PROJECT: 34442.1.5 ID: R-2514D

SHEET NO.: **CONTENTS:**

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34442.1.5 (R-2514D)	01	41

PROJ. REFERENCE NO.: 34442.1.5 F.A. PROJ. N/A

COUNTY: Jones

PROJECT DESCRIPTION: US 17 from North of NC 58 to the New Bern Bypass

SITE DESCRIPTION: Dual Bridges on -L- over the Trent River

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. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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

PERSONNEL:

Corey Futral

Charles Brake

D. Sean Leggett, RLS

Mid-Atlantic Drilling

INVESTIGATED BY: CATLIN ENGINEERS AND SCIENTISTS

CHECKED BY: Steven V. Hudson, L.G., CWD

SUBMITTED BY: Steven V. Hudson, L.G., CWD

DATE: February, 2014

NORTH CAROLINA LICENSED SEAL 1583 GEOLOGIST STEVEN V. HUDSON 2/5/14

SEAL

SIGNATURE

DRAWN BY: Steven V. Hudson, L.G., CWD

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

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

CATLIN Engineers and Scientists

ID	WBS ELEMENT	SHEET NO.	TOTAL SHEETS
R-2514D	34442.1.5	02	41

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

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

SOIL LEGEND AND AASHTO CLASSIFICATION

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

P.I. OF A-7-5 ≤ L.L. - 30 : P.I. OF A-7-6 ≥ L.L. - 30

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

ABBREVIATIONS

AR - AUGER REFUSAL
BLS - BELOW LAND SURFACE
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F. - FINE
FIAD - FILLED IMMEDIATELY AFTER DRILLING
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NA - NOT APPLICABLE
NE - NOT ENCOUNTERED
NM - NOT MEASURED
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAA - SAME AS ABOVE
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
U.C.P. - UNDIFFERENTIATED
COASTAL PLAIN
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:
- ☐ DIEDRICH D-50
- ☒ DIEDRICH D-25
- ☒ CME-45B ATV
- ☒ CME-550
- ☐ PORTABLE HOIST
- ☐ AMS POWER PROBE
- ☐ OTHER _____

ADVANCING TOOLS:
- ☐ CLAY BITS
- ☐ 6" CONTINUOUS FLIGHT AUGER
- ☐ 8" HOLLOW AUGERS
- ☒ HARD FACED FINGER BITS
- ☐ TUNG.-CARBIDE INSERTS
- ☒ CASING ☐ W/ADVANCER
- ☒ TRICONE 2 7/8" STEEL TEETH
- ☐ TRICONE __" TUNG.-CARBIDE
- ☒ CORE BIT
- ☐ OTHER _____

HAMMER TYPE:
- ☒ AUTOMATIC ☐ MANUAL

CORE SIZE:
- ☐ - B_____ ☐ - H_____
- ☒ - NWD4 ☐ - _____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY AS FOLLOWS:

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

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V. SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL.*
SEVERE (SEV.)	ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGISTS PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGISTS PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGISTS PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	> 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 3 FEET
VERY CLOSE	< 0.16 FEET

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

HYDRAULIC PUSH (HP) - ADVANCEMENT OF SAMPLING TOOLS UTILIZING MECHANICAL/HYDRAULIC DOWN-FORCE OF DRILLING MACHINE.

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

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

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

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

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR 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 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 (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

CATLIN #: 213104.04

BENCH MARK: Survey conducted with Trimble 5800 GPS and Trimble TSC2 Data Collector. Additional traditional survey conducted with Total Station using NCDOT -BL-43 and -BL-44 ELEVATION: -BL-43=12.2ft / -BL-44=3.4ft

NOTES:
Coordinate System = North Carolina State Plane 1983
Project Datum = North American Datum 1983 (Conus)
Zone = North Carolina 3200
Geoid Model = GEOID03 (Conus)
All Units = US Feet

-BL-43: N:465899 / E:2530617
-BL-44: N:466050 / E:2530634

ADAPTED FROM NCDOT FILE "Geotechnical_English.cel" named "Lgd_1" Rev. 9/23/09

NAD 83/NSRS 2007

PREPARED BY:
CATLIN
Engineers and Scientists
Wilmington, North Carolina
PROJ #: 213104.04

WBS NO.:	34442.1.5
TIP NO.:	R-2633D
COUNTY:	JONES

SHEET 03

100 50 0 100
SCALE IN FEET

DUAL BRIDGES
ON -L- OVER THE
TRENT RIVER

-BL- 44 PINC 101+83.44

-BL- 46 PINC 108+21.00

-BL- 43 PINC 100+31.19

-BL- 42 PINC 98+42.77

-BL- 45 PINC 104+91.52

N 6°49'04.6" E

TRENT RIVER

EB1-A SBL 385+30 57LT
B1-A SBL 384+26 57LT
B2-A SBL 385+20 57LT
B3-A 386+13 53LT
B4-A SBL 387+12 57LT
B5-A SBL 388+02 57LT
B6-A SBL 388+99 55LT
B7-A SBL 389+98 56LT
B8-A SBL 390+93 55LT
B9-A SBL 391+88 54LT
B10-A SBL 392+86 45LT
B11-A SBL 393+74 59LT
B12-A SBL 394+71 56LT
EB2-A SBL 395+67 54LT

EB1-B NBL 383+30 57RT
B1-B NBL 384+25 57RT
B2-B NBL 385+20 57RT
B3-B NBL 386+14 59RT
B4-B NBL 387+11 55RT
B5-B NBL 388+04 60RT
B6-B NBL 389+02 54RT
B7-B NBL 389+98 56RT
B8-B NBL 390+92 51RT
B9-B NBL 391+81 26RT
B10-B NBL 392+80 58RT
B11-B NBL 393+75 58RT
B12-B NBL 394+65 58RT
EB2-B NBL 395+66 52RT

385 390 395

105.6

BM #19
SEE SHEET 1-F
ELEV. 13.46'

BM #20
SEE SHEET 1-F
ELEV. 3.92'

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220 Old Dairy Road
Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
213104.04

DESCRIPTION:	
Dual Bridges on -L- over the Trent River	

SHEET NO.:	04 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

PROFILE
SOUTH BOUND LANE
57 FEET LEFT OF -L-

V.E. = 2.5

EB1-A SBL 383+30 57ft LT

B1-A SBL 384+26 57ft LT

B2-A SBL 385+20 57ft LT

B3-A SBL 386+13 53ft LT

B4-A SBL 387+12 57ft LT

B5-A SBL 388+02 57ft LT

B6-A SBL 388+99 55ft LT

Existing Land Surface

10/13

Limestone Lens. V. dense.

Orange tan, Clayey Silt f. V. soft.

Brown to yellow tan, f. SAND to Silty, f. SAND. Loose to v. loose. Alluvial

Gray, Silty CLAY. V. soft to med. stiff.

Gray to dark orange brown, f. SAND to Silty, f. SAND. V. loose to loose.

Limestone Lens

Limestone Lens

Limestone Lens

Limestone Lens

A Fine SAND to Silty, f. SAND. V. loose to loose. Undivided Coastal Plain

B Tan to yellow orange, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. V. loose to dense. (Belgrade Formation)

C Light to dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Med. to v. dense. (Riverbend Formation)

GROUNDLINE PROFILE AT 57 FEET LEFT OF -L- GENERATED FROM DATA PROVIDED BY NCDOT GEU IN FILE "r2514d_ls_tin.tin " DATED 8/6/2013.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

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

383+00 384+00 385+00 386+00 387+00 388+00 389+00

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213104.04

DESCRIPTION:	
Dual Bridges on -L- over the Trent River	

SHEET NO.:	05 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

PROFILE
SOUTH BOUND LANE
57 FEET LEFT OF -L-

V.E. = 2.5

B6-A SBL
388+99
55ft LT

B7-A SBL
389+98
56ft LT

B8-A SBL
390+93
55ft LT

B9-A SBL
391+86
54ft LT

B10-A SBL
392+86
45ft LT

B11-A SBL
393+74
59ft LT

B12-A SBL
394+71
56ft LT

Brown to yellow tan, f. SAND to Silty, f. SAND. Alluvial

SURFACE WATER ELEVATION AS OF 12/06/2013

Existing Land Surface

10/13

Gray, Silty CLAY Low plast. V. soft to med. stiff.

Organic Muck and Highly Organic Sand and Silty Sand. V. soft to med. stiff. Alluvial

12/13

Organic Muck and Highly Organic Sand and Silty Sand. V. soft to med. stiff. Alluvial

12/13

12/13

Calc. f. SAND. Med. dense.

Gray to dark orange brown, f. SAND to Silty, f. SAND. Limestone frags. at base of stratum.

Limestone Lens

A Fine SAND to Silty, f. SAND. V. loose to loose. Undivided Coastal Plain

B Tan to yellow orange, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Med. dense to dense. (Belgrade Formation)

C Light to dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Med. dense to dense. (Riverbend Formation)

D Light to dark gray, uniform f. SAND. Organic odor noted through majority of unit. Med. to v. dense.

GROUNDLINE PROFILE AT 57 FEET LEFT OF -L- GENERATED FROM DATA PROVIDED BY NCDOT GEU IN FILE "r2514d_ls_tin.tin " DATED 8/6/2013.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

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

389+00 390+00 391+00 392+00 393+00 394+00 395+00

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Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
213104.04

DESCRIPTION: Dual Bridges on -L- over the Trent River

SHEET NO.:	06 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

PROFILE
SOUTH BOUND LANE
57 FEET LEFT OF -L-

V.E. = 2.5

EB2-A SBL
395+65
57ft LT

Gray to dark orange brown, f. SAND to Silty, f. SAND. Limestone frags. at base of stratum. V. loose to loose. Alluvial.

Organic Muck and Highly Organic Sand and Silty Sand. V. soft to med. stiff. Alluvial

Existing Land Surface

10/13

1, 13, 9, 7, 3, 6, 18, 31, 41, 40, 60, 40, 33, 48, 49

A, B, C, D

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

395+00 396+00 397+00 398+00 399+00 400+00 401+00

A Fine SAND to Silty, f. SAND. V. loose to med. dense. Undivided Coastal Plain

B Tan to yellow orange, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Loose to dense. (Belgrade Formation)

C Light to dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. V. dense. (Riverbend Formation)

D Light to dark gray, uniform f. SAND. Organic odor noted through majority of unit. Dense to v. dense.

GROUNDLINE PROFILE AT 57 FEET LEFT OF -L- GENERATED FROM DATA PROVIDED BY NCDOT GEU IN FILE "r2514d_ls_tin.tin " DATED 8/6/2013.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

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Corporate Licensure No. for Engineering Services C-0585
213104.04

DESCRIPTION:	
Dual Bridges on -L- over the Trent River	

SHEET NO.:	07 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

PROFILE
NORTH BOUND LANE
57 FEET RIGHT OF -L-

V.E. = 2.5

EB1-B NBL
383+30
57ft RT

B1-B NBL
384+25
57ft RT

B2-B NBL
385+20
57ft RT

B3-B NBL
386+14
59ft RT

B4-B NBL
387+11
55ft RT

B5-B NBL
388+04
60ft RT

B6-B NBL
389+02
54ft RT

Existing Land Surface

Brown to yellow tan, f. SAND to Silty, f. SAND. V. loose to loose. Alluvial

Light gray, Soft to med. stiff, Clayey SILT.

Gray to dark orange brown, f. SAND. V. loose.

Limestone Lens

10/13

11/13

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

A Fine SAND to Silty, f. SAND. V. loose to loose. Undivided Coastal Plain

B Tan to yellow orange, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Med. dense to v. loose. (Belgrade Formation)

C Light to dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Med. to v. dense. (Riverbend Formation)

D Light to dark gray, uniform f. SAND. Organic odor noted through majority of unit. Med. to v. dense.

GROUNDLINE PROFILE AT 57 FEET RIGHT OF -L- GENERATED FROM DATA PROVIDED BY NCDOT GEU IN FILE "r2514d_ls_tin.tin " DATED 8/6/2013.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

383+00 384+00 385+00 386+00 387+00 388+00 389+00

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220 Old Dairy Road
Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
213104.04

DESCRIPTION:	Dual Bridges on -L- over the Trent River
SHEET NO.:	08 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

PROFILE
NORTH BOUND LANE
57 FEET RIGHT OF -L-

V.E. = 2.5

B6-B NBL
389+02
54ft RT

B7-B NBL
389+89
56ft RT

B8-B NBL
390+92
51ft RT

B9-B NBL
391+81
26ft RT

B10-B NBL
392+80
55ft RT

B11-B NBL
393+75
38ft RT

B12-B NBL
394+63
58ft RT

11/13

12/13

11/13

11/13

Brown to yellow tan, f. SAND to Silty, f. SAND.
V. loose to loose.
Alluvial

SURFACE WATER ELEVATION
AS OF 12/06/2013

Existing Land Surface

Light gray, soft to
med. stiff, Clayey SILT

Organic Muck
and Highly Organic
Sand and Silty Sand.
V. soft. Alluvial

Organic Muck
and Highly Organic
Sand and Silty Sand.
V. loose. Alluvial

Gray to dark orange brown,
f. SAND to Silty, f. SAND.
Limestone frags. at base of stratum.
V. loose to med. dense.
Alluvial

Limestone Lens

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

389+00
390+00
391+00
392+00
393+00
394+00
395+00

A Fine SAND to Silty, f. SAND. V. loose to loose. Undivided Coastal Plain

B Tan to yellow orange, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Loose to dense. (Belgrade Formation)

C Light to dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Med. to v. dense. (Riverbend Formation)

D Light to dark gray, uniform f. SAND. Organic odor noted through majority of unit. Dense to v. dense w/tr. med. dense.

GROUNDLINE PROFILE AT 57 FEET RIGHT OF -L- GENERATED FROM DATA PROVIDED BY NCDOT GEU IN FILE "r2514d_ls_tin.tin " DATED 8/6/2013.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

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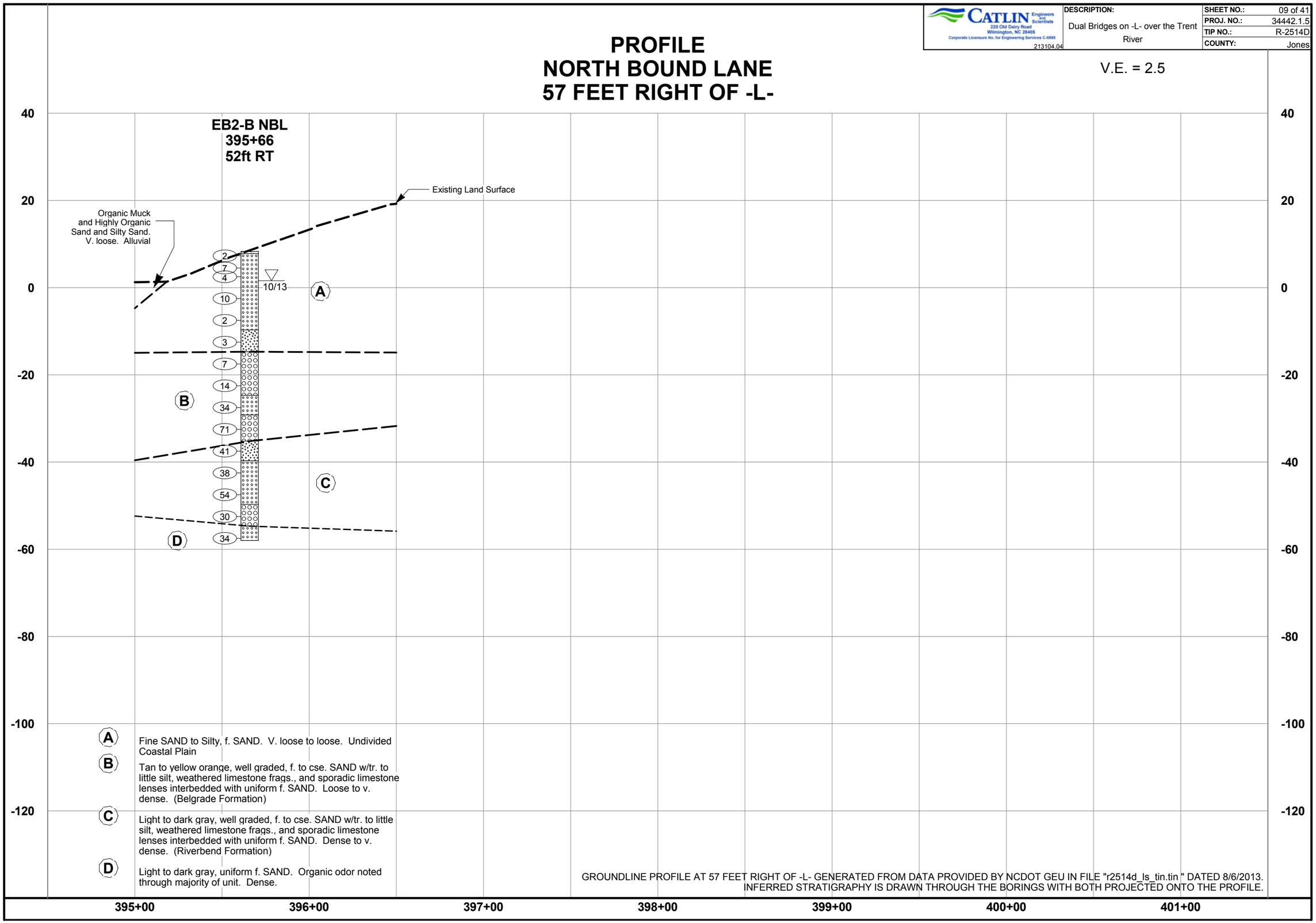
Corporate Licensure No. for Engineering Services C-0585
213104.04

DESCRIPTION:	
Dual Bridges on -L- over the Trent River	

SHEET NO.:	09 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

PROFILE
NORTH BOUND LANE
57 FEET RIGHT OF -L-

V.E. = 2.5



A Fine SAND to Silty, f. SAND. V. loose to loose. Undivided Coastal Plain

B Tan to yellow orange, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Loose to v. dense. (Belgrade Formation)

C Light to dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Dense to v. dense. (Riverbend Formation)

D Light to dark gray, uniform f. SAND. Organic odor noted through majority of unit. Dense.

