STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5519	1	46

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	105+00 TO 120+00	4	-	-
-L-	132+00 TO 147+00	5	-	-
-L-	205+00 TO 220+00	6	-	-
-L-	222+00 TO 237+00	7	-	-
-L-	239+00 TO 254+00	8	-	-
-L-	262+00 TO 277+00	9	-	15
-L-	279+00 TO 294+00	10	-	-
-L-	316+00 TO 331+00	11	-	-
-L-	356+00 TO 371+00	12	-	-
-L-	393+00 TO 407+00	13	-	-
-SR1-	10+00 TO 21+00	10	14	-

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *CUMBERLAND*

PROJECT DESCRIPTION *I-95 BUSINESS /US 301 FROM NC 87 SOUTH TO NC 59*

INVENTORY

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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

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

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

PERSONNEL

A. S. PAUL

T. E. EVANS

INVESTIGATED BY *A. S. PAUL*

DRAWN BY *ASP & TEE*

CHECKED BY *J. R. HAMM*

SUBMITTED BY *FALCON*

DATE *DECEMBER 2014*

NORTH CAROLINA PROFESSIONAL SEAL 039779 12/5/14 ENGINEER JEREMY R. HAMM

SIGNATURE DATE

SIGNATURE DATE

REFERENCE:

PROJECT:

PROJECT REFERENCE NO.	SHEET NO.
W-5519	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

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

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

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

RECOMMENDATION SYMBOLS

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

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

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

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

HAMMER TYPE:
- [ ] AUTOMATIC [ ] MANUAL

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

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [X] KESSLER DCP

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

BENCH MARK:
BORING ELEVATIONS RETREIVED FROM *.TIN* FILES
ELEVATION: FEET

NOTES:
FIAD - FILLED IMMEDIATELY AFTER DRILLED

DATE: 8-15-14

09/08/99

TIP PROJECT: W-5519

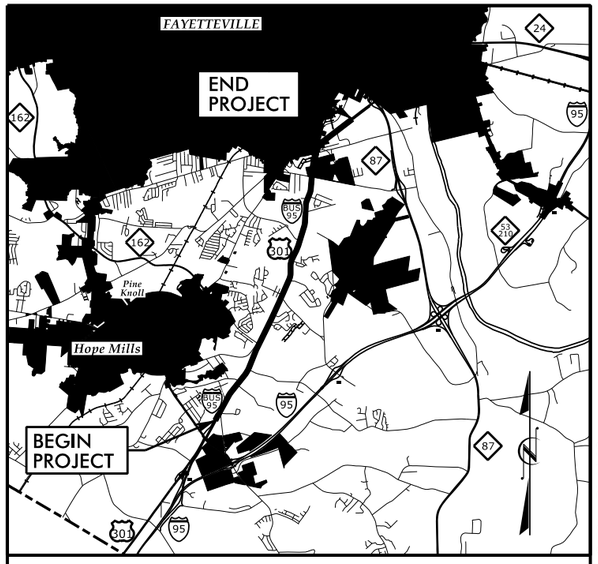
CONTRACT:

$$$$$$SYSTIME$$$$$$

$$$$$$USERNAME$$$$$$

$$$$$$DGN$$$$$$

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



VICINITY MAP
(NTS)

25% PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

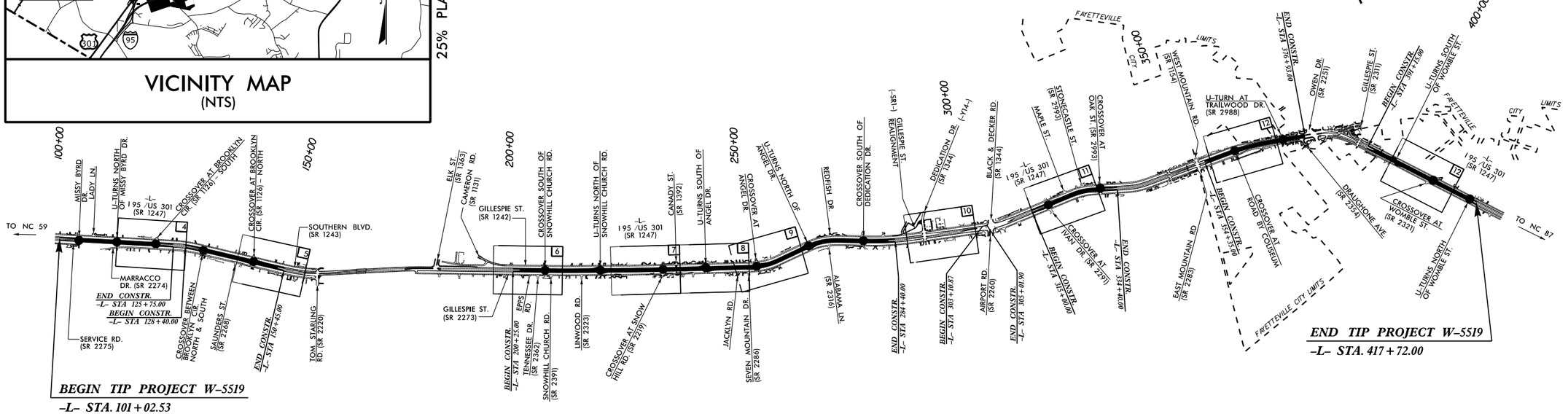
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5519	2A	46

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
45849.1.FR1	HSIP-095-2(128)46	PE
45849.2.FR1	HSIP-095-2(128)46	R/W
45849.3.FR1	HSIP-095-2(128)46	CONST

LOCATION: I-95 BUSINESS /US 301 FROM NC 87 SOUTH TO NC 59

TYPE OF WORK: PAVING, GRADING, DRAINAGE, PAVEMENT MARKINGS AND SIGNING

NAD 83
NC GRID



NCDOT CONTACT: SEAN MATUSZEWSKI
PROJECT ENGINEER - DIVISION DESIGN CONSTRUCTION

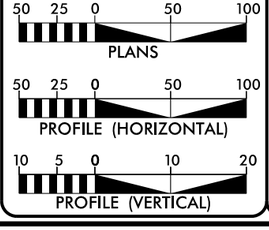
A PORTION OF THIS PROJECT IS WITHIN MUNICIPAL BOUNDARIES OF THE CITY OF FAYETTEVILLE, N.C.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES



DESIGN DATA

ADT 2015 = 26,160
ADT 2035 = 41,860
K = 10 %
D = 70 %
T = 9 % *
V = 60 MPH
* TTST = 9% DUAL N/A
FUNC CLASS = PRINCIPAL ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT W-5519 = 3.814 mi.
LENGTH STRUCTURE TIP PROJECT W-5519 = 0.000 mi.
TOTAL LENGTH TIP PROJECT W-5519 = 3.814 mi.

Prepared for NCDOT In the Office of:

moffatt & nichol
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOV. 24, 2014

LETTING DATE:
NOV. 17, 2015

TIM REID, P.E.
PROJECT ENGINEER

TRENT HUFFMAN, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

moffatt & nichol
1616 EAST MILLBROOK ROAD, SUITE 160
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(919) 781-4626 VOICE (919) 781-4869 FAX

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

moffatt & nichol
1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 781-4626 VOICE (919) 781-4869 FAX

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

Roadway Subsurface Investigation Report - Inventory

I-95 Business / US-301 from NC 87 South to NC 59
Cumberland County, North Carolina
TIP: W-5519
Falcon Project No.: G14025.00

Prepared for:
Moffatt and Nichol
1616 East Millbrook Road, Suite 160
Raleigh, NC 27608

Submitted by:
Falcon Engineering, Inc.
1210 Trinity Road, Suite 110
Raleigh, North Carolina 27607
(919) 871-0800
www.falconengineers.com

December 5, 2014

PREFACE

This roadway subsurface investigation was conducted between September 30 and October 10, 2014 in general accordance with our Proposal to Provide Geotechnical Engineering Services, dated March 5, 2014. The recommendations provided in this report are based solely on our site reconnaissance, hand auger borings, laboratory test data, engineering evaluation of these data, and generally accepted soil engineering practices and principles.

A total of thirty-four (34) hand auger borings were performed for the new intersection improvements and service road alignment. Representative soil samples, collected from hand auger cuttings, were selected for laboratory testing to verify visual field classifications. In addition, one (1) bulk sample was collected for additional laboratory testing for use in our geotechnical engineering analyses.

Falcon appreciates the opportunity to have provided our geotechnical engineering services for the above referenced project. If you have any questions concerning the contents of this report or need additional information, please do not hesitate to contact our office.

FALCON ENGINEERING, INC.

Report Prepared By:

Allan Paul, PE
Geotechnical Engineer

Report Reviewed By:

Jeremy R. Hamm, PE
Geotechnical Department Manager

TIP: W-5519
COUNTY: Cumberland
DESCRIPTION: I-95 Business / US-301 from NC 87 South to NC 59
SUBJECT: Roadway Subsurface Investigation – Inventory

PROJECT DESCRIPTION

This project consists of various intersection improvements along several miles of I-95 Business in Cumberland County, North Carolina. Many of the intersection improvements will include new pavements for turn lanes and turn outs, while some intersections will only include removal of existing pavements. Site grading for construction of new pavements will be minimal and generally include less than 3 feet of cut and/or fill, with the majority of pavements to be constructed near existing site grades.

The following alignments, totaling approximately 30,200 feet (5.72 miles) were explicitly investigated.

Alignment	Station
-L- (I-95 Business)	101+02.53 – 125+75.00
	128+40.00 – 150+45.00
	200+25.00 – 284+40.00
	315+00.00 – 334+40.00
	354+35.00 – 374+66.00
	391+15.00 – 417+72.00
-SR1- (Dedication Lane)	14+00.00 – 21+57.71

Site plans and boring logs along these alignments are included in this report.

AREAS OF SPECIAL GEOTECHNICAL INTEREST

The following sections contain cohesive and/or highly plastic soils which have the potential to cause embankment/subgrade and or slope stability problems during construction:

Station	Offset
113+60 -L-	Right
139+00 -L-	Center
262+00 -L-	Center
266+00 -L-	Right

Groundwater was measured within the following area within 6 feet of existing grade and may cause groundwater related stability problems during construction:

Station	Offset
262+00 -L-	Center

PHYSIOGRAPHY AND GEOLOGY

The project site is in the western portion of the Coastal Plain Physiographic Province of North Carolina. According to the ***Geologic Map of North Carolina*** (1985), the site is underlain by the Black Creek Formation (Kb) and the Cape Fear Formation (Kc) of the Cretaceous age. The Black Creek Formation is noted to contain gray to black, lignitic clay with thin beds and laminae of fine-grained micaceous sand and thick lenses of cross-bedded sand. Glauconitic, fossiliferous clayey sandy lenses are present in the upper portions. The Cape Fear formation is noted to contain sandstone and sandy mudstone yellowish gray to bluish gray, mottled red to yellowish orange, indurated, graded and laterally continuous sand bedding, and blocky clay with faint cross-bedding.

The majority of new pavement construction New fills on the order of up to 3 feet are proposed along both left and right sides of the project within the right-of-way and for the relocation of Dedication Drive (-SR1-).

Existing site topography is relatively flat with moderate grade changes near low lying areas; typical of the coastal plains especially in flood plains. Predominantly wide and shallow drainage swales parallel existing roadway alignments, and carry roadway drainage toward various drainage features and natural creeks/swamps

SOIL PROPERTIES

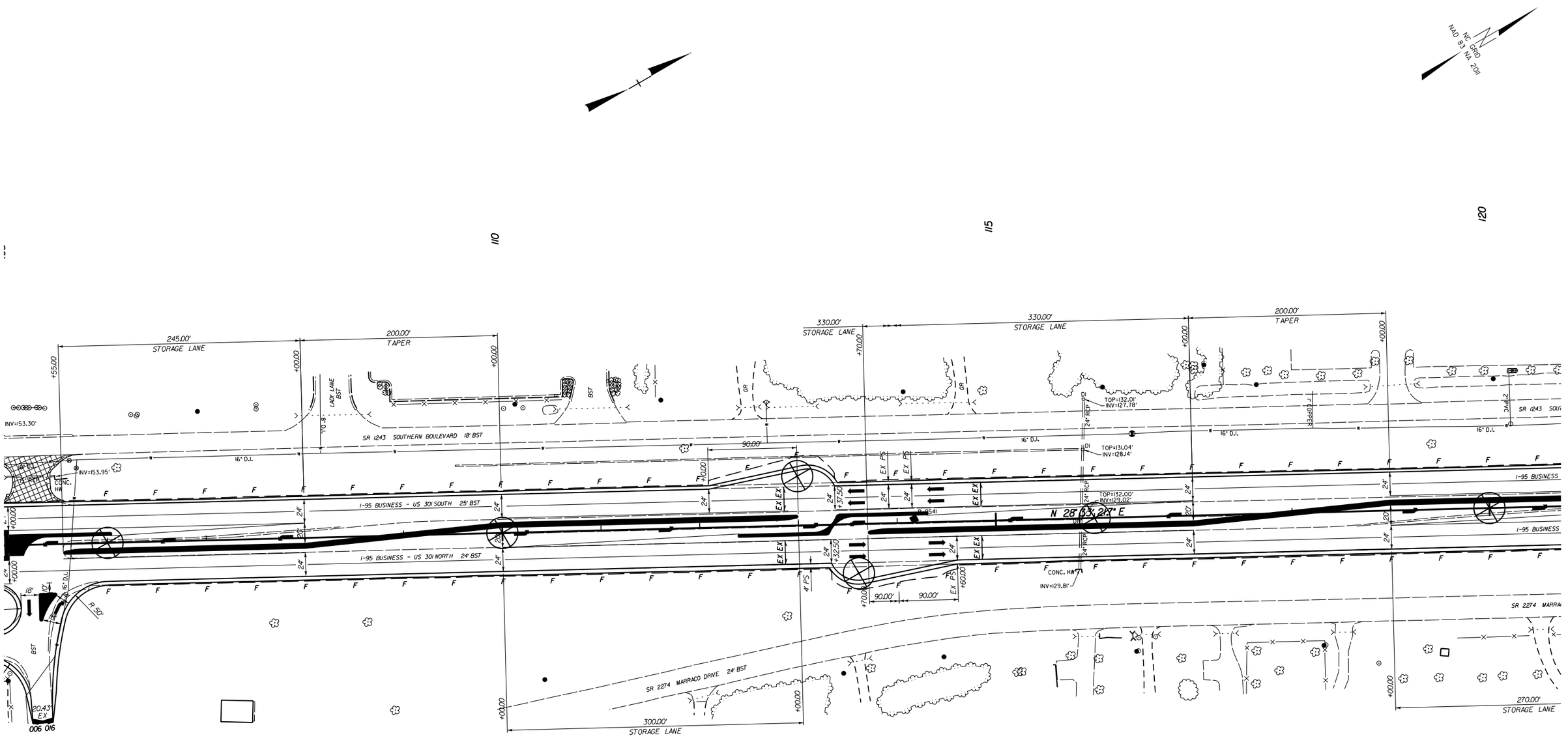
The typical soils encountered along the project include existing roadway embankments and coastal plains deposits.

Roadway Embankment soils were encountered at the ground surface or beneath existing pavements in and adjacent to existing roadways and consisted of moist, slightly silty sand (A-1-b) and silty/clayey sand (A-2-4 and A-2-6).

Coastal Plain soils were encountered at the ground surface and underneath roadway embankment. These soils consist of dry to saturated, sand (A-3), silty/clayey sands (A-2-4, A-2-6, A-2-7) and sandy clays (A-6,A-7).

GROUNDWATER PROPERTIES

Groundwater levels were measured at the time of boring completion, and in some cases after a waiting period of at least 24 hours. Hand auger borings drilled within and in close proximity to existing roadways were backfilled immediately after completion due to safety considerations. Groundwater was observed at shallow depths near low lying areas and should be anticipated to be within 6 feet of finished roadway grades near Station 260+00 to 263+00 -L-. Detailed groundwater measurements are included in the attached boring logs.



NOTES:

- PLANS ADOPTED FROM ELECTRONIC FILES RECEIVED FROM MOFFATT AND NICHOL, DATED NOVEMBER 2014.

