
420.28	468.4

Tested By 129-04-0411 *Date* 3/29/18 *Checked By* GEM *Date* 5/11/18

page 1 of 1

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 5

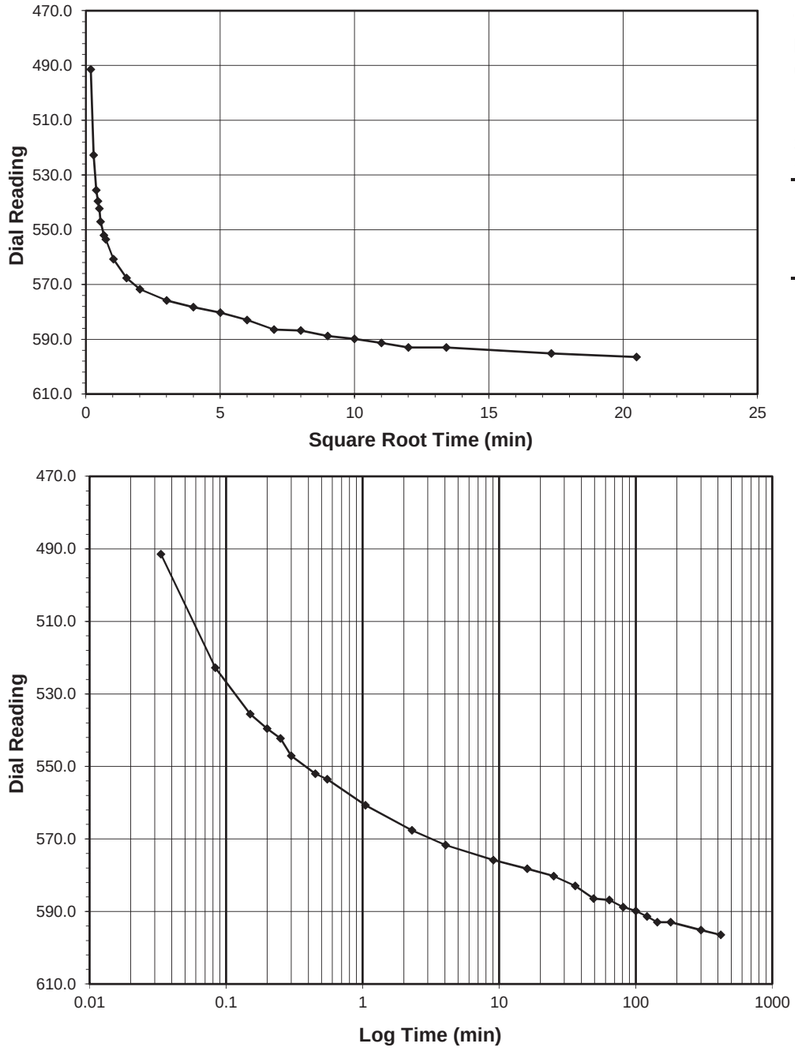
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**2.0-4.0**
Final Reading	**(div)**	**596.5**
Consolidometer No.		**R491**
1 Division	(in)	0.0001
Start Date		3/29/18
Start Time		15:31:10

Elapsed Time (min)	Dial Reading (div)
Initial	**468.4**
0.03	491.5
0.08	522.8
0.15	535.6
0.20	539.6
0.25	542.2
0.30	547.1
0.45	552.0
0.55	553.5
1.05	560.7
2.30	567.6
4.05	571.7
9.05	575.9
16.05	578.2
25.05	580.3
36.05	583.0
49.05	586.4
64.05	586.8
81.05	588.8
100.05	589.9
121.07	591.4
144.07	593.0
180.07	593.0
300.07	595.1
420.28	596.5

Tested By 129-04-0411 *Date* 3/29/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 6