GROUNDLINE PROFILE AT 57 FEET RIGHT OF -L- GENERATED FROM DATA PROVIDED BY NCDOT GEU IN FILE "r2514d_ls_tin.tin " DATED 8/6/2013.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

V.E. = 1

CATLIN Engineers and Scientists
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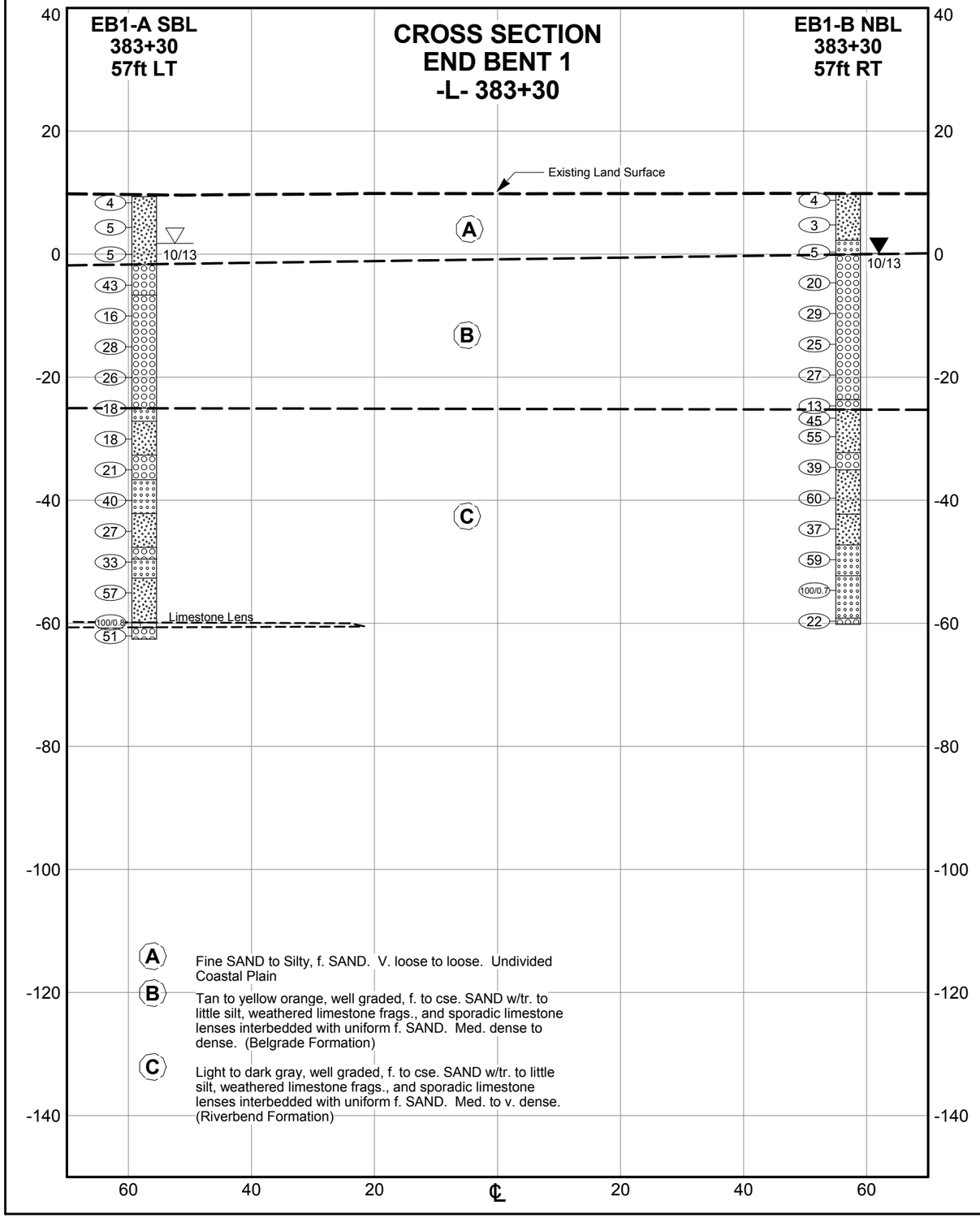
Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
213104.04

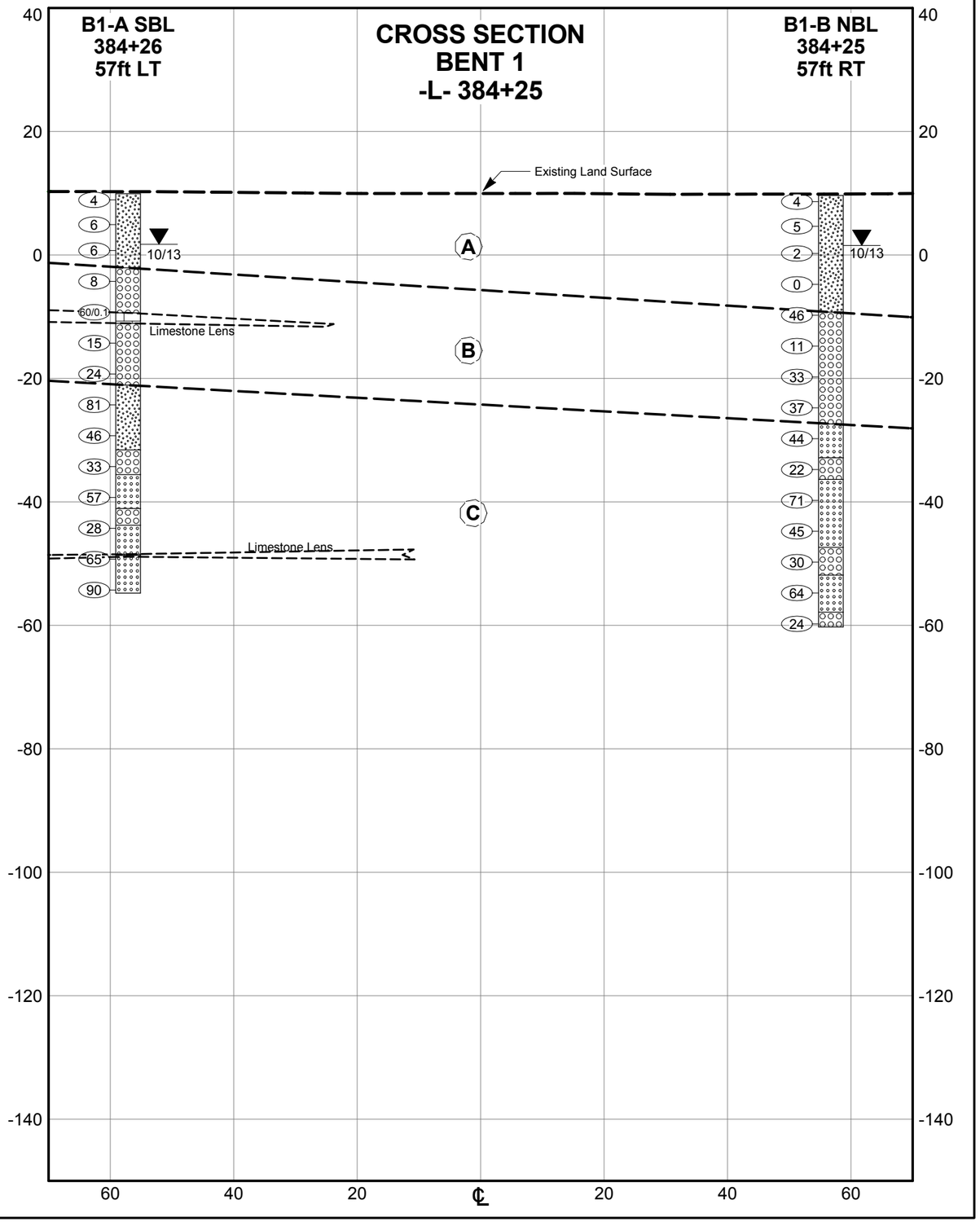
DESCRIPTION:	SHEET NO.:	10 of 41
Dual Bridges on -L- over the Trent River	PROJ. NO.:	34442.1.5
	TIP NO.:	R-2514D
	COUNTY:	Jones



A — Fine SAND to Silty, f. SAND. V. loose to loose. Undivided Coastal Plain

B — Tan to yellow orange, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Med. dense to dense. (Belgrade Formation)

C — Light to dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Med. to v. dense. (Riverbend Formation)



V.E. = 1

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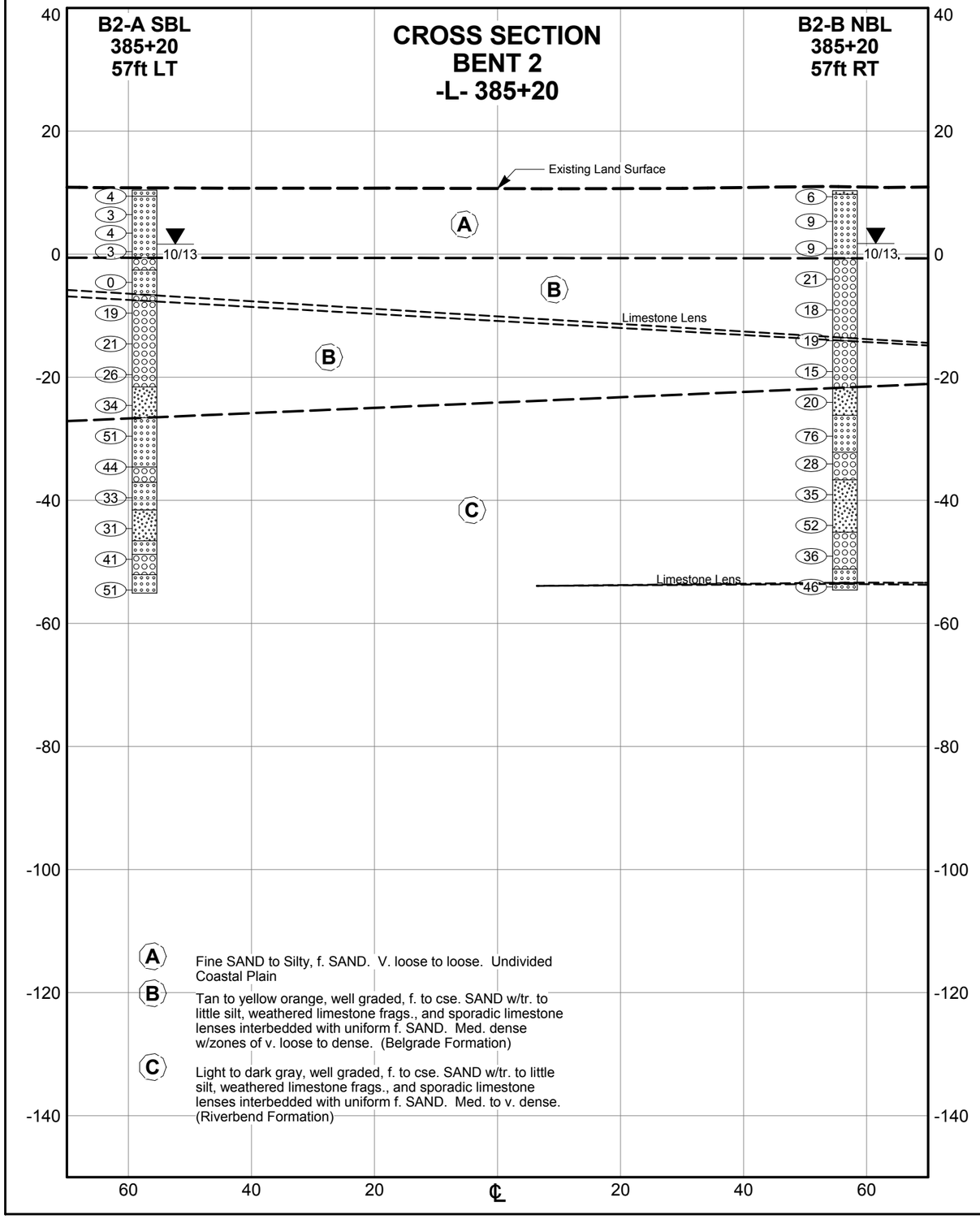
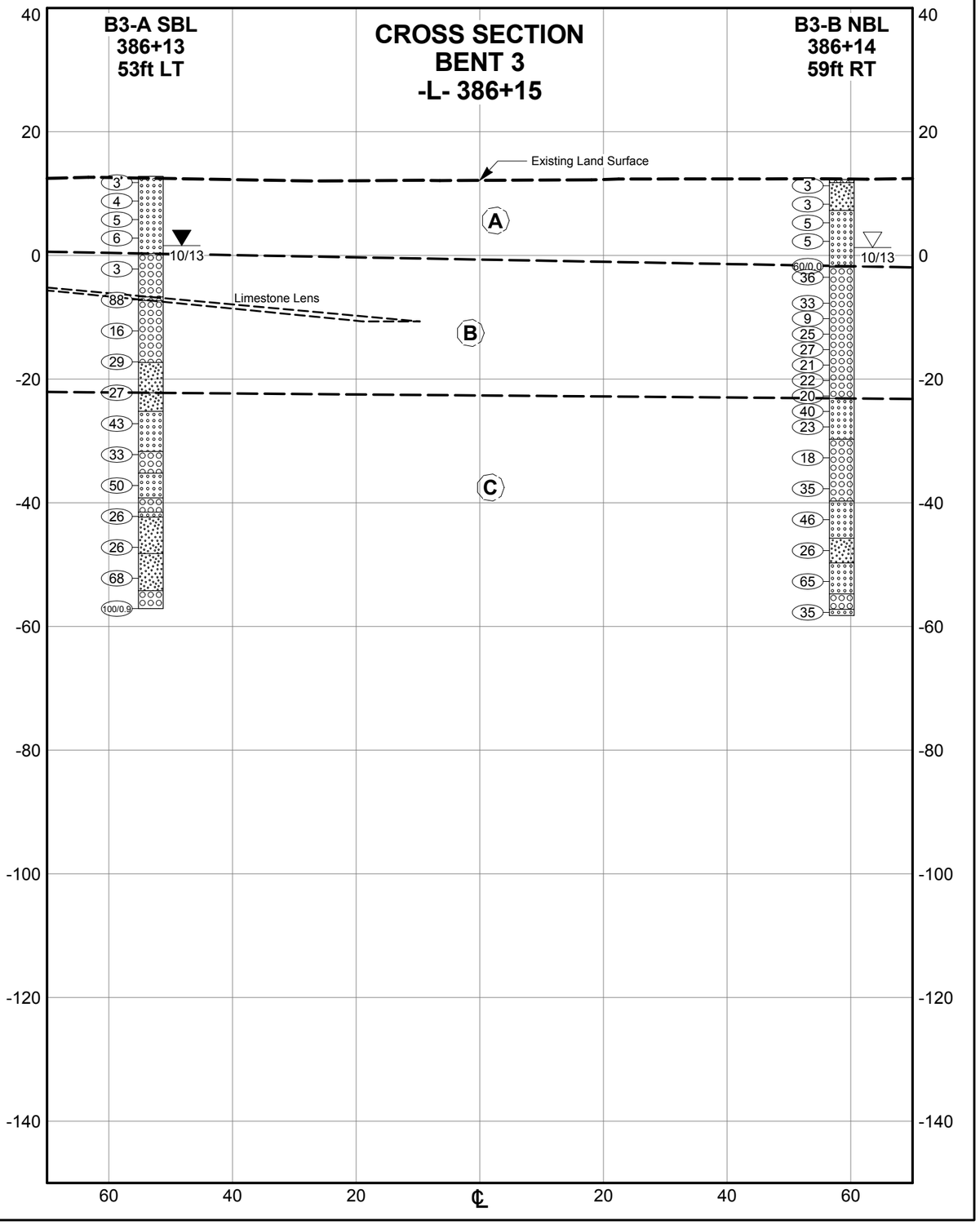
Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
213104.04

DESCRIPTION:	SHEET NO.:	11 of 41
Dual Bridges on -L- over the Trent River	PROJ. NO.:	34442.1.5
	TIP NO.:	R-2514D
	COUNTY:	Jones





V.E. = 1

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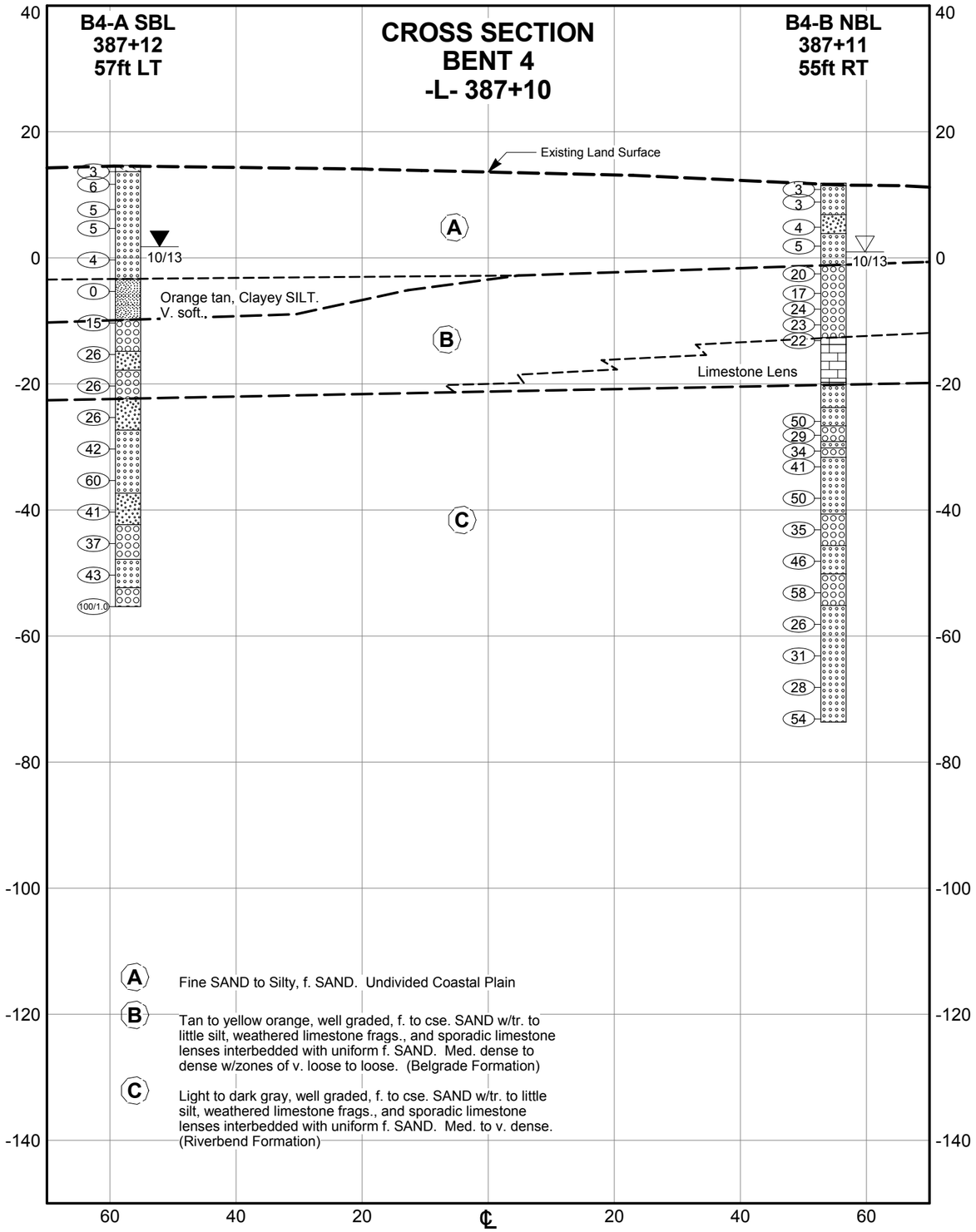
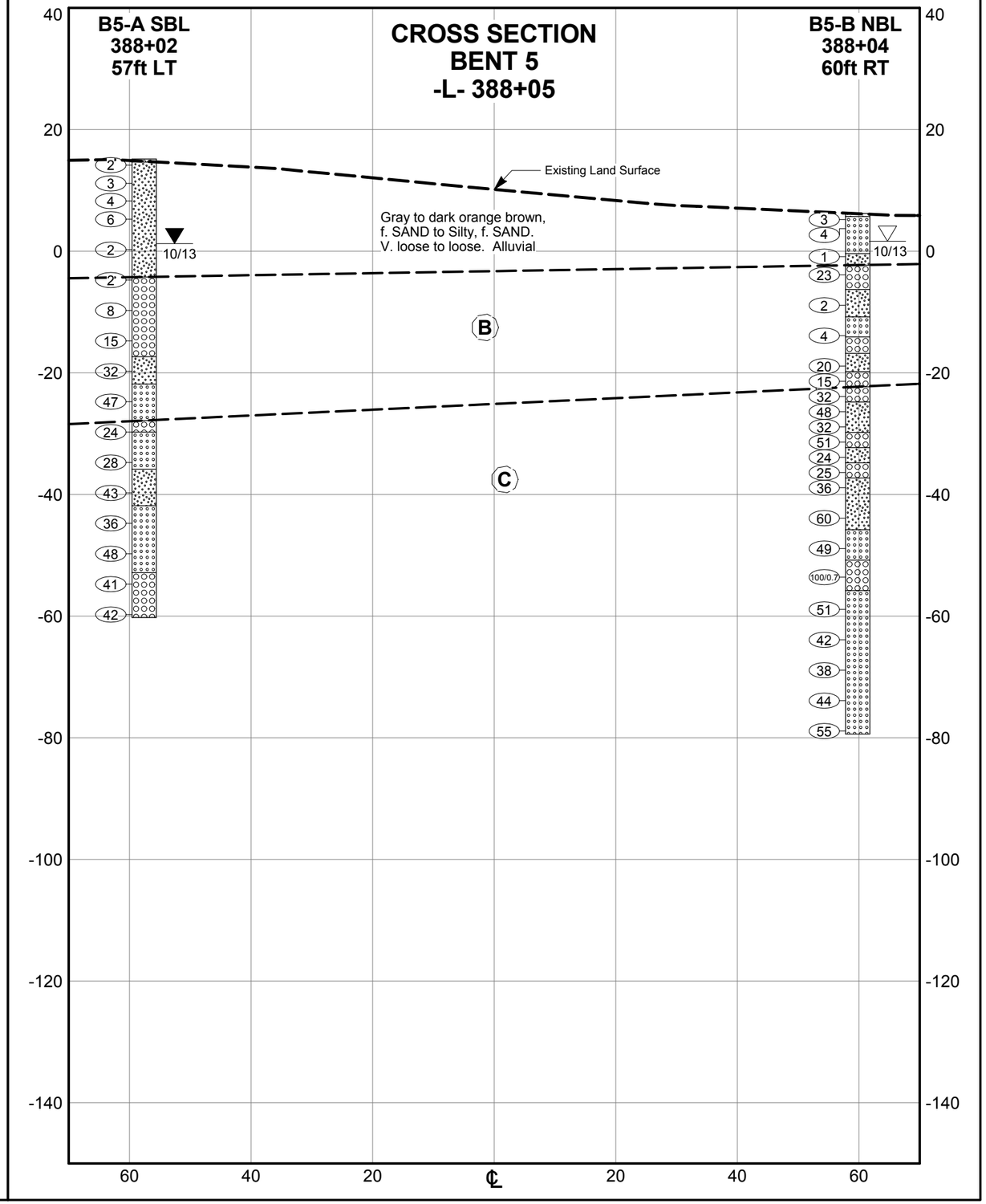
Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
213104.04