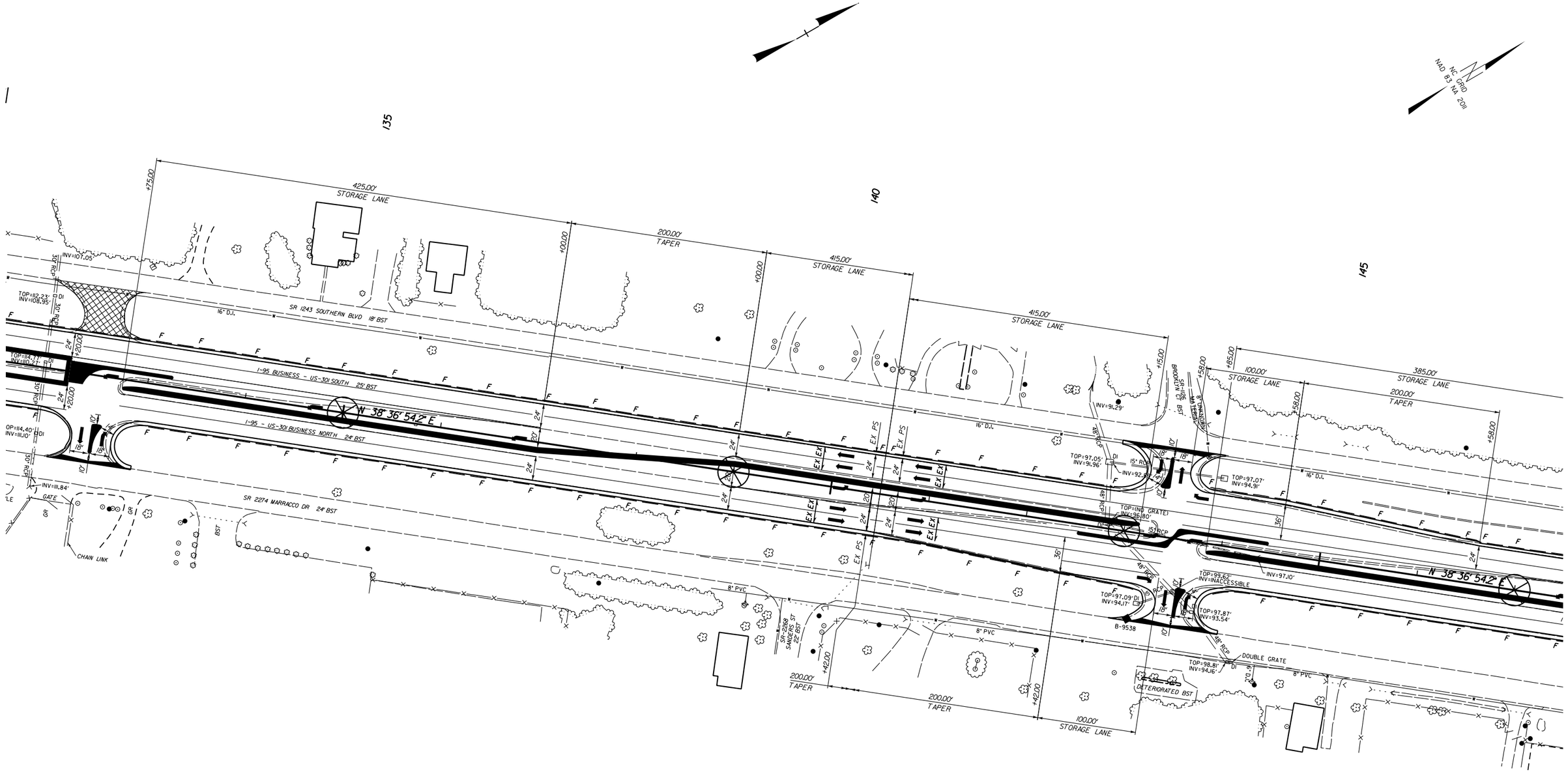
FALCON ENGINEERING

FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
RALEIGH, NC 27607

PHONE: 919.871.0800
FAX: 919.871.0803

SITE PLAN

I-95 BUSINESS /US-301 FROM NC 87 SOUTH TO NC 59
CUMBERLAND COUNTY, NORTH CAROLINA
WBS: , TIP: W-5519
FALCON PROJECT NO.: G14025.00



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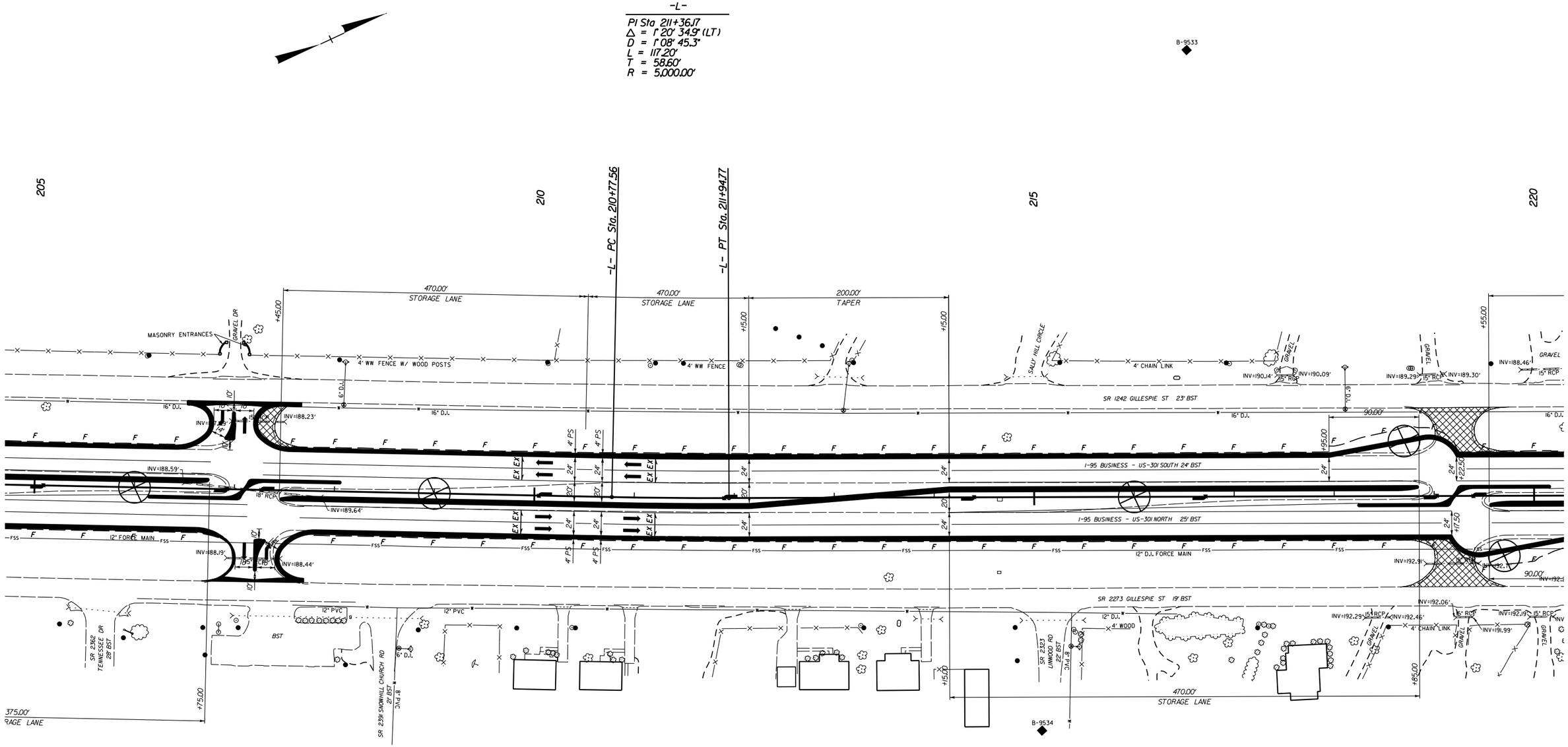

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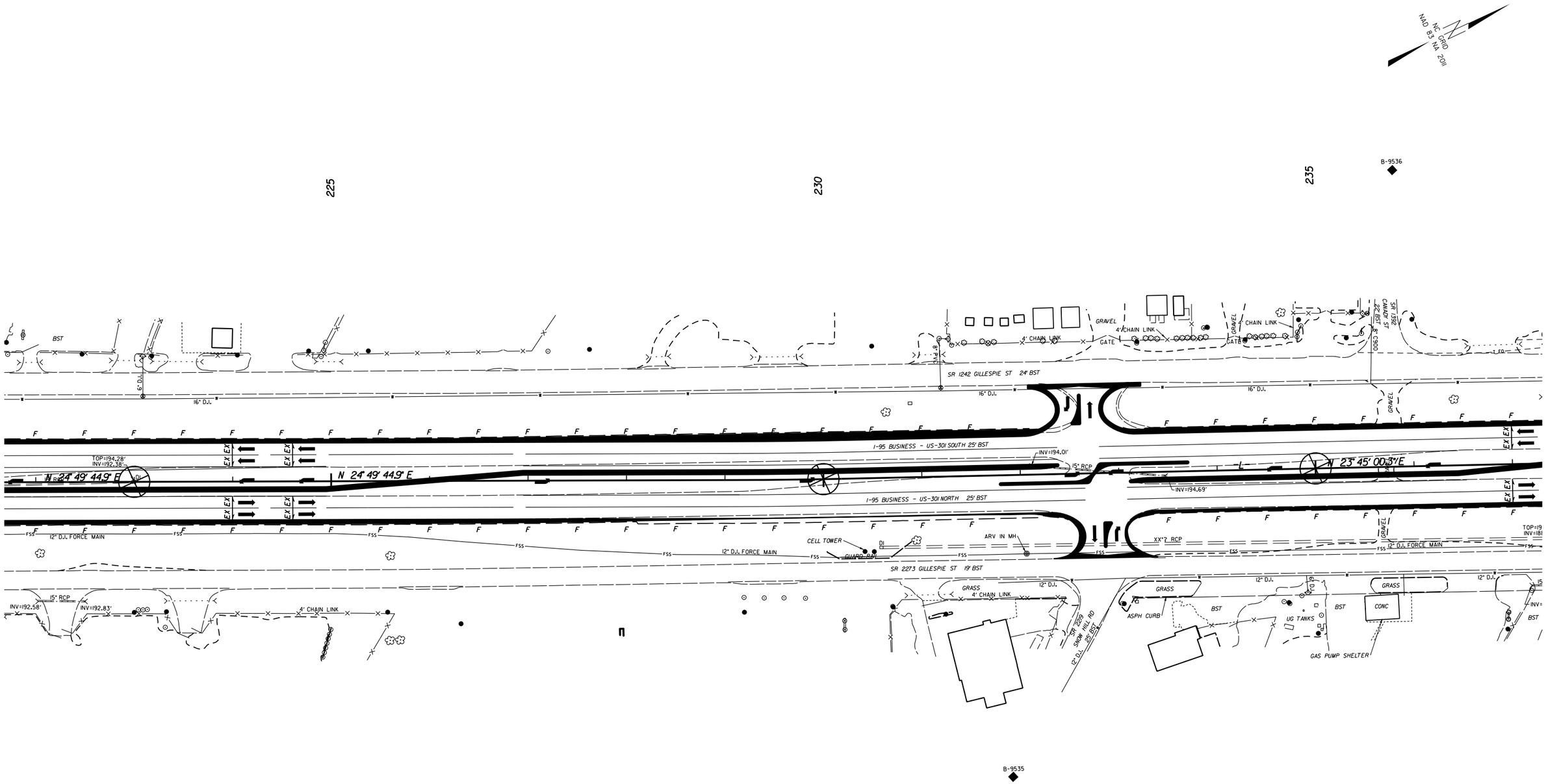

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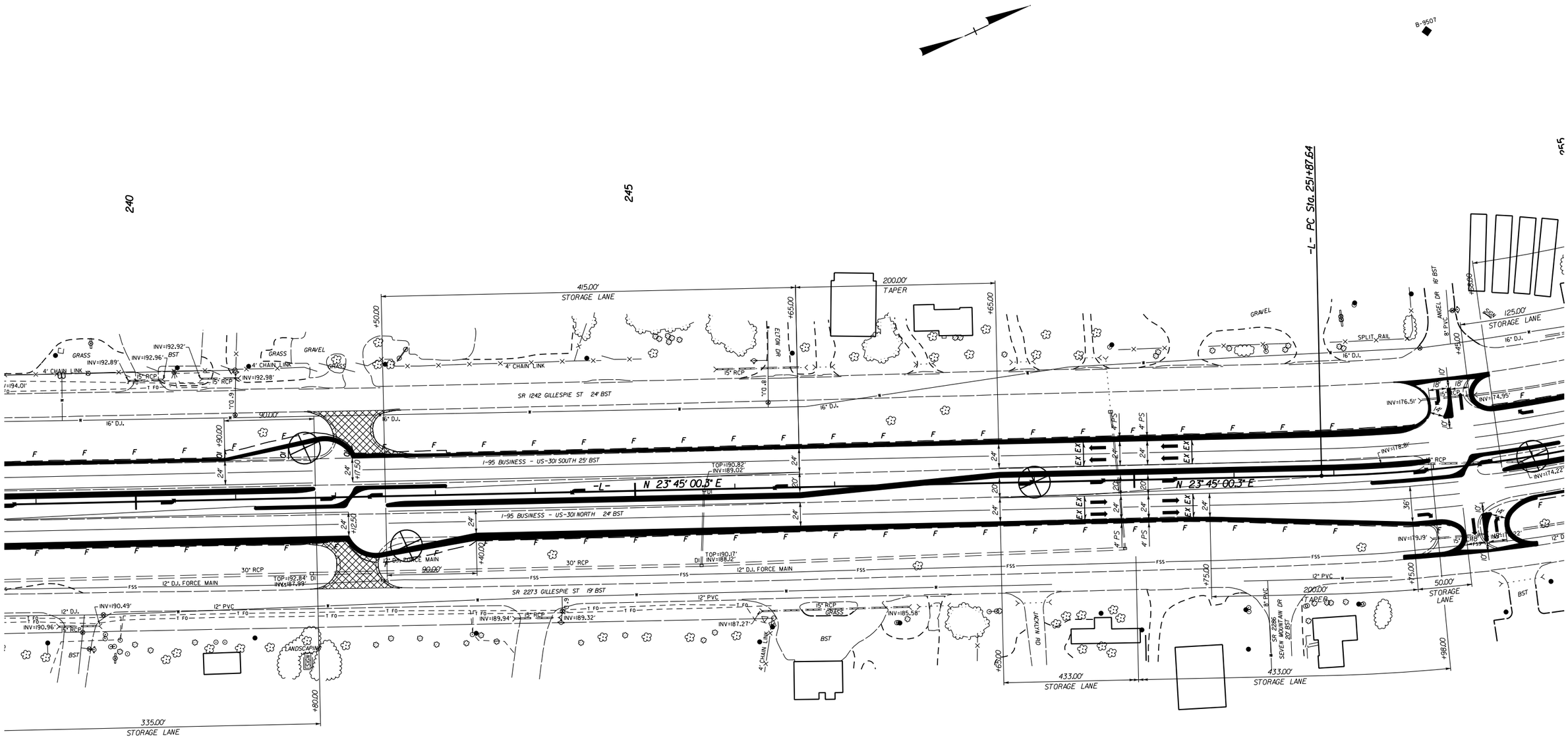

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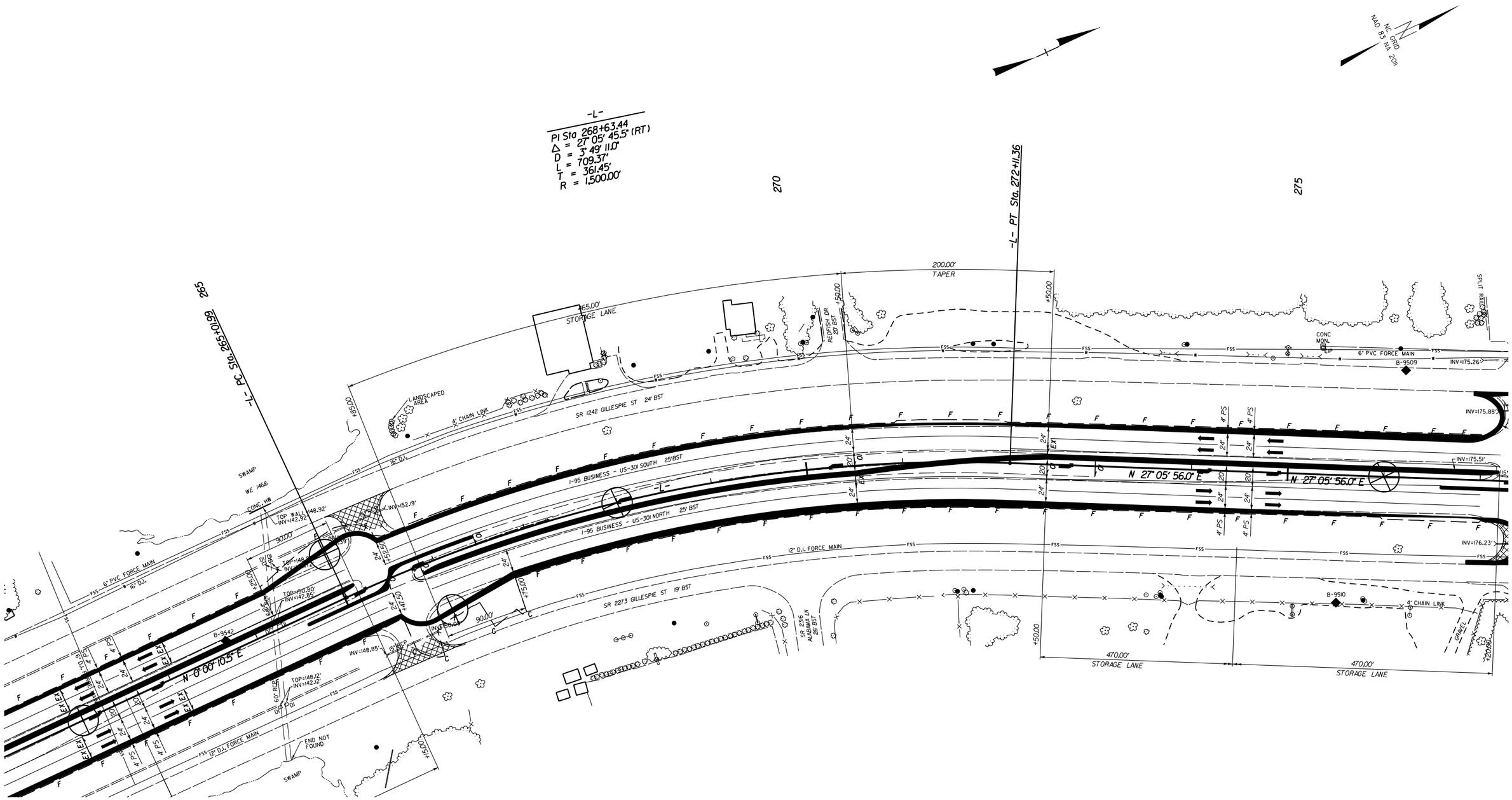