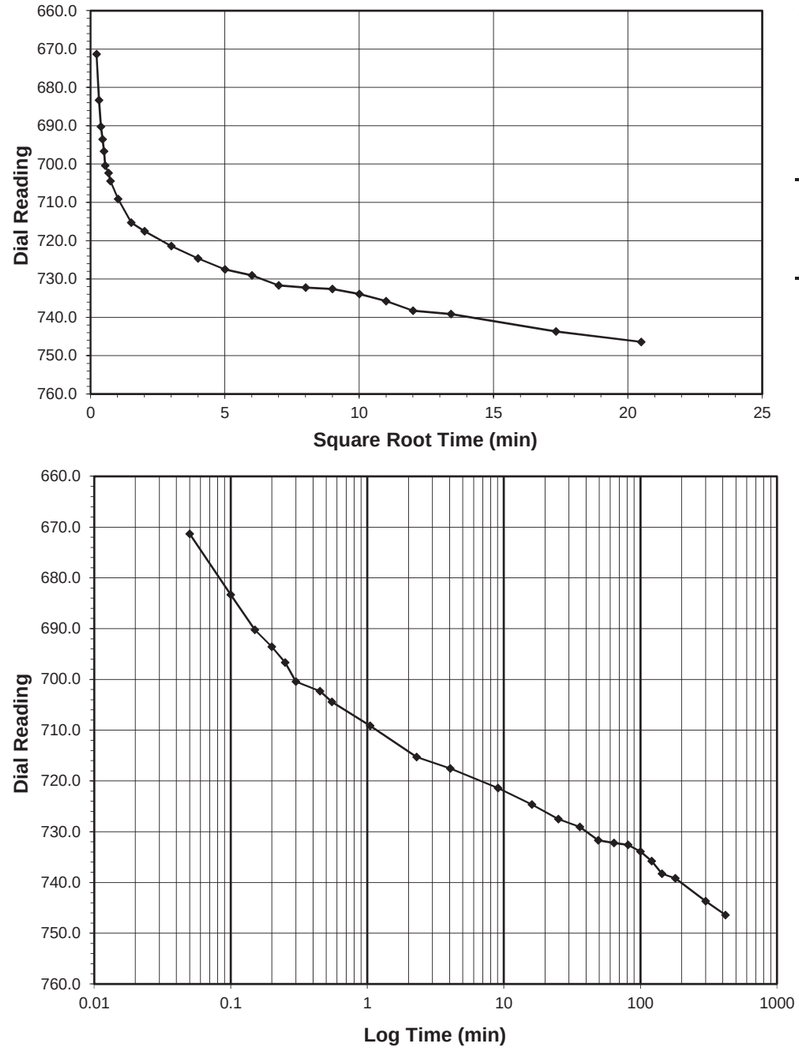
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**4.0-8.0**
Final Reading	**(div)**	**746.4**
Consolidometer No.		**R491**
1 Division	(in)	0.0001
Start Date		3/29/18
Start Time		22:31:28

Elapsed Time (min)	Dial Reading (div)
Initial	**596.5**
0.05	671.3
0.10	683.3
0.15	690.2
0.20	693.6
0.25	696.7
0.30	700.4
0.45	702.3
0.55	704.4
1.05	709.1
2.30	715.3
4.05	717.6
9.05	721.4
16.05	724.7
25.07	727.5
36.07	729.1
49.07	731.7
64.07	732.2
81.07	732.6
100.07	733.9
121.07	735.8
144.07	738.3
180.07	739.2
300.07	743.7
420.25	746.4

Tested By 129-04-0411 *Date* 3/29/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 7

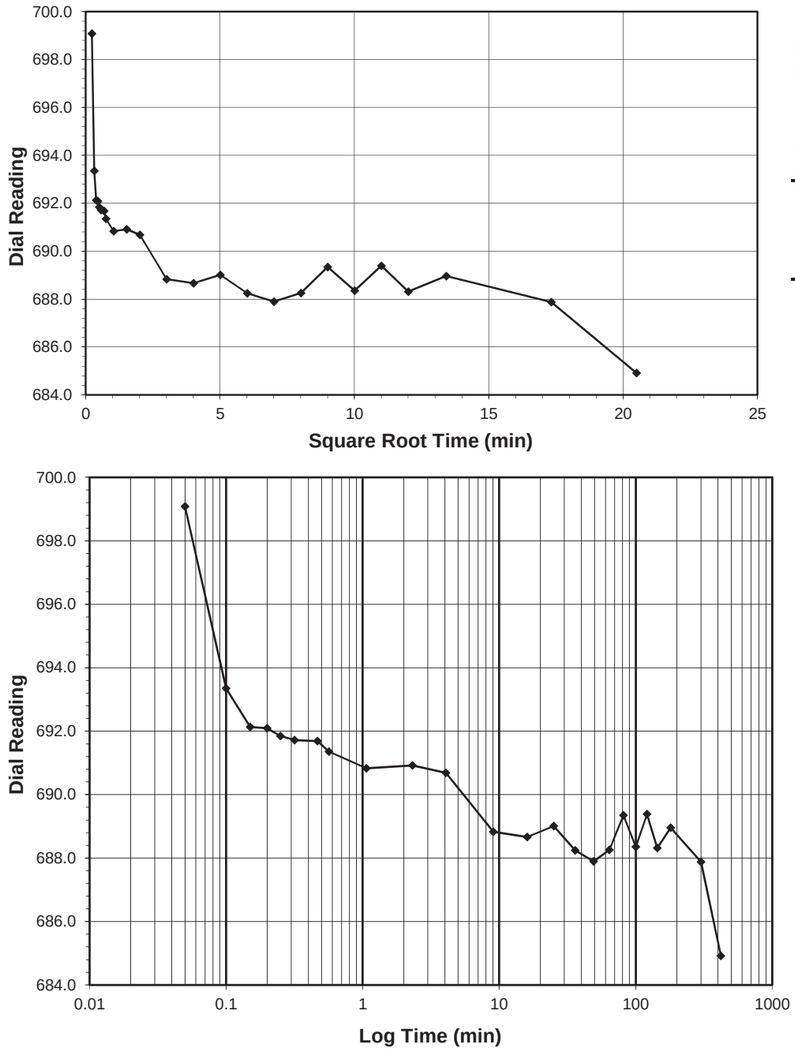
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**8.0-2.0**
Final Reading	**(div)**	**684.9**
Consolidometer No.		**R491**
1 Division	(in)	0.0001
Start Date		3/30/18
Start Time		5:31:43