DESCRIPTION:	SHEET NO.:	12 of 41
Dual Bridges on -L- over the Trent River	PROJ. NO.:	34442.1.5
	TIP NO.:	R-2514D
	COUNTY:	Jones





V.E. = 1

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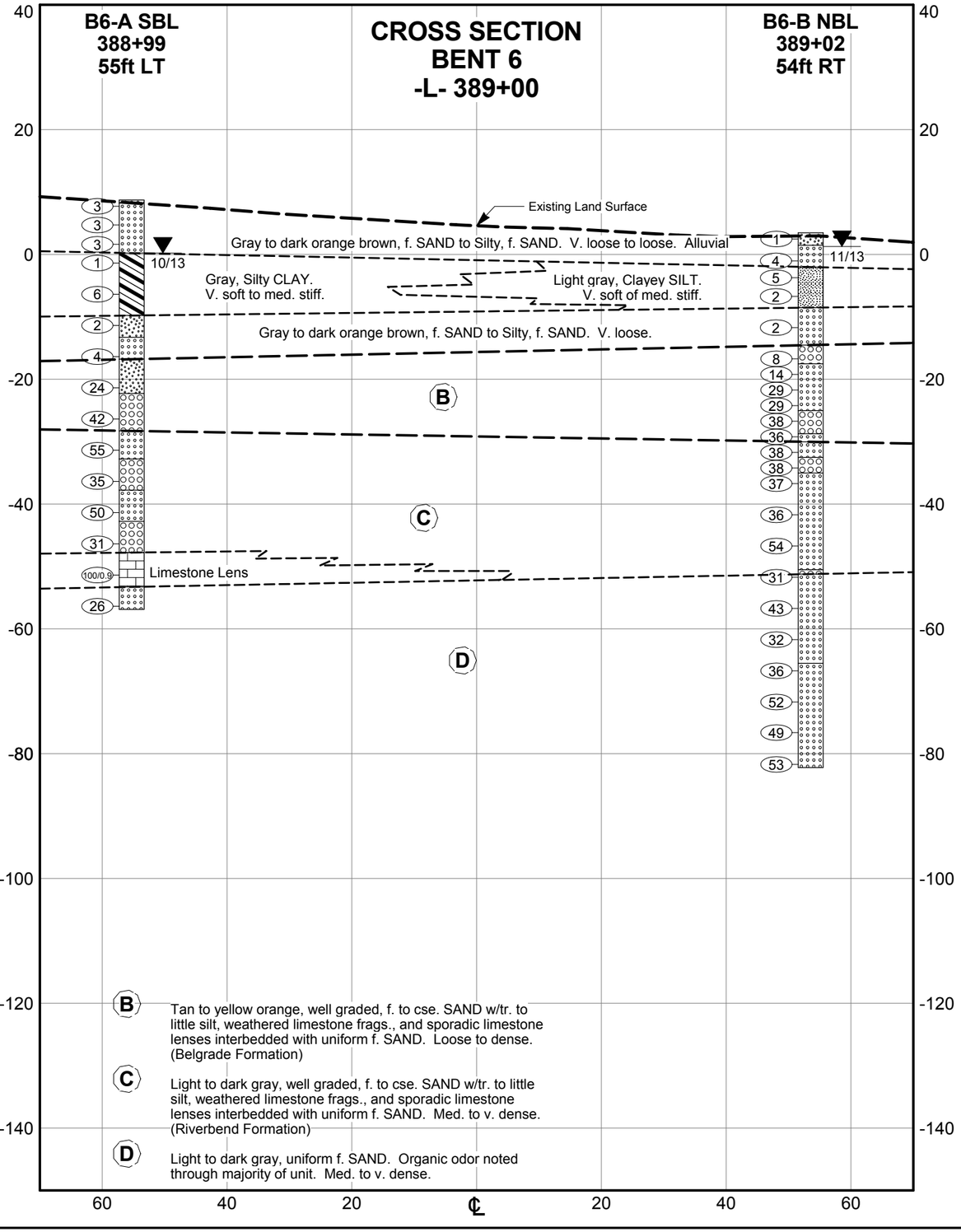
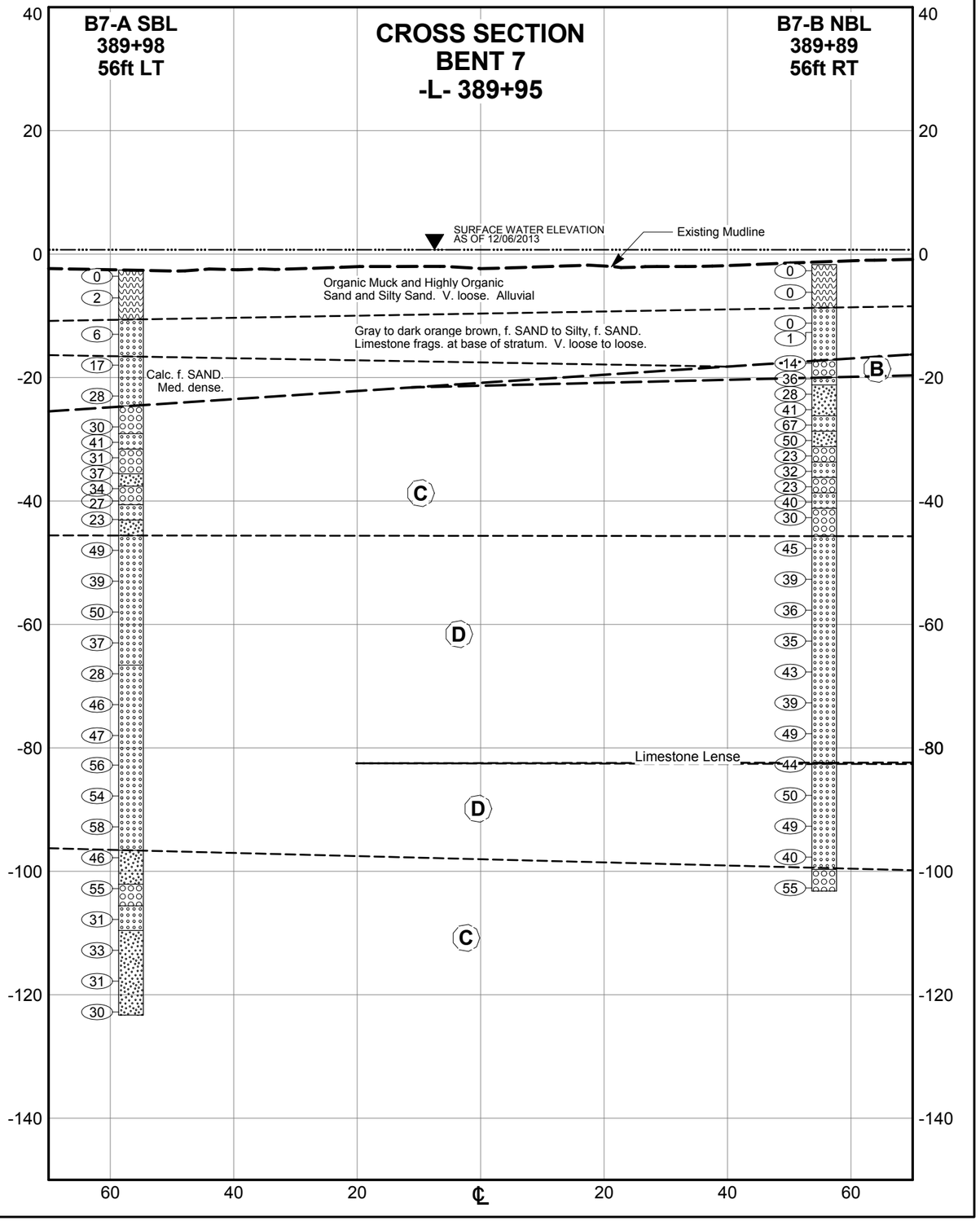
213104.04

DESCRIPTION:	SHEET NO.:	13 of 41
Dual Bridges on -L- over the Trent River	PROJ. NO.:	34442.1.5
	TIP NO.:	R-2514D
	COUNTY:	Jones





V.E. = 1

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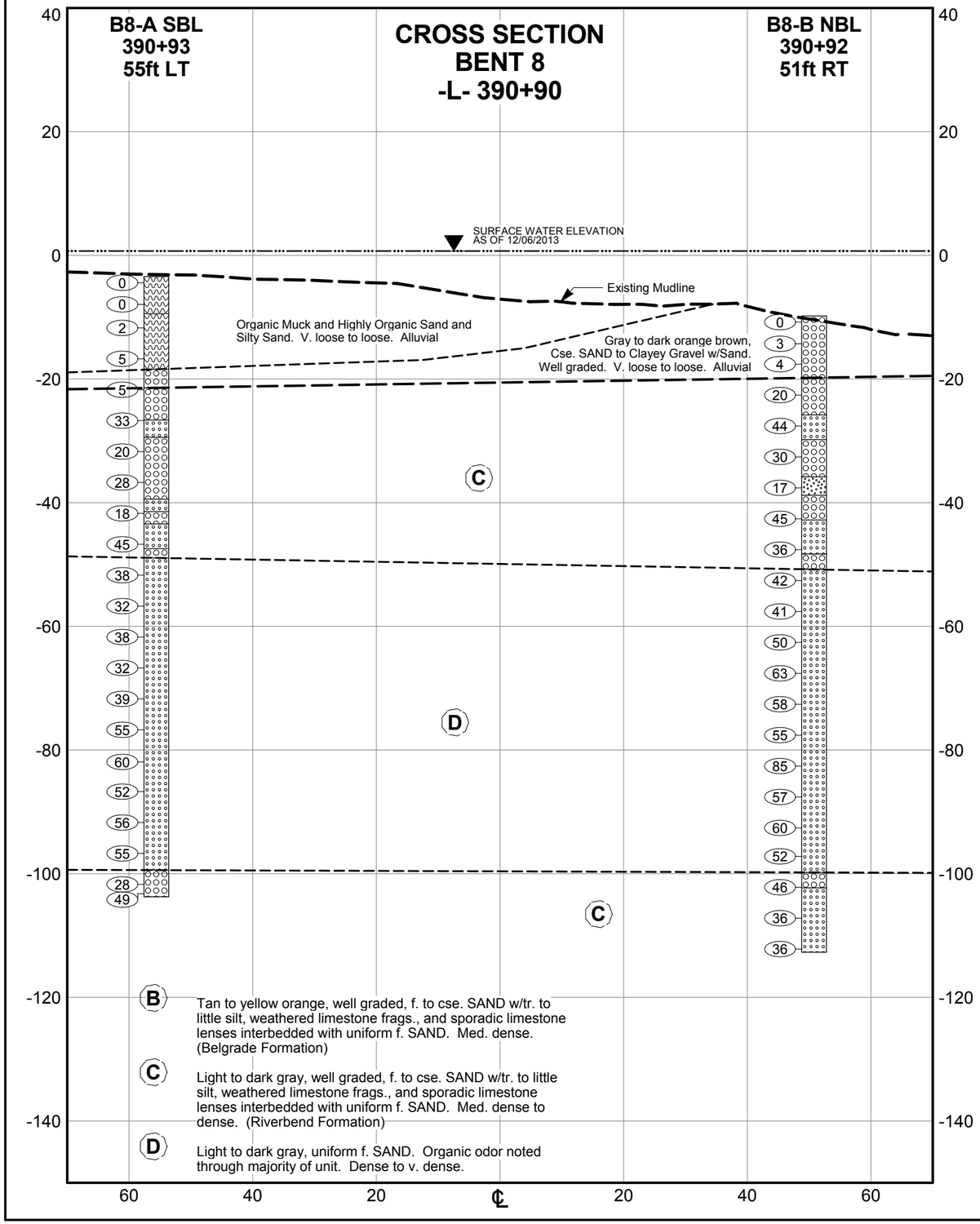
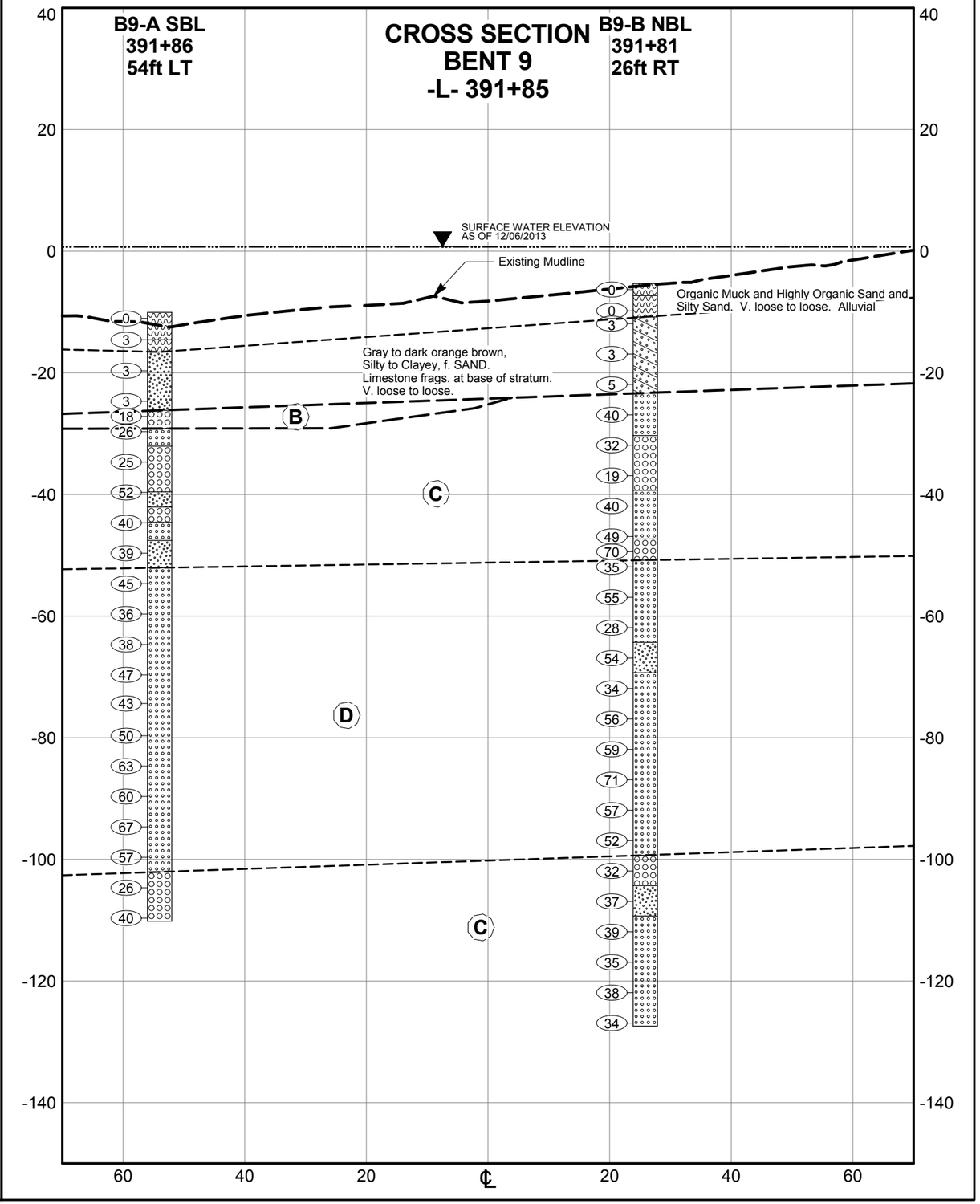
213104.04