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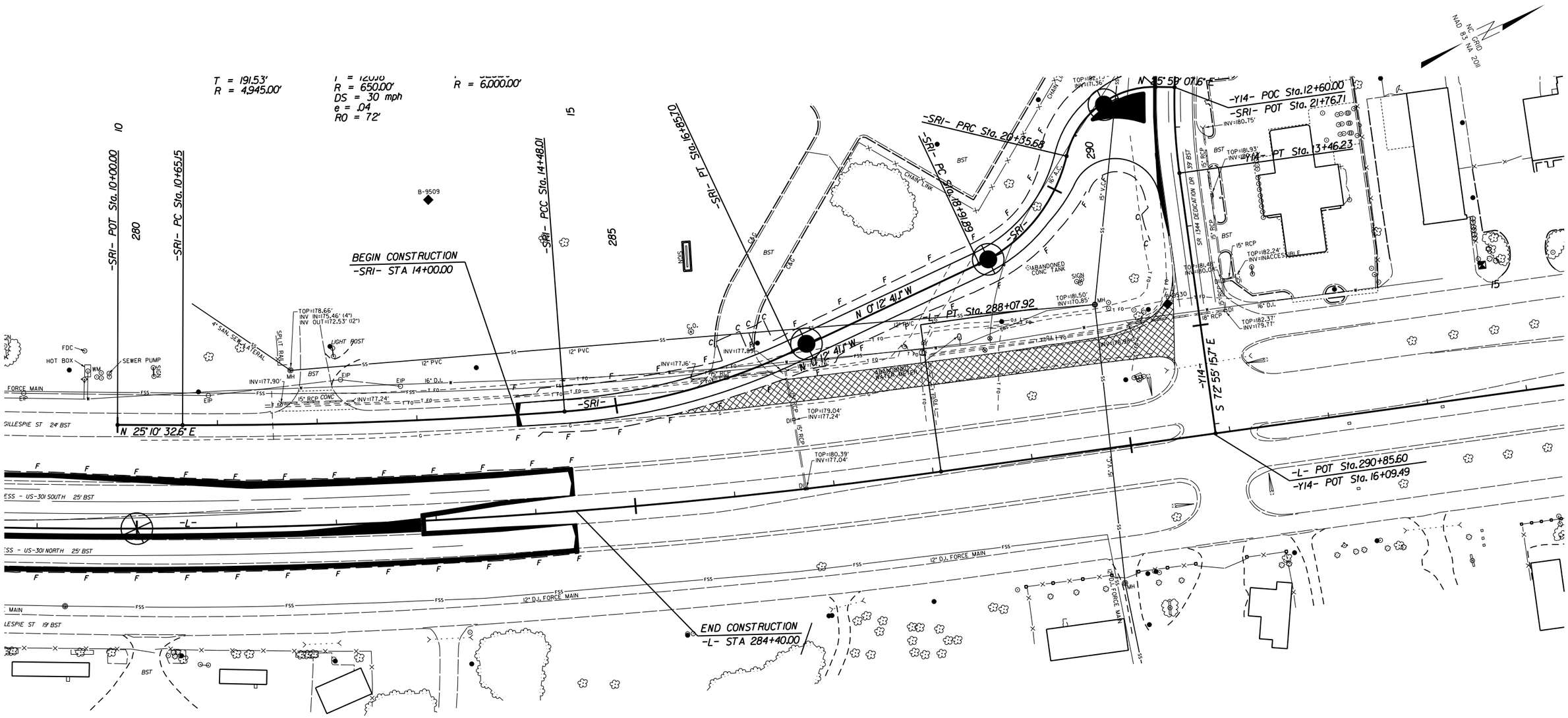

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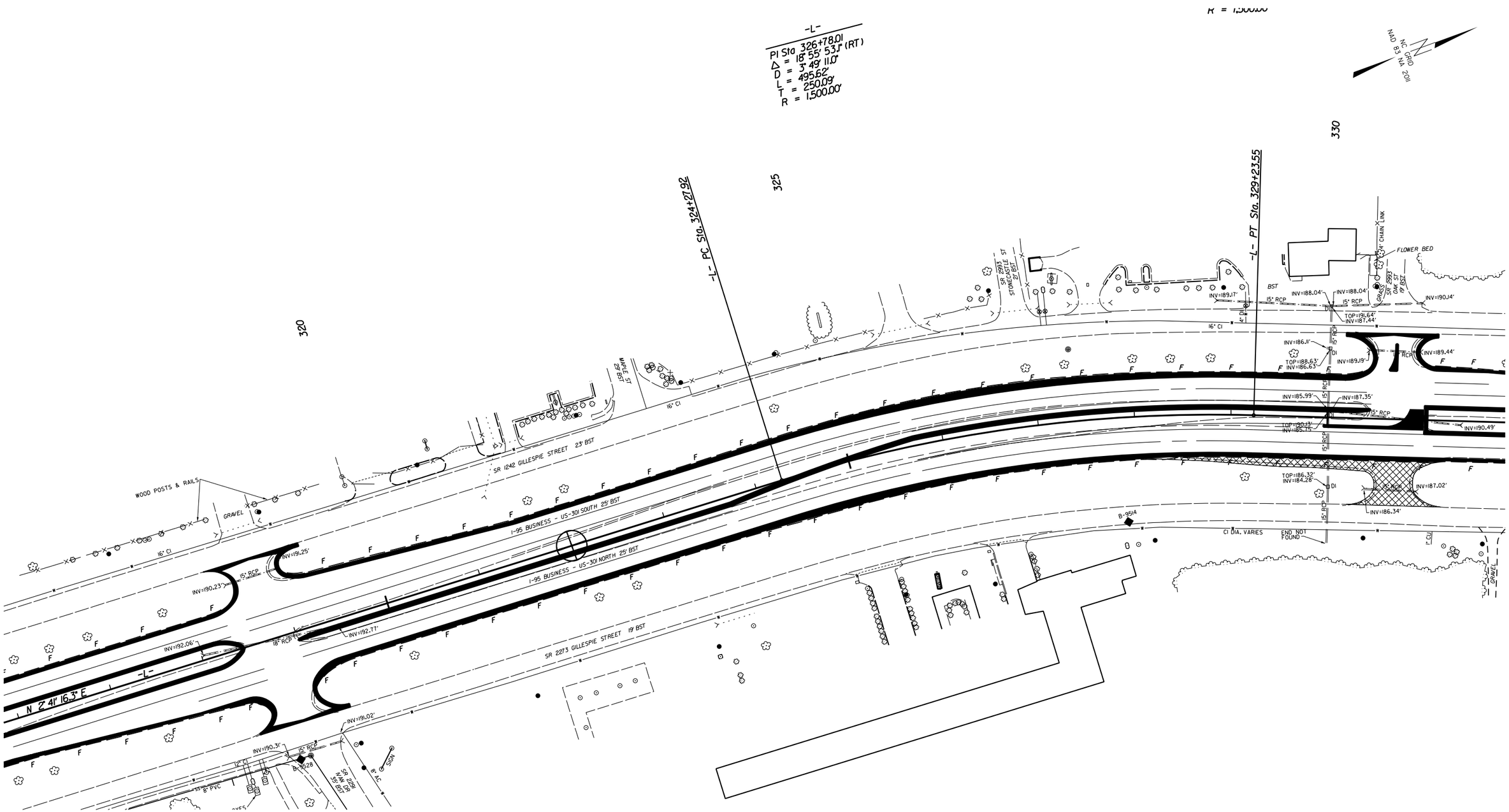

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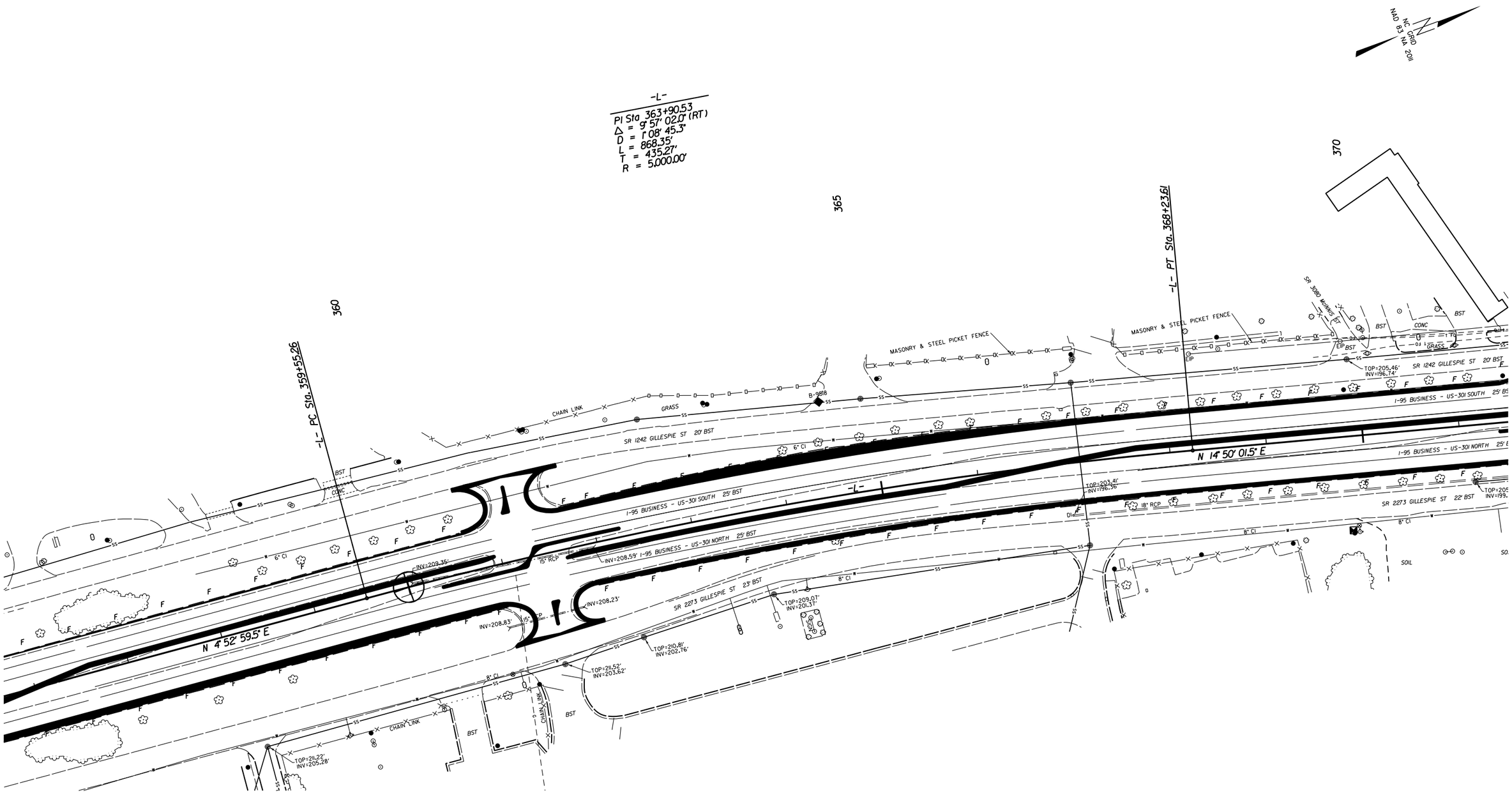

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CUMBERLAND COUNTY, NORTH CAROLINA
WBS: , TIP: W-5519
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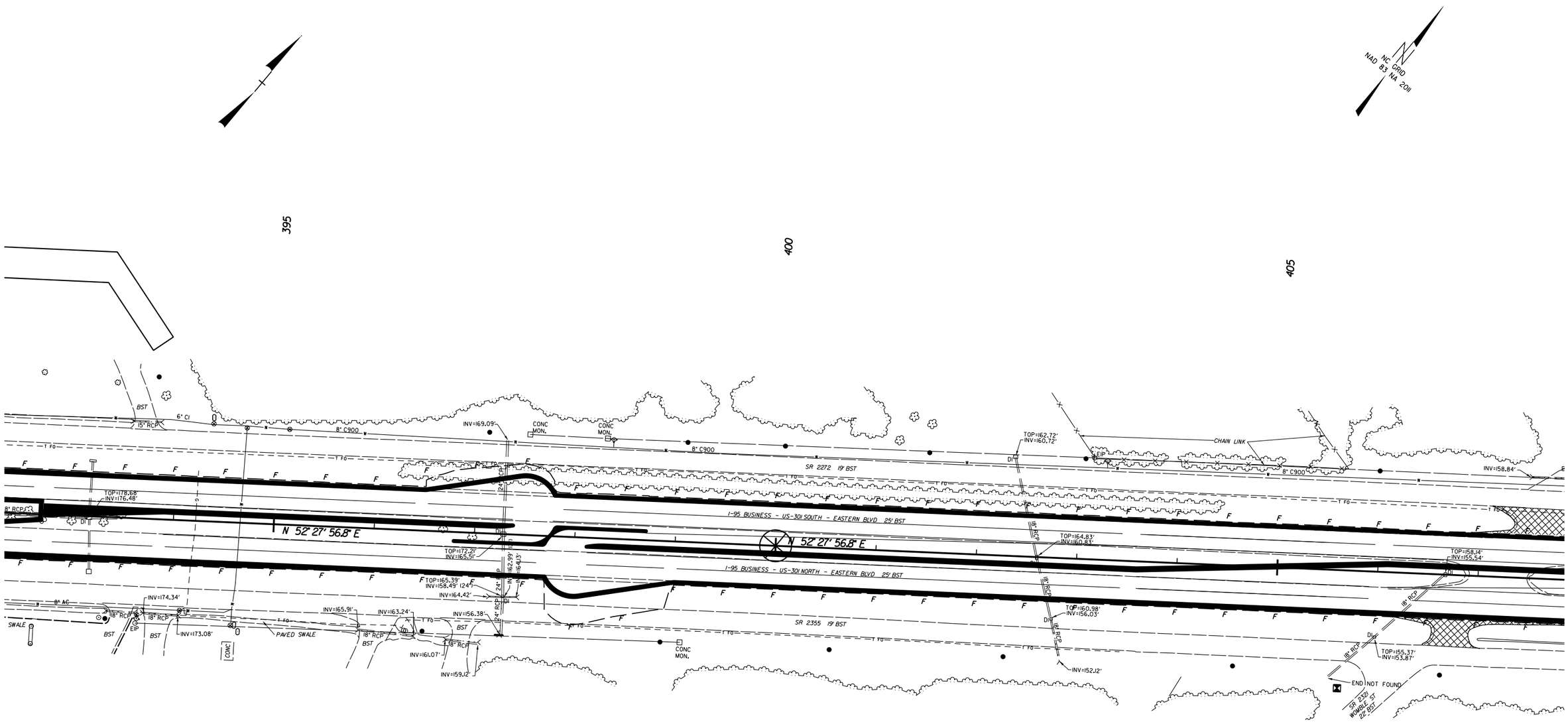

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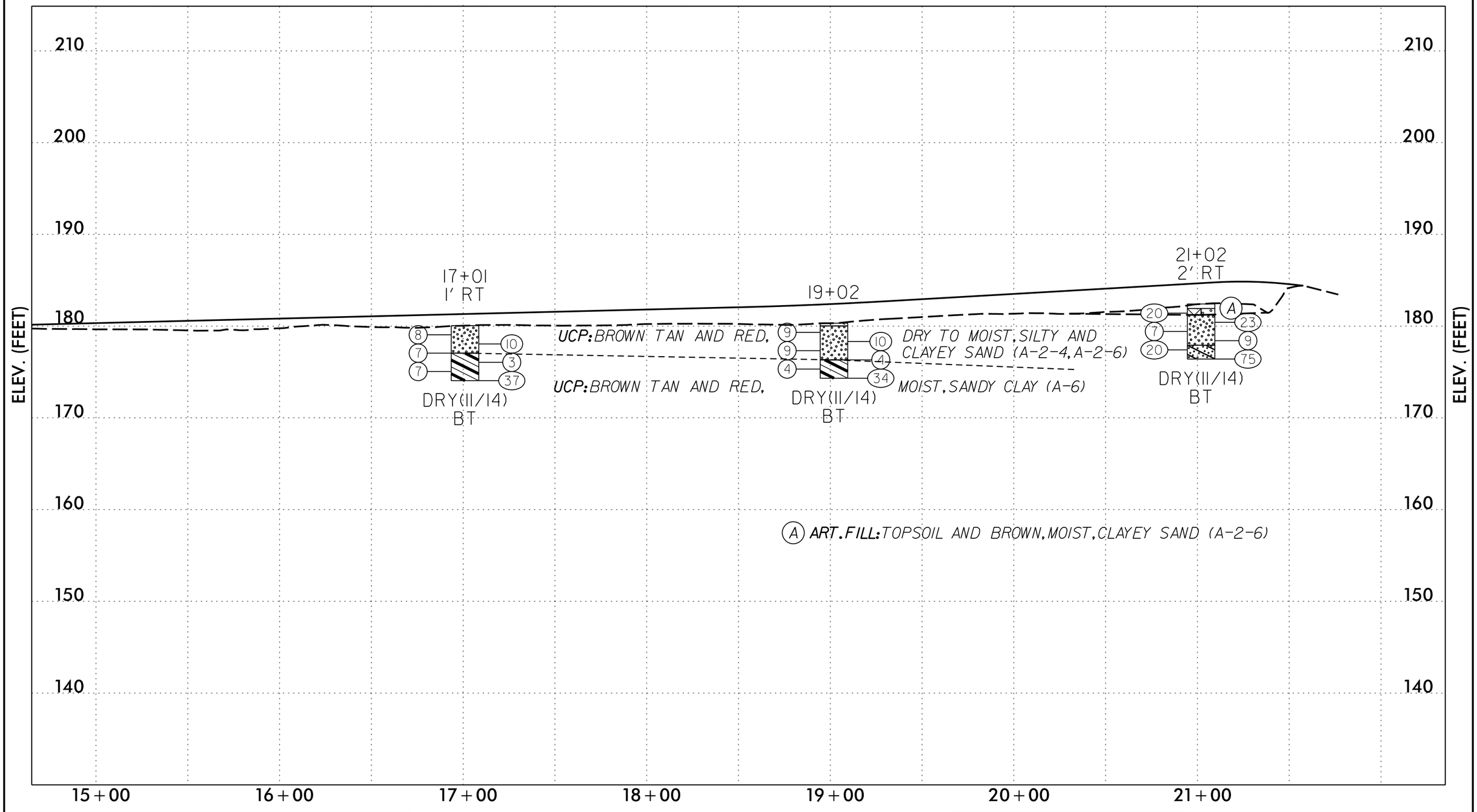
SITE PLAN

I-95 BUSINESS /US-301 FROM NC 87 SOUTH TO NC 59
CUMBERLAND COUNTY, NORTH CAROLINA
WBS: , TIP: W-5519
FALCON PROJECT NO.: G14025.00



NOTES:

- GROUNDLINE PROFILE OF –SR1– TAKEN FROM ELECTRONIC FILES RECEIVED FROM MOFFATT AND NICHOL, DATED NOVEMBER, 2014.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

VERTICAL SCALE

0 10 20

FEET

HORIZONTAL SCALE

0 50 100

FEET

FALCON ENGINEERING

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FAX: 919.871.0803

SUBSURFACE PROFILE ALONG –SR1–

I-95 BUSINESS /US-301 FROM NC 87 SOUTH TO NC 59
CUMBERLAND COUNTY, NORTH CAROLINA
WBS: , TIP: W-5519
FALCON PROJECT NO.: G14025.00

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	W-5519	15

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

165 160 155

3:1

2.99:1

RE: TAN AND GRAY, MOIST, SILTY SAND

267+00.00

165 160 155 145

3:1

6:1

4.7'