Elapsed Time (min)	Dial Reading (div)
Initial	**746.4**
0.05	699.1
0.10	693.3
0.15	692.1
0.20	692.1
0.25	691.8
0.32	691.7
0.47	691.7
0.57	691.4
1.07	690.8
2.32	690.9
4.07	690.7
9.07	688.8
16.07	688.7
25.07	689.0
36.07	688.2
49.07	687.9
64.08	688.3
81.08	689.3
100.08	688.4
121.08	689.4
144.08	688.3
180.08	689.0
300.08	687.9
420.28	684.9

Tested By 129-04-0411 *Date* 3/30/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

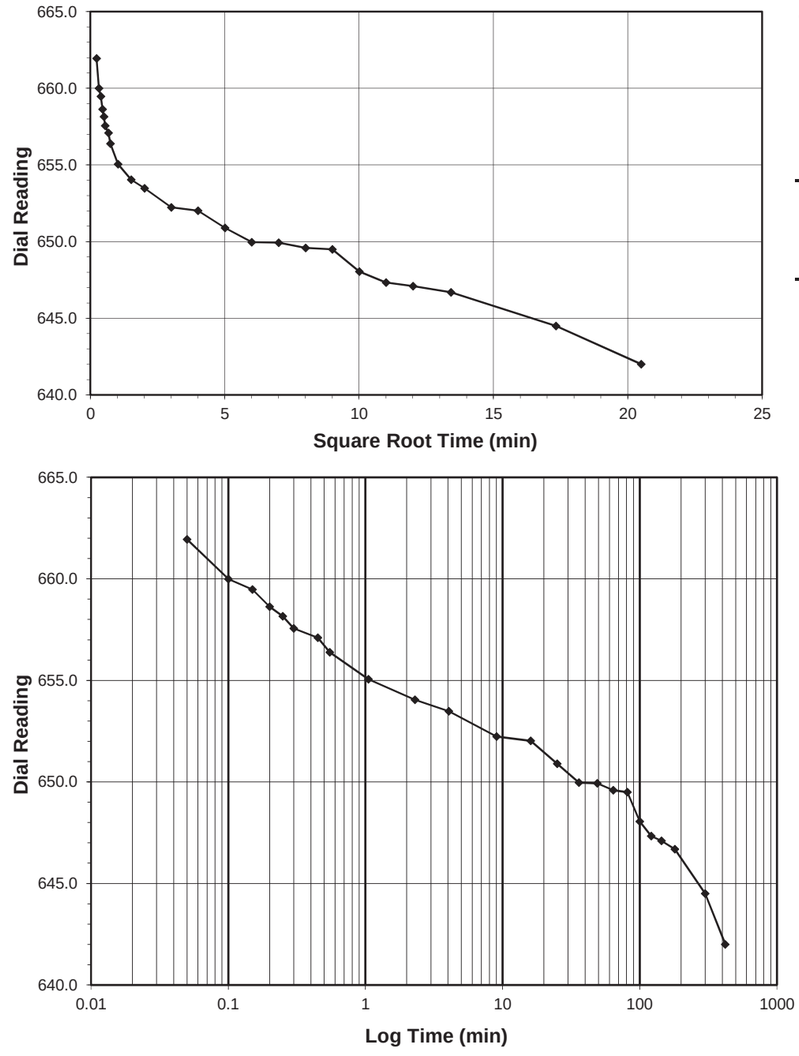
Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 8