DESCRIPTION: Dual Bridges on -L- over the Trent River

SHEET NO.:	14 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones



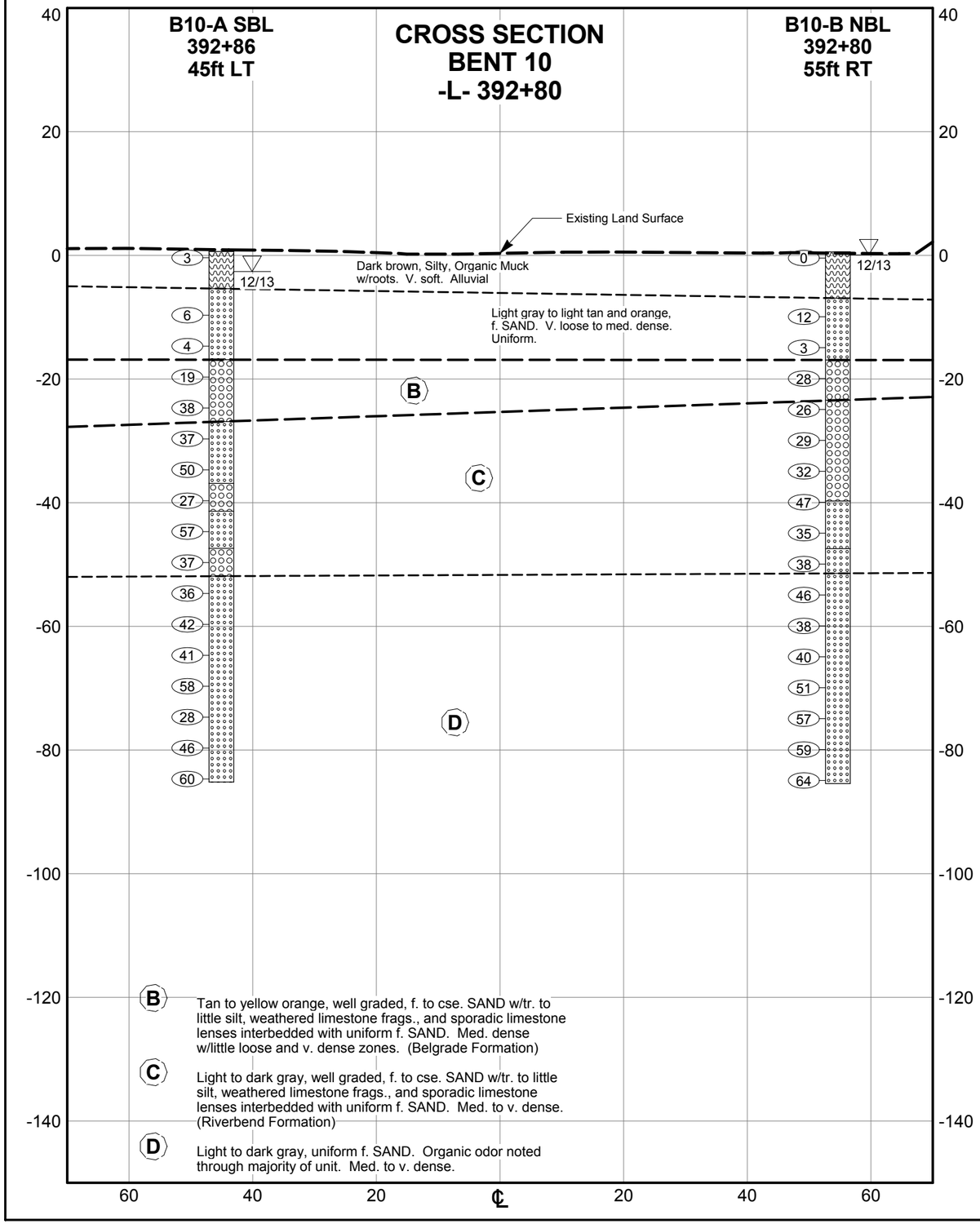


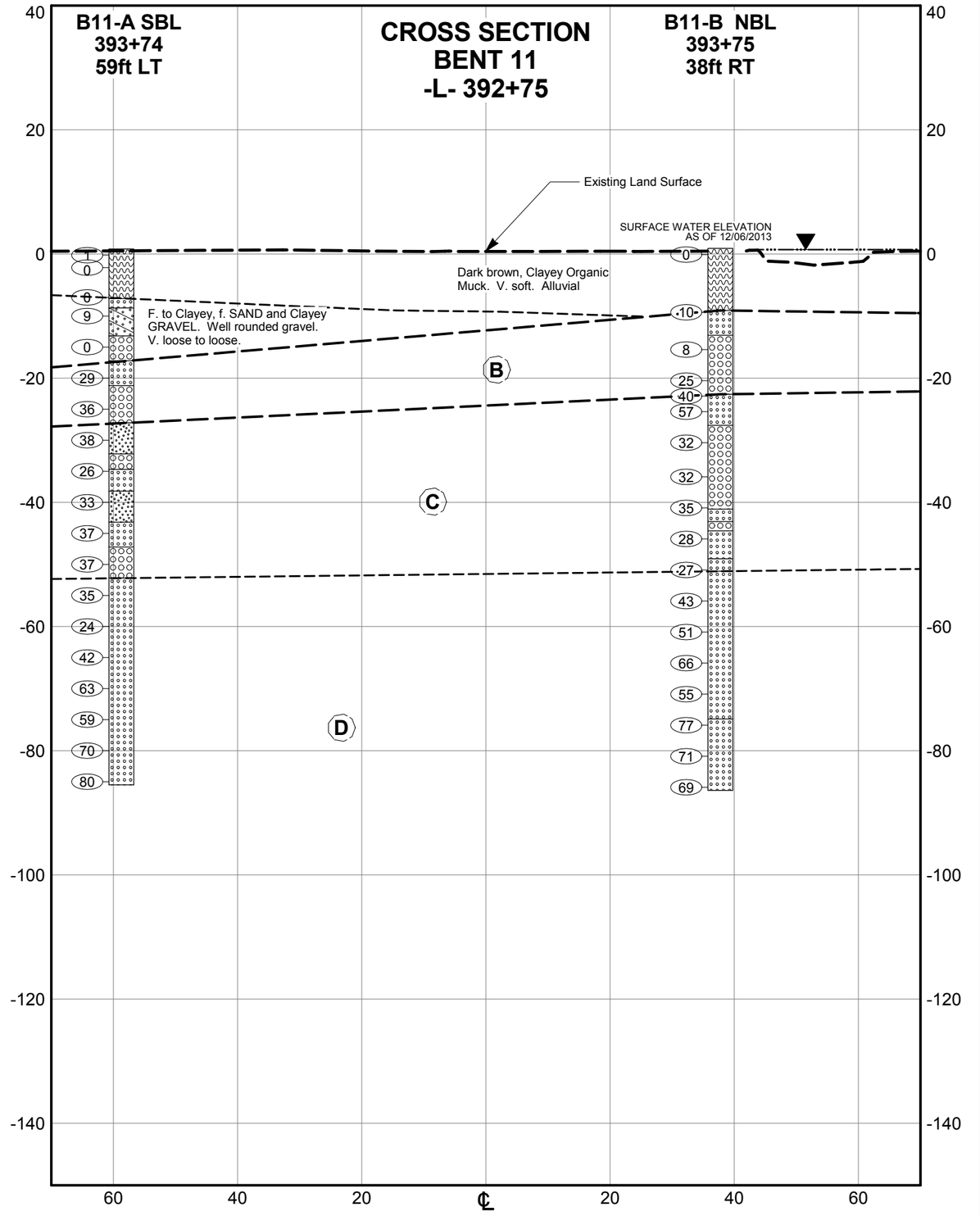
V.E. = 1

CATLIN Engineers and Scientists
220 Old Dairy Road
Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
213104.04

DESCRIPTION:	
Dual Bridges on -L- over the Trent River	

SHEET NO.:	15 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones





B — Tan to yellow orange, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Med. dense w/little loose and v. dense zones. (Belgrade Formation)

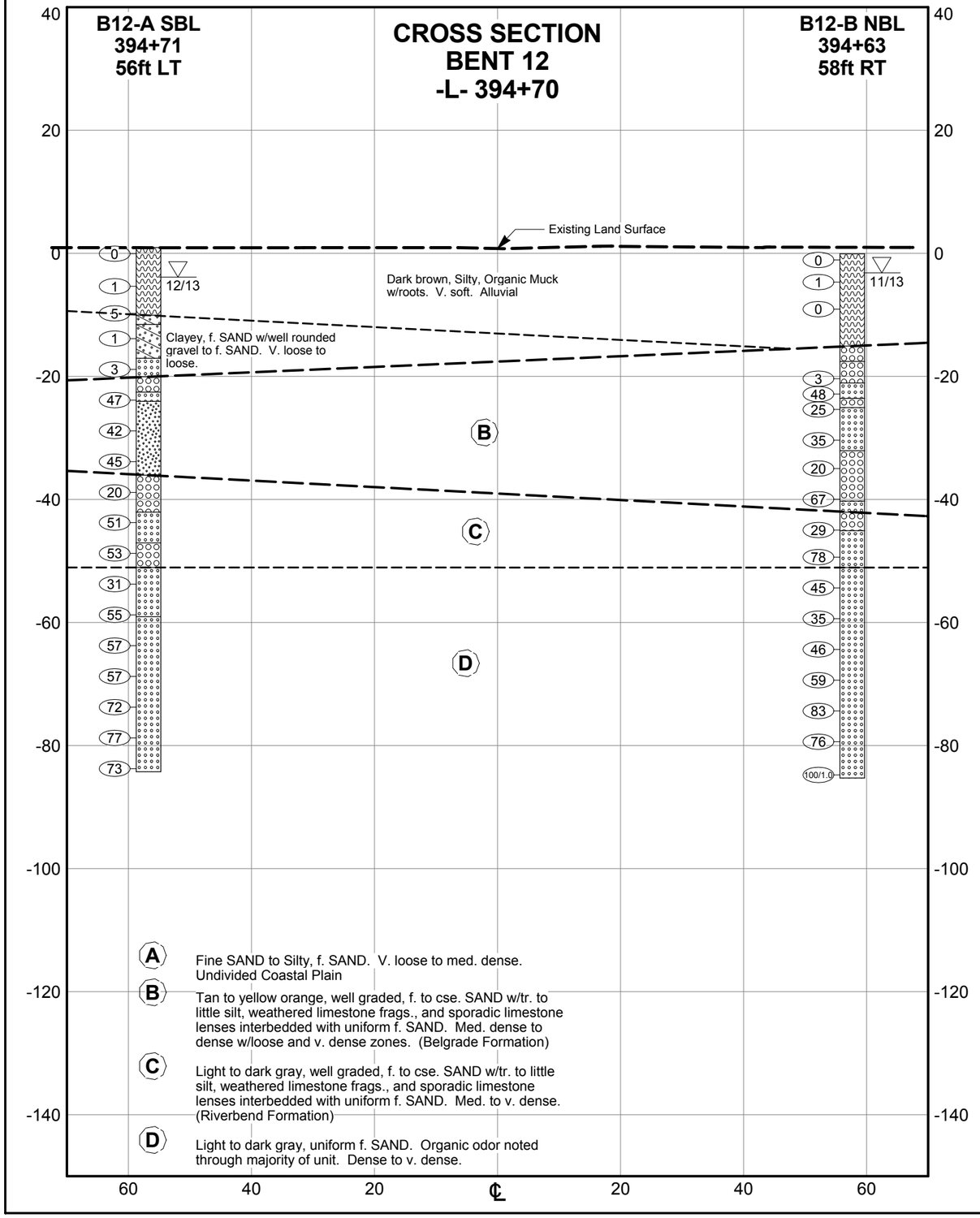
C — Light to dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses interbedded with uniform f. SAND. Med. to v. dense. (Riverbend Formation)

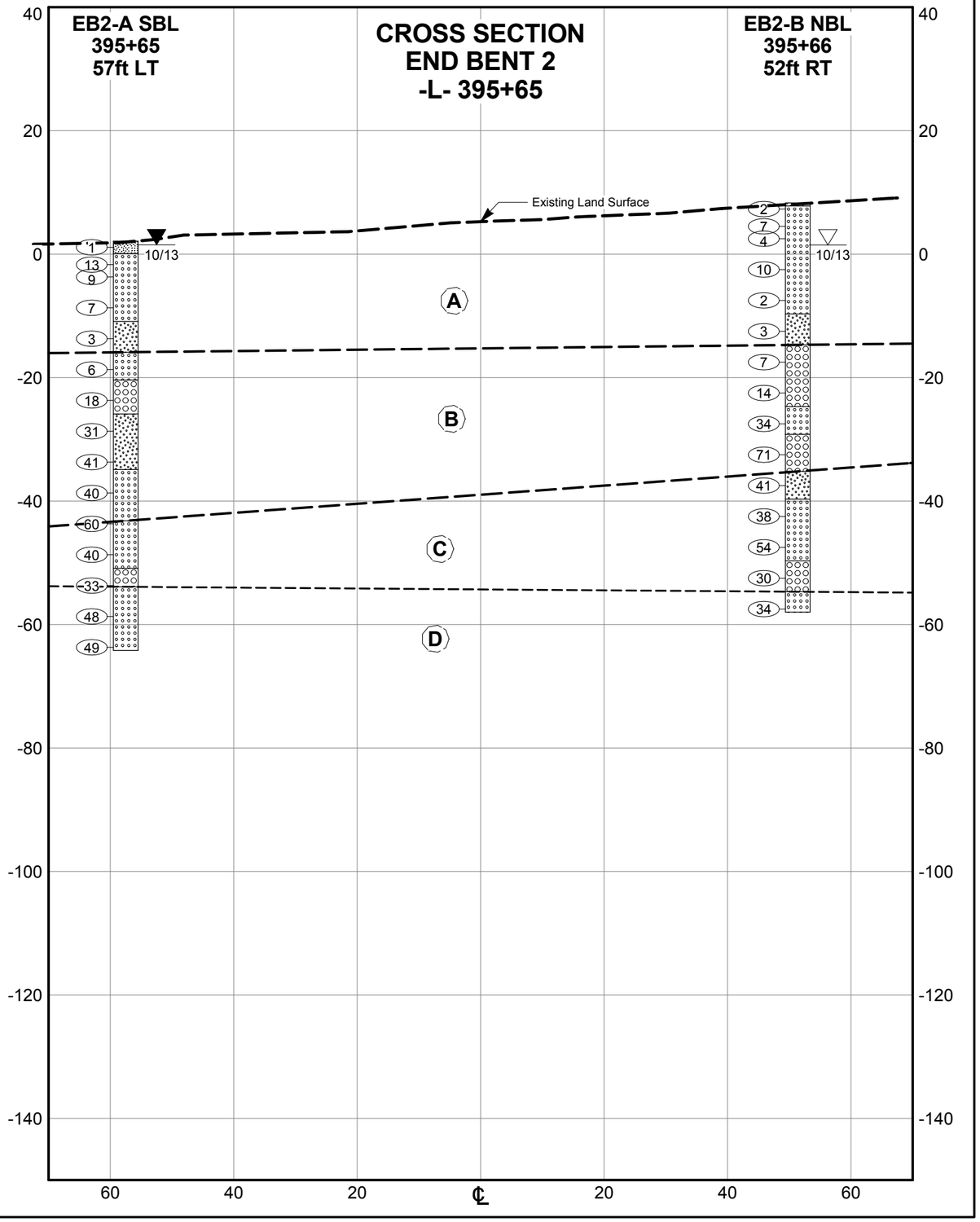
D — Light to dark gray, uniform f. SAND. Organic odor noted through majority of unit. Med. to v. dense.

V.E. = 1

CATLIN Engineers and Scientists
220 Old Dairy Road
Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
213104.04

DESCRIPTION:	Dual Bridges on -L- over the Trent River
SHEET NO.:	16 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones





NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

CATLIN Engineers and Scientists
220 Old Dairy Road
Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
213104.04

SHEET:	17 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5 | **TIP** R-2514D | **COUNTY** Jones | **GEOLOGIST** Chuck Brake

SITE DESCRIPTION Dual Bridges on -L- over the Trent River | **GROUND WTR (ft)**

BORING NO. EB1-A SBL | **STATION** 383+30 | **OFFSET** 57ft LT | **ALIGNMENT** -L- | **0 HR.** 7.6

COLLAR ELEV. 9.3 ft | **TOTAL DEPTH** 71.9 ft | **NORTHING** 465,478 | **EASTING** 2,530,503 | **24 HR.** FIAD

DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 77% 11/30/2012 | **DRILL METHOD** NW Casing w/ SPT | **HAMMER TYPE** Automatic

DRILLER D. T. Chalmers, Jr. | **START DATE** 10/16/13 | **COMP. DATE** 10/17/13 | **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										
	9.3	0.0	2	2	2	4		D		9.3 / 0.0 GROUND SURFACE UNDIVIDED COASTAL PLAIN Dark brown to tan, Silty, f. SAND.
5	5.3	4.0	2	2	3	5		D		
	0.9	8.4	2	3	2	5		D		-1.7 / 11.0 COASTAL PLAIN Light tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)
0										
-5	-4.1	13.4	11	16	27	43		Sat.		-6.7 / 16.0 Light tan to light orange, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. More friable than above.
-10	-9.1	18.4	4	7	9	16		Sat.		
-15	-14.1	23.4	13	15	13	28		Sat.		
-20	-19.1	28.4	3	10	16	26		Sat.		
-25	-24.1	33.4	6	7	11	18		Sat.		-25.1 / 34.4 Dark gray, f. SAND. (Riverbend Formation) / -27.2 / 36.5 Dark gray, Silty, f. SAND w/tr. weathered limestone frags. Gap graded.
-30	-29.1	38.4	6	5	13	18		Sat.		
-35	-34.1	43.4	15	9	12	21		Sat.		-32.7 / 42.0 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. / -36.7 / 46.0 Dark gray, f. SAND
-40	-39.1	48.4	13	17	23	40		Sat.		
-45	-44.1	53.4	23	15	12	27		Sat.		-42.2 / 51.5 Dark gray, Silty, f. SAND w/some limestone frags.
-50	-49.1	58.4	2	12	21	33		Sat.		-47.7 / 57.0 Well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. / -49.6 / 58.9 Dark gray, f. SAND. Uniform. / -52.7 / 62.0 Dark gray, Silty, f. SAND w/tr. weathered limestone frags.
-55	-54.1	63.4	14	31	26	57		Sat.		
-60	-59.1	68.4	64	36/.3		100/0.8		Sat.		-59.9 / 69.2 Indurated Limestone. Inferred from SPT and cuttings. / -60.7 / 70.0
	-61.1	70.4	16	25	26	51		Sat.		-62.6 / 71.9 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. Boring Terminated at Elevation -62.6 ft in well graded, f. to cse. SAND. (Riverbend Formation)

WBS 34442.1.5 | **TIP** R-2514D | **COUNTY** Jones | **GEOLOGIST** Chuck Brake

SITE DESCRIPTION Dual Bridges on -L- over the Trent River | **GROUND WTR (ft)**

BORING NO. EB1-B NBL | **STATION** 383+30 | **OFFSET** 57ft RT | **ALIGNMENT** -L- | **0 HR.** 8.3

COLLAR ELEV. 9.7 ft | **TOTAL DEPTH** 69.9 ft | **NORTHING** 465,465 | **EASTING** 2,530,617 | **24 HR.** 9.6

DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 77% 11/30/2012 | **DRILL METHOD** Mud Rotary | **HAMMER TYPE** Automatic

DRILLER D.T. Chalmers, Jr. | **START DATE** 10/14/13 | **COMP. DATE** 10/15/13 | **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										
	9.7	0.0	3	2	2	4		D		9.7 / 0.0 GROUND SURFACE UNDIVIDED COASTAL PLAIN Dark brown, Silty, f. SAND.
5	5.7	4.0	1	1	2	3		M		
	1.3	8.4	1	1	4	5		M		2.2 / 7.5 Med. orange, f. SAND. Uniform. / -0.1 / 9.8 COASTAL PLAIN Med. orange tan to tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. Rounded gravel (.01-.03 ft) noted in cuttings at 25.5 ft. BLS. (Belgrade Formation)
0										
-5	-3.7	13.4	16	11	9	20		Sat.		
-10	-8.7	18.4	10	15	14	29		Sat.		
-15	-13.7	23.4	11	15	10	25		Sat.		
-20	-18.7	28.4	9	14	13	27		Sat.		-23.7 / 33.4 Hammer Malfunction: Sample logged but blows ignored - redrive @ 35.4ft. / -25.3 / 35.0 Dark gray, Silty, f. SAND w/Weathered Limestone frags. throughout. Well graded. (Riverbend Formation)
-25	-23.7	33.4	18	13				Sat.		
-30	-25.7	35.4	16	21	24	45		Sat.		-32.3 / 42.0 Lt. gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. / -35.1 / 44.8 Dark gray, f. SAND.
-35	-28.7	38.4	18	29	26	55		Sat.		
-40	-33.7	43.4	13	17	22	39		Sat.		
-45	-38.7	48.4	10	23	37	60		Sat.		-42.3 / 52.0 Dark gray, Silty, f. SAND w/some weathered limestone frags. Well graded.
-50	-43.7	53.4	15	18	19	37		Sat.		-47.3 / 57.0 **Dark gray, f. SAND. Uniform.**
-55	-48.7	58.4	17	26	33	59		Sat.		-52.3 / 62.0 Dark gray, f. SAND w/tr. shell frags. interbedded w/thin (0.1ft) Limestone lenses.
-60	-53.7	63.4	22	75	25/.2	100/0.7		Sat.		-59.2 / 68.9 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. / -60.2 / 69.9 Boring Terminated at Elevation -60.2 ft in well graded, f. to cse. SAND. (Riverbend Formation)
	-58.7	68.4	76	9	13	22		Sat.		