RE: TAN AND GRAY, MOIST, SILTY SAND

UCP: GRAY AND ORANGE, MOIST, CLAY

266+50.00

160 155 150 145

3:1

L_26600

3.01:1

RE: TAN AND GRAY, MOIST, SILTY SAND

UCP: GRAY AND ORANGE, MOIST, CLAY

DRY (09/14)
BT

266+00.00

160 155 150

3:1

6:1

4.7'

RE: TAN AND GRAY, MOIST, SILTY SAND

265+50.00

—℄—

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_10600	**STATION** 106+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 158.0 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 437,116	**EASTING** 2,021,911	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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)
160											
										158.0 GROUND SURFACE	0.0
										157.5 TOPSOIL (6")	0.5
										156.5 **ROADWAY EMBANKMENT** DARK TAN AND RED, SILTY SAND (A-2-4)	1.5
155										155.0 BROWN, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 155.0 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_11000	**STATION** 110+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 149.2 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 437,468	**EASTING** 2,022,103	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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
150										
										149.2 GROUND SURFACE 0.0
										149.0 TOPSOIL (2") 0.2
										146.7 **ROADWAY EMBANKMENT** TAN, SILTY SAND (A-2-4) 2.5
										146.2 **UNDIVIDED COASTAL PLAIN** DARK YELLOW, SILTY SAND (A-2-4) 3.0
										Boring Terminated at Elevation 146.2 ft

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_11300	**STATION** 113+00	**OFFSET** 50 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 141.3 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 437,755	**EASTING** 2,022,202	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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)
145											
										141.3 GROUND SURFACE	0.0
										140.8 TOPSOIL (6")	0.5
140										139.3 **ROADWAY EMBANKMENT** GRAY, SILTY SAND (A-2-4)	2.0
										138.3 **UNDIVIDED COASTAL PLAIN** BROWN, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 138.3 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_11360	**STATION** 113+60	**OFFSET** 50 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 139.7 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 437,760	**EASTING** 2,022,318	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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
140										
							S-1	22%		139.7 GROUND SURFACE 0.0
										139.4 TOPSOIL (4") 0.3
										137.5 **ROADWAY EMBANKMENT** 2.2
										136.7 TAN AND GRAY, SILTY SAND (A-2-4) 3.0
										UNDIVIDED COASTAL PLAIN ORANGE, CLAYEY SAND (A-2-7)
										Boring Terminated at Elevation 136.7 ft

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_11600	**STATION** 116+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 132.6 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 437,995	**EASTING** 2,022,389	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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)
135											
										132.6 GROUND SURFACE	0.0
										131.4 TOPSOIL (2")	1.2
130										**ROADWAY EMBANKMENT**	
										129.6 GRAY AND BROWN, SILTY SAND (A-2-4)	3.0
										UNDIVIDED COASTAL PLAIN	
										GRAY, SILTY SAND (A-2-4)	
										Boring Terminated at Elevation 129.6 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_12000	**STATION** 120+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 124.7 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 438,346	**EASTING** 2,022,581	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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
125										
										124.7 GROUND SURFACE 0.0
										124.5 TOPSOIL (2") 0.2
										ROADWAY EMBANKMENT
										121.7 GRAY AND TAN, SILTY SAND (A-2-4) 3.0
										Boring Terminated at Elevation 121.7 ft

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_13500	**STATION** 135+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 111.5 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 439,602	**EASTING** 2,023,393	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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
115										ELEV. (ft) DEPTH (ft)
										111.5 GROUND SURFACE 0.0
										111.2 TOPSOIL (3") 0.3
110										**ROADWAY EMBANKMENT**
										108.5 ORANGE, SAND (A-1-b) W/ SILT 3.0
										Boring Terminated at Elevation 108.5 ft

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_13900	**STATION** 139+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 104.0 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 439,914	**EASTING** 2,023,643	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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
105										
										104.0 GROUND SURFACE 0.0
										103.6 TOPSOIL (5") 0.4
							S-2	25%		102.0 **ROADWAY EMBANKMENT** 2.0
										101.0 DARK TAN, SILTY SAND (A-2-4) 3.0
										UNDIVIDED COASTAL PLAIN
										GRAY AND WHITE, CLAY (A-7-6)
										Boring Terminated at Elevation 101.0 ft

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_14300	**STATION** 143+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 99.5 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 440,227	**EASTING** 2,023,892	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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)
100										99.5 GROUND SURFACE	0.0
										99.2 TOPSOIL (4")	0.3
										97.5 **ROADWAY EMBANKMENT** DARK TAN AND RED, SILTY SAND (A-2-4)	2.0
										96.8 **UNDIVIDED COASTAL PLAIN** TAN, SILTY SAND (A-2-4)	2.7
										96.5 GRAY, SANDY CLAY (A-6)	3.0
										Boring Terminated at Elevation 96.5 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_14700	**STATION** 147+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 99.8 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 440,539	**EASTING** 2,024,142	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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)
100										99.8 GROUND SURFACE	0.0
										99.5 TOPSOIL (4")	0.3
										98.0 **ROADWAY EMBANKMENT** TAN AND RED, CLAYEY SAND (A-2-6)	1.8
										96.8 **UNDIVIDED COASTAL PLAIN** WHITE SAND (A-3)	3.0
										Boring Terminated at Elevation 96.8 ft	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_20600	**STATION** 206+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 190.5 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 445,809	**EASTING** 2,026,753	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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)
195											
190										190.5 GROUND SURFACE	0.0
										190.2 TOPSOIL (3")	0.3
										188.5 **ROADWAY EMBANKMENT** BROWN, SILTY SAND (A-2-4)	2.0
										187.5 **UNDIVIDED COASTAL PLAIN** TAN, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 187.5 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_20900	**STATION** 209+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 192.3 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 446,078	**EASTING** 2,026,885	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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
195										
190										192.3 GROUND SURFACE 0.0
										192.0 TOPSOIL (4") 0.3
										190.3 **ROADWAY EMBANKMENT** BROWN, SILTY SAND (A-2-4) 2.0
										189.3 **UNDIVIDED COASTAL PLAIN** TAN, SILTY SAND (A-2-4) 3.0
										Boring Terminated at Elevation 189.3 ft

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_21600	**STATION** 216+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 193.8 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 446,711	**EASTING** 2,027,184	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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
195										ELEV. (ft) DEPTH (ft)
										193.8 0.0 GROUND SURFACE
										193.8 0.0 TOPSOIL (4")
										191.9 1.9 **ROADWAY EMBANKMENT** BROWN, SILTY SAND (A-2-4)
										190.8 3.0 **UNDIVIDED COASTAL PLAIN** TAN, SILTY SAND (A-2-4)
										Boring Terminated at Elevation 190.8 ft

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_21870	**STATION** 218+70	**OFFSET** 55 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 194.0 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 446,979	**EASTING** 2,027,247	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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
195										
										194.0 0.0 GROUND SURFACE
										193.2 0.8 TOPSOIL (9")
										191.0 3.0 **UNDIVIDED COASTAL PLAIN** TAN, SILTY SAND (A-2-4)
										Boring Terminated at Elevation 191.0 ft

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_21970	**STATION** 219+70	**OFFSET** 60 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 193.6 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 447,021	**EASTING** 2,027,394	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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)
195										193.6 GROUND SURFACE	0.0
										193.3 TOPSOIL (4")	0.3
										191.9 **ROADWAY EMBANKMENT** BROWN, SILTY SAND (A-2-4)	1.7
										190.6 **UNDIVIDED COASTAL PLAIN** TAN, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 190.6 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_22300	**STATION** 223+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 194.1 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 447,346	**EASTING** 2,027,478	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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)
195										194.1 GROUND SURFACE	0.0
										193.6 TOPSOIL (6")	0.5
										192.4 **UNDIVIDED COASTAL PLAIN** TAN, SILTY SAND (A-2-4)	1.7
										191.1 TAN, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 191.1 ft	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_23000	**STATION** 230+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 195.6 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 447,982	**EASTING** 2,027,771	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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)
200											
195										195.6 GROUND SURFACE	0.0
										194.2 TOPSOIL (4")	1.4
							S-3	10%		**ROADWAY EMBANKMENT** BROWN, SILTY SAND (A-2-4)	
										192.6 **UNDIVIDED COASTAL PLAIN** DARK TAN AND TAN, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 192.6 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_23500	**STATION** 235+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 195.5 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 448,439	**EASTING** 2,027,973	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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	
200											
195										195.5 GROUND SURFACE	0.0
										194.3 **ROADWAY EMBANKMENT** DARK RED, SILTY SAND (A-2-4)	1.2
										192.5 **UNDIVIDED COASTAL PLAIN** ORANGE, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 192.5 ft	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_24170	**STATION** 241+70	**OFFSET** 50 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 195.0 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 449,073	**EASTING** 2,028,197	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/01/14	**COMP. DATE** 10/01/14	**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)
195										195.0 GROUND SURFACE	0.0
										194.7 TOPSOIL (3")	0.3
										193.0 **UNDIVIDED COASTAL PLAIN** TAN AND GRAY, SILTY SAND (A-2-4)	2.0
										192.0 TAN, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 192.0 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_24270	**STATION** 242+70	**OFFSET** 50 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 195.2 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 449,122	**EASTING** 2,028,333	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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
200										
195										195.2 GROUND SURFACE 0.0
										193.5 TOPSOIL (1") 1.7
										192.2 **UNDIVIDED COASTAL PLAIN** TAN, SILTY SAND (A-2-4) 3.0
										TAN, CLAYEY SAND (A-2-4)
										Boring Terminated at Elevation 192.2 ft

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_24900	**STATION** 249+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 185.5 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 449,721	**EASTING** 2,028,536	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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)
190											
185										185.5 GROUND SURFACE	0.0
										185.3 TOPSOIL (2")	0.2
										183.5 **UNDIVIDED COASTAL PLAIN** TAN, SILTY SAND (A-2-4)	2.0
										182.5 BROWN, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 182.5 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_25400	**STATION** 254+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 176.2 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 450,184	**EASTING** 2,028,724	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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)
180											
175										176.2 GROUND SURFACE	0.0
										176.0 TOPSOIL (2")	0.2
										174.8 **ROADWAY EMBANKMENT** GRAY AND RED, SILTY SAND (A-2-4)	1.4
										173.7 YELLOW, SILTY SAND (A-2-4)	2.5
										173.2 RED, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 173.2 ft	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_26200	**STATION** 262+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 151.5 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 450,979	**EASTING** 2,028,779	**24 HR.** 1.0
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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)
155											
										151.5 GROUND SURFACE	0.0
										151.3 TOPSOIL (2")	0.2
150										149.7 **ROADWAY EMBANKMENT** GRAY AND TAN, SILTY SAND (A-2-4)	1.8
							S-4	28%		148.5 **UNDIVIDED COASTAL PLAIN** TAN AND GRAY, CLAY (A-7-6)	3.0
										Boring Terminated at Elevation 148.5 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_26500	**STATION** 265+00	**OFFSET** 50 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 152.3 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 451,279	**EASTING** 2,028,729	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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	
155											
										152.3 GROUND SURFACE	0.0
										152.0 TOPSOIL (3")	0.3
150										150.8 **ROADWAY EMBANKMENT** GRAY AND TAN, SILTY SAND (A-2-4)	1.5
										149.3 TAN AND ORANGE, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 149.3 ft	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_26600	**STATION** 266+00	**OFFSET** 55 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 152.7 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 451,375	**EASTING** 2,028,837	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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)
155											
										152.7 GROUND SURFACE	0.0
										152.4 TOPSOIL (3")	0.3
										152.0 **ROADWAY EMBANKMENT**	0.7
150										TAN AND GRAY, SILTY SAND (A-2-4)	
										149.7 **UNDIVIDED COASTAL PLAIN**	3.0
										GRAY AND ORANGE, CLAY (A-7-6)	
										Boring Terminated at Elevation 149.7 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_26800	**STATION** 268+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 161.8 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 451,577	**EASTING** 2,028,809	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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
165										
										161.8 GROUND SURFACE 0.0
										161.5 TOPSOIL (3") 0.3
160										160.0 **ROADWAY EMBANKMENT** 1.8
										TAN AND GRAY, SILTY SAND (A-2-4)
										Boring Terminated by Auger Refusal at Elevation 158.8 ft on RCP

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_27600	**STATION** 276+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 177.5 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 452,310	**EASTING** 2,029,121	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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)
180											
										177.5 GROUND SURFACE	0.0
										177.2 TOPSOIL (3")	0.3
175										**UNDIVIDED COASTAL PLAIN**	
										174.5 TAN, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 174.5 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_28000	**STATION** 280+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 181.0 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 452,668	**EASTING** 2,029,299	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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
185										
										181.0 GROUND SURFACE 0.0
										180.7 TOPSOIL (3") 0.3
180							S-5	9%		179.0 **ROADWAY EMBANKMENT** 2.0
										178.0 ORANGE AND GRAY, SILTY SAND (A-2-4) 3.0
										UNDIVIDED COASTAL PLAIN
										YELLOW, SILTY SAND (A-2-4)
										Boring Terminated at Elevation 178.0 ft

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_32200	**STATION** 322+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 195.5 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 456,732	**EASTING** 2,030,208	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 09/30/14	**COMP. DATE** 09/30/14	**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)
200											
195										195.5 GROUND SURFACE	0.0
										195.2 TOPSOIL (2")	0.3
										ROADWAY EMBANKMENT	
										192.5 TAN, SILTY SAND (A-2-4)	3.0
										Boring Terminated at Elevation 192.5 ft	

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_36000	**STATION** 360+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 210.4 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 460,446	**EASTING** 2,030,858	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/08/14	**COMP. DATE** 10/08/14	**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
215										
210										210.4 GROUND SURFACE 0.0
										ROADWAY EMBANKMENT
										TAN, SILTY SAND (A-2-4)
										207.4 3.0
										Boring Terminated at Elevation 207.4 ft

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. L_40000	**STATION** 400+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 169.4 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 463,758	**EASTING** 2,032,733	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 10/08/14	**COMP. DATE** 10/08/14	**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))
170										
										169.4 GROUND SURFACE 0.0
										168.9 **ROADWAY EMBANKMENT** BROWN, SILTY SAND (A-2-4) 0.5
										166.4 **ROADWAY EMBANKMENT** YELLOW TAN AND ORANGE, CLAYEY SAND (A-2-6) 3.0
										Boring Terminated at Elevation 166.4 ft

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. SR1_1701	**STATION** 17+01	**OFFSET** 1 ft RT	**ALIGNMENT** -SR1-	**0 HR.** Dry
COLLAR ELEV. 180.3 ft	**TOTAL DEPTH** 6.0 ft	**NORTHING** 453,354	**EASTING** 2,029,414	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 11/21/14	**COMP. DATE** 11/21/14	**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))
185										
180	180.3	0.0								180.3 GROUND SURFACE 0.0
	179.3	1.0	N/A	4	4	8 10		M		**UNDIVIDED COASTAL PLAIN** TAN, SILTY SAND (A-2-4)
	178.3	2.0	N/A	5	5	7		M		177.3 3.0
	177.3	3.0	N/A	3	4	3		M		BROWN AND RED, SANDY CLAY (A-6)
	176.3	4.0	N/A	1	2	7		M		174.3 6.0
175	175.3	5.0	N/A	3	4	37				Boring Terminated at Elevation 174.3 ft
			N/A	18	19					

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. SR1_1902	**STATION** 19+02	**OFFSET** CL	**ALIGNMENT** -SR1-	**0 HR.** Dry
COLLAR ELEV. 180.6 ft	**TOTAL DEPTH** 6.0 ft	**NORTHING** 453,555	**EASTING** 2,029,415	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 11/21/14	**COMP. DATE** 11/21/14	**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)
185											
180	180.6	0.0	N/A	4	5	9 10 9				180.6 GROUND SURFACE	0.0
	179.6	1.0	N/A	5	5					180.3 TOPSOIL (3")	0.3
	178.6	2.0	N/A	5	5			8%		**UNDIVIDED COASTAL PLAIN**	
	177.6	3.0	N/A	4	5					BROWN/RED, SILTY SAND (A-2-4)	
	176.6	4.0	N/A	2	2	4 4		M		176.6	4.0
175	175.6	5.0	N/A	2	2					BROWN, SANDY CLAY (A-6)	
			N/A	17	17	34		M		174.6	6.0
										Boring Terminated at Elevation 174.6 ft	

Other Samples:
CBR-1 (1.0 - 2.0)

WBS N/A	**TIP** W-5519	**COUNTY** CUMBERLAND	**GEOLOGIST** PAUL, A.	
SITE DESCRIPTION I-95 BUSINESS / US-301 FROM NC 87 SOUTH TO NC 59				**GROUND WTR (ft)**
BORING NO. SR1_2102	**STATION** 21+02	**OFFSET** 2 ft RT	**ALIGNMENT** -SR1-	**0 HR.** Dry
COLLAR ELEV. 182.7 ft	**TOTAL DEPTH** 6.0 ft	**NORTHING** 453,725	**EASTING** 453,725	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER PAUL, A.	**START DATE** 11/21/14	**COMP. DATE** 11/21/14	**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)
185											
	182.7	0.0								182.7 GROUND SURFACE	0.0
	181.7	1.0	N/A	10	10			M		182.2 TOPSOIL (6")	0.5
180	180.7	2.0	N/A	11	12	20 23				181.5 **ARTIFICIAL FILL**	1.2
	179.7	3.0	N/A	3	4	7		M		BROWN, CLAYEY SAND (A-2-6)	
	178.7	4.0	N/A	4	5	9				178.2 **UNDIVIDED COASTAL PLAIN**	4.5
	177.7	5.0	N/A	10	10	20		M		TAN AND GRAY, SILTY SAND (A-2-4)	
			N/A	37	38	75				176.7 BROWN, CLAYEY SAND (A-2-6)	6.0
										Boring Terminated at Elevation 176.7 ft	