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**2.0-0.5**
Final Reading	**(div)**	**642.0**
Consolidometer No.		**R491**
1 Division	(in)	0.0001
Start Date		3/30/18
Start Time		12:32:00

Elapsed Time (min)	Dial Reading (div)
Initial	**684.9**
0.05	661.9
0.10	660.0
0.15	659.5
0.20	658.6
0.25	658.2
0.30	657.6
0.45	657.1
0.55	656.4
1.05	655.1
2.30	654.0
4.05	653.5
9.05	652.2
16.05	652.0
25.05	650.9
36.05	650.0
49.07	649.9
64.07	649.6
81.07	649.5
100.07	648.1
121.07	647.3
144.07	647.1
180.07	646.7
300.07	644.5
420.22	642.0

Tested By 129-04-0411 *Date* 3/30/18 *Checked By* GEM *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 9

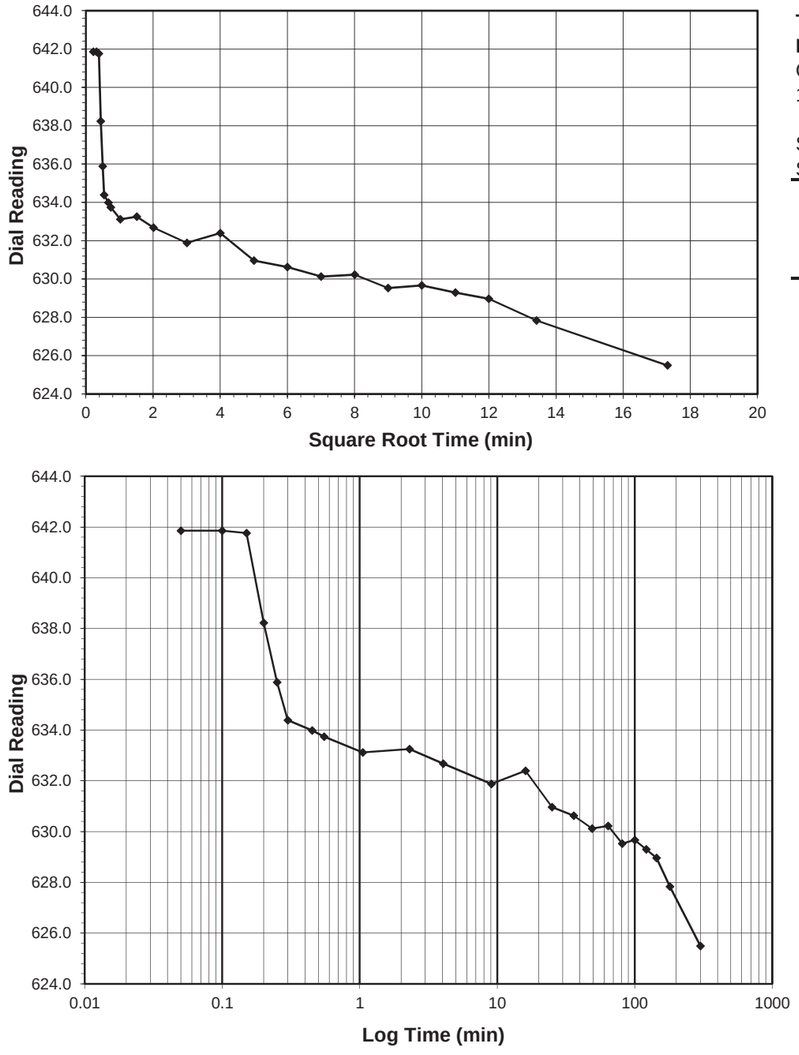
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**0.5-0.25**
Final Reading	**(div)**	**625.5**
Consolidometer No.		**R491**
1 Division	(in)	0.0001
Start Date		3/30/18
Start Time		19:32:13

Elapsed Time (min)	Dial Reading (div)
Initial	**642.0**
0.05	641.9
0.10	641.9
0.15	641.8
0.20	638.2
0.25	635.9
0.30	634.4
0.45	634.0
0.55	633.7
1.05	633.1
2.30	633.3
4.05	632.7
9.05	631.9
16.05	632.4
25.05	631.0
36.05	630.6
49.05	630.1
64.07	630.2
81.07	629.5
100.07	629.7
121.07	629.3
144.07	629.0
180.07	627.8
300.07	625.5