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PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B1-A SBL	**STATION** 384+26	**OFFSET** 57ft LT	**ALIGNMENT** -L- **0 HR.** 8.8
COLLAR ELEV. 9.9 ft	**TOTAL DEPTH** 64.7 ft	**NORTHING** 465,573	**EASTING** 2,530,515 **24 HR.** 8.2
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 77% 11/30/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER D. T. Chalmers, Jr.	**START DATE** 10/17/13	**COMP. DATE** 10/17/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
									GROUND SURFACE	
10	9.9	0.0	2	2	2		D			0.0
									UNDIVIDED COASTAL PLAIN Orange brown to orange tan, Silty, f. SAND.	
5	5.9	4.0	2	3	3		M			
0	1.7	8.2	4	3	3		Sat.			
	-2.1	12.0								
-5	-3.3	13.2	10	1	7		Sat.		COASTAL PLAIN Orange tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. Gap graded. Driller noted 0.1ft thick harder lens at 12ft.	
-10	-8.3	18.2	5	4	60/.1		Sat.		(Belgrade Formation)	
	-9.4	19.3							Light tan, Limestone.	
	-11.1	21.0							Light tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-15	-13.3	23.2	10	5	10		Sat.			
-20	-18.3	28.2	9	13	11		Sat.			
	-21.1	31.0							Dark gray, Silty, f. SAND w/tr. weathered limestone. Well graded. (Riverbend Formation)	
-25	-23.3	33.2	24	39	42		Sat.			
-30	-28.3	38.2	12	19	27		Sat.			
	-31.6	41.5							Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-35	-33.3	43.2	7	12	21		Sat.			
	-35.6	45.5							Dark gray, f. SAND. Uniform.	
-40	-38.3	48.2	14	24	33		Sat.			
	-41.1	51.0							Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-45	-43.3	53.2	6	12	16		Sat.			
	-43.8	53.7							Dark gray, f. SAND. Uniform.	
	-48.5	58.4								
-50	-48.3	58.2	4	21	44		Sat.			
	-48.7	58.6							Limestone Lens Dark gray, f. SAND. Uniform.	
	-53.3	63.2	21	32	58		Sat.			
	-54.8	64.7							Boring Terminated at Elevation -54.8 ft in uniform f. SAND. (Riverbend Formation)	

BLOWS PER FOOT: 0 25 50 75 100

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B1-B NBL	**STATION** 384+25	**OFFSET** 57ft RT	**ALIGNMENT** -L- **0 HR.** 8.2
COLLAR ELEV. 9.6 ft	**TOTAL DEPTH** 69.9 ft	**NORTHING** 465,559	**EASTING** 2,530,628 **24 HR.** 8.1
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 77% 11/30/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER D.T. Chalmers, Jr.	**START DATE** 10/15/13	**COMP. DATE** 10/16/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
									GROUND SURFACE	
10	9.6	0.0	2	2	2		D			0.0
									UNDIVIDED COASTAL PLAIN Dark brown to orange tan, Silty, f. SAND.	
5	5.6	4.0	2	2	3		D			
0	1.2	8.4	2	1	1		Sat.			
-5	-3.8	13.4	WOH	WOH	WOH		Sat.			
-10	-8.8	18.4	16	24	22		Sat.			
	-9.3	18.9							COASTAL PLAIN Light orange tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	
-15	-13.8	23.4	6	6	5		Sat.			
-20	-18.8	28.4	10	18	15		Sat.			
-25	-23.8	33.4	8	13	24		Sat.			
	-27.4	37.0							Dark gray, f. SAND (Riverbend Formation)	
-30	-28.8	38.4	15	21	23		Sat.			
	-32.9	42.5							Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-35	-33.8	43.4	8	10	12		Sat.			
	-36.4	46.0							Dark gray, f. SAND	
-40	-38.8	48.4	16	29	42		Sat.			
	-47.4	57.0							Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-45	-43.8	53.4	7	15	30		Sat.			
	-48.8	58.4								
-50			8	18	12		Sat.			
	-51.9	61.5							Dark gray, f. SAND	
-55	-53.8	63.4	9	29	35		Sat.			
	-57.9	67.5							Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-60	-58.8	68.4	3	6	18		Sat.			
	-60.3	69.9							High shell frag. content. Boring Terminated at Elevation -60.3 ft in well graded, f. to cse. SAND. (Riverbend Formation)	

BLOWS PER FOOT: 0 25 50 75 100

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NCDOT GEOTECHNICAL ENGINEERING UNIT
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TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake	
SITE DESCRIPTION Dual Bridges on -L- over the Trent River				**GROUND WTR (ft)**
BORING NO. B2-A SBL	**STATION** 385+20	**OFFSET** 57ft LT	**ALIGNMENT** -L-	**0 HR.** 8.8
COLLAR ELEV. 10.4 ft	**TOTAL DEPTH** 65.5 ft	**NORTHING** 465,667	**EASTING** 2,530,526	**24 HR.** 8.8
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic	
DRILLER D. T. Chalmers, Jr.	**START DATE** 10/21/13	**COMP. DATE** 10/21/13	**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)
	10.4	0.0	2	2	2	4		D		GROUND SURFACE	0.0
	7.4	3.0	1	2	1	3		D		UNDIVIDED COASTAL PLAIN Dark brown, f. SAND. Uniform. Orange tan to light tan, f. SAND. Uniform.	1.0
	4.4	6.0	2	2	2	4					
	1.4	9.0	2	1	2	3		Sat.			
	-3.6	14.0	1	0	0	0		Sat.		COASTAL PLAIN Well rounded gravel (.01-.03 ft) in drill cuttings noted by driller. (Belgrade Formation) Orange, f. SAND. Uniform.	11.0 13.0 17.0
	-8.6	19.0	11	9	10	19		Sat.		Driller noted thin Limestone layers through interval. Light tan grading to light gray at base, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	18.0
	-13.6	24.0	3	12	9	21		Sat.			
	-18.6	29.0	12	14	12	26		Sat.			
	-23.6	34.0	10	15	19	34		Sat.		Orange tan, Silty, f. SAND w/tr. weathered limestone and shell frags. Gap graded.	32.0
	-28.6	39.0	11	23	28	51		Sat.		Dark gray, f. SAND Organic odor. (Riverbend Formation)	37.0
	-33.6	44.0	23	24	20	44		Sat.		Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	45.0
	-38.6	49.0	13	14	19	33		Sat.		Dark gray, f. SAND Organic odor.	47.5
	-43.6	54.0	10	17	14	31		Sat.		Dark gray, Silty, f. SAND w/tr. weathered limestone frags. Gap graded. Organic odor.	52.0
	-48.6	59.0	7	28	13	41		Sat.		Uniform, f. SAND Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	57.0 59.2
	-53.6	64.0	12	20	31	51		Sat.		Dark gray, f. SAND Organic odor.	62.5
								Sat.		Boring Terminated at Elevation -55.1 ft in uniform f. SAND. (Riverbend Formation)	65.5

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake	
SITE DESCRIPTION Dual Bridges on -L- over the Trent River				**GROUND WTR (ft)**
BORING NO. B2-B NBL	**STATION** 385+20	**OFFSET** 57ft RT	**ALIGNMENT** -L-	**0 HR.** 8.4
COLLAR ELEV. 10.3 ft	**TOTAL DEPTH** 64.9 ft	**NORTHING** 465,653	**EASTING** 2,530,639	**24 HR.** 8.6
DRILL RIG/HAMMER EFF./DATE CAT1303 CME-550 77% 11/30/2012		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER D.T. Chalmers, Jr.	**START DATE** 10/16/13	**COMP. DATE** 10/16/13	**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	DEPTH (ft)
	10.3	0.0	3	3	3	6		D		GROUND SURFACE	0.0
	6.3	4.0	3	4	5	9		M		UNDIVIDED COASTAL PLAIN Light to dark tan, Silty, f. SAND. Light orange tan to tan, f. SAND.	0.6
	1.9	8.4	5	5	4	9		Sat.			
	-3.1	13.4	7	7	14	21		Sat.		COASTAL PLAIN Orange tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	11.0
	-8.1	18.4	7	9	9	18		Sat.			
	-13.1	23.4	22	11	8	19		Sat.		Indurated Lens of tan Limestone.	23.9 24.4
	-18.1	28.4	6	8	7	15		Sat.		Orange tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
	-23.1	33.4	7	10	10	20		Sat.		Dark gray, Silty, f. SAND w/interbedded weathered limestone. (Riverbend Formation)	32.0
	-28.6	38.9	13	22	54	76		Sat.		Dark gray, f. SAND	36.5
	-33.1	43.4	11	12	16	28		Sat.		Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	42.5
	-38.1	48.4	17	21	14	35		Sat.		Dark gray, Silty, f. SAND w/weathered limestone lenses.	47.0
	-43.1	53.4	7	25	27	52		Sat.		Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	55.5
	-48.1	58.4	27	24	12	36		Sat.		Dark gray, f. SAND	61.5
	-53.1	63.4	10	20	26	46		Sat.		Dark gray, Weathered Limestone. Dark gray, f. SAND Boring Terminated at Elevation -54.6 ft in uniform f. SAND. (Riverbend Formation)	63.7 63.9 64.9

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TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B3-A SBL	**STATION** 386+13	**OFFSET** 53ft LT	**ALIGNMENT** -L-	**0 HR.** 11.2
COLLAR ELEV. 12.8 ft	**TOTAL DEPTH** 69.9 ft	**NORTHING** 465,759	**EASTING** 2,530,541	**24 HR.** 11.2
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER D.T. Chalmers, Jr.	**START DATE** 10/22/13	**COMP. DATE** 10/22/13	**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)
	12.8	0.0	2	1	2	3		D		12.8 GROUND SURFACE	0.0
										UNDIVIDED COASTAL PLAIN Dark brown to light tan, f. SAND. Uniform.	
10	9.8	3.0	2	2	2	4		D			
	6.8	6.0	2	2	3	5		M			
5	3.8	9.0	2	2	4	6		Sat.			
0	-1.2	14.0	WOH	1	2	3				0.3 COASTAL PLAIN	12.5
								Sat.		Light tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	
-5	-6.2	19.0	13	60	28	88		Sat.		-6.7 Orange tan, Silty, f. to cse. SAND layer.	19.5
-10	-11.2	24.0	14	11	5	16		Sat.		-7.3	20.1
-15	-16.2	29.0	11	9	20	29		Sat.		-17.3 Orange tan, Silty, f. SAND w/some weathered limestone frags. Well graded.	30.1
-20	-21.2	34.0	7	11	16	27		Sat.		-22.2 Dark gray, Silty, f. SAND w/tr. weathered limestone and shell frags. (Riverbend Formation)	35.0
-25	-26.2	39.0	9	17	26	43		Sat.		-24.7 Dark gray, f. SAND. Uniform w/organic odor.	37.5
-30	-31.2	44.0	10	18	15	33		Sat.		-31.7 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	44.5
-35	-36.2	49.0	15	23	27	50		Sat.		-35.2 Dark gray, f. SAND. Uniform w/organic odor.	48.0
-40	-41.2	54.0	9	12	14	26		Sat.		-39.2 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	52.0
-45	-46.2	59.0	9	13	13	26		Sat.		-41.5 -42.3 Dark gray, f. SAND. Uniform. Dark gray, Silty, f. SAND w/weathered limestone frags. Gap graded.	54.3 55.1
-50	-51.2	64.0	15	29	39	68		Sat.		-48.2	61.0
-55	-56.2	69.0	31	69/.4		100/0.9		Sat.		-54.2 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. -57.1 Boring Terminated with Standard Penetration Test Refusal at Elevation -57.1 ft in f. to cse. SAND (Riverbend Formation)	67.0 69.9

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B3-B NBL	**STATION** 386+14	**OFFSET** 59ft RT	**ALIGNMENT** -L-	**0 HR.** 11.0 Caved
COLLAR ELEV. 12.3 ft	**TOTAL DEPTH** 70.5 ft	**NORTHING** 465,746	**EASTING** 2,530,652	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER D.T. Chalmers, Jr.	**START DATE** 10/31/13	**COMP. DATE** 10/31/13	**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
	12.3	0.0	1	1	2	3		D		12.3 GROUND SURFACE 0.0
	11.8	0.5								UNDIVIDED COASTAL PLAIN Dark brown, f. SAND. High organic content. Uniform.
10	9.3	3.0	2	1	2	3		D		
	6.3	6.0	2	2	3	5		D		7.3 Dark brown to light gray, Silty, f. SAND. 5.0
5	3.3	9.0	2	2	3	5		M		Light gray, f. SAND. Uniform.
0	-1.7	14.0	60/0			60/0.0				-1.7 14.0
	-2.5	14.8	10	18	18	36				-1.9 COASTAL PLAIN 14.2
-5	-6.7	19.0	5	20	13	33		Sat.		No return. Cuttings suggest Silty, Limestone. Driller noted 0.2ft thick Lens. (Belgrade Formation).
	-9.2	21.5	5	4	5	9		Sat.		Orange tan to tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
-10	-11.7	24.0	7	16	9	25		Sat.		
	-14.2	26.5	20	13	14	27		Sat.		
-15	-16.7	29.0	7	10	11	21		Sat.		
	-19.2	31.5	32	10	12	22		Sat.		
-20	-21.7	34.0	7	9	11	20		Sat.		-23.1 Dark gray, f. SAND. Uniform. (Riverbend Formation) 35.4
	-24.2	36.5	28	19	21	40		Sat.		
-25	-26.7	39.0	13	9	14	23		Sat.		-29.7 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. 42.0
	-31.7	44.0	12	11	7	18		Sat.		
-30	-36.7	49.0	21	21	14	35		Sat.		-39.7 Dark gray, f. SAND. Uniform. 52.0
-35	-41.7	54.0	10	20	26	46		Sat.		
-40	-46.7	59.0	19	13	13	26		Sat.		-45.7 Gray, Silty, f. SAND w/some shell frags. 58.0
-45	-51.7	64.0	18	26	39	65		Sat.		-49.7 Dark gray, f. SAND. Uniform. 62.0
-50	-56.7	69.0	40	15	20	35		Sat.		-54.7 Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. 67.0
-55								Sat.		-57.2 -58.2 Gray, f. SAND. Uniform. Boring Terminated at Elevation -58.2 ft in uniform f. SAND. (Riverbend Formation) 69.5 70.5

NCDOT BORE DOUBLE 213104.04 NCDOT-TRENT-RIVER.GPJ CATLIN.GDT 2/4/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake	
SITE DESCRIPTION Dual Bridges on -L- over the Trent River				**GROUND WTR (ft)**
BORING NO. B4-A SBL	**STATION** 387+12	**OFFSET** 57ft LT	**ALIGNMENT** -L-	**0 HR.** 12.9
COLLAR ELEV. 14.7 ft	**TOTAL DEPTH** 70.0 ft	**NORTHING** 465,858	**EASTING** 2,530,549	**24 HR.** 12.9
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
DRILLER N/A	**START DATE** 10/23/13	**COMP. DATE** 10/23/13	**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)
										14.7 GROUND SURFACE	0.0
	14.7	0.0	2	1	2	3		D		13.7 UNDIVIDED COASTAL PLAIN Dark brown, f. SAND w/organics.	1.0
	12.7	2.0	2	3	3	6		D		Light yellow tan, f. SAND. Uniform.	
10											
	8.7	6.0	2	2	3	5		Sat.			
5	5.7	9.0	2	3	2	5		Sat.			
0	0.7	14.0	2	2	2	4		Sat.			
	-4.3	19.0	WOH	WOH	WOH	0		Sat.		-3.3 Orange tan, Clayey SILT.	18.0
-10	-9.3	24.0	3	7	8	15		Sat.		-9.8 COASTAL PLAIN Light tan to white, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	24.5
-15	-14.3	29.0	7	14	12	26		Sat.		-14.8 Orange tan, Silty, f. SAND w/some weathered limestone frags.	29.5
-20	-19.3	34.0	16	14	12	26		Sat.		-17.8 Light orange tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	32.5
-25	-24.3	39.0	17	12	14	26		Sat.		-22.3 Dark gay, Silty, f. SAND w/tr. weathered limestone frags. Gap graded. (Riverbend Formation)	37.0
-30	-29.3	44.0	21	19	23	42		Sat.		-27.3 Dark gray, f. SAND. Uniform. Organic odor.	42.0
-35	-34.3	49.0	17	24	36	60		Sat.			
-40	-39.3	54.0	14	22	19	41		Sat.		-37.3 Dark gray, Silty, f. SAND w/tr. weathered limestone frags.	52.0
-45	-44.3	59.0	12	17	20	37		Sat.		-42.3 Dark gray, Silty, f. SAND w/some weathered limestone frags. Gap graded.	57.0
-50	-49.3	64.0	10	19	24	43		Sat.		-47.8 Dark gray, f. SAND. Uniform. Organic odor.	62.5
-55	-54.3	69.0	33	67/.5		100/1.0		Sat.		-52.3 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	67.0
										-55.3 Boring Terminated with Standard Penetration Test Refusal at Elevation -55.3 ft in well graded, f. to cse. SAND. (Riverbend Formation)	70.0

NCDOT BORE DOUBLE 213104.04_NCDOT TRENT RIVER.GPJ CATLIN.GDT 12/24/13

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PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

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PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B4-B NBL	**STATION** 387+11	**OFFSET** 55ft RT	**ALIGNMENT** -L- / **0 HR.** 10.9
COLLAR ELEV. 11.9 ft	**TOTAL DEPTH** 85.5 ft	**NORTHING** 465,843	**EASTING** 2,530,660 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Automatic
DRILLER D. T. Chalmers, Jr.	**START DATE** 10/29/13	**COMP. DATE** 10/31/13	**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											
	11.9	0.0								GROUND SURFACE	0.0
			1	1	2	3		D		UNDIVIDED COASTAL PLAIN Dark brown, Silty, f. SAND. High root content.	0.4
10	9.9	2.0	2	2	1	3		D		Light tan, f. SAND.	
	5.9	6.0								6.9	5.0
			2	2	2	4		M		Dark orange tan, Silty, f. SAND.	
5	2.9	9.0								3.9	8.0
			3	2	3	5		Sat.		Light tan gray, f. SAND.	
0											
	-1.6	13.4								-1.2	13.0
			21	12	8	20		Sat.		COASTAL PLAIN Light tan to orange tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	
-5	-4.7	16.5									
			10	6	11	17		Sat.			
	-7.2	19.0									
			13	13	11	24		Sat.			
-10	-9.7	21.5									
			10	10	13	23		Sat.			
	-12.2	24.0								-12.7	24.5
			23	11	11	22		Sat.		-13.8 Light tan, Cemented f. SAND (Limestone).	25.6
-15										Tan to yellowish orange, Foss. Sandy Limestone. Thin (<0.2ft) mod. indurated lenses interbedded with friable Weathered Limestone lenses.	
-20										-19.8	31.6
										-20.2 Gray, Cemented f. Sand (Limestone). (Riverbend Formation)	32.0
										Dark gray, uniform f. SAND w/tr. weathered limestone frags.	
-25	-25.0	36.8								-23.8	35.6
			12	24	26	50		Sat.			
	-27.2	39.0								-26.7	38.5
			17	13	16	29		Sat.		Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-30	-29.7	41.5								-29.2	41.0
			14	19	15	34		Sat.		-30.2 Dark gray, f. SAND. Uniform.	42.0
	-32.2	44.0								-31.7	43.5
			12	18	23	41		Sat.		Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-35										Dark gray, f. SAND. Uniform.	
	-37.2	49.0									
			17	24	26	50		Sat.			
-40											
	-42.2	54.0								-40.7	52.5
			14	14	21	35		Sat.		Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-45											
	-47.2	59.0								-45.7	57.5
			21	17	29	46		Sat.		Dark gray, f. SAND. Uniform.	
-50											
	-52.2	64.0								-50.2	62.0
			29	28	30	58		Sat.		Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-55											
	-57.2	69.0								-55.2	67.0
			11	13	13	26		Sat.		Dark gray to gray, f. SAND. Uniform.	
-60											
	-62.2	74.0									
			13	15	16	31		Sat.			
-65											

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	79.0								Dark gray to gray, f. SAND. Uniform. *(continued)*
			12	12	16	28		Sat.		
-70										
	-72.2	84.0								
			20	20	34	54		Sat.		
										-73.7 85.5
										Boring Terminated at Elevation -73.7 ft in uniform f. SAND. (Riverbend Formation)

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B4-B NBL	**STATION** 387+11	**OFFSET** 55ft RT	**ALIGNMENT** -L-	**0 HR.** 10.9
COLLAR ELEV. 11.9 ft	**TOTAL DEPTH** 85.5 ft	**NORTHING** 465,843	**EASTING** 2,530,660	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** NW Casing W/SPT & Core	**HAMMER TYPE** Automatic
DRILLER D.T. Chalmers, Jr.	**START DATE** 10/29/13	**COMP. DATE** 10/31/13	**SURFACE WATER DEPTH** N/A
CORE SIZE N	**TOTAL RUN** 10.0 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)
-13.75											Begin Coring @ 25.6 ft		
-15	-13.8	25.6	5.0	2:30/1.0 0:59/1.0 0:30/1.0 0:47/1.0 0:49/1.0	(2.3) 46%			(2.3) 38%			Light tan, Limestone w/high porosity from shell casts. Interlayers and inclusions of silt. Silt is approximately 25% of rock. (Silty, Molluscan Cast, Biomic Rudite)	-13.8	25.6
-20	-18.8	30.6	5.0	0:45/1.0 1:55/1.0 0:33/1.0 0:32/1.0 0:32/1.0	(1.0) 20%			(1.0) 20%				-19.8	31.6
-25	-23.8	35.6									Dark gray, Cemented f. SAND.	-20.2	32.0
-30												-23.8	35.6
-35													
-40													
-45													
-50													
-55													
-60													
-65													
-70													

NCDOT CORE DOUBLE 213104.04 NCDOT-TRENT-RIVER.GPJ CATLIN.GDT 12/20/13

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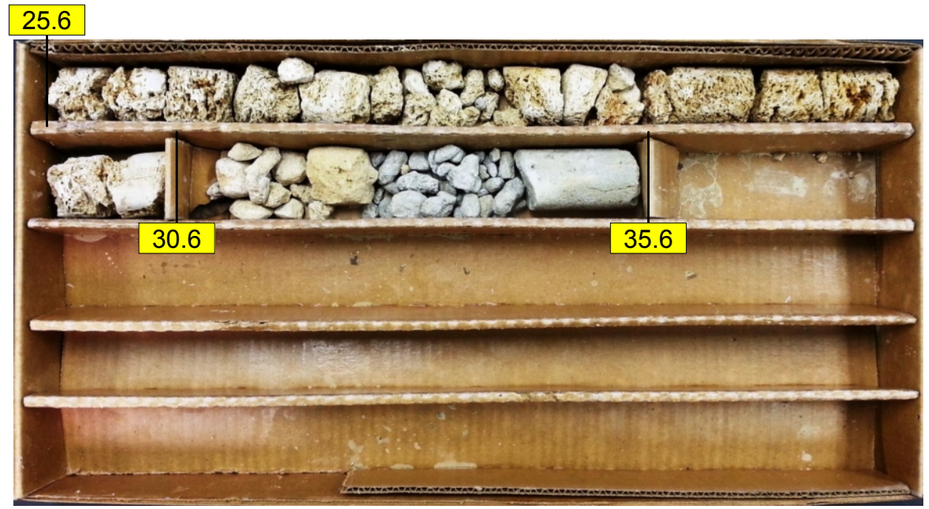
B4-B NBL
BOX 1 of 1
ELEV. -13.75 to -18.75 FT