DCP TEST DATA

File Name: W-5519

Project: *G14025.00* **Date:** 30-Sep-14
Location: L_10600 **Soil Type(s):** A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	60	1
1	93	1
15	290	1
15	458	1
15	635	1
17	975	1
		1
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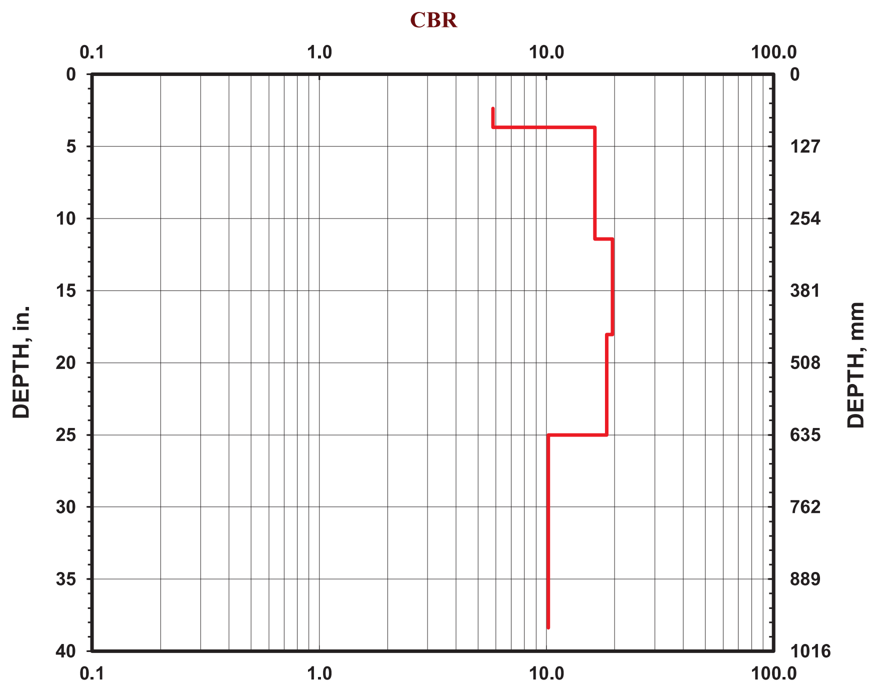

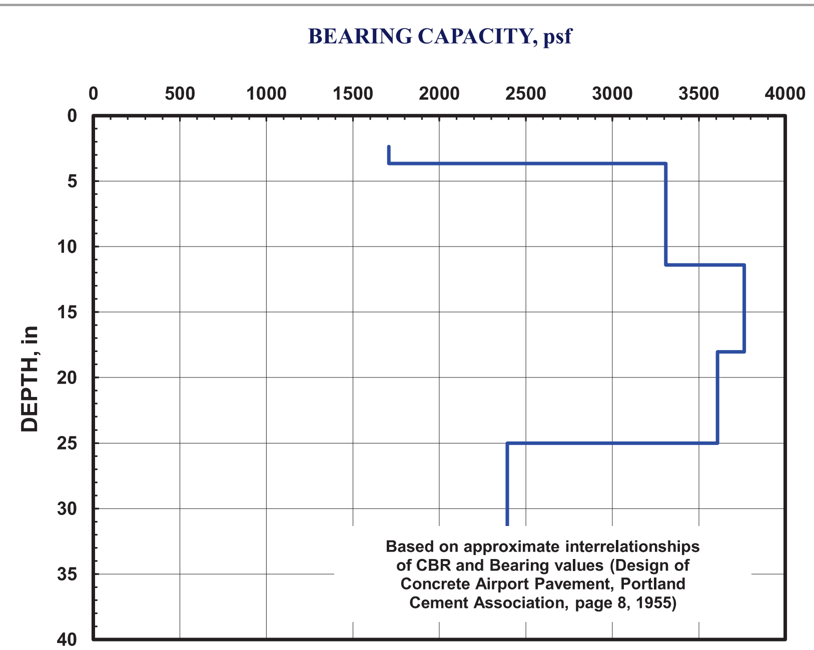

DCP TEST DATA

File Name: W-5519

Project: *G14025.00* **Date:** 30-Sep-14
Location: L_11300 **Soil Type(s):** A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	34	1
2	100	1
10	290	1
10	462	1
7	660	1
4	915	1
1	985	1
		1
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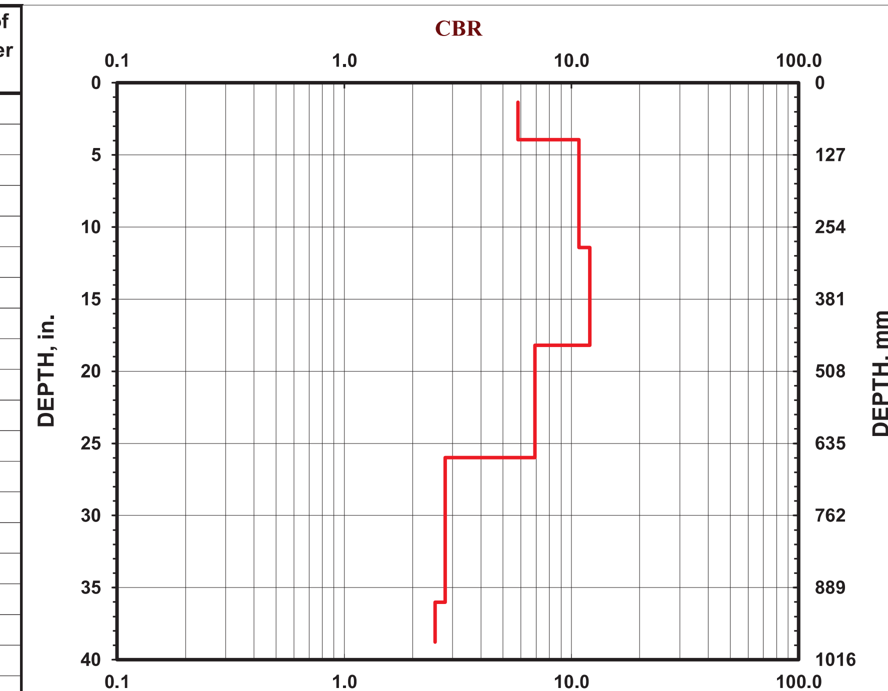

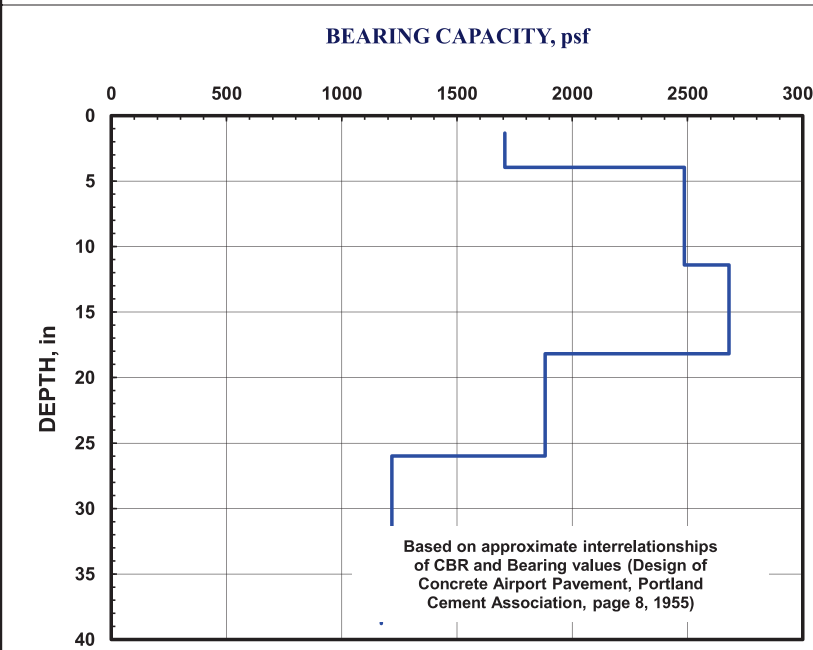

DCP TEST DATA

File Name: W-5519

Project: *G14025.00*
Date: 30-Sep-14
Location: L_11360
Soil Type(s): A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
1	68	1
5	210	1
5	336	1
5	500	1
5	663	1
5	863	1
3	987	1
		1
		1
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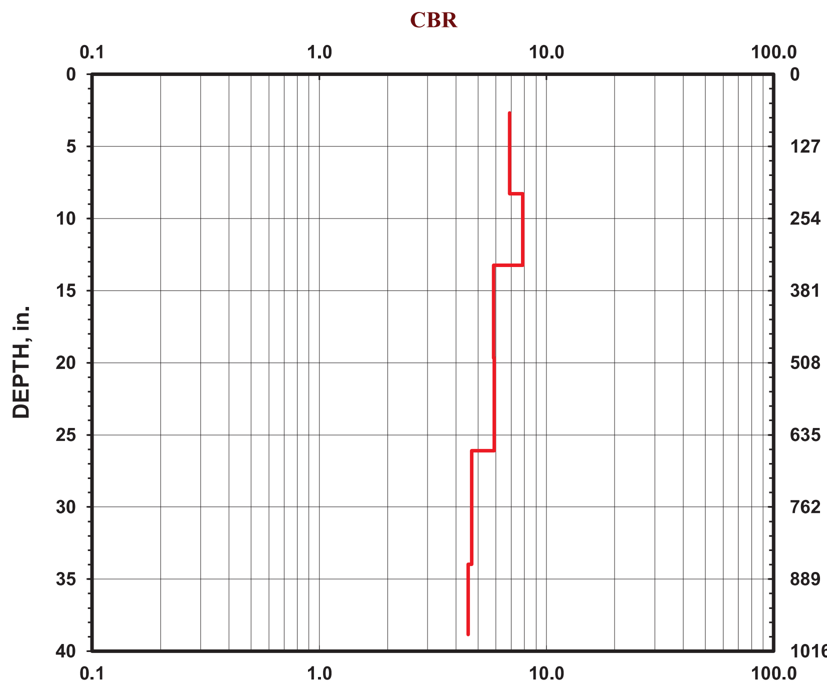

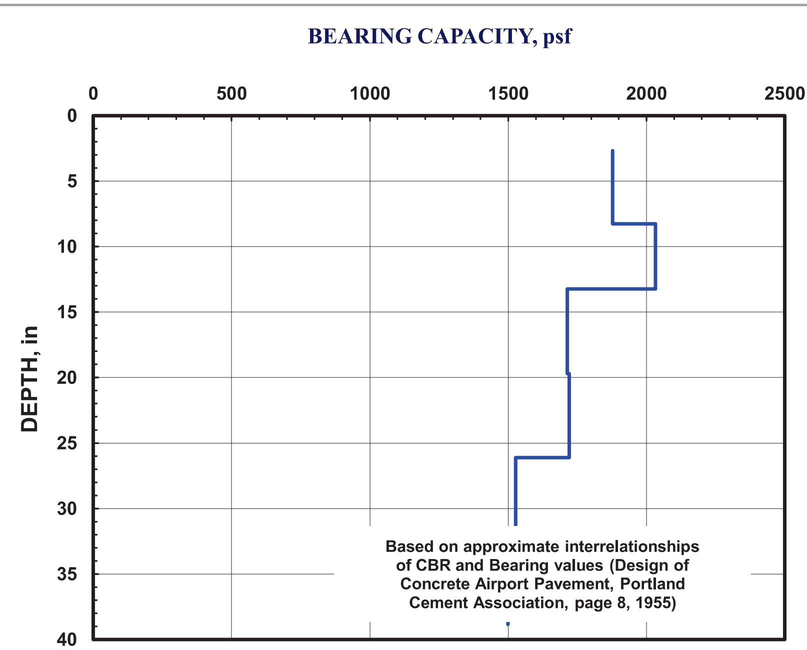

DCP TEST DATA

File Name: W-5519

Project: *G14025.00*
Date: 30-Sep-14
Location: L_12000
Soil Type(s): A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	55	1
5	160	1
5	256	1
35	720	1
12	985	1
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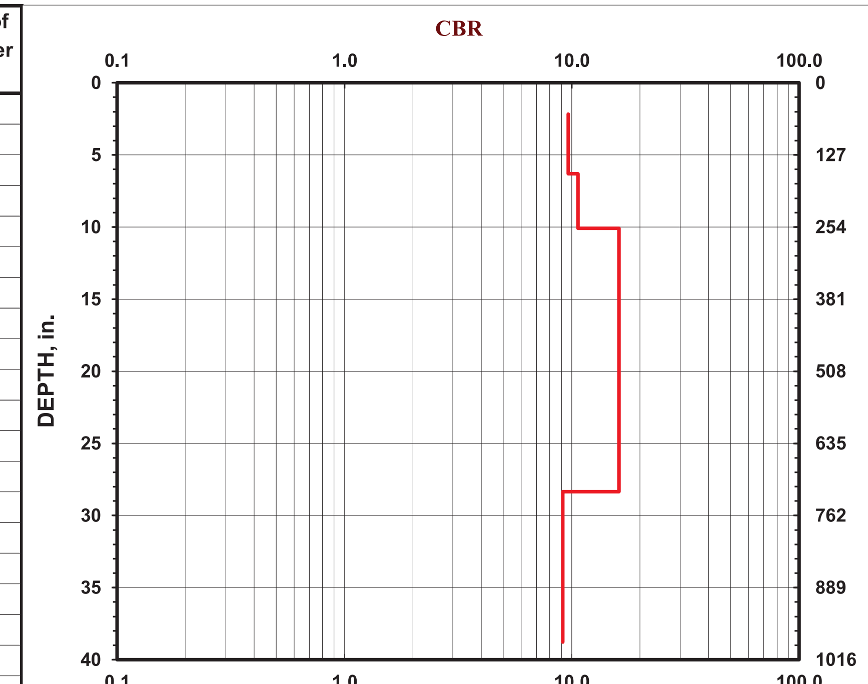

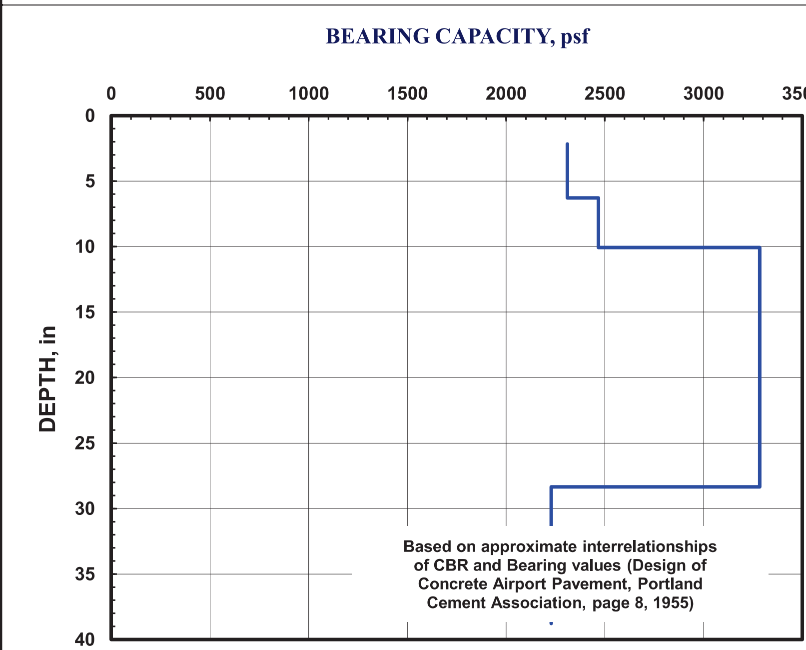

DCP TEST DATA

File Name: W-5519

Project: *G14025.00*
Location: L_13900
Date: 30-Sep-14
Soil Type(s): A-2-4

Hammer
- ○ 10,1 lbs,
- ◉ 17,6 lbs,
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	44	1
4	162	1
10	344	1
8	490	1
3	650	1
3	782	1
10	980	1
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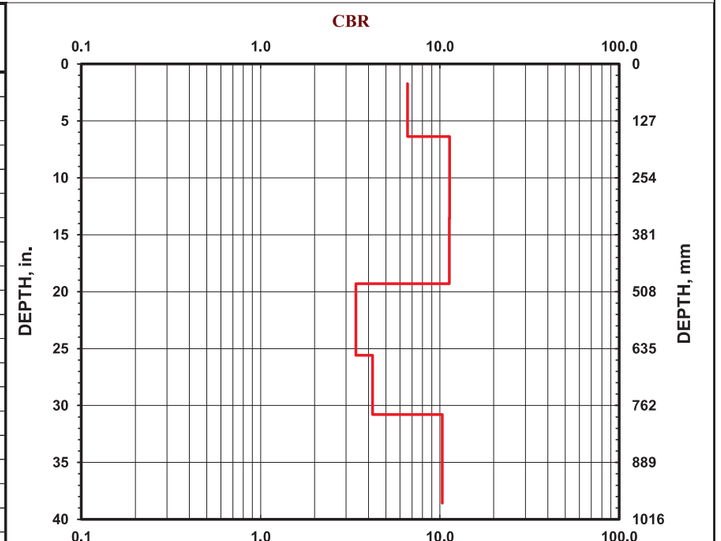

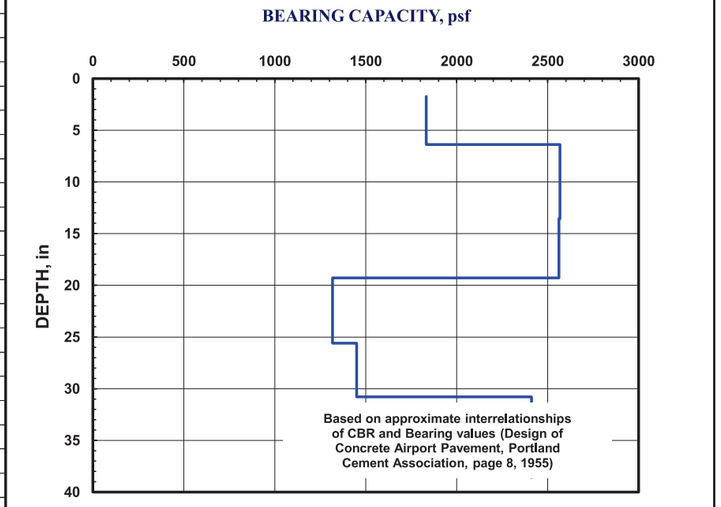

DCP TEST DATA

File Name: W-5519

Project: *G14025.00*
Location: L_14700
Date: 30-Sep-14
Soil Type(s): A-2-4

Hammer
- ○ 10,1 lbs,
- ◉ 17,6 lbs,
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	35	1
6	175	1
10	370	1
29	685	1
40	980	1
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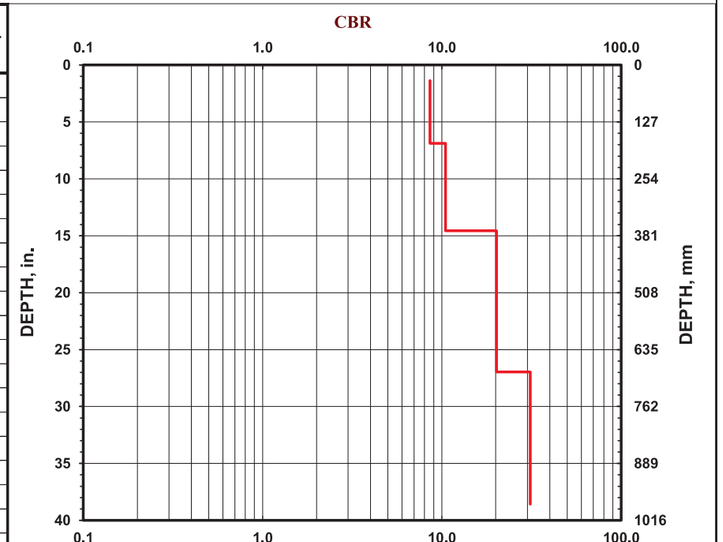