Tested By *129-04-0411* *Date* *3/30/18* *Checked By* *GEM* *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 10

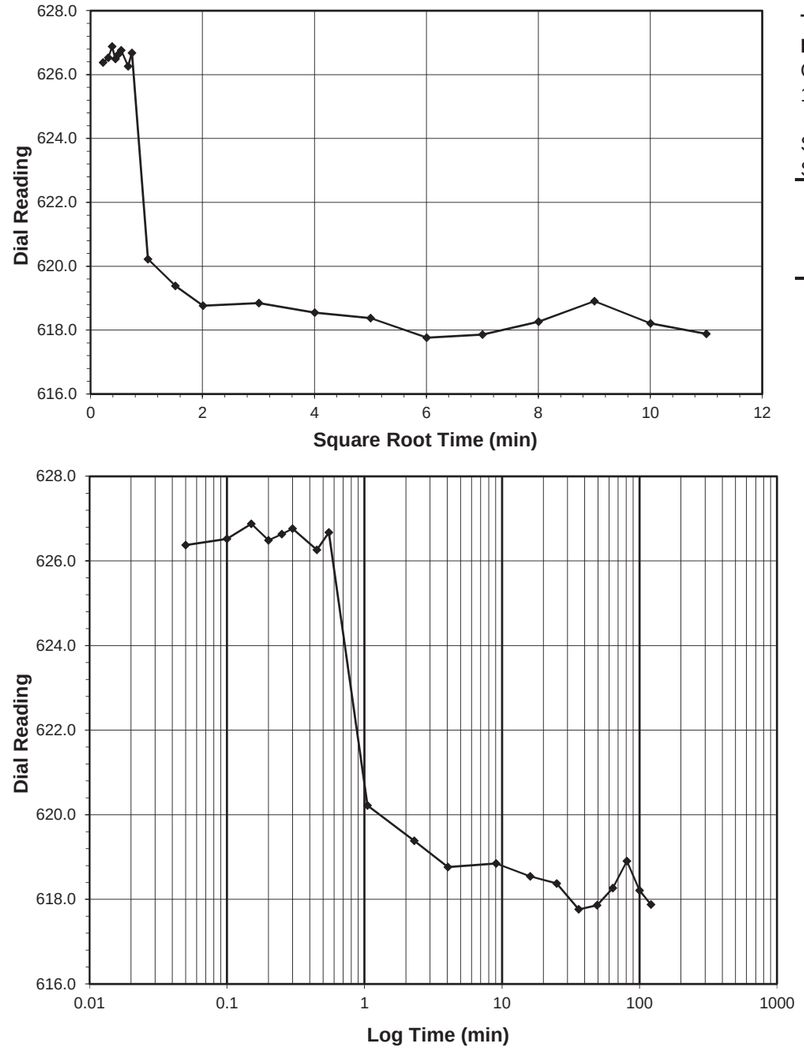
2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net

ONE DIMENSIONAL CONSOLIDATION

AASHTO T-216

Client	ESP Associates	Boring No.	-L- STA. 506+89, 75' RT
Client Project	R-1015 Site B CS34.324.00	Depth (ft)	7.0-9.0
Project No.	R-2018-075-001	Sample No.	ST-3
Lab ID	R-2018-075-001-015	Visual Description	ORANGE SAND

Sample Conditions: UNDISTURBED, INUNDATED AND DOUBLE DRAINED



Test Load	**(tsf)**	**0.25-0.125**
Final Reading	**(div)**	**617.9**
Consolidometer No.		**R491**
1 Division	(in)	0.0001
Start Date		3/31/18
Start Time		2:32:32

Elapsed Time (min)	Dial Reading (div)
Initial	**625.5**
0.05	626.4
0.10	626.5
0.15	626.9
0.20	626.5
0.25	626.6
0.30	626.8
0.45	626.3
0.55	626.7
1.05	620.2
2.30	619.4
4.05	618.8
9.05	618.9
16.05	618.5
25.05	618.4
36.07	617.8
49.07	617.9
64.07	618.3
81.07	618.9
100.07	618.2
121.07	617.9

Tested By *129-04-0411* *Date* *3/31/18* *Checked By* *GEM* *Date* 5/11/18

DCN: CT-24E Date: 5/3/12 Revision: 3

Z:\2018 PROJECTS\ESP Associates\2018-075 ESP - R-1015 SITE 8\[2018-075-001-015 GEOJAC-16TSF1 Cv.xlsm]STEP 11

2200 Westinghouse Blvd., Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460 • www.geotechnics.net