0.0 1.0 2.0
SCALE IN FEET

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PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B5-A SBL	**STATION** 388+02	**OFFSET** 57ft LT	**ALIGNMENT** -L- — **0 HR.** 14.4
COLLAR ELEV. 15.2 ft	**TOTAL DEPTH** 75.4 ft	**NORTHING** 465,947	**EASTING** 2,530,559 — **24 HR.** 13.9
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER D. T. Chalmers, Jr.	**START DATE** 10/23/13	**COMP. DATE** 10/23/13	**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											
15	15.2	0.0	1	1	1	2		D		15.2 GROUND SURFACE	0.0
	12.2	3.0	2	1	2	3		D		14.7 UNDIVIDED COASTAL PLAIN Dark brown, Highly organic Silty, f. SAND. Tan to light tan, Silty, f. SAND w/some mottling at 4ft. BLS.	0.5
10	9.3	5.9	2	2	2	4		M			
	6.3	8.9	3	2	4	6		M			
5											
	1.3	13.9	2	1	1	2		Sat.			
0											
	-3.8	18.9	WOH	1	1	2		Sat.		-4.3 COASTAL PLAIN Light tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	19.4
-5											
	-8.8	23.9	4	3	5	8		Sat.			
-10											
	-13.8	28.9	5	6	9	15		Sat.			
-15											
	-18.8	33.9	10	20	12	32		Sat.		-17.4 Light orange tan, Silty, f. SAND w/some weathered limestone. Well graded.	32.5
-20											
	-23.8	38.9	13	20	27	47		Sat.		-21.9 Light tan, f. SAND. Uniform.	37.0
-25											
	-28.8	43.9	8	8	16	24		Sat.		-27.9 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Riverbend Formation)	43.0
-30										-29.8 Dark gray, f. SAND. Uniform.	44.9
	-33.8	48.9	16	14	14	28		Sat.			
-35											
	-38.8	53.9	8	18	25	43		Sat.		-35.9 Dark gray, Silty, f. SAND w/weathered limestone and shell frags.	51.0
-40											
	-43.8	58.9	15	19	17	36		Sat.		-41.9 Dark gray, f. SAND. Uniform.	57.0
-45											
	-48.8	63.9	9	21	27	48		Sat.			
-50											
	-53.8	68.9	23	29	12	41		Sat.		-52.9 Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	68.0
-55											
	-58.8	73.9	6	15	27	42		Sat.			
-60											

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B5-A SBL	**STATION** 388+02	**OFFSET** 57ft LT	**ALIGNMENT** -L- — **0 HR.** 14.4
COLLAR ELEV. 15.2 ft	**TOTAL DEPTH** 75.4 ft	**NORTHING** 465,947	**EASTING** 2,530,559 — **24 HR.** 13.9
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER D.T. Chalmers, Jr.	**START DATE** 10/23/13	**COMP. DATE** 10/23/13	**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						Match Line				-60.3 Boring Terminated at Elevation -60.3 ft in well graded, f. to cse. SAND. (Riverbend Formation) 75.4

NCDOT BORE DOUBLE 213104.04 NCDOT-TRENT-RIVER.GPJ CATLIN.GDT 12/20/13

NCDOT GEOTECHNICAL ENGINEERING UNIT
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TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B5-B NBL	**STATION** 388+04	**OFFSET** 60ft RT	**ALIGNMENT** -L-	**0 HR.** 4.6 Caved
COLLAR ELEV. 6.2 ft	**TOTAL DEPTH** 85.6 ft	**NORTHING** 465,935	**EASTING** 2,530,676	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER D. T. Chalmers, Jr.	**START DATE** 10/28/13	**COMP. DATE** 10/29/13	**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	6.2	0.0	2	2	1	3 4		D		GROUND SURFACE	0.0
	4.7	1.5	1	2	2			D		6.2 / UNDIVIDED COASTAL PLAIN Dark brown, Silty, f. SAND. High organic/root content. Dark to light tan, f. SAND. Uniform.	0.5
0	0.1	6.1	1	0	1	1		Sat.		-0.4 / Orange, Silty, f. SAND w/tr. well rounded gravel (0.01-0.03ft).	6.6
	-2.9	9.1	8	12	11	23		Sat.		-2.3 / COASTAL PLAIN Light tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	8.5
-5	-7.9	14.1	1	1	1	2		Sat.		-6.3 / Dark orange brown, Silty, f. SAND.	12.5
-10	-12.9	19.1	WOH	1	3	4		Sat.		-10.8 / Light tan, f. SAND. Uniform.	17.0
-15	-17.9	24.1	8	11	9	20		Sat.		-14.1 / Light tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	20.3
-20	-20.4	26.6	7	7	8	15		Sat.		-16.8 / Light tan, Silty, f. SAND w/tr. weathered limestone. Gap graded.	23.0
	-22.9	29.1	5	12	20	32		Sat.		-19.8 / Light tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	26.0
-25	-25.4	31.6	21	28	20	48		Sat.		-22.3 / Dark gray, Silty, Weathered Limestone. Some shell frags.. (Riverbend Formation)	28.5
	-27.9	34.1	7	14	18	32		Sat.		-24.8 / Dark gray, Silty, f. SAND w/weathered limestone frags. Calc.	31.0
-30	-30.4	36.6	8	26	25	51		Sat.		-29.8 / Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	36.0
	-32.9	39.1	6	7	17	24		Sat.		-32.3 / Gray, Silty, f. SAND w/tr. weathered limestone.	38.5
-35	-35.4	41.6	10	11	14	25		Sat.		-34.8 / Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	41.0
	-37.9	44.1	6	16	20	36		Sat.		-37.3 / Dark gray, Silty, f. SAND w/tr. weathered limestone frags. Organic odor.	43.5
-40	-42.9	49.1	12	33	27	60		Sat.			
-45	-47.9	54.1	14	24	25	49		Sat.		-45.8 / Dark gray, f. SAND. Uniform. Organic odor.	52.0
-50	-52.9	59.1	57	43/.2		100/0.7		Sat.		-50.8 / Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	57.0
-55	-57.9	64.1	12	23	28	51		Sat.		-55.8 / Gray to dark gray, f. SAND. Uniform.	62.0
-60	-62.9	69.1	13	17	25	42		Sat.			
-65	-67.9	74.1	9	14	24	38		Sat.			
-70											

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				Gray to dark gray, f. SAND. Uniform. *(continued)*
-75	-72.9	79.1	12	21	23	44		Sat.		
	-77.9	84.1	18	26	29	55		Sat.		-79.4 / Boring Terminated at Elevation -79.4 ft in uniform f. SAND. (Riverbend Formation) 85.6

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake	
SITE DESCRIPTION Dual Bridges on -L- over the Trent River				**GROUND WTR (ft)**
BORING NO. B6-A SBL	**STATION** 388+99	**OFFSET** 55ft LT	**ALIGNMENT** -L-	**0 HR.** 9.9
COLLAR ELEV. 8.7 ft	**TOTAL DEPTH** 65.6 ft	**NORTHING** 466,043	**EASTING** 2,530,573	**24 HR.** 8.5 Caved
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
DRILLER D.T. Chalmers, Jr.	**START DATE** 10/24/13	**COMP. DATE** 10/24/13	**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)
										8.7 GROUND SURFACE	0.0
	8.7	0.0	2	1	2	3		D		8.2 UNDIVIDED COASTAL PLAIN	0.5
5	5.7	3.0	2	1	2	3		D		Dark brown, SILT. Highly organic. Tan to yellow tan, f. SAND.	
	2.6	6.1	2	1	2	3		M		0.2	8.5
0	-0.4	9.1	WOH	WOH	1	1		Sat.		Gray, Silty CLAY w/orange mottling. Low plast.	
-5	-5.4	14.1	3	3	3	6		Sat.			
-10	-10.4	19.1	1	0	2	2		Sat.		-9.8 Gray, Silty, f. SAND w/orange mottling.	18.5
-15	-15.4	24.1	2	2	2	4		Sat.		-13.3 Dark orange tan, f. SAND. Uniform.	22.0
-20	-20.4	29.1	13	11	13	24		Sat.		-16.8 COASTAL PLAIN Tan, Silty, f. SAND w/some weathered limestone frags. Gap graded. (Belgrade Formation)	25.5
-25	-25.4	34.1	20	27	15	42		Sat.		-22.3 Tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	31.0
-30	-30.4	39.1	15	25	30	55		Sat.		-28.3 Dark gray, f. SAND. Uniform w/organic odor. (Riverbend Formation)	37.0
-35	-35.4	44.1	20	17	18	35		Sat.		-32.8 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	41.5
-40	-40.4	49.1	19	26	24	50		Sat.		-37.8 Dark gray, f. SAND. Uniform w/organic odor.	46.5
-45	-45.4	54.1	13	7	24	31		Sat.		-42.8 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	51.5
-50	-50.4	59.1	42	51	49/.4	100/0.9		Sat.		-47.8 Limestone Lens	56.5
-55	-55.4	64.1	9	11	15	26		Sat.		-53.3 Dark gray, f. SAND. Uniform w/organic odor.	62.0
										-56.9 Boring Terminated at Elevation -56.9 ft in uniform f. SAND. (Riverbend Formation)	65.6

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COUNTY:	Jones

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TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B6-B NBL	**STATION** 389+02	**OFFSET** 54ft RT	**ALIGNMENT** -L- — **0 HR.** 3.3
COLLAR ELEV. 3.5 ft	**TOTAL DEPTH** 85.7 ft	**NORTHING** 466,033	**EASTING** 2,530,681 — **24 HR.** 2.2
DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 83% 11/30/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER D.T. Chalmers, Jr.	**START DATE** 11/04/13	**COMP. DATE** 11/05/13	**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											
	3.5	0.0	WOH	WOH	1	1		M		3.5 GROUND SURFACE	0.0
0	0.0	3.5	2	2	2	4		Sat		UNDIVIDED COASTAL PLAIN Brown, SILT w/tr. roots. 1.5	2.0
	-2.7	6.2	2	2	3	5		Sat		Tan gray, f. SAND w/orange mottling. Uniform.	
-5	-5.7	9.2	2	1	1	2		Sat		-2.0 Light gray, Clayey SILT.	5.5
-10	-10.7	14.2	1	1	1	2		Sat		-8.5 Orange tan, f. SAND. Uniform.	12.0
-15	-15.7	19.2	5	5	3	8		Sat		-14.5 COASTAL PLAIN Tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	18.0
-20	-18.2	21.7	7	9	5	14		Sat		-17.5 Tan orange, f. SAND. Tr. weathered limestone frags.	21.0
	-20.7	24.2	11	10	19	29		Sat			
-25	-23.2	26.7	9	13	16	29		Sat		-25.0	28.5
	-25.7	29.2	8	22	16	38		Sat		Light tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-30	-28.2	31.7	10	16	20	36		Sat		-28.7	32.2
	-30.7	34.2	8	18	20	38		Sat		-30.0 Tan, f. SAND. Uniform. Calc.	33.5
-35	-33.2	36.7	8	22	16	38		Sat		Dark gray, f. SAND. Uniform. (Riverbend Formation)	
	-35.7	39.2	8	13	24	37		Sat		-32.5 Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	36.0
-40	-40.7	44.2	3	15	21	36		Sat		-35.0 Dark gray, f. SAND. Uniform.	38.5
-45	-45.7	49.2	13	19	35	54		Sat			
-50	-50.7	54.2	8	8	23	31		Sat		-50.5	54.0
	-55.7	59.2	10	11	32	43		Sat		-51.2 Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. Gray, f. SAND. Uniform.	54.7
-55											
-60	-60.7	64.2	10	12	20	32		Sat			
-65	-65.7	69.2	10	14	22	36		Sat		-65.5 organic odor	69.0
-70	-70.7	74.2	14	23	29	52		Sat			
-75											

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				
	-75.7	79.2	16	20	29	49		Sat		organic odor *(continued)*
-80	-80.7	84.2	17	23	30	53		Sat		-82.2 Boring Terminated at Elevation -82.2 ft in uniform f. SAND. (Riverbend Formation)

NCDOT BORE DOUBLE 213104.04 NCDOT-TRENT-RIVER.GPJ CATLIN.GDT 2/3/14

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TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B7-A SBL	**STATION** 389+98	**OFFSET** 56ft LT	**ALIGNMENT** -L- / **0 HR.** +0.5
COLLAR ELEV. -2.6 ft	**TOTAL DEPTH** 120.7 ft	**NORTHING** 466,141	**EASTING** 2,530,583 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER Bobbie D. Fowler	**START DATE** 11/07/13	**COMP. DATE** 11/13/13	**SURFACE WATER DEPTH** 2.2ft

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)
0											
	-2.6	0.0	WOH	WOH	WOH	0		Sat.		-2.6 WATER BOTTOM	0.0
-5	-6.1	3.5	WOH	WOH	2	2		Sat.		ALLUVIAL Dark brown, Highly Organic Silty Clay to Silt.	
-10	-12.0	9.4	1	2	4	6		Sat.		-10.6 Dark gray, f. SAND w/tr. gravel (.01-.03 ft).	8.0
-15	-17.0	14.4	2	5	12	17		Sat.		-16.6 Dark gray to gray, calc. f. SAND w/tr. weathered limestone. Gap graded.	14.0
-20	-22.0	19.4	20	14	14	28		Sat.		-24.6 COASTAL PLAIN Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	22.0
-25	-27.0	24.4	18	17	13	30		Sat.		-29.1 Dark gray, f. SAND. Uniform. (Riverbend Formation)	26.5
-30	-29.5	26.9	19	14	27	41		Sat.		-31.6 Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	29.0
	-32.0	29.4	13	15	16	31		Sat.		-35.6 Gray, f. SAND. Uniform w/tr. weathered limestone frags.	33.0
-35	-34.5	31.9	14	19	18	37		Sat.		-37.6 Sandy, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	35.0
	-37.0	34.4	10	9	25	34		Sat.		-40.6 Dark gray, f. SAND. Uniform.	38.0
-40	-39.0	36.4	10	9	18	27		Sat.		-43.1 Gray, f. SAND w/tr. weathered limestone. Gap graded.	40.5
	-42.0	39.4	8	13	10	23		Sat.		-45.6 Dark to light gray, f. SAND. Uniform.	43.0
-45	-47.0	44.4	14	21	28	49		Sat.			
-50	-52.0	49.4	16	18	21	39		Sat.			
-55	-57.0	54.4	13	20	30	50		Sat.			
-60	-62.0	59.4	14	16	21	37		Sat.			
-65	-67.0	64.4	8	10	18	28		Sat.		-66.6 organic odor	64.0
-70	-72.0	69.4	17	20	26	46		Sat.			
-75	-77.0	74.4	17	20	27	47		Sat.			
-80											

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B7-A SBL	**STATION** 389+98	**OFFSET** 56ft LT	**ALIGNMENT** -L- / **0 HR.** +0.5
COLLAR ELEV. -2.6 ft	**TOTAL DEPTH** 120.7 ft	**NORTHING** 466,141	**EASTING** 2,530,583 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER Bobbie D. Fowler	**START DATE** 11/07/13	**COMP. DATE** 11/13/13	**SURFACE WATER DEPTH** 2.2ft

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
-80						Match Line				
	-81.8	79.2	19	26	30	56		Sat.		organic odor *(continued)*
-85	-86.8	84.2	18	22	32	54		Sat.		
-90	-91.8	89.2	19	25	33	58		Sat.		
-95	-96.8	94.2	19	19	27	46		Sat.		-96.6 Gray, Silty, f. SAND w/tr. weathered limestone — 94.0
-100	-101.8	99.2	15	29	26	55		Sat.		-102.1 Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. — 99.5
-105	-106.8	104.2	11	15	16	31		Sat.		-105.6 Dark gray, f. SAND. Uniform. Slight organic odor. — 103.0
-110	-111.8	109.2	10	14	19	33		Sat.		-109.6 Dark gray, Silty, f. SAND. — 107.0
-115	-116.8	114.2	9	12	19	31		Sat.		-123.3 Boring Terminated at Elevation -123.3 ft in Silty, f. SAND. (Riverbend Formation) — 120.7
-120	-121.8	119.2	11	13	17	30		Sat.		

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COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake	
SITE DESCRIPTION Dual Bridges on -L- over the Trent River				**GROUND WTR (ft)**
BORING NO. B7-B NBL	**STATION** 389+89	**OFFSET** 56ft RT	**ALIGNMENT** -L-	**0 HR.** +0.6
COLLAR ELEV. -1.7 ft	**TOTAL DEPTH** 101.5 ft	**NORTHING** 466,119	**EASTING** 2,530,694	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic	
DRILLER Bobbie D. Fowler	**START DATE** 11/12/13	**COMP. DATE** 11/12/13	**SURFACE WATER DEPTH** 1.6ft	

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)
0											
	-1.7	0.0	WOH	WOH	WOH	0		Sat.		-1.7 WATER BOTTOM	0.0
										ALLUVIAL Dark brown, Highly Organic Clayey Sand.	
-5	-5.2	3.5	WOH	WOH	WOH	0		Sat.			
-10	-10.2	8.5	WOH	WOH	WOH	0		Sat.		-8.7	7.0
	-11.7	10.0	WOH	1	0	1		Sat.		Light gray, f. SAND. Uniform.	
-15	-16.7	15.0	5	8	6	14		Sat.		-17.2	15.5
	-19.2	17.5	8	16	20	36		Sat.		COASTAL PLAIN Yellow tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	-20.0 18.3
-20	-21.7	20.0	14	16	12	28		Sat.		-21.2	19.5
	-24.2	22.5	13	16	25	41		Sat.		Gray, f. SAND. Uniform.	
-25	-26.7	25.0	19	28	39	67		Sat.		Gray, f. SAND, Silty w/tr. weathered limestone frags. Gap graded.	-26.2 24.5
	-29.2	27.5	14	30	20	50		Sat.		Dark gray, f. SAND. Uniform w/organic odor.	-28.7 27.0
-30	-31.7	30.0	15	11	12	23		Sat.		Dark gray, Silty, f. SAND w/tr. weathered limestone frags. Organic odor.	-31.2 29.5
	-34.2	32.5	14	16	16	32		Sat.		Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	-33.7 32.0
-35	-36.7	35.0	10	10	13	23		Sat.		Dark gray, f. SAND w/tr. weathered limestone frags.	-36.2 34.5
	-39.2	37.5	11	16	24	40		Sat.		Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	-38.7 37.0
-40	-41.7	40.0	12	16	14	30		Sat.		Dark gray, f. SAND w/tr. weathered limestone frags.	-41.2 39.5
										Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	-45.7 44.0
-45	-46.7	45.0	14	18	27	45		Sat.		Dark gray, f. SAND. Uniform. Organic odor.	
-50	-51.7	50.0	13	17	22	39		Sat.			
-55	-56.7	55.0	13	18	18	36		Sat.			
-60	-61.7	60.0	11	15	20	35		Sat.			
-65	-66.7	65.0	14	19	24	43		Sat.			
-70	-71.7	70.0	16	18	21	39		Sat.			
-75	-76.7	75.0	14	22	27	49		Sat.			
-80											

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake	
SITE DESCRIPTION Dual Bridges on -L- over the Trent River				**GROUND WTR (ft)**
BORING NO. B7-B NBL	**STATION** 389+89	**OFFSET** 56ft RT	**ALIGNMENT** -L-	**0 HR.** +0.6
COLLAR ELEV. -1.7 ft	**TOTAL DEPTH** 101.5 ft	**NORTHING** 466,119	**EASTING** 2,530,694	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic	
DRILLER Bobbie D. Fowler	**START DATE** 11/12/13	**COMP. DATE** 11/12/13	**SURFACE WATER DEPTH** 1.6ft	