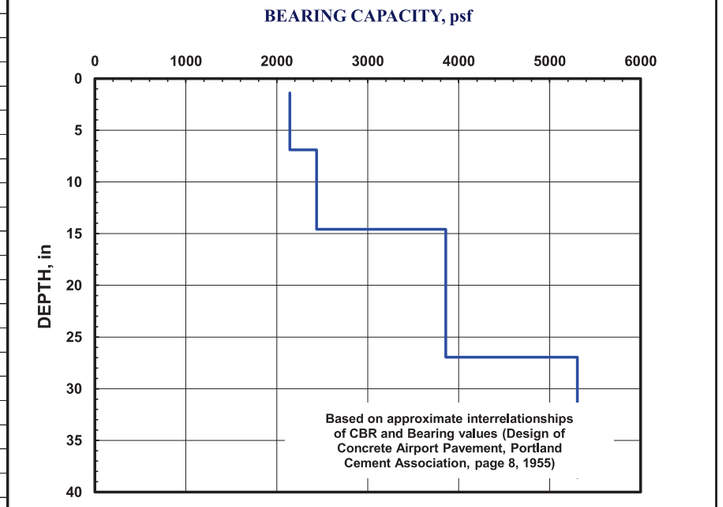

DCP TEST DATA

File Name: W-5519

Project: *G14025.00*
Date: 30-Sep-14
Location: L_20900
Soil Type(s): Type in the soil type

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	35	1
10	173	1
15	313	1
35	720	1
4	864	1
4	987	1
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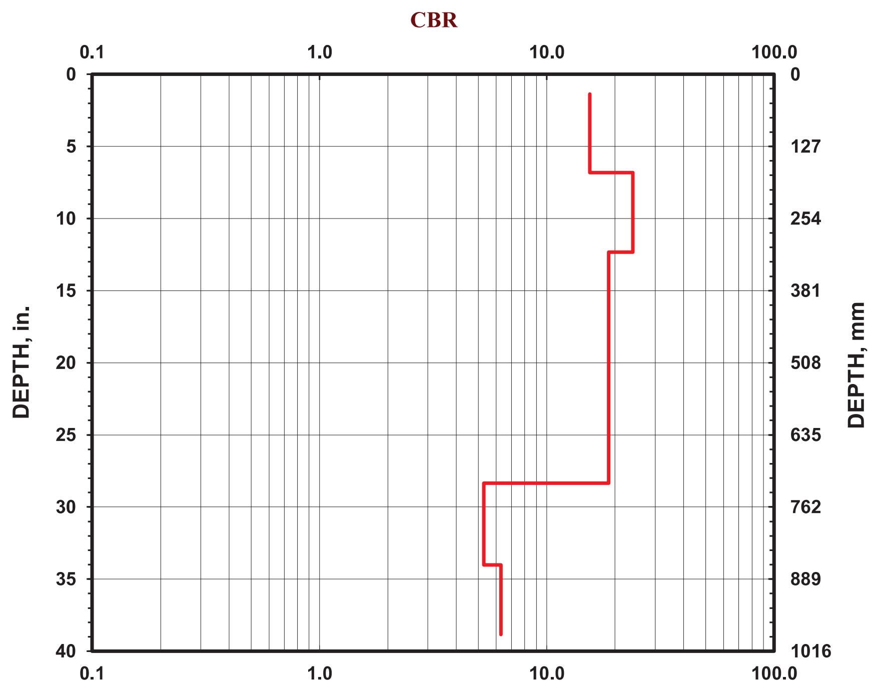

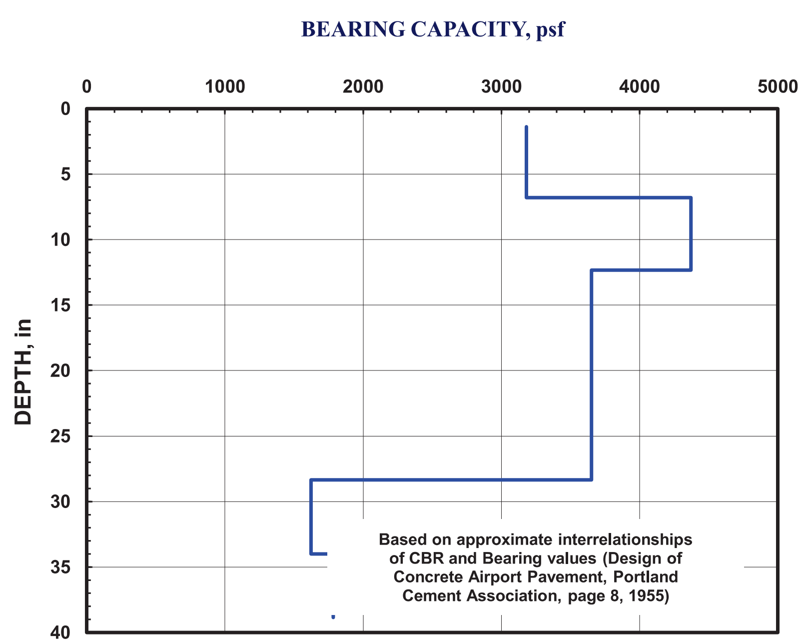

DCP TEST DATA

File Name: W-5519

Project: *G14025.00*
Date: 30-Sep-14
Location: L_21870
Soil Type(s): A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
1	35	1
5	142	1
5	217	1
10	332	1
25	763	1
8	987	1
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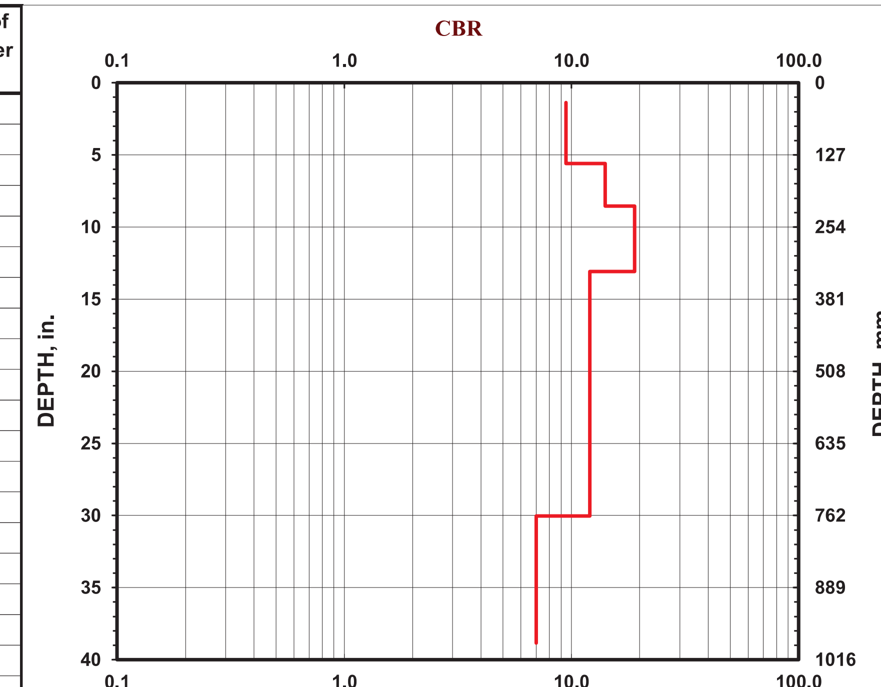

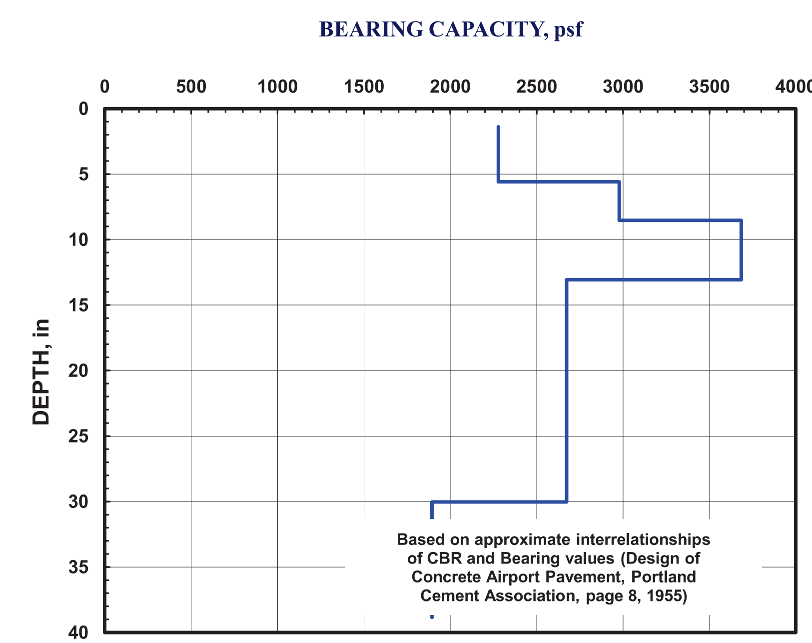

DCP TEST DATA

File Name: W-5519

Project: *G14025.00*
Date: 30-Sep-14
Location: R-15
Soil Type(s): A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
1	55	1
5	182	1
5	264	1
20	530	1
10	731	1
3	843	1
3	987	1
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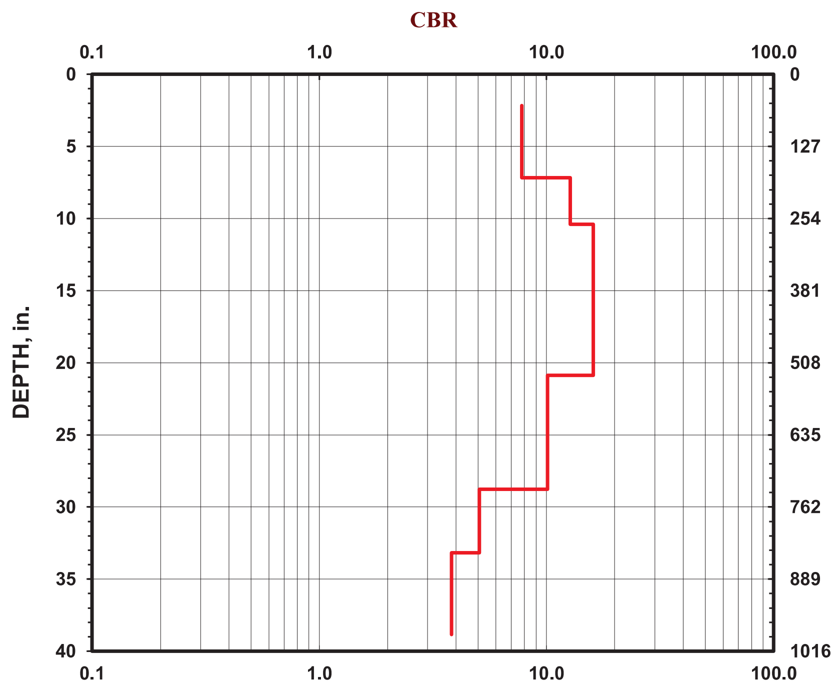

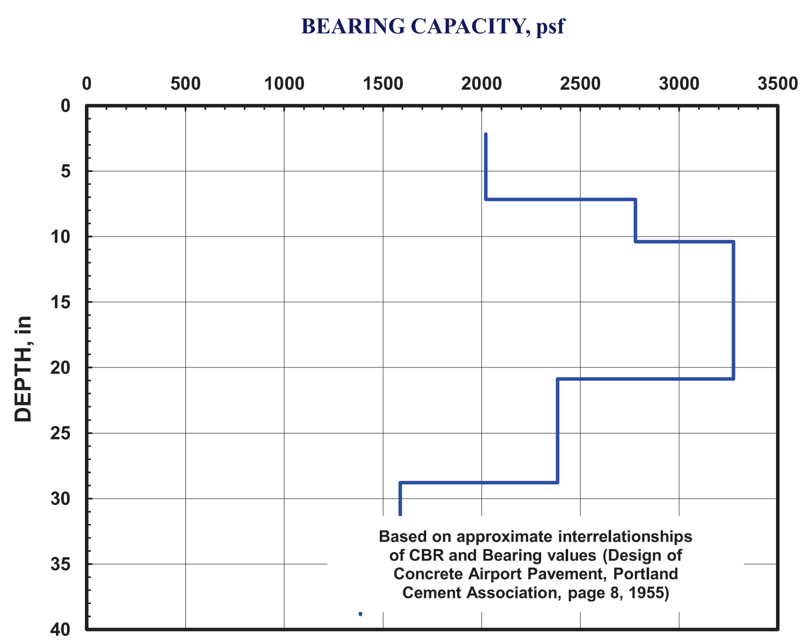

DCP TEST DATA

File Name: W-5519

Project: *G14025.00*
Date: 30-Sep-14
Location: L_23000
Soil Type(s): A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	30	1
5	124	1
5	197	1
10	318	1
15	550	1
8	740	1
1	795	1
1	872	1
1	940	1
1	987	1
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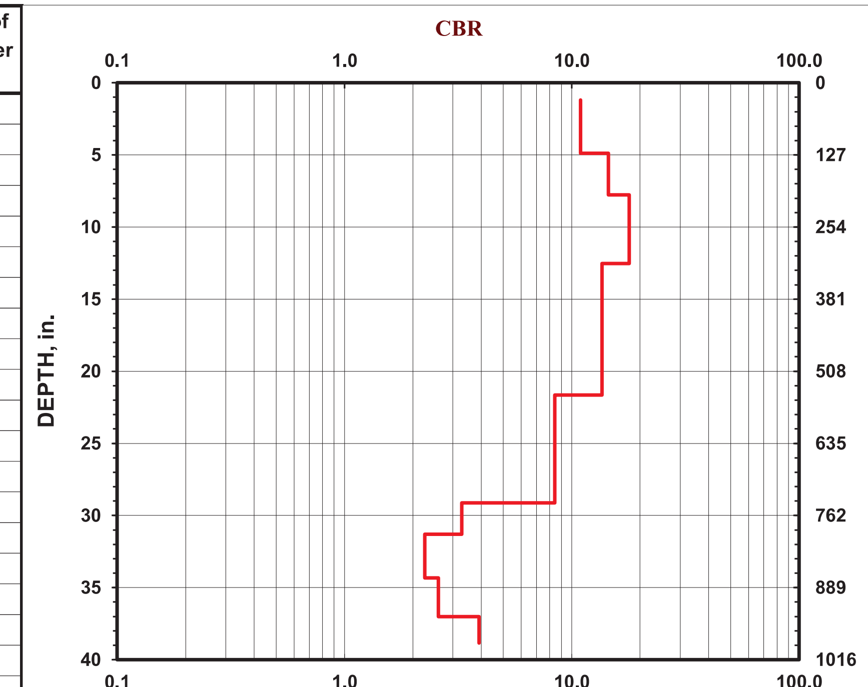

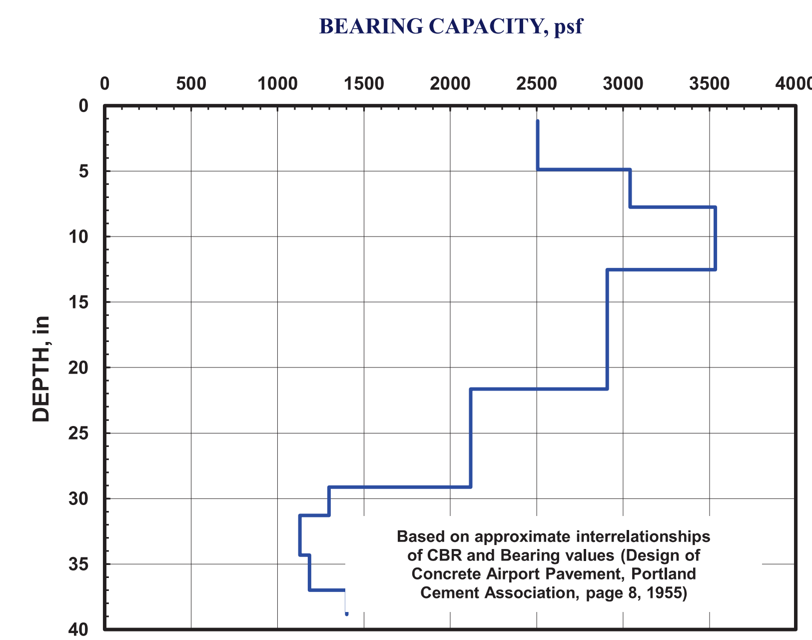

DCP TEST DATA

File Name: W-5519

Project: *G14025.00* **Date:** 30-Sep-14
Location: L_24270 **Soil Type(s):** A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	32	1
3	115	1
10	288	1
15	430	1
30	677	1
19	987	1
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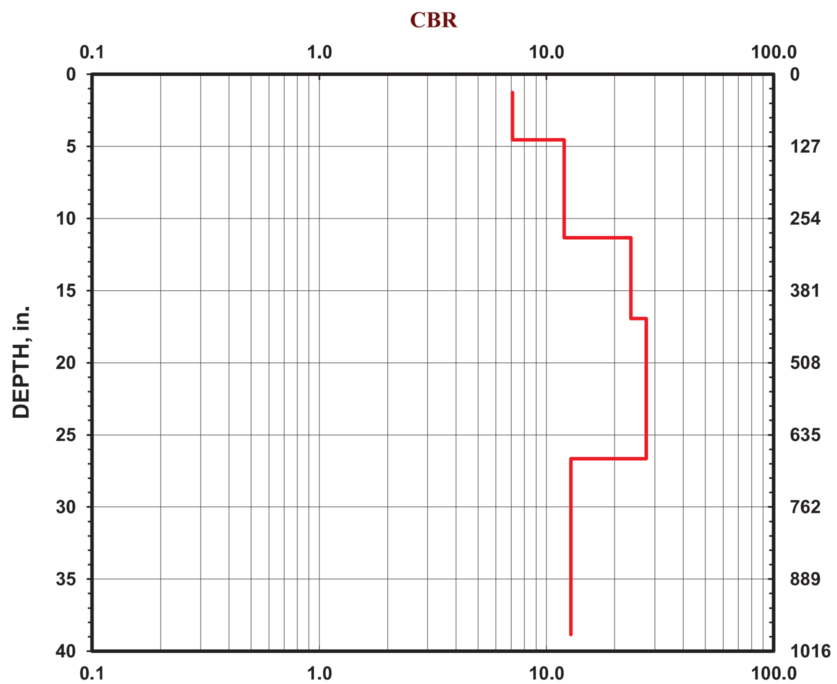

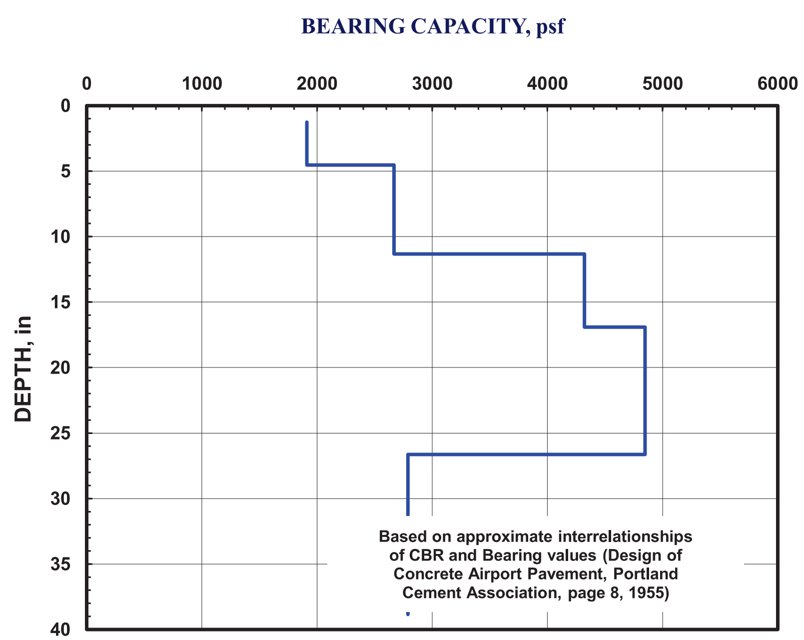

DCP TEST DATA

File Name: W-5519

Project: *G14025.00* **Date:** 30-Sep-14
Location: L_24900 **Soil Type(s):** A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	43	1
7	221	1
11	388	1
25	644	1
11	965	1
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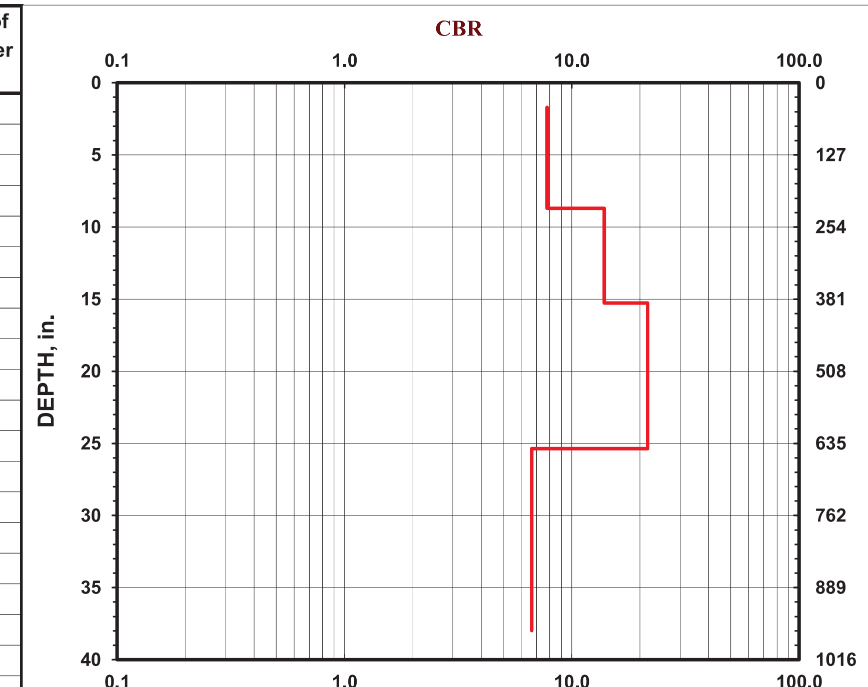

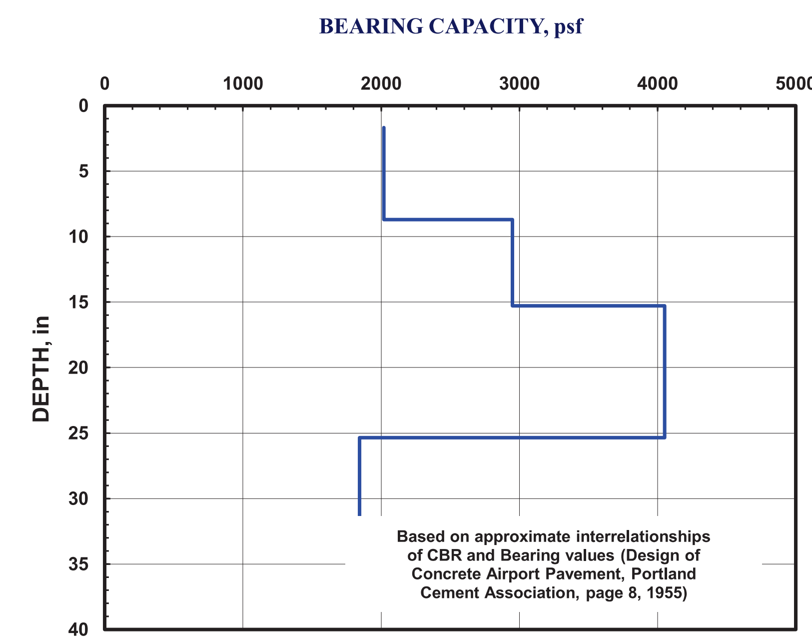

DCP TEST DATA

File Name: W-5519

Project: *G14025.00*
Location: L_26200
Date: 30-Sep-14
Soil Type(s): A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
1	76	1
3	165	1
5	260	1
10	368	1
17	590	1
5	764	1
5	970	1
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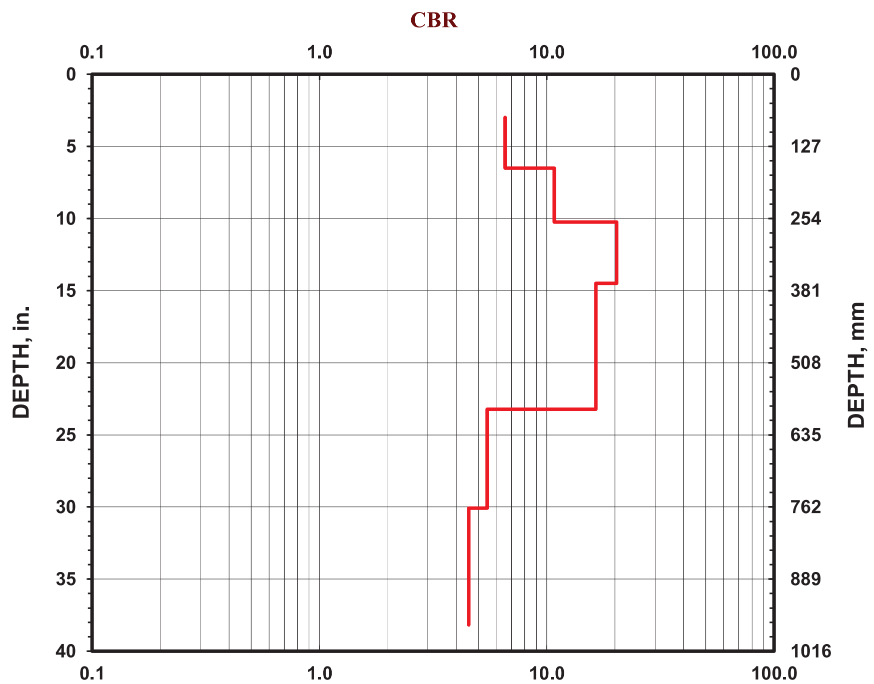

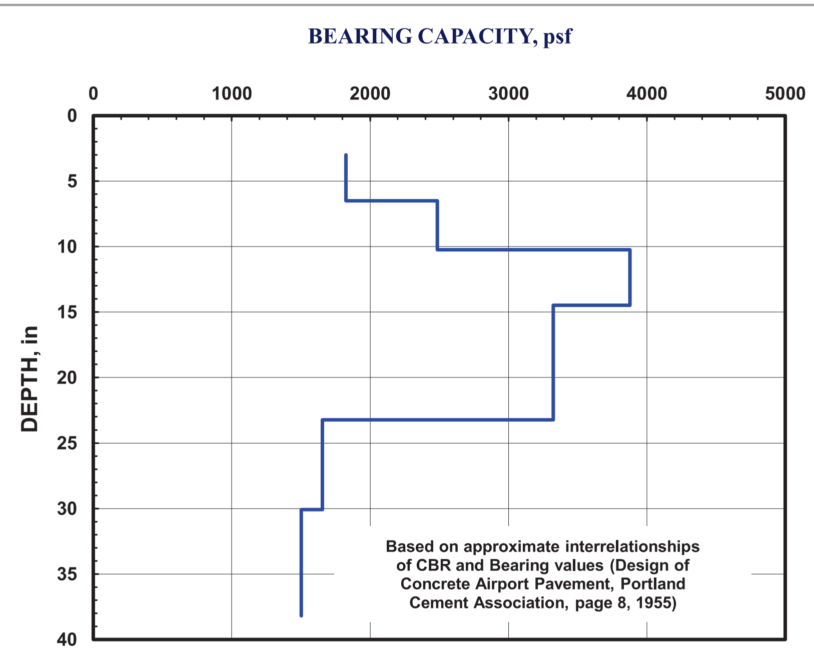

DCP TEST DATA

File Name: W-5519

Project: *G14025.00*
Location: L_26800
Date: 30-Sep-14
Soil Type(s): A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	30	1
7	214	1
5	295	1
11	414	1
11	585	1
14	987	1
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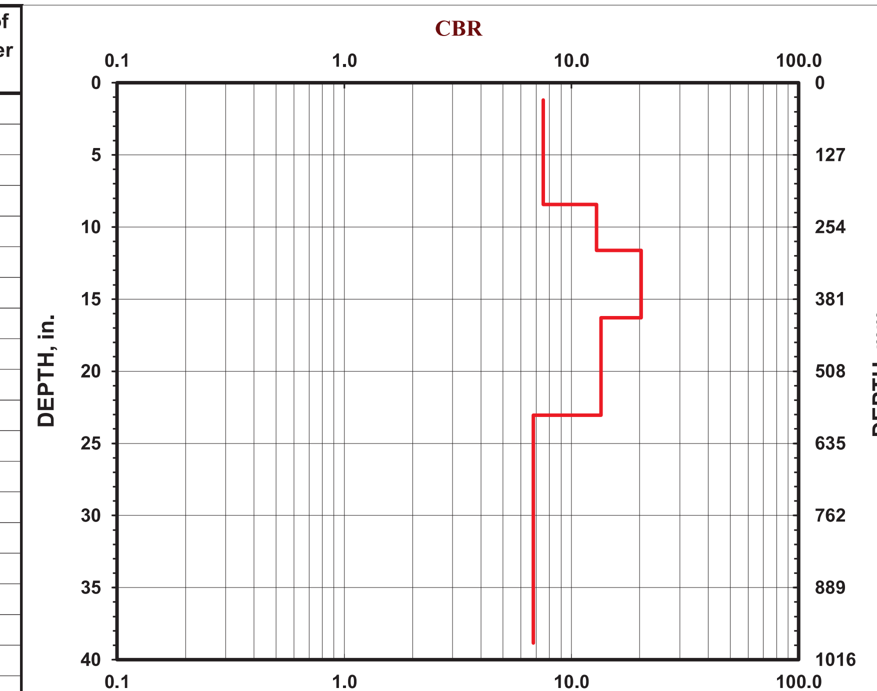

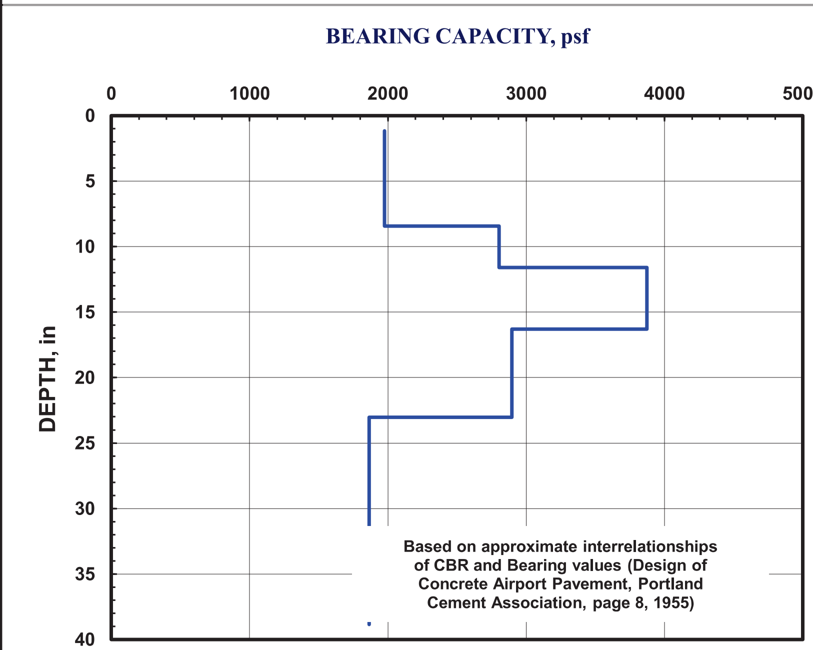

DCP TEST DATA

File Name: W-5519

Project: *G14025.00**Date:** 30-Sep-14
Location: L_32200**Soil Type(s):** A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	40	1
10	297	1
7	390	1
25	583	1
30	985	1
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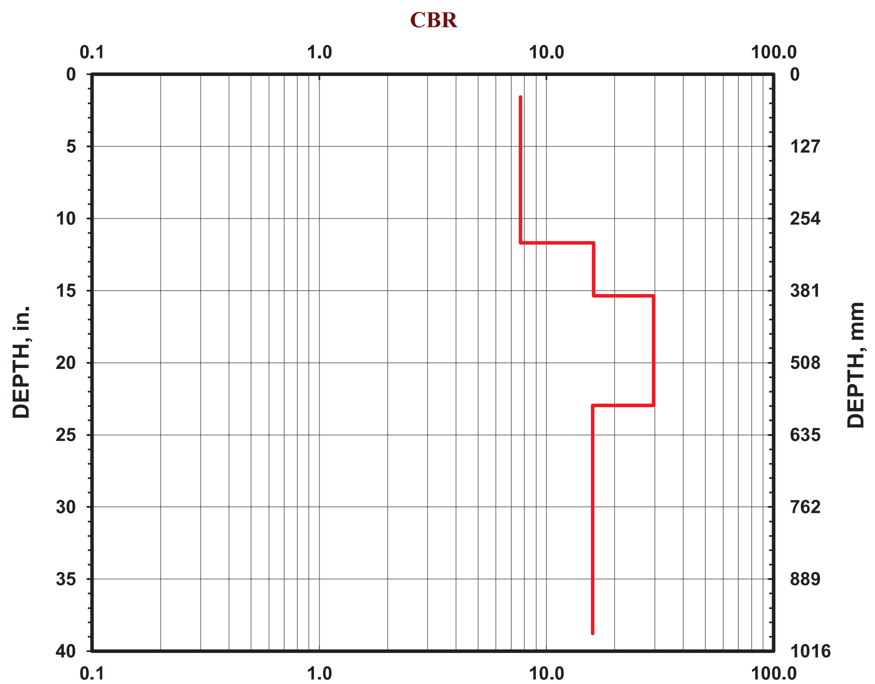