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
-80						Match Line				
	-81.7	80.0	6	14	30	44		Sat.		-82.4 Dark gray, f. SAND. Uniform. Organic odor. *(continued)* 80.7
-85	-86.7	85.0	17	24	26	50		Sat.		-82.6 Limestone Lens 80.9
	-91.7	90.0	19	22	27	49		Sat.		Dark gray, f. SAND. Uniform. Organic odor.
-90	-96.7	95.0	13	15	25	40		Sat.		-99.7 98.0
-95	-101.7	100.0	13	33	22	55		Sat.		Light gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. -103.2 101.5
-100										Boring Terminated at Elevation -103.2 ft in well graded, f. to cse. SAND. (Riverbend Formation)

NCDOT BORE DOUBLE 213104.04 NCDOT-TRENT-RIVER.GPJ CATLIN.GDT 12/20/13

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COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B8-A SBL	**STATION** 390+93	**OFFSET** 55ft LT	**ALIGNMENT** -L-	**0 HR.** +3.8
COLLAR ELEV. -3.4 ft	**TOTAL DEPTH** 100.3 ft	**NORTHING** 466,236	**EASTING** 2,530,596	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER Bobbie D. Fowler	**START DATE** 11/15/13	**COMP. DATE** 11/15/13	**SURFACE WATER DEPTH** 4.3ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
									-3.4 / 0.0 WATER BOTTOM
	-3.4	0.0	WOH	WOH	WOH		Sat.		ALLUVIAL Dark brown, Organic Muck w/Clayey, f. Sand.
	-6.9	3.5	WOH	WOH	WOH		Sat.		
	-9.4	6.0							Dark tan, f. SAND. Muck. High org.
	-10.7	7.3	1	1	1		Sat.		
	-15.7	12.3	1	2	3		Sat.		
	-18.4	15.0							Dark gray, Gravelly Sand. Gap graded.
	-20.7	17.3	2	3	2		Sat.		
	-21.4	18.0							COASTAL PLAIN Dark gray to gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
	-25.7	22.3	7	13	20		Sat.		
	-26.6	23.2							(Riverbend Formation) Dark gray, f. SAND. Uniform.
	-29.4	26.0							Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
	-30.7	27.3	10	10	10		Sat.		
	-35.7	32.3	10	14	14		Sat.		
	-39.4	36.0							Dark gray, f. SAND. Uniform.
	-40.7	37.3	10	9	9		Sat.		
	-41.4	38.0							Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
	-43.4	40.0							Dark gray, f. SAND. Organic odor.
	-45.7	42.3	10	20	25		Sat.		
	-47.4	44.0							Weathered Limestone. Inferred from cuttings.
	-48.9	45.5							Dark gray, f. SAND. Organic odor. Tr. weathered limestone frags. at top of stratum.
	-50.7	47.3	9	17	21		Sat.		
	-55.7	52.3	10	12	20		Sat.		
	-60.7	57.3	10	14	24		Sat.		
	-65.7	62.3	9	13	19		Sat.		
	-70.7	67.3	12	14	25		Sat.		
	-75.7	72.3	15	24	31		Sat.		
	-80.9	77.5	17	29	31		Sat.		Dark gray, f. SAND. Organic odor. Tr. weathered limestone frags. at top of stratum. *(continued)*
	-85.7	82.3	16	22	30		Sat.		
	-90.7	87.3	13	24	32		Sat.		
	-95.7	92.3	18	25	30		Sat.		
	-99.4	96.0							Light to dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
	-100.7	97.3	10	11	17		Sat.		
	-102.2	98.8	19	20	29		Sat.		
	-103.7	100.3							Boring Terminated at Elevation -103.7 ft in well graded, f. to cse. SAND. (Riverbend Formation)

WBS 34442.1.5 | TIP R-2514D | COUNTY Jones | GEOLOGIST Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River | GROUND WTR (ft)
BORING NO. B8-A SBL | STATION 390+93 | OFFSET 55ft LT | ALIGNMENT -L- | 0 HR. +3.8
COLLAR ELEV. -3.4 ft | TOTAL DEPTH 100.3 ft | NORTHING 466,236 | EASTING 2,530,596 | 24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012 | DRILL METHOD NW Casing w/ SPT | HAMMER TYPE Automatic
DRILLER Bobbie D. Fowler | START DATE 11/15/13 | COMP. DATE 11/15/13 | SURFACE WATER DEPTH 4.3ft

Match Line

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PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B8-B NBL	**STATION** 390+92	**OFFSET** 51ft RT	**ALIGNMENT** -L- **0 HR.** +8.8
COLLAR ELEV. -9.8 ft	**TOTAL DEPTH** 102.9 ft	**NORTHING** 466,222	**EASTING** 2,530,701 **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER Bobbie D. Fowler	**START DATE** 11/18/13	**COMP. DATE** 11/19/13	**SURFACE WATER DEPTH** 10.0ft

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)
-5										
-10	-9.8	0.0	WOH	WOH	WOH	0		Sat.		-9.8 WATER BOTTOM 0.0 ALLUVIAL Dark brown to dark tan, cse. SAND w/tr. organics.
	-13.3	3.5	1	1	2	3		Sat.		
-15	-16.6	6.8	1	1	3	4		Sat.		
-20	-21.6	11.8	3	9	11	20		Sat.		-19.8 10.0 COASTAL PLAIN Light gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)
-25	-26.6	16.8	14	21	23	44		Sat.		-25.8 16.0 Dark gray, f. SAND. Uniform w/tr. shell frags. Organic odor. (Riverbend Formation)
-30	-31.6	21.8	14	13	17	30		Sat.		-29.8 20.0 Light gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
-35	-36.6	26.8	3	8	9	17		Sat.		-35.8 26.0 Dark gray, Silty, f. SAND w/tr. weathered limestone frags. Calc.
-40	-41.6	31.8	12	23	22	45		Sat.		-38.8 29.0 Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
-45	-46.6	36.8	20	22	14	36		Sat.		-42.8 33.0 Dark gray, f. SAND. Uniform.
-50	-51.6	41.8	14	17	25	42		Sat.		-48.3 38.5 Limestone frags. Inferred from cuttings.
-55	-56.6	46.8	11	19	22	41		Sat.		-50.8 41.0 Light to dark gray, f. SAND. Uniform. Organic odor.
-60	-61.6	51.8	16	22	28	50		Sat.		
-65	-66.6	56.8	12	28	35	63		Sat.		
-70	-71.6	61.8	13	22	36	58		Sat.		
-75	-76.6	66.8	12	17	38	55		Sat.		
-80	-81.6	71.8	21	33	52	85		Sat.		
-85										

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B8-B NBL	**STATION** 390+92	**OFFSET** 51ft RT	**ALIGNMENT** -L- **0 HR.** +8.8
COLLAR ELEV. -9.8 ft	**TOTAL DEPTH** 102.9 ft	**NORTHING** 466,222	**EASTING** 2,530,701 **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER Bobbie D. Fowler	**START DATE** 11/18/13	**COMP. DATE** 11/19/13	**SURFACE WATER DEPTH** 10.0ft

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
-85						Match Line				
-90	-86.6	76.8	12	21	36	57		Sat.		Light to dark gray, f. SAND. Uniform. Organic odor. *(continued)*
-95	-91.6	81.8	15	23	37	60		Sat.		
-100	-96.2	86.4	15	20	32	52		Sat.		-99.8 90.0 Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
-105	-101.2	91.4	23	24	22	46		Sat.		-102.3 92.5 Gray, f. SAND w/tr. weathered limestone frags. grading to no frags. Organic odor.
-110	-106.2	96.4	11	15	21	36		Sat.		
	-111.2	101.4	12	14	22	36		Sat.		-112.7 102.9 Boring Terminated at Elevation -112.7 ft in uniform f. SAND. (Riverbend Formation)

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COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B9-A SBL	**STATION** 391+86	**OFFSET** 54ft LT	**ALIGNMENT** -L- / **0 HR.** +7.8
COLLAR ELEV. -10.1 ft	**TOTAL DEPTH** 100.1 ft	**NORTHING** 466,328	**EASTING** 2,530,608 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER Bobbie D. Fowler	**START DATE** 11/14/13	**COMP. DATE** 11/14/13	**SURFACE WATER DEPTH** 8.1ft

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										-10.1 WATER BOTTOM	0.0
	-10.1	0.0	WOH	WOH	WOH	0		Sat.		ALLUVIAL Dark brown, Silty, Organic Muck.	
	-13.6	3.5								-14.6	4.5
-15			3	1	2	3		Sat.		Dark brown, f. SAND. Highly organic.	
	-18.7	8.6								-16.6	6.5
-20			3	1	2	3		Sat.		Dark gray, Silty, f. SAND. Uniform.	
	-23.7	13.6									
-25			1	2	1	3		Sat.			
	-26.2	16.1								-26.2	16.1
	-28.7	18.6	10	10	8	18		Sat.		COASTAL PLAIN Tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	
-30			11	10	16	26		Sat.		-29.2	19.1
	-33.7	23.6								-32.1	22.0
-35			9	11	14	25		Sat.		Dark gray, f. SAND. Uniform. (Riverbend Formation)	
	-38.7	28.6								Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-40			19	16	36	52		Sat.		-39.6	29.5
	-43.7	33.6								Dark gray, Silty, f. SAND w/tr. weathered limestone frags.	
-45			15	18	22	40		Sat.		-42.1	32.0
	-48.7	38.6								Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-50			11	15	24	39		Sat.		-44.6	34.5
	-53.7	43.6								Dark gray, f. SAND. Uniform.	
-55			9	20	25	45		Sat.		-47.6	37.5
	-58.7	48.6								Dark gray, Silty, f. SAND w/tr. weathered limestone frags.	
-60			9	15	21	36		Sat.			
	-63.7	53.6								-52.1	42.0
-65			11	15	23	38		Sat.		Dark gray, f. SAND. Uniform. Organic odor.	
	-68.7	58.6									
-70			12	18	29	47		Sat.			
	-73.4	63.3									
-75			14	21	22	43		Sat.			
	-78.7	68.6									
-80			17	22	28	50		Sat.			
	-83.7	73.6									
-85			23	28	35	63		Sat.			
	-88.7	78.6									
-90			15	26	34	60		Sat.			

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
-90						Match Line				Dark gray, f. SAND. Uniform. Organic odor. *(continued)*
	-93.7	83.6	18	29	38	67		Sat.		
-95										
	-98.7	88.6	21	29	28	57		Sat.		-102.1 92.0
-100										Light gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
	-103.7	93.6	41	14	12	26		Sat.		
-105										
	-108.7	98.6	13	17	23	40		Sat.		-110.2 100.1
-110										Boring Terminated at Elevation -110.2 ft in well graded, f. to cse. SAND. (Riverbend Formation)

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TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B9-B NBL	**STATION** 391+81	**OFFSET** 26ft RT	**ALIGNMENT** -L- **0 HR.** +3.8
COLLAR ELEV. -5.3 ft	**TOTAL DEPTH** 122.1 ft	**NORTHING** 466,313	**EASTING** 2,530,687 **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER Bobbie D. Fowler	**START DATE** 11/13/13	**COMP. DATE** 11/13/13	**SURFACE WATER DEPTH** 6.0ft

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))
-5										
	-5.3	0.0	WOH	WOH	WOH	0		Sat.		-5.3 / 0.0 WATER BOTTOM
	-7.3	2.0								ALLUVIAL
	-8.8	3.5	WOH	WOH	WOH	0		Sat.		Dark brown, Clayey, Organic Muck.
-10	-10.8	5.5	1	2	1	3		Sat.		Dark brown, f. SAND. Muck. Highly organic. / -10.8 / 5.5 Gray, Clayey, f. SAND. Tr. organics in middle of stratum. Tr. well rounded gravel (.01-.03 ft) at base.
-15	-15.9	10.6	1	2	1	3		Sat.		
-20	-20.9	15.6	2	2	3	5		Sat.		
-25	-23.3	18.0								-23.3 / 18.0 COASTAL PLAIN
	-25.9	20.6	11	17	23	40		Sat.		Dark gray, f. SAND. Uniform. Organic odor. (Riverbend Formation)
-30	-30.3	25.0								-30.3 / 25.0 Light gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
	-30.9	25.6	10	22	10	32		Sat.		
-35	-35.9	30.6	8	8	11	19		Sat.		
-40	-39.3	34.0								-39.3 / 34.0 Dark gray, f. SAND w/tr. weathered limestone frags. Organic odor.
	-40.9	35.6	12	16	24	40		Sat.		
-45	-45.9	40.6	15	23	26	49		Sat.		
	-47.3	42.0								-47.3 / 42.0 Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
	-48.4	43.1	24	12	58	70		Sat.		
-50	-50.8	45.5								-50.8 / 45.5 Dark gray, f. SAND. Uniform. Organic odor.
	-50.9	45.6	10	15	20	35		Sat.		
-55	-55.9	50.6	15	24	31	55		Sat.		
-60	-60.9	55.6	9	11	17	28		Sat.		
-65	-64.3	59.0								-64.3 / 59.0 Dark gray, Silty, f. SAND. Uniform. Organic odor.
	-65.9	60.6	15	22	32	54		Sat.		
-70	-69.3	64.0								-69.3 / 64.0 Dark gray, f. SAND. Uniform. Organic odor.
	-70.9	65.6	15	15	19	34		Sat.		
-75	-75.9	70.6	17	25	31	56		Sat.		
-80	-80.9	75.6	16	24	35	59		Sat.		
-85										

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B9-B NBL	**STATION** 391+81	**OFFSET** 26ft RT	**ALIGNMENT** -L- **0 HR.** +3.8
COLLAR ELEV. -5.3 ft	**TOTAL DEPTH** 122.1 ft	**NORTHING** 466,313	**EASTING** 2,530,687 **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD5152 D-25 75% 05/25/2012		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER Bobbie D. Fowler	**START DATE** 11/13/13	**COMP. DATE** 11/13/13	**SURFACE WATER DEPTH** 6.0ft

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
-85						Match Line				
	-85.9	80.6	9	28	43	71		Sat.		Dark gray, f. SAND. Uniform. Organic odor. *(continued)*
-90	-90.9	85.6	13	23	34	57		Sat.		
-95	-95.9	90.6	16	21	31	52		Sat.		
-100	-99.3	94.0								-99.3 / 94.0 Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
	-100.9	95.6	21	15	17	32		Sat.		
-105	-104.3	99.0								-104.3 / 99.0 Gray, Silty, f. SAND w/tr. weathered limestone frags.
	-105.9	100.6	16	17	20	37		Sat.		
-110	-109.3	104.0								-109.3 / 104.0 Dark gray, f. SAND. Uniform. Organic odor.
	-110.9	105.6	10	16	23	39		Sat.		
-115	-115.9	110.6	9	16	19	35		Sat.		
-120	-120.9	115.6	8	16	22	38		Sat.		
-125	-125.9	120.6	12	13	21	34		Sat.		
	-127.4	122.1								-127.4 / 122.1 Boring Terminated at Elevation -127.4 ft in uniform f. SAND. (Riverbend Formation)

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COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Corey Futral
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B10-A SBL	**STATION** 392+86	**OFFSET** 45ft LT	**ALIGNMENT** -L-	**0 HR.** 3.2
COLLAR ELEV. 0.6 ft	**TOTAL DEPTH** 85.8 ft	**NORTHING** 466,425	**EASTING** 2,530,629	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER W. Matt Wiggins	**START DATE** 12/11/13	**COMP. DATE** 12/11/13	**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										
0	0.6	0.0	2	1	2	3		Sat.		0.6 GROUND SURFACE 0.0 ALLUVIAL Dark brown, Silty, Organic Muck w/roots.
-5										-5.4 6.0 Light tan to light gray, f. SAND. Uniform.
-10	-8.7	9.3	2	3	3	6		Sat.		
-15	-13.7	14.3	3	3	1	4		Sat.		-16.9 17.5 COASTAL PLAIN Light tan w/orange mottling, f. SAND w/some to trace well rounded gravel (.01-.03 ft) and weathered limestone frags. Well graded. (Belgrade Formation)
-20	-18.7	19.3	7	9	10	19		Sat.		
-25	-23.7	24.3	20	23	15	38		Sat.		-26.9 27.5 Med. gray, f. SAND w/tr. well rounded gravel (.01-.03 ft.) in top of stratum. (Riverbend Formation)
-30	-28.7	29.3	9	19	18	37		Sat.		
-35	-33.7	34.3	3	31	19	50		Sat.		-36.9 37.5 Med. gray, f. to cse. SAND w/weathered limestone frags. Well graded.
-40	-38.7	39.3	6	10	17	27		Sat.		-41.4 42.0 Med. gray, f. SAND. Uniform.
-45	-43.7	44.3	4	25	32	57		Sat.		
-50	-48.7	49.3	7	17	20	37		Sat.		-47.4 48.0 Light gray, f. SAND w/weathered limestone frags. Well graded.
-55	-53.7	54.3	14	15	21	36		Sat.		-51.9 52.5 Light gray, f. SAND. Uniform.
-60	-58.7	59.3	19	22	20	42		Sat.		
-65	-63.7	64.3	15	20	21	41		Sat.		
-70	-68.7	69.3	17	25	33	58		Sat.		
-75	-73.7	74.3	10	15	13	28		Sat.		

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Corey Futral
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B10-A SBL	**STATION** 392+86	**OFFSET** 45ft LT	**ALIGNMENT** -L-	**0 HR.** 3.2
COLLAR ELEV. 0.6 ft	**TOTAL DEPTH** 85.8 ft	**NORTHING** 466,425	**EASTING** 2,530,629	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER W. Matt Wiggins	**START DATE** 12/11/13	**COMP. DATE** 12/11/13	**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
-75						Match Line				Light gray, f. SAND. Uniform. *(continued)*
-80	-78.7	79.3	21	23	23	46		Sat.		
-85	-83.7	84.3	23	27	33	60		Sat.		-85.2 85.8 Boring Terminated at Elevation -85.2 ft in uniform f. SAND. (Riverbend Formation)

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PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Corey Futral	
SITE DESCRIPTION Dual Bridges on -L- over the Trent River				**GROUND WTR (ft)**
BORING NO. B10-B NBL	**STATION** 392+80	**OFFSET** 55ft RT	**ALIGNMENT** -L-	**0 HR.** 0.5
COLLAR ELEV. 0.6 ft	**TOTAL DEPTH** 86.0 ft	**NORTHING** 466,408	**EASTING** 2,530,727	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic	
DRILLER W. Matt Wiggins	**START DATE** 12/12/13	**COMP. DATE** 12/12/13	**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											
0	0.6	0.0	WOH	WOH	WOH	0		Sat.		0.6 GROUND SURFACE	0.0
										ALLUVIAL Dark brown, Silty Organic Muck.	
-5										-6.9	7.5
	-8.9	9.5	5	6	6	12		Sat.		Light gray to light tan and orange, f. SAND. Uniform.	
-10											
	-13.9	14.5	1	1	2	3		Sat.		-16.9	17.5
-15										COASTAL PLAIN Light tan with light gray, well graded, f. to cse. SAND w/limestone frags. (Belgrade Formation)	
	-18.9	19.5	8	12	16	28		Sat.			
-20											
	-23.9	24.5	15	11	15	26		Sat.		-23.4	24.0
-25										Light gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Riverbend Formation)	
	-28.9	29.5	15	14	15	29		Sat.			
-30											
	-33.9	34.5	22	13	19	32		Sat.			
-35											
	-38.9	39.5	21	21	26	47		Sat.		-39.7	40.3
-40										Med. gray, f. SAND. Uniform overall.	
	-43.9	44.5	14	16	19	35		Sat.			
-45										-47.4	48.0
	-48.9	49.5	14	19	19	38		Sat.		tr. limestone frags.	
-50										-51.4	52.0
	-53.9	54.5	14	21	25	46		Sat.			
-55											
	-58.9	59.5	11	17	21	38		Sat.			
-60											
	-63.9	64.5	11	23	17	40		Sat.			
-65											
	-68.9	69.5	23	25	26	51		Sat.			
-70											
	-73.9	74.5	18	25	32	57					
-75											

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Corey Futral	
SITE DESCRIPTION Dual Bridges on -L- over the Trent River				**GROUND WTR (ft)**
BORING NO. B10-B NBL	**STATION** 392+80	**OFFSET** 55ft RT	**ALIGNMENT** -L-	**0 HR.** 0.5
COLLAR ELEV. 0.6 ft	**TOTAL DEPTH** 86.0 ft	**NORTHING** 466,408	**EASTING** 2,530,727	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic	
DRILLER W. Matt Wiggins	**START DATE** 12/12/13	**COMP. DATE** 12/12/13	**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
-75						Match Line				
	-78.9	79.5	21	26	33	59		Sat.		
-80										
	-83.9	84.5	19	27	37	64		Sat.		
-85										-85.4 86.0
										Boring Terminated at Elevation -85.4 ft in uniform f. SAND. (Riverbend Formation)

NCDOT BORE DOUBLE 213104.04 NCDOT-TRENT-RIVER.GPJ CATLIN.GDT 12/20/13

NCDOT GEOTECHNICAL ENGINEERING UNIT
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PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Corey Futral
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B11-A SBL	**STATION** 393+74	**OFFSET** 59ft LT	**ALIGNMENT** -L- / **0 HR.** 1.0
COLLAR ELEV. 0.8 ft	**TOTAL DEPTH** 86.3 ft	**NORTHING** 466,515	**EASTING** 2,530,625 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER W. Matt Wiggins	**START DATE** 12/06/13	**COMP. DATE** 12/09/13	**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											
	0.8	0.0	1	0	1	1		Sat.		0.8 GROUND SURFACE	0.0
0	-1.2	2.0	WOH	WOH	WOH	0		Sat.		ALLUVIAL Dark brown, Clayey Organic Muck	
-5	-6.0	6.8	WOH	WOH	WOH	0		Sat.		-7.2	8.0
	-9.0	9.8	6	4	5	9		Sat.		-8.7 Tan, f. SAND. Uniform. Gray w/orange mottling, Clayey, f. SAND.	9.5
-10	-14.0	14.8	WOH	WOH	WOH	0		Sat.		-13.2	14.0
-15	-19.0	19.8	14	15	14	29		Sat.		-17.2 Clayey GRAVEL. Well rounded (0.01-0.03ft)	18.0
-20	-24.0	24.8	14	15	21	36		Sat.		-21.2 COASTAL PLAIN Tan, f. SAND w/tr. weathered limestone frags. and lenses. (Belgrade Formation)	22.0
-25	-29.0	29.8	11	14	24	38		Sat.		Tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-30	-34.0	34.8	6	13	13	26		Sat.		-27.2	28.0
-35	-39.0	39.8	7	26	7	33		Sat.		Dark gray, f. to cse. SAND w/tr. weathered limestone. (Riverbend Formation)	
-40	-44.0	44.8	4	14	23	37		Sat.		-32.2	33.0
-45	-49.0	49.8	5	21	16	37		Sat.		Dark gray, Gravelly, f. to cse. SAND.	
-50	-54.0	54.8	4	15	20	35		Sat.		-34.7	35.5
-55	-59.0	59.8	6	12	12	24		Sat.		Dark gray, f. SAND. Uniform.	
-60	-64.0	64.8	8	16	26	42		Sat.		-38.2	39.0
-65	-69.0	69.8	17	29	34	63		Sat.		Dark gray, calc., f. to cse. SAND w/tr. weathered limestone.	
-70	-74.0	74.8	16	26	33	59		Sat.		-43.2	44.0
-75										Dark gray, f. SAND. Uniform.	
										-47.2	48.0
										Gray, f. SAND w/some weathered limestone.	
										-52.2	53.0
										Dark gray, f. SAND. Uniform.	