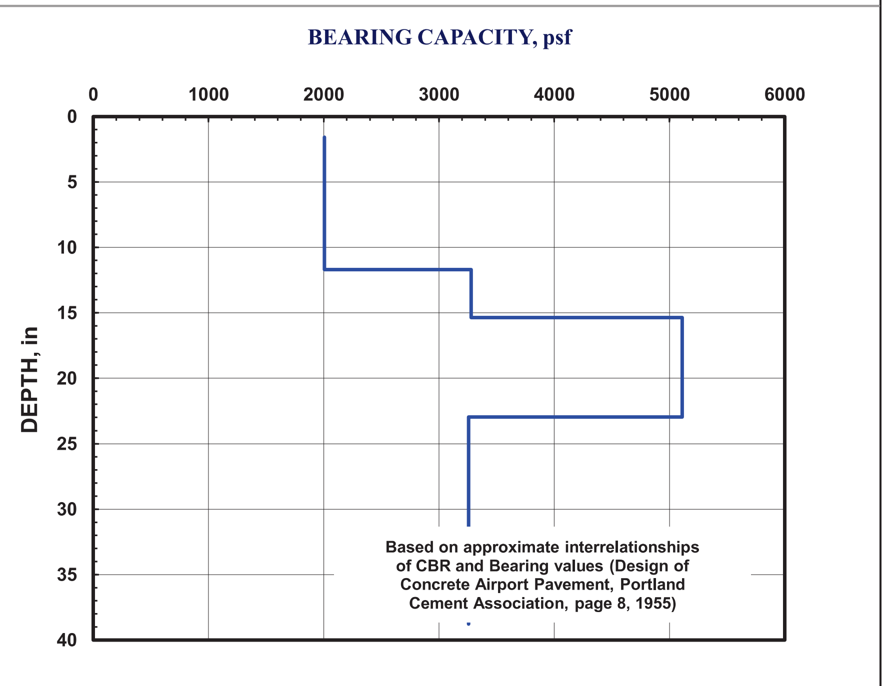

DCP TEST DATA

File Name: W-5519

Project: *G14025.00**Date:** 30-Sep-14
Location: L_36000**Soil Type(s):** A-2-4

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ◉ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
2	45	1
5	185	1
5	308	1
5	410	1
5	465	1
5	623	1
10	830	1
5	985	1
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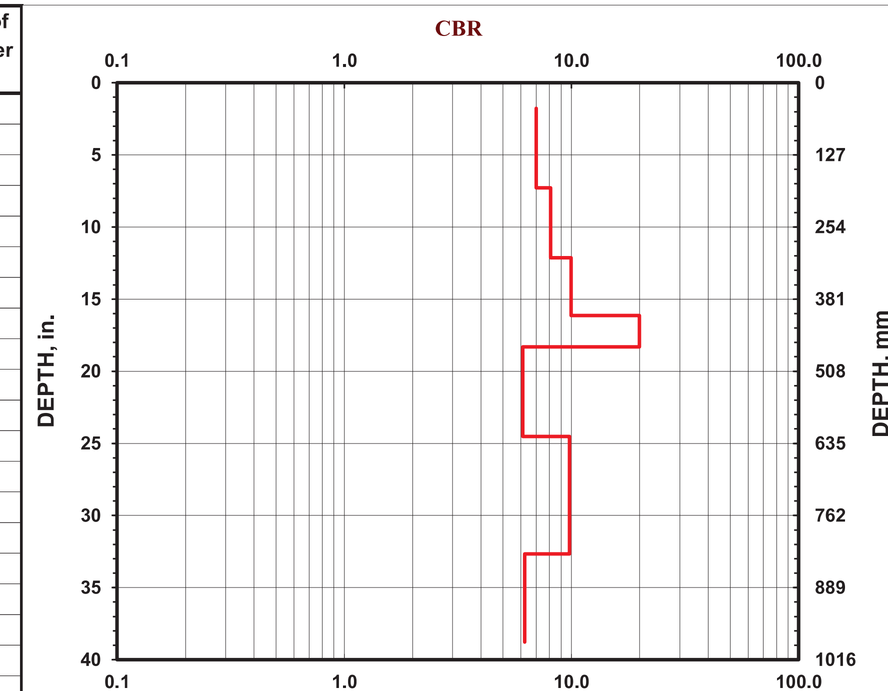

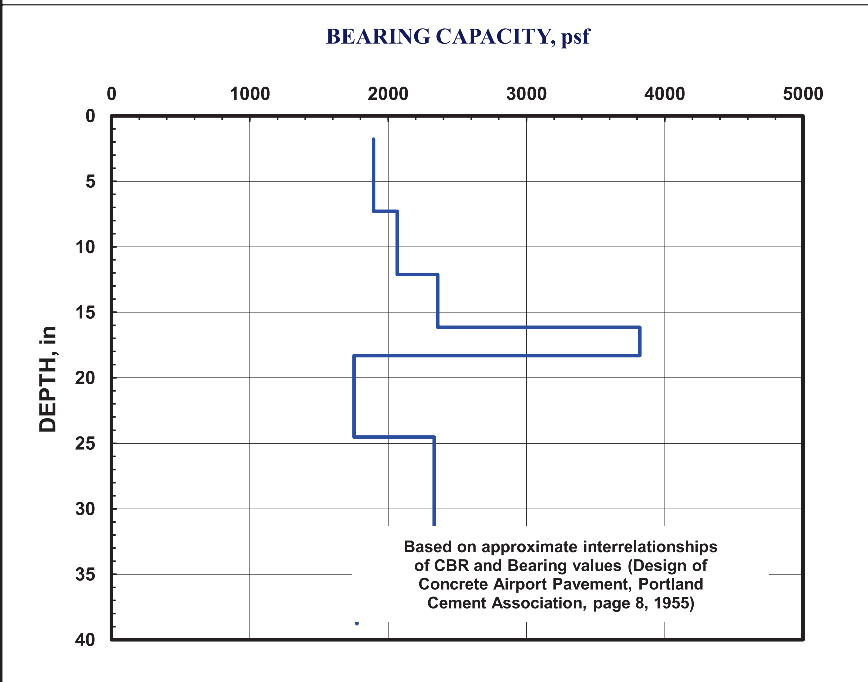

DCP TEST DATA

File Name: W-5519

Project: *G14025.00**Date:** 30-Sep-14
Location: L_40000**Soil Type(s):** A-2-4

Hammer
- ○ 10.1 lbs.
- ● 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ○ CL
- ● All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	36	1
2	132	1
6	226	1
8	292	1
8	357	1
22	580	1
9	791	1
4	968	1
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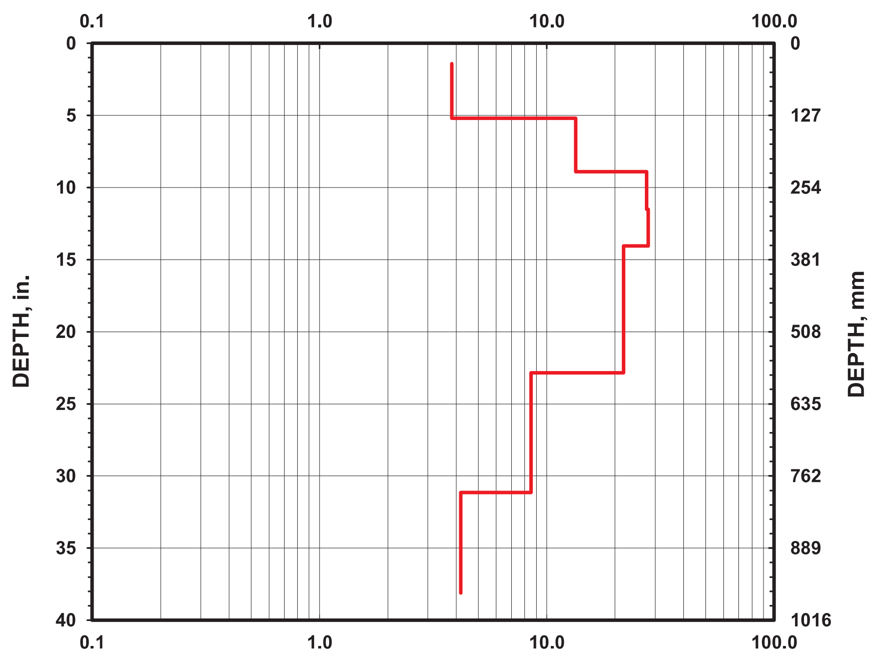
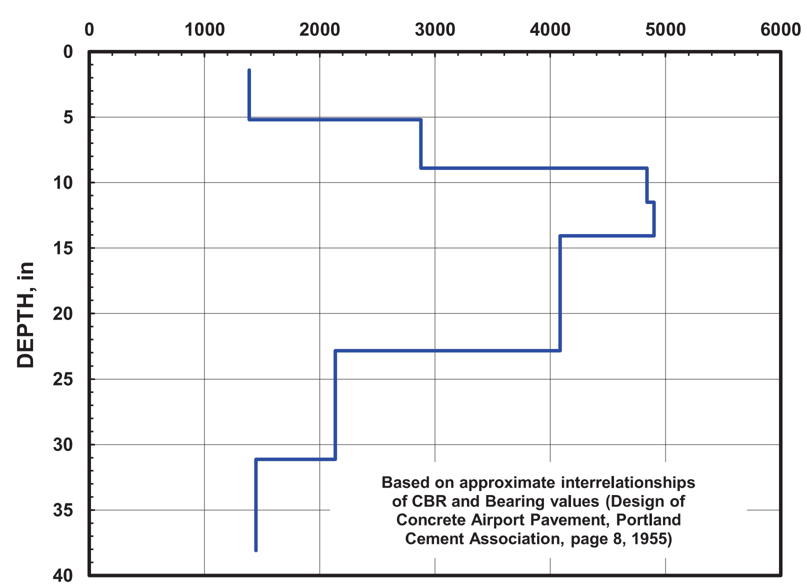


BEARING CAPACITY, psf



FALCON 1210 TRINITY ROAD, SUITE 110, RALEIGH, NORTH CAROLINA 27607

AASHTO SOIL CLASSIFICATION AND GRADATION SHEET

I-95 BUSINESS / US 301 FROM NC 87 SOUTH TO NC 59

TIP: W-5519

CUMBERLAND COUNTY, NORTH CAROLINA

FALCON ENGINEERING, INC. PROJECT NO: G14025.00

BORING		SAMPLE	TOTAL SAMPLE			Atterberg Limit Test Results			Natural Moisture Content	Organic Content	Corrected CBR @ 0.1"	Optimum Water Content	Max. Dry Density
AASHTO Classification			PERCENT PASSING										
STATION	OFFSET (FEET)	DEPTH (FEET)	#10	#40	#200	LL	PL	PI	%	%		%	PCF
L_11360		S-1	99	66	35	51	26	25	21.7	-	-	-	-
A-2-7(3)													
113+60	50' RT	2.2-3.0											
L_13900		S-2	99	78	63	53	25	28	25.4	-	-	-	-
A-7-6(16)													
139+00	CL	2.0-3.0											
L_23000		S-3	100	68	24	17	11	6	9.5	-	-	-	-
A-2-4(0)													
230+00	CL	1.4-3.0											
L_26200		S-4	99	79	57	57	26	31	27.6	-	-	-	-
A-7-6(15)													
262+00	CL	1.8-3.0											
L_28000		S-5	99	68	15	16	0	NP	9.3	-	-	-	-
A-2-4(0)													
280+00	CL	0.3-2.0											
SR_1902		BS-1	100	81	18	15	0	NP	7.9	-	21.0	11.3	120.0
A-2-4(0)													
19+00	CL	0.3-3.0											

SIGNATURE

105-03-0803

Notes:
LL = Liquid limit
PL = Plastic limit
PI = Plasticity index = LL - PL

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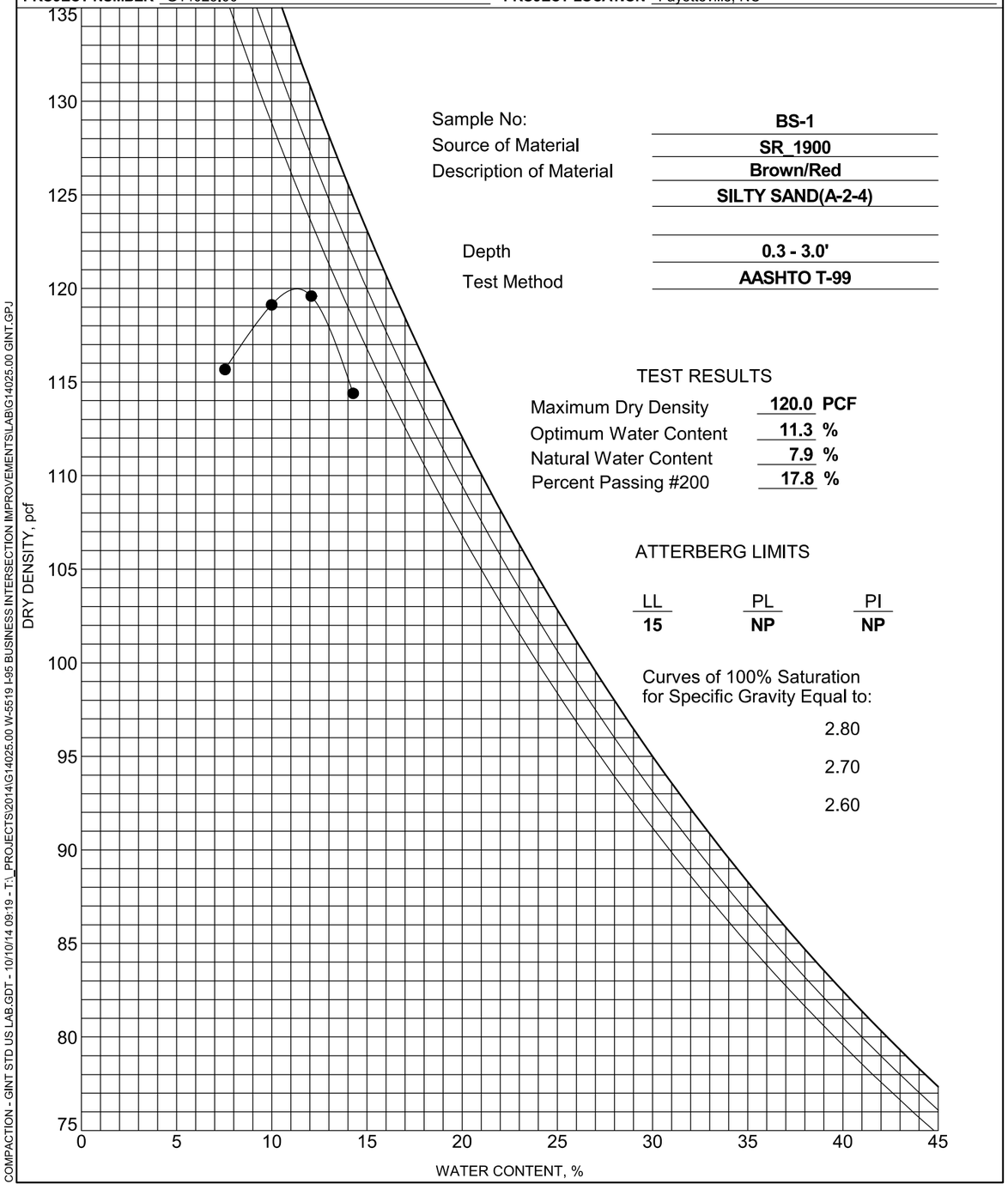
1210 Trinity Rd., Suite 110
Raleigh, NC 27607
Telephone: (919) 871-0800
Fax: (919) 871-0803

MOISTURE-DENSITY RELATIONSHIP

CLIENT Moffat & Nichol **PROJECT NAME** W5519 I-95 Business Intersection Improvements

PROJECT NUMBER G14025.00 **PROJECT LOCATION** Fayetteville, NC



Sample No:	BS-1
Source of Material	SR_1900
Description of Material	Brown/Red SILTY SAND(A-2-4)
Depth	0.3 - 3.0'
Test Method	AASHTO T-99

TEST RESULTS

Maximum Dry Density	120.0	PCF
Optimum Water Content	11.3	%
Natural Water Content	7.9	%
Percent Passing #200	17.8	%

ATTERBERG LIMITS

LL	PL	PI
15	NP	NP

Curves of 100% Saturation for Specific Gravity Equal to:

2.80

2.70

2.60

COMPACTION - GINT STD US LAB.GDT - 10/10/14 09:19 - T:_PROJECTS\2014\G14025.00 W-5519 I-95 BUSINESS INTERSECTION IMPROVEMENTS\LAB\G14025.00 GINT.GPJ

FALCON ENGINEERING 1210 TRINITY RD., SUITE 110, RALEIGH, NC 27607

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T-193 \ ASTM D-1883

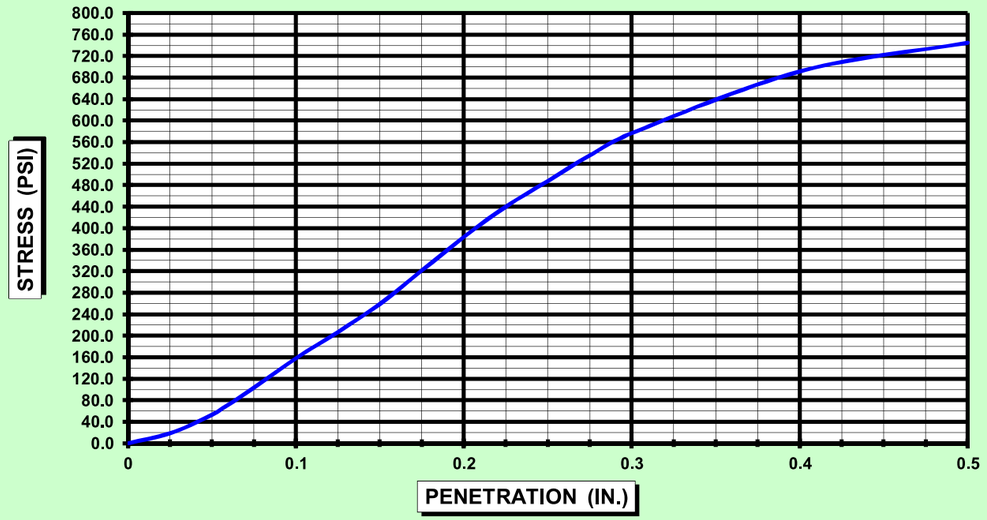
PROJECT #:	G14025.00	DATE:	10/13/2014
PROJECT NAME:	W5519 I-95 Business Intersection Improvements		
BORING:	SR_1900 SAMPLE: BS-1	DEPTH:	0.3-3.0

SOIL DESCRIPTION: Brown/Red SILTY SAND (A-2-4)

COMPACTION METHOD	AASHTO T-99	SOAK	96 HRS.
MAXIMUM DRY DENSITY	120.0 PCF	STRAIN RATE	.05 IN / MIN.
OPTIMUM MOISTURE CONTENT	11.3%	LOAD CELL	2500lb
TEST DATA		SURCHARGE WEIGHT	10 lb.
DRY DENSITY	116.8 PCF	SURCHARGE PER SQUARE FOOT	51 lbs/sq.ft.
MOISTURE CONTENT	11.3%	FINAL MOISTURE CONTENT	N/A
PERCENT COMPACTION	97.3%	SWELL	-0.02%

	ACTUAL	CORRECTED
CBR VALUE AT .1"	15.8	21.0
CBR VALUE AT .2"	25.6	29.3

STRESS-PENETRATION CURVE



LIQUID LIMIT	15	PLASTIC LIMIT	NP	PLASTIC INDEX	NP
Percent Passing #200 Sieve = 17.8%		Natural Moisture Content = 7.9%			