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Corey Futral
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B11-A SBL	**STATION** 393+74	**OFFSET** 59ft LT	**ALIGNMENT** -L- / **0 HR.** 1.0
COLLAR ELEV. 0.8 ft	**TOTAL DEPTH** 86.3 ft	**NORTHING** 466,515	**EASTING** 2,530,625 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER W. Matt Wiggins	**START DATE** 12/06/13	**COMP. DATE** 12/09/13	**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
-75						Match Line		Sat.		Dark gray, f. SAND. Uniform. *(continued)*
-80	-79.0	79.8	23	30	40	70		Sat.		
-85	-84.0	84.8	19	33	47	80		Sat.		-85.5 86.3 Boring Terminated at Elevation -85.5 ft in uniform f. SAND. (Riverbend Formation)

NCDOT BORE DOUBLE 213104.04 NCDOT TRENT RIVER.GPJ CATLIN.GDT 2/3/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

CATLIN Engineers and Scientists
220 Old Dairy Road
Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
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COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B11-B NBL	**STATION** 393+75	**OFFSET** 38ft RT	**ALIGNMENT** -L-	**0 HR.** 0.4
COLLAR ELEV. 0.9 ft	**TOTAL DEPTH** 87.3 ft	**NORTHING** 466,504	**EASTING** 2,530,722	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER W. Matt Wiggins	**START DATE** 11/21/13	**COMP. DATE** 11/22/13	**SURFACE WATER DEPTH** 0.8ft

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											
	0.9	0.0	WOH	WOH	WOH	0		Sat.		0.9 GROUND SURFACE	0.0
0										ALLUVIAL Dark brown, Organic Muck.	
	-8.4	9.3	4	6	4	10		Sat.		-9.1	10.0
-5										Dark gray, f. SAND. Uniform.	
	-14.4	15.3	5	3	5	8		Sat.		-13.1	14.0
-10										COASTAL PLAIN Tan to light yellow tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	
	-19.4	20.3	18	10	15	25		Sat.			
-15	-21.9	22.8	11	15	25	40		Sat.		-22.6	23.5
	-24.4	25.3	16	28	29	57		Sat.		Dark gray, f. SAND w/tr. weathered limestone frags. (Riverbend Formation)	
-20										-27.6	28.5
	-29.4	30.3	9	17	15	32		Sat.		Gray, Sandy, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-25											
	-34.9	35.8	6	17	15	32		Sat.			
-30											
	-39.9	40.8	3	8	27	35		Sat.		-41.1	42.0
-35										Dark gray, f. SAND. Uniform.	
	-44.9	45.8	4	10	18	28		Sat.		-43.1	44.0
-40										Limestone lens. Inferred from cuttings.	
	-49.9	50.8	5	14	13	27		Sat.		-44.6 Gray to dark gray, f. SAND.	45.5
-45										-49.1	50.0
	-54.9	55.8	12	18	25	43		Sat.		Tr. weathered limestone frags.	
-50										-51.1	52.0
	-59.9	60.8	12	22	29	51		Sat.			
-55											
	-64.9	65.8	20	29	37	66		Sat.			
-60											
	-69.9	70.8	19	24	31	55		Sat.			
-65											
	-74.9	75.8								-74.9	75.8
-70											
-75											

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B11-B NBL	**STATION** 393+75	**OFFSET** 38ft RT	**ALIGNMENT** -L-	**0 HR.** 0.4
COLLAR ELEV. 0.9 ft	**TOTAL DEPTH** 87.3 ft	**NORTHING** 466,504	**EASTING** 2,530,722	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER W. Matt Wiggins	**START DATE** 11/21/13	**COMP. DATE** 11/22/13	**SURFACE WATER DEPTH** 0.8ft

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				
	-79.9	80.8	24	34	43	77		Sat.		Slight organic odor *(continued)*
-80										
	-84.9	85.8	21	31	40	71		Sat.		
-85										
			22	31	38	69		Sat.		-86.4 87.3 Boring Terminated at Elevation -86.4 ft in uniform f. SAND. (Riverbend Formation)

NCDOT BORE DOUBLE 213104.04 NCDOT-TRENT-RIVER.GPJ CATLIN.GDT 12/20/13

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B12-A SBL	**STATION** 394+71	**OFFSET** 56ft LT	**ALIGNMENT** -L-	**0 HR.** 4.8
COLLAR ELEV. 0.9 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 466,611	**EASTING** 2,530,639	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER N/A	**START DATE** 12/04/13	**COMP. DATE** 12/05/13	**SURFACE WATER DEPTH** 0.1ft

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											
	0.9	0.0	WOH	WOH	WOH	0		Sat.		0.9 GROUND SURFACE	0.0
0										ALLUVIAL	
	-4.4	5.3	1	0	1	1				Dark brown, Clayey Organic Muck.	
-5								Sat.			
	-8.8	9.7	1	0	5	5				-10.1	11.0
-10								Sat.		-11.6 Dark gray, Clayey, f. SAND.	12.5
	-12.9	13.8	2	0	1	1				Well rounded gravel noted in cuttings.	
-15								Sat.			
	-17.9	18.8	2	2	1	3				-17.1 Orange tan, f. SAND. Uniform.	18.0
-20								Sat.		-20.1	21.0
	-22.9	23.8	16	22	25	47				COASTAL PLAIN	
-25								Sat.		-22.6 Weathered Limestone Frags. Logged from cuttings. (Belgrade Formation)	23.5
	-27.9	28.8	13	21	21	42				-24.1 Yellow tan, f. SAND. Uniform.	25.0
-30								Sat.		Light tan to light orange tan, f. SAND w/weathered limestone frags. and lenses (0.1 ft. thick) of limestone.	
	-32.9	33.8	17	28	17	45					
-35								Sat.			
	-37.9	38.8	10	10	10	20				-36.1	37.0
-40								Sat.		Dark gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Riverbend Formation)	
	-42.8	43.7	18	24	27	51				-42.1 Dark gray, f. SAND. Uniform.	43.0
-45								Sat.			
	-47.8	48.7	14	26	27	53				-47.1	48.0
-50								Sat.		Light gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
	-52.8	53.7	9	14	17	31				-51.1 Gray, f. SAND. Uniform.	52.0
-55								Sat.			
	-57.8	58.7	14	29	26	55				-59.1 Organic odor	60.0
-60								Sat.			
	-62.8	63.7	15	26	31	57					
-65								Sat.			
	-67.8	68.7	18	25	32	57					
-70								Sat.			
	-72.8	73.7	18	33	39	72					
-75								Sat.			

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B12-A SBL	**STATION** 394+71	**OFFSET** 56ft LT	**ALIGNMENT** -L-	**0 HR.** 4.8
COLLAR ELEV. 0.9 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 466,611	**EASTING** 2,530,639	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER N/A	**START DATE** 12/04/13	**COMP. DATE** 12/05/13	**SURFACE WATER DEPTH** 0.1ft

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				
	-77.8	78.7	24	33	44	77		Sat.		Organic odor *(continued)*
-80										
	-82.8	83.7	25	35	38	73		Sat.		-84.3 85.2
										Boring Terminated at Elevation -84.3 ft in uniform f. SAND. (Riverbend Formation)

NCDOT GEOTECHNICAL ENGINEERING UNIT
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COUNTY:	Jones

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B12-B NBL	**STATION** 394+63	**OFFSET** 58ft RT	**ALIGNMENT** -L-	**0 HR.** 3.1
COLLAR ELEV. -0.1 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 466,589	**EASTING** 2,530,752	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER W. Matt Wiggins	**START DATE** 11/19/13	**COMP. DATE** 11/20/13	**SURFACE WATER DEPTH** 0.8ft

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)
0											
	-0.1	0.0	WOH	WOH	WOH	0				-0.1 GROUND SURFACE	0.0
										ALLUVIAL Very soft material. No recovery. Material assumed based on site conditions.	
	-3.7	3.6	1	1	0	1					
-5											
	-8.1	8.0	WOH	WOH	WOH	0					
-10											
-15										-15.1 Logged from cuttings. Well rounded gravel (.01-.03 ft) in cuttings.	15.0
										-17.6 COASTAL PLAIN Tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)	17.5
	-19.4	19.3	4	2	1	3		Sat.			
	-21.9	21.8	11	22	26	48		Sat.		-21.1 Tan yellow, f. SAND. Uniform. Organic odor.	21.0
-25	-24.4	24.3	4	7	18	25		Sat.		-23.6 Tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	23.5
										-25.1 Tan yellow, f. SAND. Uniform.	25.0
-30	-29.4	29.3	17	17	18	35		Sat.			
	-32.1	32.0								Yellow tan, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
	-34.0	33.9	3	11	9	20		Sat.			
-35											
	-39.0	38.9	11	16	51	67		Sat.		-40.3 Light yellow tan, f. SAND. Calc. Uniform.	40.2
-40										-42.1 Gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Riverbend Formation)	42.0
	-44.0	43.9	9	8	21	29		Sat.		-45.1 Dark gray to gray, f. SAND. Uniform to gap graded w/tr. weathered limestone frags.	45.0
-45											
	-48.4	48.3	17	34	44	78		Sat.			
-50										-51.1 Dark gray to yellow gray, f. SAND. Uniform. Organic odor beginning at 58 ft. BLS.	51.0
	-53.4	53.3	11	20	25	45		Sat.			
-55											
	-58.4	58.3	14	15	20	35		Sat.			
-60											
	-63.4	63.3	12	20	26	46		Sat.			
-65											
	-68.4	68.3	24	28	31	59		Sat.			
-70											
	-73.4	73.3	29	36	47	83		Sat.			
-75											
	-78.4	78.3	24	28	48	76		Sat.			
-80											

WBS 34442.1.5	**TIP** R-2514D	**COUNTY** Jones	**GEOLOGIST** Chuck Brake
SITE DESCRIPTION Dual Bridges on -L- over the Trent River			**GROUND WTR (ft)**
BORING NO. B12-B NBL	**STATION** 394+63	**OFFSET** 58ft RT	**ALIGNMENT** -L-	**0 HR.** 3.1
COLLAR ELEV. -0.1 ft	**TOTAL DEPTH** 85.2 ft	**NORTHING** 466,589	**EASTING** 2,530,752	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE MAD2544 CME 45 82% 07/25/2013		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER W. Matt Wiggins	**START DATE** 11/19/13	**COMP. DATE** 11/20/13	**SURFACE WATER DEPTH** 0.8ft

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
-80						Match Line				
	-83.8	83.7	28	44	56	100/1.0		Sat.		Dark gray to yellow gray, f. SAND. Uniform. Organic odor beginning at 58 ft. BLS. *(continued)*
-85										-85.3 85.2 Boring Terminated at Elevation -85.3 ft in uniform f. SAND. (Riverbend Formation)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

CATLIN Engineers and Scientists
220 Old Dairy Road
Wilmington, NC 28405
Corporate Licensure No. for Engineering Services C-0585
213104.04

SHEET:	40 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

WBS 34442.1.5 | **TIP** R-2514D | **COUNTY** Jones | **GEOLOGIST** Corey Futral

SITE DESCRIPTION Dual Bridges on -L- over the Trent River | **GROUND WTR (ft)**

BORING NO. EB2-A SBL | **STATION** 395+65 | **OFFSET** 57ft LT | **ALIGNMENT** -L- | **0 HR.** 0.6

COLLAR ELEV. 2.1 ft | **TOTAL DEPTH** 66.3 ft | **NORTHING** 466,704 | **EASTING** 2,530,650 | **24 HR.** 0.6

DRILL RIG/HAMMER EFF./DATE MAD3964 CME-45C 86% 07/25/2013 | **DRILL METHOD** NW Casing w/ SPT | **HAMMER TYPE** Automatic

DRILLER W. Matt Wiggins | **START DATE** 10/22/13 | **COMP. DATE** 10/22/13 | **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)
	2.1	0.0	WOH	1	0	1		W		GROUND SURFACE	0.0
										UNDIVIDED COASTAL PLAIN	
										Dark gray and brown, Clayey SILT w/tr. f. sand and roots.	
0	-0.7	2.8	3	8	5	13		Sat.			2.0
	-2.7	4.8	6	5	4	9		Sat.		Light gray, f. SAND. Uniform. Tr. orange mottling in top of stratum.	
-5											
	-7.7	9.8	3	3	4	7		Sat.			
-10											
	-10.9										13.0
	-12.7	14.8	2	2	1	3		Sat.		Med. gray, Silty, f. SAND.	
-15											
	-15.9										18.0
	-17.7	19.8	5	5	1	6		Sat.		COASTAL PLAIN	
-20										Med. gray w/orange mottling, f. SAND w/tr. limestone frags. (Belgrade Formation)	
	-20.4										22.5
	-22.7	24.8	9	9	9	18		Sat.		Light tan w/orange mottling, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.	
-25											
	-25.9										28.0
	-27.7	29.8	14	15	16	31		Sat.		Med. tan w/orange mottling, Silty, f. SAND w/some limestone frags. Well graded.	
-30											
	-32.7	34.8	18	24	17	41		Sat.			
-35											
	-34.9										37.0
	-37.7	39.8	9	22	18	40		Sat.		Med. to light tan, f. SAND w/tr. limestone frags.	
-40											
	-42.7	44.8	17	29	31	60		Sat.			
-45											
	-43.2										45.3
	-47.7	49.8	17	24	16	40		Sat.		Dark gray, f. SAND. Uniform. (Riverbend Formation)	
-50											
	-50.9										53.0
	-52.7	54.8	15	14	19	33		Sat.		Light gray, f. to cse. SAND w/Weathered Limestone. Well graded.	
-55											
	-53.9										56.0
	-57.7	59.8	13	23	25	48		Sat.		Med. to dark gray, f. SAND. Uniform.	
-60											
	-62.7	64.8	12	18	31	49		Sat.			
	-64.2										66.3
										Boring Terminated at Elevation -64.2 ft in uniform f. SAND. (Riverbend Formation)	

WBS 34442.1.5 | **TIP** R-2514D | **COUNTY** Jones | **GEOLOGIST** Corey Futral

SITE DESCRIPTION Dual Bridges on -L- over the Trent River | **GROUND WTR (ft)**

BORING NO. EB2-B NBL | **STATION** 395+66 | **OFFSET** 52ft RT | **ALIGNMENT** -L- | **0 HR.** 7.0

COLLAR ELEV. 8.3 ft | **TOTAL DEPTH** 66.3 ft | **NORTHING** 466,692 | **EASTING** 2,530,758 | **24 HR.** FIAD

DRILL RIG/HAMMER EFF./DATE MAD3964 CME-45C 86% 07/25/2013 | **DRILL METHOD** NW Casing w/ SPT | **HAMMER TYPE** Automatic

DRILLER W. Matt Wiggins | **START DATE** 10/22/13 | **COMP. DATE** 10/22/13 | **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
	8.3	0.0	1	1	1	2		D		GROUND SURFACE 8.3 0.0
										UNDIVIDED COASTAL PLAIN 7.8 0.5
										Dark brown, Topsoil w/tr. leaves and roots.
5	5.5	2.8	3	3	4	7		M		Med. to light tan, f. SAND. Uniform. Med. orange mottling noted below ~9 ft.
	3.5	4.8	2	2	2	4		W		
0										
	-1.5	9.8	4	5	5	10		Sat.		
-5										
	-6.5	14.8	2	1	1	2		Sat.		
-10										
	-9.7									18.0
	-11.5	19.8	1	2	1	3		Sat.		Med. tan w/orange and dark brown mottling, Silty, f. SAND.
-15										
	-14.7									23.0
	-16.5	24.8	2	5	2	7		Sat.		COASTAL PLAIN
-20										Med. tan w/light gray to lt. tan w/orange, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses. (Belgrade Formation)
	-21.5	29.8	7	7	7	14		Sat.		
-25										
	-24.7									33.0
	-26.5	34.8	15	20	14	34		Sat.		Med. to light tan w/light orange mottling, f. SAND. Uniform.
-30										
	-29.2									37.5
	-31.5	39.8	18	19	52	71		Sat.		Med. tan w/light brown and orange mottling, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
-35										
	-35.2									43.5
	-36.5	44.8	12	19	22	41		Sat.		Med. gray, Silty, f. SAND w/tr. shell and weathered limestone frags. Gap graded. (Riverbend Formation)
-40										
	-39.7									48.0
	-41.5	49.8	14	21	17	38		Sat.		Med. gray, f. SAND. Uniform.
-45										
	-46.5	54.8	21	23	31	54		Sat.		
-50										
	-49.7									58.0
	-51.5	59.8	42	19	11	30		Sat.		Light gray, well graded, f. to cse. SAND w/tr. to little silt, weathered limestone frags., and sporadic limestone lenses.
-55										
	-54.7									63.0
	-56.5	64.8	11	12	22	34		Sat.		Light gray, f. SAND. Uniform.
	-58.0									66.3
										Boring Terminated at Elevation -58.0 ft in uniform f. SAND. (Riverbend Formation)

SITE PHOTOGRAPHS

CATLIN Engineers and Scientists	
Wilmington, NC 213104.03	
SHEET NO.:	41 of 41
PROJ. NO.:	34442.1.5
TIP NO.:	R-2514D
COUNTY:	Jones

END BENT TWO FACING SOUTH
ALONG -L- CENTER LINE

DRILL ON BORING B-11A SBL
FACING NORTH ALONG -L- SBL

BENT 7 FACING SOUTH
ALONG -L- CENTER LINE

BENT 8 FACING NORTH
ALONG -L- CENTER LINE